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## **FOREWORD**

Presented number of Silesian University of Technology. Scientific Papers. Organization and Management Series. Contemporary management. Presented papers contain result of researches conducted by various universities from Poland. The number consists of 40 papers.

The papers presented in the number concentrate on many topics connected with organization and management. There are in the number papers about: economics, human resource management, quality management, project management, management methods, crisis management, innovation management, logistics, impact of COVID-19 pandemic on management, leadership, production management, business ethic, Smart City, public management, Industry 4.0 and business analytics.

*Radosław Wolniak*





## STRUCTURED INVOICES AS AN EXAMPLE OF TAX DIGITIZATION – BENEFITS AND CHALLENGES FOR ENTREPRENEURS

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**Purpose:** For many years, the progressing process of tax digitization has been observed. This facilitates tax audits and increases their effectiveness. While private individuals may voluntarily choose to contact the tax office using digital tools, entrepreneurs are obliged to use the introduced digital solutions. In this paper, an attempt has been made to synthetically present and summarize the reasons for introducing and the impact of new technologies on running a business in Poland. The aim of the considerations undertaken in the paper is the KSeF analysis and indicating its impact on the functioning of enterprises.

**Design/methodology/approach:** To achieve the presented objective, studies of the literature of the subject and the content of legal acts concerning the analyzed field were used. The authors presented the essence of tax digitization and made an assessment from the point of view of their impact on Polish entrepreneurs. A survey was also conducted among entrepreneurs in the Silesian Voivodeship. Its aim was to get to know the state of knowledge and opinions of entrepreneurs associated with KSeF. Research methodology - a questionnaire was used. The study was conducted in the period from 9 to 30 July 2023. A statistical analysis was also carried out. Due to the scale used in the questionnaire, the correlation measures - Spearman and Fi-Youl coefficient and the corresponding significance tests - were selected as the appropriate statistical analysis tool.

**Findings:** The result of the conducted research should be used to identify the consequences and effectiveness of the KSeF, as well as to indicate the way to prepare for the planned changes. The digitization of VAT means new obligations for the entrepreneur, but also reduces the tax gap.

**Research limitations/implications:** The verification of empirical data on the analyzed research problem was based on the use of available data on the digitization of taxes in Poland. Tax regulations from the last few years were analyzed. Their analysis confirmed the ongoing process of tax digitization, as exemplified by the National System of e-Invoices (KSeF), which affects the conduct of business in Poland.

**Practical implications:** The results of the survey prove that entrepreneurs have little knowledge about the KSeF. They also show great fears related to the new obligation, and above all, the adaptation of digital tools to the new requirements.

**Originality/value:** The technological revolution in the field of taxes brings new obligations, but also improves the fight against tax fraud and reduces the tax gap. Enterprises are faced with the need to constantly adapt to the changes that are being introduced in order to reduce tax fraud

and make it easier for Polish taxpayers to control transactions. The presented research and conclusions will be a practical guide for entrepreneurs regarding digitization in the field of taxes, especially in the context of new obligations related to issuing invoices using the KseF. The considerations contained in the work are an innovative introduction to the analysis of the new reality of the tax system, in particular VAT.

**Keywords:** digitization, tax digitization, tax gap, KSeF.

**Category of the paper:** research paper.

## 1. Introduction

Tax issues have been of interest to both theoreticians and practitioners of economics for a long time. An efficient and effective tax system of the state ensures a constant inflow of funds to finance budget expenditures.

Existing information limitations determine the possibilities of tax avoidance and evasion, therefore, in order to seal the tax system, measures are taken to build an effective control and data analysis system. These activities mainly concern the tax on goods and services (VAT). Complicated and extensive tax regulations and information deficits, as well as the problem with the control of settlements between taxpayers made the VAT gap a significant problem (Murphy, 2019). The area of the tax system that has been digitized the most so far is the tax on goods and services. The digitization of VAT is primarily aimed at preventing tax evasion and thus reducing the VAT gap. In accordance with this, the government has undertaken a number of activities aimed at building an effective system of control and management in the field of tax on goods and services. (Kowal, Lichota, 2020).

For many years, we have been able to observe the process of changing the way of communication with the taxpayer, from traditional, i.e. personal contact, to contact using electronic means of communication. In the Polish literature of the subject, the essence of tax digitization and the impact of this process on the state budget, as well as running a business, is still a relatively rare phenomenon.

For several years, the progressing process of digitization of tax reporting in Poland has been observed. This is not surprising because electronic reporting allows tax authorities to carry out more effective checks. This leads to a tightening of the tax system.

A manifestation of tax digitization are specific tools dedicated to entrepreneurs. New obligations have been imposed on taxpayers, e.g. implementation of JPK (SAFT), MDR files or e-financial statements. The next stage of digitization in the field of taxes is the National e-Invoice System (KseF) (Szymanek, 2022).

The research problem of the paper is: Will structured invoices affect the conduct of business in Poland?

The aim of the considerations undertaken in the study is to analyze the KSeF implementation process and to indicate its impact on the functioning of enterprises.

For the purposes of this study, the following research hypothesis was formulated:

*The National e-Invoice System (KseF) increases the obligations imposed on entrepreneurs.*

The following data sources were used in the work:

- Polish and foreign literature,
- a survey questionnaire conducted among entrepreneurs.

## 2. Tax digitization

The breakthrough moment for the digitization of taxes was the introduction of the Standard Audit File-Tax (SAF-T; pol. JPK) in 2016. Since then, there has been a clear progress in the use of digital technologies in all areas of government administration. This phenomenon is also visible in the area of taxes. The obligatory character of most introduced solutions in the field of taxes determines the dynamic development of digitization of the tax administration.

Tax authorities supervise taxpayers through tax audits. One of the forms of supervision is the control of data sent to tax offices. Initially, this data was submitted in paper form, however, traditional tax reporting has been widely criticized because of its inefficiency (Bozanić, Dorsmith, Huddarta, 2012) or complexity (Chen, 2012). As a result of actions aimed at sealing the tax system, a number of organizational, technical and documentation solutions were introduced, for example: on-line cash registers, STIR, JPK\_VAT or KSeF.

There is a need to distinguish the optional use of technology in tax settlement by taxpayers who want to simplify and automate processes in the enterprise from the obligatory use of technology as a result of changes in tax law. Until mid-2016, the automation of the tax settlement process was mainly used in large companies. Its use by taxpayers was not really required. The situation changed with the introduction of the obligation to send JPK\_VAT files electronically.

Digitization can help to alleviate information limitations regarding entrepreneurs' economic activities through (Jacobs, 2017):

- the possibility of reducing the tax gap through more efficient tax audits,
- implementing more sophisticated tax systems.

It is recognized that two groups of factors contributed to the digital revolution in taxes (Fornalik, Ziętek, 2019):

1. Technological factors that involve the optional use of digital tools that can be distinguished as:
  - technological advancement,
  - the need for fast and detailed analysis- "big data",
  - increase in labor costs,
  - developing infrastructure and increased opportunities to implement new technologies.
2. Pro-fiscal factors that are associated with the mandatory use of technology for tax settlement. In this group are:
  - the need to tighten the tax system,
  - transparency of tax settlements,
  - ensuring full transparency of the taxpayer's activities,
  - increasing the effectiveness of tax audits through automation,
  - preventing events that have a negative impact on the public finances,
  - reducing the costs of functioning of the tax administration,
  - the possibility of cross-verification of B2B transactions.

The main reason for the development of the technology used in data processing is the growing requirements of tax authorities around the world, forcing a wider range of reported data and presentation methods. Technological progress is of interest to legislators in many countries. New digital tools are relevant for the 21st century (Hrabcak, Popovic, 2020).

Digitization affects the economy of individual countries. The digitization process is beneficial for tax authorities, as it contributes to the increase in the efficiency of tax collection, allows for faster detection of tax fraud, and also allows the tax office to access more and more data about taxpayers. For entrepreneurs it means greater responsibilities to meet new challenges. The use of digital technologies makes it possible to reduce the tax gap and thus increase state revenues (Kitsios, Jalles, Verdier, 2020).

### **3. Digital tools used in the tax on goods and services**

VAT has the largest share in the state budget revenue (see Table 1). When analyzing the year 2022, it should be noted that the amount of VAT revenue is affected by the reduction of VAT rates on food and energy products under the anti-inflation shields. Also, the new digital tools introduced to tighten the tax system have a significant impact on the level of state budget revenue (Report on the implementation of the state budget, 2023).

**Table 1.**  
*Sources of state revenue in 2022*

	<b>Act (PLN thousand)</b>	<b>Implementation (PLN thousand)</b>
<b>Total revenue</b>	<b>491.936.950</b>	<b>504.820.801</b>
<b>Tax and non-tax revenue</b>	<b>489.088.458</b>	<b>502.238.455</b>
<b>Tax revenue</b>	<b>453.791.261</b>	<b>465.456.109</b>
1. indirect taxes	319.784.861	314.049.712
a) tax on good and services	237.412.161	230.390.544
b) excise duty	79.072.700	79.773.438
c) gaming tax	3.300.000	3.885.730
2. Corporate Income Tax	53.896.400	70.136.603
3. Personal Income Tax	69.410.000	68.107.159
4. Tax on the extraction of certain minerals	2.600.000	3.786.792
Tax on certain financial institutions	5.400.000	6.078.931
5. Retail tax	2.700.000	3.296.914
6. Other tax revenue	0	0
<b>Non-tax revenue</b>	<b>35.297.197</b>	<b>36.782.345</b>
1. Dividends and profit payments	898.701	1.679.683
2. Payments from NBP profit	844.455	844.455
3. Duty	6.283.000	8.271.573
4. Revenue of state budgetary units and other non-tax revenue	23.820.381	22.535.767
5. Payments made by local government units	3.450.660	3.450.867
<b>Non-refundable funds from the European Union and other sources</b>	<b>2.848.492</b>	<b>2.582.347</b>

Source: Report on the discussion of the state budget for the period from 1 January 2022 to 31 December 2023. Discussion, Council of Ministers, Warsaw 2023, p. 68.

Based on the structure of state budget revenues, it can be seen that taxes play a leading role in the state budget revenues. Revenues from VAT and excise duties account for about 3/5 of the total budget revenue.

Goods and services tax functions in almost all economies of the world - in over 168 countries and dependent territories (OECD, 2008). The concept of value added tax developed by Maurice Lauré was implemented by the French legislature in 1954 (Kopeć, 2020). Then the idea of this tax began to be introduced into the legislation of other countries of the then EEC.

The main characteristics of VAT are as follows (Council Directive 2006/112/WE, 2006):

- consumption tax, indirect, multi-stage,
- has a price-setting nature,
- burdens the consumer,
- is deductible and refundable,
- proportional - is exactly proportional to the price,
- universal – the turnover of each good and service is subject to taxation,
- is neutral for the entrepreneur.

The tax on goods and services was introduced in Poland in 1993. VAT is the main source of budget revenue. Until 2016, only temporary instruments were used in Poland, which, however, did not result in reducing the tax gap. Since 2016 that solutions aimed at creating

an effective control system have begun to be introduced. Some entrepreneurs try to reduce the amount of VAT due and underestimate the value of taxable sales. (Toczek, 2022). Due to the fact that the tax on goods and services is the main source of budget revenue, it is of particular interest to the tax authorities.

The VAT gap can be defined as the difference between the amount of expected VAT revenue and the amount that is paid to the tax authority. It arises as a result of tax avoidance, tax evasion or fraud as a result of the use of the so-called VAT carousels. In order to limit its amount, many activities have been introduced to digitize the processes related to this tax. The digitization of VAT is carried out by requiring the obligatory use of the indicated tools (see Table 2).

**Table 2.**

*Selected goods and services tax digitization tools*

<b>Tools</b>	<b>The purpose of the implementation</b>	<b>Date</b>
Standard Audit File for TAX (SAFT, JPK)	reduction of unnecessary paperwork, facilitations for internal and external auditors, faster tax audits, automation.	since 1.07.2016 – for large enterprises since 1.01.2017 – for SMEs, since 1.01.2018 – for micro-enterprises for 2020- JPK_VAT for all entrepreneurs
ICT system of the Clearing House (STIR)	reducing the VAT gap and combating VAT carousels	since 01.01.2018
Split Payment Mechanism (MPP)	sealing the system and reducing the VAT gap as well as ensuring security for entrepreneurs when making transactions	since 1.11.2019 MPP is mandatory for invoices over 15,000. PLN which relate to the so-called sensitive goods and services specified in Annex 15 to the VAT Act. For other transactions, MPP remains voluntary.
On-line cash registers	the online sales registration system is another, complementary to SAFT, tool that allows you to seal the VAT system. It is focused in particular on limiting the shadow economy in retail sales	since 1.05.2019
National E-Invoice System (KSeF)	reducing the tax gap, facilitating running a business	For active VAT payers – 1.07.2024 For taxpayers exempt from VAT – 1.01.2025

Source: Oleśniewicz, 2016; Pałys, 2021.

#### **4. Standard Audit File for TAX- SAFT (JPK)**

The obligation to send SAFT is regulated in Poland by the Act of September 10, 2015 amending the Tax Ordinance Act and certain other acts. All active VAT taxpayers are obliged to prepare and send Standard Audit Files - JPK\_V7 - to the Ministry of Finance. JPK\_V7 is nothing more than processed information from VAT sales and purchase registers to an officially specified electronic format. These data are sent to NTA authorities in a uniform, electronic form. The JPK\_VAT is a set of information on purchases and sales, which result from VAT

registers for a given month. There is an obligation to send the file only in the electronic version by the 25th day of the month for the previous month.

From October 1, 2020, JPK VAT and the VAT declaration have been replaced by JPK\_V7. The introduction of JPK (SAFT) as one of the digital tools aims to respond more effectively to phenomena related to tax evasion. In this way, tax authorities can more easily detect possible carousel offences.

Within the JPK files, the following files can be distinguished:

- JPK\_KR,
- JPK\_FA,
- JPK\_WB,
- JPK\_MAG,
- JPK\_PKPiR,
- JPK\_EWP,
- JPK\_VAT.

Apart from the last mentioned item, which is sent without the request of the tax authority, taxpayers are obliged to send the indicated items at the request of the tax authority. The tax authority may request the transfer of JPK (SAFT) in case of:

- tax audit,
- checking activities,
- customs and tax control,
- tax proceedings.

Among the most important advantages of the JPK (SAFT), the following should be mentioned:

- sealing the tax system,
- reducing the costs of meeting tax obligations,
- no need for paper printouts,
- facilitation for internal and external auditors,
- ensuring the rules of fair competition on the market.

All entrepreneurs registered as active VAT taxpayers are required to submit JPK\_V7. Failure to submit it on time may result in penal and fiscal sanctions. Depletion of budget receivables above PLN 10,000 is treated as a tax offence.

The implementation of the JPK files (SAFT) is a great help for the tax authorities, as it allows for unification and faster performance of control and verification activities. The JPK (SAFT) also allows entrepreneurs to monitor the situation of their enterprise, as it gives the opportunity to detect any irregularities in the books. In addition, electronic control by tax authorities is less burdensome than before, when controls were carried out at the company's headquarters.

## 5. ICT system of the Clearing House (STIR)

One of the solutions to help tighten the tax system is the ICT network reporting mechanism STIR, which has been in operation since January 2018.

The ICT Clearing House system is used to process data provided by banks and credit unions in order to determine the risk indicator of using the banking sector to commit tax fraud. This system was created because criminals very often use the financial sector for tax fraud. The definition of the risk indicator is contained in Art. 119zg point 8 Op, and according to it, it is an indicator of the use of the activities of banks and credit unions for purposes related to tax fraud (Tax Ordinance).

In the era of increasingly progressive computerization, the exchange of information and cooperation between public authorities and entities of the financial sector has become a fact. The role of banks is growing, as the number of non-cash transactions and settlements made by means of electronic communication is also increasing. At the same time, criminals are increasingly using IT tools to commit banking crimes. (Macudziński M, 2018).

The Head of the National Tax Administration (NTA; pol. KAS) receives information about the accounts of qualified entities within the meaning of the Act and about all transactions of these entities made through bank accounts covered by this system or accounts of a cooperative savings and credit union ("SKOK"). Subsequently, the IT system performs a tax fraud risk analysis. The information is sent automatically and electronically through the clearing house. (Witczak, 2022).

Thanks to the STIR mechanism, information provided by banks and credit unions is processed according to specific algorithms. The aim is to determine the risk indicator of using the banking sector for fiscal fraud, especially in the field of VAT. On the basis of algorithms in the ICT system of the clearing house, information on the risk indicator is generated, which may be the basis for taking action by the head of KAS or bodies subordinate to him.

Thanks to modern IT tools, the Head of NTA is able to react quickly to attempts to use the financial system. Information on settlement accounts opened and maintained by the so-called qualified entities and daily statements of transactions carried out on these accounts. Qualified entities include natural persons conducting business activity, non-entrepreneurs but performing gainful activity, legal persons and organizational units without legal personality but with legal capacity. (Macudziński, 2018).

In addition to the aforementioned algorithms, the following are analyzed to determine the risk indicator:

- economic criteria,
- geographical criteria,
- subject criteria,
- behavioral criteria,
- link criteria.



Blocking a bank account consists in temporarily preventing the disposal of funds accumulated on the account of a qualified entity kept by a bank or SKOK. By blocking a bank account, it becomes impossible to make other fraudulent transactions in order to hide funds that were not involved, although they are in the same account.

The head of NTA may request the bank or SKOK to block the account of a qualified entity for a period not longer than 72 hours, but this period may be extended.

The STIR mechanism is another element of combating abuses in tax law. A properly conducted risk analysis resulting in the blocking of a bank account of a qualified entity allows you to select and eliminate dishonest entities from economic turnover.

## 6. Split Payment (MPP)

Another tool to reduce the VAT gap is the Split Payment (MPP), which has been operating in Poland since July 1, 2018. The MPP was created to prevent VAT carousel fraud.

The essence of MPP is that the payment for goods or services is divided into the net amount and VAT. The net amount goes to the seller's account, and the VAT amount - to his VAT account. This account is created automatically by the bank as an additional account set up to the account kept in connection with the conducted business activity. Split payment is voluntary or obligatory. The obligation to apply the MPP rests with taxpayers if the following conditions are jointly met:

- the transaction concerns "sensitive" goods or services, i.e. those listed in Annex 15 to the Act of VAT,
- the total amount of receivables from the invoice exceeds PLN 15,000.

The use of MPP is obligatory if at least one item on the invoice is included in the aforementioned attachment. If the above conditions are not met, split payment is not mandatory.

Considering that the use of the split payment mechanism is intended to counteract VAT fraud, specific benefits have been introduced for taxpayers to make them more willing to use it, e.g. (Gryziak, 2019):

- no sanctions for a transfer not included in the White List of VAT taxpayers,
- no penalty interest for late payment,
- refund of the tax difference within 25 days,
- funds accumulated on the VAT account are not subject to court or administrative enforcement.

Another benefit is the exclusion of the possibility of holding the taxpayer jointly and severally liable for the supplier's tax arrears - up to the amount corresponding to the amount of tax paid via split payment. At the same time, in the event of non-application of the MPP, there are specific sanctions for the seller and the buyer:

1. Sanctions for the seller - the head of the tax office sets an additional tax liability in the amount of 30% of the VAT amount from the invoice for the supply of goods or services covered by the MPP. Taxpayers are subject to a penalty pursuant to the provisions of the Fiscal Penal Code, which may result in a fine of up to 180 daily rates.
2. Sanctions for the buyer - the tax office sets an additional tax liability of 30% of the VAT amount for the goods or services covered by the MPP. In addition, the buyer, in accordance with the Penal Code, may receive a fine of up to 720 daily rates. If the payment for the invoice takes place without split payment, then such an expense is not recognized as a tax deductible cost.

The use of split payment guarantees that the tax authorities will receive the entire amount of VAT that should be paid to the State Treasury. At the same time, it allows to monitor the course of payments between taxpayers.

## **7. National E-Invoice System (KSeF)**

The implementation of KSeF is the next stage of digitization in the field of taxes. The process of implementing structured invoices in Poland is gradual. Changes in the creation of the National e-Invoice System were introduced by the Act of October 29, 2021 amending the Act on Value Added Tax and some other acts (Journal of Laws, item 2076).

It introduces the following invoicing terms:

- invoice - a document issued in paper or electronic form containing data required by law,
- electronic invoice - which is understood as an electronic invoice issued and received in any electronic format,
- structured invoice – an invoice issued using the National e-Invoice System with an assigned number identifying this invoice in this system.

Structured invoice means an invoice issued using KSeF with an assigned number identifying this invoice in this system. It is issued and received using interface software, in electronic form and in accordance with the template of an electronic document within the meaning of the Act of 17 February 2005 on computerization of the activities of entities performing public tasks. After entering the invoice data, the system will assign it a unique identification number and verify the compliance of the data contained therein with the structured invoice template. The invoice itself will be considered issued and delivered on the

day it is assigned an identification number by the system. It will have a structured form, with specific mandatory fields in the xml file format.

The National e-Invoice System (KSeF) is an IT program in which entrepreneurs can issue, store and receive electronic structured invoices. The system is also used to notify entities using the KSeF about:

- a) the date of issue of the structured invoice and the identification number,
- b) the date of rejection of the invoice in the event of its non-compliance with the structured invoice template,
- c) inability to issue a structured invoice - in the event of unavailability of the KSeF.

The system is also used to analyze and control the correctness of data from structured invoices.

It is necessary for the customer to accept receipt of structured invoices using KSeF. In the absence of such approval, the issuer issues a structured invoice in the system and is obliged to deliver it to the recipient in another manner agreed with him. Such an invoice is treated as a structured invoice because it has its statutory features (identification number in the KSeF system). Structured invoices will be stored in KSeF for a period of 10 years, which is counted from the end of the year in which they were issued.

KSeF is used according to the following scheme (see Table 3):

**Table 3.**  
*Stages of using KSeF*

I.n.	Stages of using KSeF
1	Issuing an invoice by the issuer in the accounting program
2	Sending an invoice to the MF platform
3	Invoice verification via the platform
4	Message to the buyer
5	Downloading the invoice by the buyer

Source: Burchart, 2022, p. 5.

From January 2022 to the end of June 2024, the use of KSeF is voluntary. In accordance with the latest changes, the date of entry into force of the mandatory KSeF has been postponed to July 1, 2024, but this date does not apply to all taxpayers.

The obligation to use KSeF is to apply to:

- active VAT taxpayers - from July 1, 2024,
- taxpayers exempt from VAT - from January 2025.

KSeF is to be used to analyze and control the correctness of data from structured invoices, which should result in increased supervision over tax settlements. Structured invoices already exist in Spain, Portugal and Italy, so this is not a new phenomenon.

The main benefits of using the National Electronic Invoice System include, for example:

- quick VAT refund - the VAT refund time is shortened from 60 to 40 days,
- safety - invoices sent electronically are encrypted,
- transparency - the taxpayer is sure that the invoice has been delivered to the contractor,
- convenience - e-invoices will have one template,
- standardization,
- ease of archiving - invoices will be stored by the administration for a period of 10 years,
- less data to be sent - there will be no need to send JPK\_FA at the request of the tax authorities, because this data will be available in KSeF,
- saving time.

## 8. Purpose and scope of the study

The survey was realized on 9-30 July among 103 micro-entrepreneurs. The research tool used in the study was a questionnaire filled in person. Among the respondents, 73 are taxpayers exempt from VAT, the rest are taxpayers registered as active VAT payers.

Respondents were selected in a purposeful way within a sample of enterprises from the region of the Silesian Voivodeship. The questions were constructed on a closed set of answers. The statements were assigned the same range of answers, which gave them the features of a set of ordinal scales.

Each statement was rated by the respondent according to its consistency with his opinion. The study used a 5-point Likert scale.

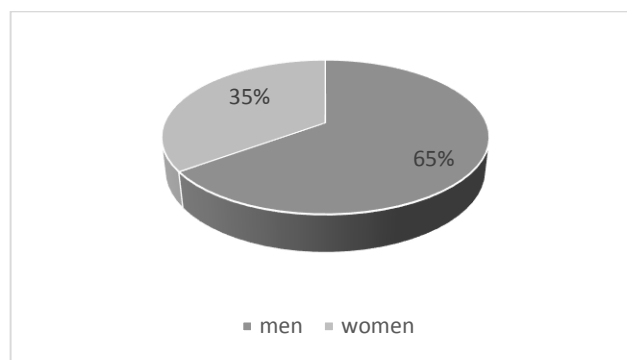
The survey questionnaire was divided into two parts. The first part concerned data specific to the surveyed entrepreneurs. The second part of the survey concerned the assessment of KSeF by the respondents. The survey was anonymous.

Respondents were asked the following 9 questions:

1. How do you assess the state of your knowledge about KSeF? (the higher the number, the higher the state of knowledge).  
5/4/3/2/1
2. In your opinion, does KSeF mean increased obligations for the entrepreneur?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
3. In your opinion, does KSeF involve incurring additional costs?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
4. In your opinion, do taxpayers have enough time to prepare for the changes concerning the KSeF?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral

5. Do you think that KSEF will contribute to sealing the tax system?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
6. Do you think that KSeF will facilitate the invoicing process?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
7. Do you consider adapting your procedures to the KSeF as a big challenge?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
8. Is the introduction of structured invoices associated with employee training?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral
9. Will the use of KSeF hinder running a business?  
Strongly agree/Agree/Disagree/Strongly disagree/Neutral

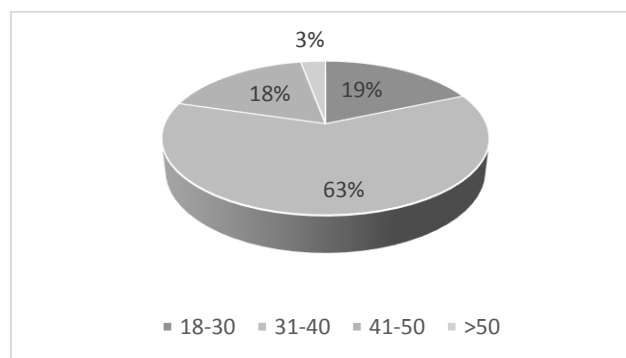
Most of the respondents were men (65%) (Figure 1).



**Figure 1.** Respondents' gender.

Source: Own study.

The largest group of respondents are people aged 31-40 (63), followed by people aged 18-30 (19) and 41-50 (18). Only 3 respondents were over 50 years old (see Figure 2).



**Figure 2.** Respondents' age.

Source: Own study.

It turns out that only 44% of respondents considered their knowledge to be very good (see Fig. 1), 18 respondents considered it good, while 6 of the respondents had never heard of KSeF. Meanwhile, the mandatory use of structured invoices will come into force for active taxpayers from July 2024 and requires the implementation of appropriate solutions (see Table 4).

**Table 4.**  
*Respondents' knowledge of KSeF*

Rate	Number of respondents	Percentage
5	79	76,70%
4	18	17,48%
3	0	
2	0	
1	6	5,82%
Total	103	100%

Source: Own study.

More specifically, out of the respondents who heard about the new changes to structured invoices, 73 are active VAT payers.

Evaluation of the KSeF in terms of new obligations The use of structured invoices means new obligations for the entrepreneur.

From next year, the circulation of sales documents will take place only electronically, which will force entrepreneurs to develop new procedures for issuing and circulation of documents. Therefore, 98 entrepreneurs are afraid that KSeF will hinder business activity (see Table 5).

**Table 5.**  
*KSeF means increased obligations for the entrepreneur*

	Number of respondents	Percentage
Strongly agree	69	66,99%
Agree	29	28,16%
Disagree	5	4,85
Strongly disagree	0	0
Neutral	0	0
Total	103	100%

Source: Own study.

In addition, 67% are concerned that the use of structured invoices is associated with incurring additional costs. It is especially about adapting the accounting program to new requirements, and in some cases even about the purchase of computer equipment. After all, these are significant costs (see Table 6).

**Table 6.**  
*KSeF involves incurring additional costs*

	Number of respondents	Percentage
Strongly agree	68	66,02%
Agree	30	29,13%
Disagree	5	4,85%
Strongly disagree	0	0%
Neutral	0	0
Total	103	

Source: Own study.

The too short deadline for introducing the obligation to use e-invoices is another disadvantage pointed out by the surveyed entrepreneurs (103). Structured invoices will change the entire process of invoicing transactions in the enterprise, which in turn affects other processes in the company. So, making changes in all areas is sure to involve work over a longer period of time (Burchart, 2022).

**Table 7.***Too short deadline for the introduction of KSeF*

	Number of respondents	Percentage
Strongly agree	96	93,20%
Agree	7	6,80%
Disagree	0	0
Strongly disagree	0	0
Neutral	0	0
Total	103	100%

Source: Own study.

According to the vast majority of respondents, the new regulations on structured invoices will seal the tax system (see Table 8).

**Table 8.***KSEF will contribute to sealing the tax system*

	Number of respondents	Percentage
Strongly agree	73	70,87%
Agree	13	12,62%
Disagree	6	5,83%
Strongly disagree	0	0
Neutral	11	10,68%
Total	103	100%

Source: Own study.

Only 3 respondents confirmed that KSeF will facilitate the invoicing process in the enterprise. Of the rest of the entrepreneurs, as many as 91 denied such a question (see Table 9).

**Table 9.***KSeF will facilitate the invoicing process*

	Number of respondents	Percentage
Strongly agree	0	0
Agree	3	2,91%
Disagree	17	16,51%
Strongly disagree	74	71,84%
Neutral	9	8,74%
Total	103	100%

Source: Own study.

All entrepreneurs confirmed that the application of the KSEF is a great challenge for them (see Table 10).

**Table 10.**  
*Adapting procedures to the KSeF as a big challenge*

	<b>Number of respondents</b>	<b>Percentage</b>
Strongly agree	97	94,17%
Agree	6	5,83%
Disagree	0	0
Strongly disagree	0	0
Neutral	0	0
Total	103	100%

Source: Own study.

Implementation of the new regulations means the need for professional training for both the entrepreneur and the employees responsible for issuing invoices in the company (see Table 11).

**Table 11.**  
*The introduction of structured invoices associated with employee training*

	<b>Number of respondents</b>	<b>Percentage</b>
Strongly agree	97	94,17%
Agree	6	5,83%
Disagree	0	0
Strongly disagree	0	0
Neutral	0	0
Total	103	100%

Source: Own study.

Almost all respondents answered yes to the last question as well. The overwhelming majority (97) knew that the new obligations concerning the KSEF would make it more difficult to run a business (see Table 12).

**Table 12.**  
*The use of KSeF hinder running a business*

	<b>Number of respondents</b>	<b>Percentage</b>
Strongly agree	97	94,17%
Agree	0	5,83%
Disagree	0	0
Strongly disagree	0	0
Neutral	6	0
Total	103	100%

Source: Own study.

The next stage of the empirical part of the work was statistical analysis. Due to the scale used in the questionnaire, correlation measures - Spearman's and Fi-Youl's coefficient - were selected as the appropriate tools for statistical analysis.

On the basis of the conducted survey research, statistical dependencies of individual formulations of the questionnaire were examined. This stage began with the assessment of the state of knowledge of entrepreneurs regarding the KSEF and the age of the respondents (see Table 13).



**Table 13.**

Values of Spearman's correlation coefficients between the age of the respondents and the assessment of the state of knowledge about KSeF

Rank	Measure		
	R	T(N-2)	p
KSeF knowledge	0,1340	1,3177	0,1908
Increased responsibilities	0,0501	0,5045	0,6150
The need to incur additional costs	0,0501	0,5045	0,6150
Too short deadline for the introduction of the KSeF	-0,1822	-1,7778	0,0787
Sealing the tax system	-0,0906	-0,9141	0,3628
Facilitating the invoicing process	<b>-0,2185</b>	<b>-2,1122</b>	<b>0,0375</b>
A big challenge for the entrepreneur	-0,0072	-0,0724	0,9424
Compulsory training for employees	-0,0811	-0,8179	0,4153
Making it difficult to run a business	<b>0,2790</b>	<b>2,7562</b>	<b>0,0071</b>

Source: Own study.

With the increase in the age of the respondents, the belief that the new regulations will facilitate the process of issuing invoices in the enterprise decreases ( $r = -0.2185$ ;  $p = 0.0375$ ), and the belief that KSeF will hinder business activity increases ( $r = 0.2790$ ;  $p = 0.0071$ ) (Table 14).

**Table 14.**

Values of the  $\phi$  - Youla correlation coefficients and the  $\chi^2$  significance test for the gender of the respondents and the assessment of individual KSeF features

Rank	Measure		
	R	T(N-2)	p
KSeF knowledge	-0,1050	3,073	0,0611
Increased responsibilities	-	-	-
The need to incur additional costs	-	-	-
Too short deadline for the introduction of the KSeF	<b>0,1810</b>	<b>10,4125</b>	<b>0,0013</b>
Sealing the tax system	0,0959	2,9237	0,0873
Facilitating the invoicing process	-	-	-
A big challenge for the entrepreneur	-	-	-
Compulsory training for employees	<b>-0,2612</b>	<b>21,6940</b>	<b>0,0000</b>
Making it difficult to run a business	-0,1050	3,073	0,0611

Source: Own study.

The conducted study confirmed that men significantly stronger believe that KSeF is associated with compulsory employee training ( $\phi = 0.2612$   $p < 0.0001$ ), and women significantly higher believe that the deadline for introducing new regulations is too short ( $\phi = 0.1810$   $p = 0.0013$ ).

## 9. Summary

The main purpose of the work was to answer the research question formulated as follows: "Will structured invoices affect doing business in Poland?" The aim of the considerations undertaken in the work has been to analyze the KSeF implementation process and to indicate its impact on the functioning of enterprises.

The paper hypothesizes that the National System of e-invoices increases the obligations imposed on entrepreneurs in Poland. The conducted survey research enabled the verification of the hypothesis. Their results confirm that KSeF will make running a business in Poland more difficult.

The results of the conducted research lead to the following conclusions:

1. Most of the respondents were men.
2. KSeF was assessed negatively. The vast majority of respondents do not have any knowledge of the KSeF.
3. Almost all surveyed entrepreneurs believe that the new regulations will result in increased obligations within the scope of their business activity. Entrepreneurs will be responsible for adjusting their systems to support the KSeF, including the transfer of electronic invoices to the KSeF and receiving invoices from it. Entrepreneurs must also ensure the proper preparation of data and the invoicing process to ensure the sending and storage of invoices in accordance with the requirements of the Polish Financial Supervision Authority.
4. As before, almost all respondents are concerned that KSeF entails additional costs. Adaptation to the new requirements involves costs related to the implementation of the system.
5. Entrepreneurs believe that such a revolutionary change in the issue of issuing and storing invoices should be provided with a sufficiently long period of time to adapt to the new requirements. Postponing the date of the mandatory use of KSeF is to provide sufficient time for appropriate training and education to actively and effectively use the system. This can contribute to greater acceptance and easier adaptation to new requirements.
6. KSeF is one of the tools supporting the fight against tax fraud. Despite the reluctance of entrepreneurs regarding the new obligations and the related need to incur additional costs, at the same time they notice the positive effect of introducing the KSeF in the form of sealing the tax system.
7. Most entrepreneurs do not associate the introduction of KSeF with facilitating the process of issuing invoices in the enterprise.
8. At the same time, for all surveyed entrepreneurs, the implementation of new obligations is a big challenge.

9. All respondents agree that the use of structured invoices implies the obligation to conduct training for employees responsible for issuing invoices in the company.
10. Almost all entrepreneurs confirmed that the new regulations on structured invoices will make it more difficult to run a business.

There is no doubt that the National e-Invoices system is a challenge for entrepreneurs. The obligation to test and implement raises concerns on their part regarding additional costs related to adapting to new requirements and changes in the organization of work. The aim of the work was achieved in accordance with the assumed plan, the hypothesis was verified and confirmed.

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## DETERMINANTS OF COUNTERPRODUCTIVE WORK BEHAVIOR – EVIDENCE FROM THE HOSPITALITY INDUSTRY IN POMERANIAN REGION IN POLAND

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**Purpose:** The research aims to investigate the factors that contribute to the occurrence of negative behaviors in the hospitality sector.

**Design/methodology/approach:** The research design involved the use of a structured questionnaire with both close-ended and open-ended questions to gather data from employees across different job positions and levels. The data collected were analyzed using appropriate statistical techniques for the quantitative data, such as descriptive statistics and correlation analysis. The open-ended questions provided qualitative insights into participants' experiences and perceptions, which were analyzed using thematic analysis to identify common themes and patterns, especially among employees with high rate of CWBs.

**Findings:** The study provide valuable insights into the factors contributing to negative behaviors in the hospitality industry. The results shed light on the complex interplay between individual characteristics, organizational factors, and the occurrence of CWBs. We have found potential discrepancy between employees' self-perceptions and their willingness to disclose involvement in highly harmful behaviors. The position and gender may play a role in the reporting and acknowledgment of CWBs

**Research limitations/implications:** The study contributes to the literature on CWBs in the hospitality industry, which is an under-researched area and highlights the importance of considering different types of CWBs when investigating the relationship between demographic and organizational variables and CWBs. The generalizability of the findings may be limited and the use of a self-reported questionnaire may be subject to response bias and social desirability bias.

**Practical implications:** The practical implications of this research suggest that organizations should pay closer attention to demographic and organizational factors when designing interventions aimed at reducing CWBs. Moreover, it is important to consider the varying nature of different types of CWBs when developing intervention strategies to address them.

**Originality/value:** The originality of this research lies in its focus on the hospitality industry in Poland and the use of a questionnaire specifically developed for this study, including open-ended questions (it allowed for a more nuanced understanding of CWBs). This study contributes to the limited research on CWBs in this context and provides insights into the relationship between demographic and organizational variables and CWBs.

**Keywords:** counterproductive work behavior (CWB), perception and occurrence of CWB, hospitality industry, demographic variables, organizational variables.

**Category of the paper:** research paper.

## 1. Introduction

The development of the hospitality industry is determined by a number of factors, including: the political and economic situation of the country, the geographic and climatic location, the attractiveness of the country and the regions within it, the state of security and communication, the affluence of society and its awareness of tourism, the state of development of domestic and international tourism, as well as the business needs, in terms of the demand for hospitality services (Panasiuk, Szostak, 2009). According to a report compiled by the Polish Economic Institute, the tourism industry suffers most from losses caused by the spread of the Covid-19 pandemic. Two reasons for this situation have been specified - the reduced demand for tourism services under the situation of uncertainty and the administrative restrictions limiting mobility and, above all, the ability to travel abroad (Czernicki et al., 2020). K. Firlej and B. Spychalska draw attention to the fact that the current trends in tourism call for development of an attractive, innovative and comprehensive tourism product economically accessible to a wide range of recipients of such services, simultaneously stressing that the Polish hospitality market has been dominated by two investment trends. The first entails the development of budget hotels guaranteeing the investors high efficiency and low sensitivity to environmental factors. The second involves investments in hotels offering a specific product meeting the requirements and expectations of a small group of hotel guests (e.g., Spa & wellness hotels and resorts) (Firlej, Spychalska, 2015).

Globally, a steady and gradual growth of the hospitality market can be observed over the past few years. An upward trend in hotel occupancy has been observed, which has continued in hotels providing services both in Europe (from 61% in 2009 to 73% in 2019) as well as in the USA (from 55% in 2009 to 66% in 2019) (Statista: Hotel Market in Europe: Occupancy rate of the hotel industry worldwide from 2008 to 2019, by region).

Also in Poland, the number of hotels grew steadily from 2000 (924 hotels) to 2019 (2635 hotels). In 2020, the number dropped to 2498, and in 2021 it slightly increased to 2521. Between 2019 and 2021, the number of hotels in the Tri-City increased from 87 to 97. In 2019, Tri-City had the most facilities with a three star hotel rating (45 hotels), and 47 hotels in the years 2020-2021. (Statista: Hotels in Poland. Industries and Markets). In March 2020, a 65% decrease in the number of tourist accommodation users was recorded, compared to March 2019 (Tourism in Poland in the Face of the COVID-19 Pandemic. Central Statistical Office Report). Despite the significant decline and economic slowdown in the tourism and hospitality industry, brought

on by the Covid-19 pandemic, as many as 97% of companies plan to hire new employees in 2023, a result comparable to the companies operating in the IT (97%), or E-commerce and digital, marketing or transportation (96% each) sectors (Hays Poland. Salary Guide 2023).

The considerable dynamism accompanying the development of the hospitality industry leaves the sector particularly vulnerable to the occurrence of counterproductive behavior. The main objective of the article was to identify counterproductive behaviors among employees of Tri-City hotels and determine the factors affecting the frequency of such behavior. Using a convenience sampling technique, six hotels were selected for the study. The survey was conducted on a group of 204 employees, using a designed survey questionnaire containing closed-ended questions on working conditions, wages, atmosphere and the evaluation and occurrence of CWBs, as well as open-ended questions regarding employees' perceptions of problems they perceive in the workplace and factors contributing to their satisfaction.

The first section of the paper presents a review of the literature on the determinants of counterproductive work behavior, including a discussion of the occurrence and effects of such behavior in the hospitality industry. The methodology of the study is explained in the following section, with a brief description of the research tool designed (the questionnaire), the research procedure and the respondent (hotel workers) structure. The results of the research conducted are then presented, showing the complex interdependence between individual personal characteristics and organizational factors and the occurrence of CWB. Finally, the last section illustrates the principal conclusions drawn from the study, in particular, the implications for further research, outlined on the basis of the analysis and findings.

## **2. Counterproductive behavior and its determinants**

Counterproductive work behavior (CWB), also referred to as dysfunctional or deviant behavior, can be defined as any behavior detrimental to the achievement of organizational goals, violating organizational norms or resulting in decreased productivity (Spector, Fox, 2005). Counterproductive behavior can take a variety of forms, which can be assigned to 4 categories: production CWB, property CWB, political CWB, and personal aggression (Robinson, Bennett, 1995). Counterproductive actions can be detrimental not only to an organization, narrowly defined as an organizational and economic system, but to a broad group of stakeholders: company owner/s, co-workers, supervisors, customers, shareholders, stockholders, suppliers, or the community (Ones, Dilchert, 2013). The costs arising from the occurrence of counterproductive behavior can be divided into economic and non-economic ones. The first group encompasses all the losses, expressed in monetary value, incurred by companies due to employee counterproductive behavior. Non-economic costs include, but are not limited to, employee turnover, sickness absenteeism, wasted materials, failure to transmit

information, lower employee morale, as well as social costs, such as an increase in the number of health care and early retirement system beneficiaries or waste of scarce natural resources (Dilchert, 2018). Recently, much attention has been devoted in scientific publications to the study of the incidence of counterproductive behavior, yet there is still a scarcity of publications facilitating the understanding of this behavior and, in particular, the factors influencing its occurrence (Cohen, 2016; Wallace, Coughlan, 2023).

The literature highlights two types of factors affecting the frequency of counterproductive behavior, i.e., factors of an individual nature and organizational factors. Factors of an individual nature can include specific employee characteristics conducive to CWB, such as anger, vindictiveness, narcissism, level of aggression, impulsiveness, anxiety or egotism (Spector, Fox, 2002, 2005). Individual traits (e.g., conscientiousness and agreeableness, resistance to stress), intrinsic motivation, and cognitive abilities can mitigate counterproductive behavior (Smithikrai, 2008; Diefendorff, Metha, 2007; Dilcher et al., 2007; Marcus, Schuler, 2004).

Numerous studies also attest to the relationship between employees' demographic characteristics and the incidence of CWB. These studies indicate a negative correlation between the occurrence of CWB and the age of employees (Berry et al., 2007; Uche et al., 2017; Pletzer et al., 2017). This may be explained by the fact that awareness of behavioral consequences and the degree of control over one's own emotions increases with age (Barling et al., 2009). The negative correlation between the age of employees and the propensity to engage in organizationally harmful behavior is more prevalent in countries offering higher retirement benefits and characterized by stronger social ties (Pletzer et al., 2017). The incidence of CWB may also be interrelated with seniority, however not all studies show significant correlations in this regard (Hafidz, 2012).

The results of research on the relationship between employee gender and the propensity for counterproductive behavior are not conclusive. A small number of publications indicate no correlation between gender and the incidence of aggressive behavior in the workplace (Barling et al., 2009). Most studies indicate the existence of statistically significant differences between males and females in terms of CWB engagement, e.g., studies conducted among workers in Nigeria (Uche et al., 2017) or in the United States (Cohen et al., 2013). A meta-analysis based on the results of studies from 395 publications also indicates a slight correlation between employee gender and the frequency of CWB (Ng et al., 2016). According to the results of the aforementioned studies, women are less likely to engage in such behavior. Hershcovis et al. (2007) indicate that gender constitutes one of the factors influencing the frequency of aggressive behavior toward others. Such behaviors are more prevalent among men. The results of the study, however, primarily show variation in direct aggression. The differences are less pronounced at the level of counterproductive behavior directed at the organization. Likewise, in a study conducted on a group of 221 senior-level students with fulltime work experience, scientists found that males were likely to engage in CWB more frequently than females (Samnani et al., 2014).



The position held by an employee can also be a factor in the frequency of engaging in certain forms of counterproductive behavior. Lower-level employees are more likely to intentionally engage in behaviors falling within the category of production deviance (e.g., deliberate slow performance of work, resource wasting) (Sims, 2002). What is more, the literature indicates existence of differences between 'white-collar workers' and 'blue-collar workers.' The former are less likely to engage in counterproductive behavior than executive workers. Such behaviors as arbitrary reduction of working hours, vandalism, theft and absenteeism occur with greater frequency in the latter group of workers in particular. Lower levels of satisfaction among executive employees, less autonomy in their actions (Finstad et al., 2019), and weaker interpersonal ties, compared to office workers, can be indicated here as factors (Martinko et al., 2002).

Furthermore, the incidence of counterproductive behavior may be driven by the organizational factors present in the workplace. CWB antecedents can stem from four sources—supervisors, coworkers, private life and the organization. With regard to the group of organization-related antecedents, study results show that such unfavorable antecedents as organizational constraints, workplace aggression and psychological contract breach correlate more strongly with CWB, compared to such favorable antecedents as organizational support, ethical climate (Liao et al., 2020) and organizational climate (Lipińska-Grobelny, 2021). Other organizational factors affecting counterproductive behavior include role overload and role ambiguity (Yean et al., 2022), communication overload (Lv et al., 2021), atmosphere of job insecurity (Shi et al., 2013), or perceived potential for individual promotion (Sagioglou et al., 2023). Another factor correlated with the incidence of CWB is the so-called organizational injustice (Cohen-Charash, Spector, 2001) and, particularly, unfair reward allocation. Employees not only compare their own pay to the pay of their colleagues performing similar tasks, but they also compare it against that of employees in similar positions at other organizations. Therefore, pay should not only be sufficient but also equal for employees holding similar positions.

Identification of the causes of counterproductive behavior enables implementation of preventive measures. The complex nature of this phenomenon, however, necessitates both elimination of and counteraction to the occurrence of such harmful labor practices (Turek, 2012).

### **3. Occurrence and effects of counterproductive behavior in the hospitality industry**

The specific nature of service sector employees' work exposes organizations to the occurrence of counterproductive behavior (Sarwar et al., 2023; Sahabuddin et al., 2023; Yousaf

et. al., 2022). Diverse factors lead hotel employees to be more susceptible to such behaviors (Cao et al., 2023; Wallace, Coughlan, 2023; Gip et al., 2023; El-Sawalhy et al., 2022; Kim et al., 2020), in particular, the challenges arising from the large workload, long working hours, and emotional strain (Kotera et al., 2019). Companies operating in the service sector, where employees have direct contact with customers, are particularly vulnerable to high losses resulting from the occurrence of counterproductive behavior. The nature of the work exposes those performing it to customer incivility, which leads to increased levels of work-related stress and emotional exhaustion (Boukis et al., 2020), which is in turn one of the causes of increased incidence of counterproductive behavior (Penney, Spector, 2005). Moreover, customer incivility, can result in withdrawal, which is categorized as counterproductive behavior, manifested in reduced levels of work engagement/avoidance of duties, lateness or absenteeism (Sliter et al., 2012; Boukis et al., 2020; Cortina et al., 2001).

Studies conducted among hospitality industry managers show that high levels of job insecurity also affect employee turnover and increase job change intentions (McGinley, Mattila, 2020).

Furthermore, the need for research on employee behavior should be highlighted, as the hospitality industry has been among the sectors most affected by the restrictions surrounding the COVID-19 pandemic (Dang-Van et al., 2022). The rationale behind the study of counterproductive behavior lies in the change in the frequency and type of such behavior. This stems from the weakening of social ties in organizations and the need to continuously improve the efficiency of organizational processes (Macko, 2009).

## **4. Research - methods and results**

### **4.1. The aim of the research and methodology**

The objective of the study conducted among hospitality industry employees was to identify the occurrence of counterproductive behaviors and the factors affecting the frequency thereof. To realize the stated objective, a systematic literature review was first carried out, compiling the results of existing studies on the intensity of the occurrence of particular counterproductive behaviors as well as on the impact of individual personal and organization-related factors on the occurrence of these behaviors. This was followed by an empirical study using a purpose-built questionnaire. A self-report survey of CWB was used in the study. Despite the concerns regarding this type of a research tool, i.e., the possible underestimation of the scale of counterproductive employee behavior, the meta-analysis results (Berry et al., 2012) have revealed higher counterproductive work behavior than reported by the observers (peers or

supervisors), as well as moderate to strong correlations between the self-reports and other ratings of CWB.

The questionnaire consisted of closed-ended questions regarding the perception of the harmfulness of particular behaviors and the declared frequency of those behaviors, as well as questions assessing selected working conditions, which, in line with conclusions of earlier studies presented in the literature, can be correlated with the intensity of counterproductive behavior. The criterion for the selection of the counterproductive behaviors included in the questionnaire was the likelihood of their occurrence in a specific workplace, i.e., a hotel. The questions referring to the respondents' subjective assessment of individual counterproductive behaviors as well as the questions regarding the frequency of engagement in such behaviors were based on a four-point Likert scale, where 1 indicated answers "I do not mind such behavior"/"I happen to do it often", whereas 4 - "I condemn such behavior"/"I never behave such manner". Additionally, the survey questionnaire featured open-ended questions which allowed for a more detailed specification of the problems occurring in the workplace, according to the respondents' assessment, and identification of the relationship between these phenomena and the occurrence of counterproductive behavior. The use of open-ended questions facilitated non-standard responses regarding the workplace-related problems noted by the respondents. Categorization was used to structure the responses. In the analysis of the results, particular focus was placed on the group of those employees who indicated engagement in counterproductive behavior more frequently (the group of respondents whose average of counterproductive behaviors was higher than the average for the total respondents).

A convenience sampling technique was used to select the hotels participating in the study. Ultimately, permission to conduct the study was obtained from six hotels located in the Tri-City area. A total of 204 respondents took part in the survey. The characteristics of the survey participants are presented in the table 1.

**Table 1.**

*Respondent profile (n = 204)*

Characteristics	Frequency (n)	Percentage (%)
<b>Gender</b>		
Female	132	67.35
Male	64	32.65
<b>Age (years)</b>		
Under 28	85	42.93
29-45	92	46.46
More then 45	21	10.61
<b>Tenure</b>		
Less then 1 year	49	24.87
1-15 yearas	137	69.54
More then 16 years	11	5.58
<b>Position</b>		
Managers	62	31.47
Specialist	39	19.8
Other	96	48.37

Source: own elaboration based on the study results.

Females predominated among the respondents. Most of the surveyed employees were under the age of 45, with less than 15 years of work experience in the hospitality industry. The majority of the surveyed employees were executive personnel.

Descriptive statistics and correlation factor calculation were used in the analysis of quantitative survey results. To analyze the open-ended question responses, categorization was used

## 4.2. Results

Analysis of the frequency of each counterproductive behavior and the average value of its declared occurrence was carried out in breakdown by groups of employees classified by demographic characteristics (Table 2).

**Table 2.**  
*Self-assessment of engagement in counterproductive behavior by employee groups categorized by age, gender and position*

Behavior	Age			Gender		Position	
	Under 28 y/o	29-45 y/o	Over 45 y/o	Female	Male	Executive (Group 1)	Managerial (Group 2)
Gossiping in the workplace	2.51	2.46	2.74	2.48	2.60	2.52	2.53
Intentional misleading of a visitor/customer	3.68	3.74	4.00	3.75	3.72	3.78	3.66
Lateness to work	3.23	2.94	3.21	3.09	3.11	3.14	2.96
Leaving work early	3.00	2.91	3.00	3.07	2.70	2.97	2.89
Prolonging work breaks	3.38	3.49	3.26	3.44	3.37	3.34	3.60
Impoliteness to co-workers and superiors	3.57	3.46	3.68	3.64	3.30	3.53	3.52
Impoliteness to or disregard for customers	3.86	3.85	3.95	3.89	3.81	3.86	3.88
Feigning a work overload when in reality not as many tasks need to be performed	3.50	3.66	3.63	3.63	3.50	3.53	3.72
Hiding one's work errors	3.46	3.57	3.47	3.56	3.42	3.50	3.54
Use of sick leave despite good health	3.84	3.98	3.79	3.95	3.78	3.88	3.92
Taking extra money for what entails one's responsibilities/tasks anyway	3.88	3.88	3.95	3.92	3.82	3.92	3.80
Refusal to carry out or failure to carry out work orders or assigned work	3.73	3.74	3.95	3.80	3.69	3.81	3.64
Performance of work slower than one's capabilities	3.48	3.63	3.68	3.64	3.44	3.53	3.65
Generating additional/other income during working hours	3.78	3.73	4.00	3.81	3.74	3.82	3.68
Wasting company-owned supplies/resources/raw materials	3.57	3.68	3.68	3.72	3.43	3.71	3.45
Not reporting a problem hoping that the situation will resolve itself	3.59	3.63	3.58	3.62	3.56	3.62	3.57
Reading other people's messages or looking through their personal belongings	3.83	3.89	4.00	3.90	3.82	3.93	3.75
Blaming others for one's own error/s	3.87	3.89	3.95	3.94	3.76	3.90	3.87

Cont. table 2.

Using a company phone, printer or other materials for private purposes	3.25	3.14	3.47	3.18	3.29	3.44	2.72
Failure to provide or withholding important information	3.85	3.85	3.84	3.87	3.78	3.90	3.74
Pursuance of overtime work when the amount of work to be performed does not indicate such need	3.76	3.84	3.95	3.86	3.73	3.83	3.79
Average	3.52	3.57	3.66	3.59	3.49	3.59	3.48

Source: own compilation based on the study results.

The significance of the relationship between employee age, seniority, gender and CWB was further examined by calculating the correlation coefficient. The results are presented in the following Table 3.

**Table 3.**

*Correlation between demographic factors and the occurrence of counterproductive behavior*

Variable	Correlation (Hotel calculations)				
	Average	SD	Job position	Age	Gender
Gossiping in the workplace	2.53	1.07	-0.01	0.00	0.08
Intentional misleading of a visitor/customer	3.76	0.56	-0.13	0.10	0.06
Lateness to work	3.04	1.02	-0.12	-0.09	0.11
Leaving work early	2.92	1.02	-0.07	-0.05	-0.06
Prolonging work breaks	3.47	0.87	0.10	0.02	0.03
Impoliteness to co-workers and superiors	3.53	0.81	-0.05	-0.02	-0.15
Impoliteness to or disregard for customers	3.86	0.47	0.01	0.04	-0.04
Feigning a work overload when in reality not as many tasks need to be performed	3.63	0.74	0.04	0.06	-0.06
Hiding one's work errors	3.46	0.88	0.05	-0.02	-0.11
Use of sick leave despite good health	3.89	0.50	0.03	-0.00	-0.18*
Taking extra money for what entails one's responsibilities/tasks anyway	3.90	0.41	-0.12	0.01	-0.19*
Refusal to carry out or failure to carry out work orders or assigned work	3.74	0.66	-0.15	0.07	-0.08
Performance of work slower than one's capabilities	3.55	0.76	0.03	0.13	-0.12
Generating additional/other income during working hours	3.81	0.56	-0.17*	0.02	-0.15
Wasting company-owned supplies/resources/raw materials	3.62	0.77	-0.21*	-0.01	-0.22*
Not reporting a problem hoping that the situation will resolve itself	3.58	0.90	-0.03	0.02	-0.07
Reading other people's messages or looking through their personal belongings	3.86	0.50	-0.20*	0.08	-0.10
Blaming others for one's own error/s	3.89	0.43	-0.03	0.05	-0.24*
Using a company phone, printer or other materials for private purposes	3.15	0.99	-0.36*	0.02	0.05
Failure to provide or withholding important information	3.83	0.54	-0.18*	-0.06	-0.09
Pursuance of overtime work when the amount of work to be performed does not indicate such need	3.82	0.57	-0.08	0.06	-0.16

\* correlations significant at  $p < 0.05$ .

Source: own compilation based on the survey results.

Analysis of the survey results shows that counterproductive behavior decreases with age, which is not true of all behaviors, however. When it comes to evading work by unjustified sick leave, for example, the frequency of such practices increases with age.

The average of the declared counterproductive behaviors in which the employees surveyed engaged indicates that such behaviors occur less frequently or are declared less often by women, compared to men. In the case of such behaviors as the use of sick leaves and taking extra money for work falling within the scope of one's duties and responsibilities, statistically significant ( $p < 0.05$ ) correlations between the gender of the respondents and the occurrence of these behaviors can be observed. Only behaviors such as gossiping in the workplace, lateness to work or the use of employer-owned items or materials were declared more often by women than by men. To determine whether the difference among employee groups categorized by pay was significant, a t-test was performed for each specified behavior. The t-test showed a statistically significant difference in the frequency of male and female CWB for such behaviors as: leaving work early ( $t = 2.21$ ,  $df = 169$ ,  $p = 0.03$ ), impolite behavior ( $t = 2.67$ ,  $df = 169$ ,  $p = 0.01$ ), illegitimate use of sick leave ( $t = 2.25$ ,  $df = 171$ ,  $p = 0.03$ ), material/supply wasting ( $t = 2.34$ ,  $df = 170$ ,  $p = 0.02$ ), blaming others for one's own errors ( $t = 2.64$ ,  $df = 167$ ,  $p = 0.01$ ).

Among the employee groups characterized by the variable of the position held, the highest number of counterproductive behaviors were declared by managerial personnel. Statistically significant correlations (significant at  $<0.05$ ) were found for five of the behaviors specified. To identify possible differences in the incidence of CWB in the two groups, a t-test was performed. The t-test showed a statistically significant difference in the frequency of such behaviors as material/supply wasting ( $t = -2.04$ ,  $df = 170$ ,  $p = 0.04$ ), reading other people's messages ( $t = -2.27$ ,  $df = 168$ ,  $p = 0.02$ ) and use of company equipment for personal purposes ( $t = -4.73$ ,  $df = 168$ ,  $p = 0.00$ ). In addition, correlations between organizational factors (assessment thereof from the employees' perspective) and counterproductive behavior were examined.

**Table 4.**

*Correlation between organizational factors and occurrence of counterproductive behavior*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Expectation of promotion	0.01	-0.01	-0.00	-0.00	0.16	0.03	-0.05	-0.01	0.00	0.19*	0.12	0.02	-0.10	-0.01	-0.06	-0.13	-0.08	0.10	-0.10	0.04	0.06	-0.00
Expectation of a salary increase	0.04	-0.07	0.10	0.08	0.19*	0.15	-0.03	-0.09	0.04	0.08	0.12	0.00	-0.12	0.02	-0.09	0.01	-0.03	0.06	-0.21*	0.16	-0.08	0.03
Job change intentions	0.01	0.05	0.03	0.27*	0.07	0.12	0.32*	0.19*	0.06	0.04	0.22*	0.10	0.21*	0.07	0.06	0.12	0.00	-0.03	0.09	0.00	-0.03	0.18*
Work atmosphere assessment	-0.04	0.08	-0.03	-0.05	0.08	-0.09	0.00	-0.13	-0.07	-0.00	0.08	0.13	-0.09	-0.02	0.02	-0.08	0.23*	0.12	-0.05	0.01	0.01	-0.01
Number of responsibilities/duties	0.11	0.13	0.02	0.18*	-0.08	0.18*	0.19*	0.01	0.13	0.11	0.09	0.02	-0.03	0.10	0.04	0.12	0.09	-0.01	0.05	0.16	-0.02	0.15
Frequency of task performance in overtime	0.07	0.10	0.02	0.06	-0.08	0.28*	0.12	-0.06	0.11	0.00	-0.04	0.00	0.09	0.10	0.13	0.06	0.07	0.00	0.15	0.21*	0.17*	0.15

Cont. table 4.

Assessment of the current level of remuneration in relation to other hotels' offers	-0.02	0.17	0.02	0.13	0.07	0.07	0.08	0.07	0.02	-0.01	-0.03	-0.09	0.02	-0.04	0.00	-0.01	-0.17*	-0.06	0.01	0.02	0.17*	0.05
Exploitation of employee's qualifications	-0.01	-0.06	-0.04	0.05	0.05	0.03	0.03	0.03	-0.06	-0.12	-0.01	-0.01	0.10	0.03	-0.02	-0.06	-0.11	-0.02	0.01	-0.04	0.04	-0.01
Would the employee recommend the job	-0.02	-0.07	0.08	0.04	0.08	0.14	0.14	0.07	0.05	0.04	-0.04	-0.16	0.10	0.05	-0.10	-0.03	-0.16	-0.00	-0.06	-0.08	-0.01	0.01

1. Gossiping in the workplace
2. Intentional misleading of a visitor/customer
3. Lateness to work
4. Leaving work early
5. Prolonging work breaks
6. Impoliteness to co-workers and superiors
7. Impoliteness to or disregard for customers
8. Feigning a work overload when in reality not as many tasks need to be performed
9. Hiding one's work errors
10. Use of sick leave despite good health
11. Taking extra money for what entails one's responsibilities/duties anyway
12. Refusal to carry out or failure to carry out work orders or assigned work
13. Performance of work slower than one's capabilities
14. Generating additional/other income during working hours
15. Wasting company-owned supplies/resources/raw materials
16. Not reporting a problem hoping that the situation will resolve itself
17. Reading other people's messages or looking through their personal belongings
18. Blaming others for one's own error/s
19. Using a company phone, printer or other materials for private purposes
20. Failure to provide or withholding important information
21. Pursuance of overtime work when the amount of work to be performed does not indicate such need
22. Average of counterproductive behavior

\* correlations statistically significant at  $p < 0.05$ .

Source: own elaboration based on the study results.

Despite the lack of a statistically significant correlation between the average occurrence of counterproductive behavior and workplace-related factors, the results of the study indicate such correlations for individual counterproductive behaviors. For instance, survey respondents expecting a promotion in the near future make less use of sick leave. Moreover, respondents with fewer duties/responsibilities show less counterproductive behavior involving abuse of other employees or inappropriate behavior toward customers. The occurrence of some counterproductive behaviors was also influenced by the need to carry out tasks overtime. Employees performing less overtime were less impolite toward co-workers and more likely to share information.

The intention to change jobs was positively correlated with the declared frequency of counterproductive behavior, which means that reduced counterproductive behavior is also associated with lower employee turnover. Correlation analysis in stratification by employee gender showed that the frequency of female counterproductive behavior was correlated with the need to work overtime (the correlation between overtime work frequency and the average with the declared frequency of counterproductive behavior engagement was 0.20). Reduced overtime work was most highly correlated with the occurrence of such behaviors as hiding one's

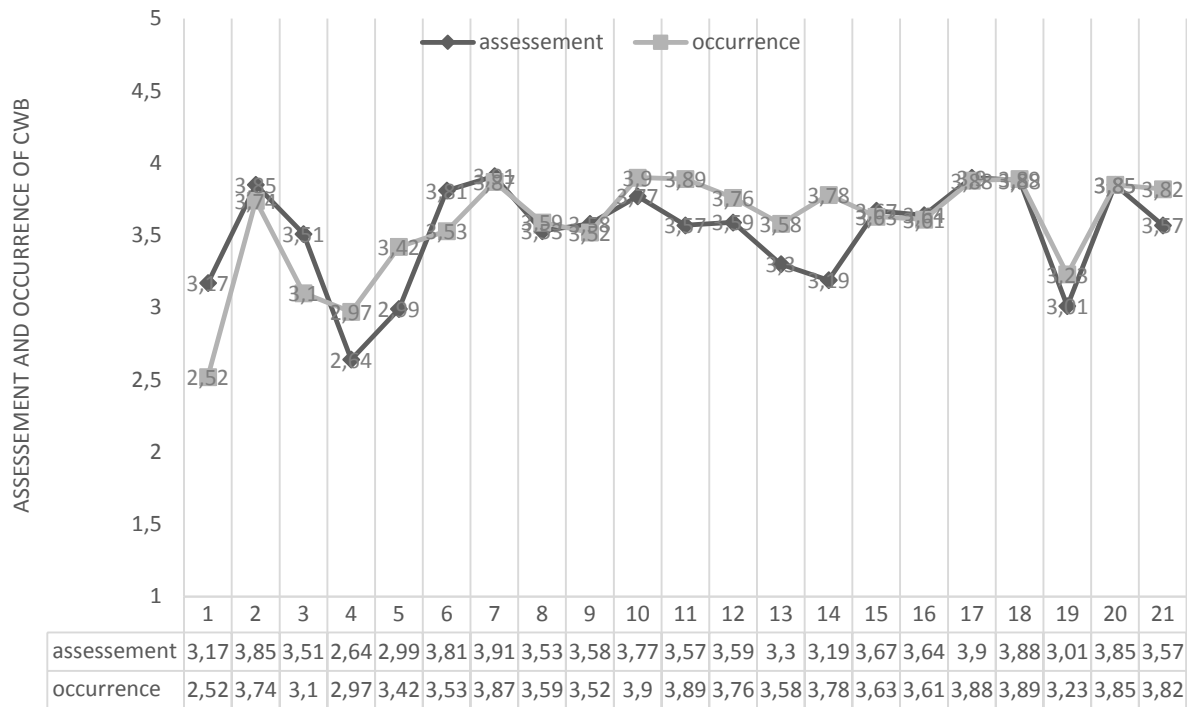
own mistakes (0.22), impoliteness to co-workers (0.27), and failure to transmit information (0.20).

The analysis of the survey results further indicated a statistically significant correlation between job change intents and the frequency of counterproductive behavior (0.18), whereby this correlation was much stronger for male respondents (0.26) than for women (0.12).

The responses to the open-ended survey questions were analyzed using a systematized approach of response categorization. The respondents were divided into two groups categorized by the frequency of declared counterproductive behavior, where the median was the point of the division. In the analysis of the group of the respondents who reported higher incidence of counterproductive behavior, higher frequency in the indication of low pay, poor work atmosphere and communication problems were observed as the causes of CWB. This suggests that these factors may be relevant to the growth and persistence of counterproductive behavior. Moreover, the respondents declaring a higher frequency of counterproductive behavior indicated insincerity in their dealings with their superiors, a lack of appreciation of their efforts, or a high level of hierarchy. The second group of respondents, who reported fewer counterproductive behaviors, likewise indicated a problem with employee appreciation. Unlike the former group, however, these employees did not report problems in their interactions with the management personnel. A difference in the responses regarding positive aspects of work was also observed. The group of employees who reported fewer counterproductive behaviors were more likely to indicate a positive workplace atmosphere, while they were less likely to indicate job stability, compared to the second group of the respondents. These results suggest that employees who engage in fewer counterproductive behaviors value the benefits of a positive work environment more than job security.

In the context of counterproductive work behavior research, a problem often arises with the reliability of the results obtained, particularly when, as is the case with most research on CWB (Fox et al., 2007), self-reports are used to identify such behaviors. Employees can underreport their engagement in this type of behavior, due to fear of the consequences resulting from the disclosure thereof, but also as a result of a general tendency to avoid a negative self-image (Berry et al., 2012).





**Figure 1.** Variation between perception and occurrence of CWB. Legend as for table 4.

Source: own compilation based on the study results.

According to the analysis illustrated in the above chart (Figure 1), lower frequency of declared counterproductive behaviors, which respondents rated as more negative, have been observed. An additional comparative analysis of the differences between the assessment of the behaviors and the declared frequency thereof was carried out, distinguishing the surveyed employee groups by salary and position (management/executive personnel). A comparison of the results obtained in the groups of both males and females indicates an observed trend, according to which men declared a higher frequency of counterproductive behavior, which they themselves rated as more negative. These results suggest a smaller discrepancy between the negative assessment of behaviors and the reported engagement in such behaviors. Similarly, managerial personnel showed a smaller discrepancy in terms of the assessment of CWB and the actual occurrence of such behavior.

## 5. Discussion

The results of the survey conducted among hospitality industry employees on the impact of individual factors on CWB confirm earlier conclusions presented in the literature indicating that the incidence of counterproductive behavior, especially behavior related to the misuse of work time, decreases with age (Berry et al., 2007; Uche et al., 2017; Pletzer et al., 2017).

Such a correlation also exists for workers of other sectors, e.g., in the shipbuilding industry (Białas, Litwin, 2021). Moreover, the study, similarly to what was indicated in earlier publications (Spector, Zhou, 2014; Baka et al., 2015), confirmed the relationship between employee gender and the frequency of certain counterproductive behaviors. With regard to the differences between the incidence of such behaviors among employee groups categorized by job position, however, the study conducted among hotel employees did not confirm the previous findings (e.g., Finstad et al., 2019) indicating that managerial personnel are less likely to engage in counterproductive behaviors, compared to executive personnel. This may be related to employees' greater fear of admitting, even in an anonymous survey, to this type of behavior. The difference between the rating of the harmfulness of CWB and the declared engagement in such behaviors, which was smaller for executive employees, can also be indicative of this problem.

Although the correlation analysis allows identification of a relationship between the assessment of the workplace atmosphere and the occurrence of counterproductive behavior for only one of the specified behaviors (reading other people's messages or going through other people's belongings), the answers to the open-ended questions show that the organizational climate can influence the frequency of such behavior, particularly if it is linked to what the respondents consider inadequate communication and negatively evaluated management. This confirms previous research findings on the impact of these factors on the occurrence of counterproductive behavior (Lipińska-Grobelny, 2021).

## **6. Conclusion(s)**

The presented research facilitates a better understanding of the underlying causes of CWB, which is of particularly significance in the hospitality industry, due to the nature of the work and the potential consequences of such behaviors. Hospitality workers are often required to interact with customers in a friendly and professional manner, and CWB can significantly damage the reputation of a business. What is more, CWB can lead to decreased job satisfaction and employee turnover, which can be costly for employers. Thus, discernment and cognizance of the causes and consequences of CWB allows development of effective strategies to prevent or mitigate the negative consequences of CWB, leading to improved customer satisfaction and employee well-being. Through comparison of employees' self-reported assessments of the level of the detrimental influence of CWB with their self-reported frequency of engagement in such behaviors, the present research provides better comprehension of employees' perceptions of the gravity of such behavior and the association thereof with actual behavior.

Despite the potential contribution of the present study, two main limitations ought to be considered. First, the present study is focused on a single industry, which allows for an in-depth understanding, but limits its generalizability to other industries. Second, the reliance on a CWB self-report survey may have entailed a response bias and social desirability effects (Paulhus, 1984), which could have affected the accuracy of the results.

Future research should address these limitations by inclusion of a more diverse sample of industries and incorporation of multiple data sources to measure CWB. Future research should also explore the impact of leadership styles and different dimension of workplace atmosphere on CWB in the hospitality industry. Overall, these directions can provide more comprehensive insights into the dynamics of CWB in the hospitality industry and facilitate development of effective interventions to prevent and manage CWB.

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## QUALITY OF SERVICES IN HOSPITAL HEALTH CARE

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**Purpose:** The quality of services in public hospitals is of key importance for patients' satisfaction. The aim of the paper was to indicate the most important features of the quality of services related to the patient's hospitalization, and then to diagnose the expected and received level of quality of medical services in the opinion of patients of public hospitals.

**Design/methodology/approach:** The study used SERVQUAL service quality assessment method. The study was conducted in public hospitals in the Silesian Voivodeship. 287 patients were examined. The survey consisted of two questionnaires, a part concerning determining the weights of individual criteria, and particulars. Both questionnaires contained 22 statements each, the particulars included 5 questions. The assessment was made by awarding points on a Likert scale of 1-7. The study was carried out from January to July 2023.

**Findings:** The conducted study allowed to identify key areas that require corrective action. The biggest gaps between the assessment and expectations of patients in public hospitals regard such dimensions as: empathy, professionalism, and trust, as well as the material elements.

**Research limitations/implications:** The study proposed a model of quality of services in public hospitals presenting assessment criteria aimed at diagnosing the dimensions that, in the opinion of patients, are well perceived and those that, in their opinion, need improvement.

**Practical implications:** Knowing the opinions of patients allows public hospitals to obtain information on the extent to which their healthcare meets the expectations and needs of patients. The results of the study provide the basis for taking corrective actions to improve the services provided, and public hospitals gain knowledge about the needs of patients and areas requiring solutions improving the quality of services offered.

**Social implications:** The use of the results of the study allows to adjust services to the expectations of patients in public hospitals and suggests the direction of further actions to ensure quality in health care.

**Originality/value:** The paper is an introduction to the complex topic of improving the quality of medical services and achieving an appropriate level of hospital services.

**Keywords:** medical services, quality of medical services, hospital management.

**Category of the paper:** empirical research paper.

## 1. Introduction

The health care system is one of the most important aspects of social life and the quality of medical services provided is of key importance for providing adequate care to patients. Medical services are an area that greatly affects the health and lives of patients, so it is important to ensure their high quality. A medical service is considered to be "a series of intangible activities - from the patient's first contact with the health care facility until leaving it - undertaken on commission to ensure health or enrich personal values" (Krot, 2008) and their high quality depends on a qualified medical personnel, effective treatment processes, availability of equipment and technology, as well as ensuring patient safety. Medical services are a wide spectrum of activities related to healthcare, including diagnosis, treatment, rehabilitation, and disease prevention, which means that they are part of the group of the most specific services that cannot be equally detailed due to their characteristic quantitative, qualitative, cost, and income value. These services are also characterized by high labor intensity and uncertainty of the positive result of their performance.

By improving the quality of the services offered, medical facilities strive to acquire the optimal number of patients, which increases the chances of their efficient functioning and the full use of the contract with the National Health Fund (NFZ). Correlation between the level of health services, patient satisfaction, and the degree of meeting the health needs of the society, indicate the need to set criteria enabling the evaluation for of the quality of health services. Assessment of the quality of services is one of the bases for their improvement. This paper is an introduction to the issues related to the continuous need to improve the quality of medical services by public hospitals, and to achieve a high level of satisfaction among their recipients, i.e. patients.

For the purposes of this paper, author focused on examining the level of quality of medical services in public health care, on the example of hospital services.

## 2. Quality in medical services

The concept of "quality" is a term difficult to define. This results from:

- its multidimensional and interdisciplinary nature,
- quality assessment depending on experience and knowledge,
- the concept of quality changing as a result of the development of the economy, as well as the level of awareness of entrepreneurs, managers and employees, and
- dependence on the applied quality concepts in a given organization.

The concept of "quality" originally appeared in Greek in the form of the word *poiotes*, introduced for the use of philosophical disputes, meaning the possession of certain qualities allowing to evaluate specific things, and then was translated by Cicero into Latin as the word *qualitas*, defining the properties of an object. In turn, Plato concerned quality as "a certain degree of perfection" (Bielawa, 2011, pp. 143-152). Another definition of quality was developed by his student Aristotle, who wrote that "everything that is done deserves to be done well" (Werpachowski, 2011, p. 382). This statement was the beginning for the formation of the concept of quality, which is an important element in the development of society. Currently in literature you can find a large number of proposed definitions of this concept. For example, the quality according to P.B. Crossy is "compliance with requirements" (Sobkowski, Staszewski, 2003, pp. 88-89). E.W. Deming defines quality as "the expected degree of uniformity and reliability at the lowest possible cost to match market requirements" (Deming, 1986). J.M. Juran's defines quality as "usefulness" (Juran, 1988).

Based on the above definitions, the quality of the service can be defined as the ability to meet the specific needs of the buyer by combining such features of the service that distinguish it from others (Biesok, 2013, p. 13).

The concept of "quality in medical services" in European countries gained the interest of politicians and state authorities only in the mid-1980s. The World Health Organization (WHO) defined this concept as a combination of the features of a service product, assuming at the same time that quality consists of all those features of a service product that, when combined, make the product meet the expressed and unconscious needs of the buyer (Wiśniewska, 2016). According to the Ministry of Health, the quality of medical services depends on such factors as: availability of services, effectiveness of treatment, patient safety, communication with the patient, respect for the patient, responsibility for his/ her health, and cost-effectiveness (Ministry of Health, 2020). In turn, according to the report of the European Agency for Safety and Health at Work (EU-OSHA), the key factors that affect the quality of medical services include: skills of medical personnel, availability and effectiveness of medicines and medical equipment, hygiene standards, and safety procedures (EU-OSHA, 2019).

The main recipient of the offered medical services is society, which is why it is so important to provide them with high-quality services provided by health care facilities. Their quality can be analyzed in the following spheres:

- the sphere of medical services - applies to the service provided, the procedure, examination, surgeries performed in accordance with modern medical knowledge,
- information sphere - concerns direct communication between the medical personnel and the patient (the method of providing the patient with information about his condition, disease, prognosis, etc.),
- technical sphere - applies to equipment, quality of medical and diagnostic equipment used during treatment, and

- the sphere of management, and the economic and administrative sphere - applies to the method of managing financial and material resources, and the effective use of human potential in the services provided by the institution (Krok, 2011, p. 98).

According to research conducted in Poland, the quality of medical services is perceived by patients as one of the most important criteria for choosing a medical facility and the decision to continue treatment (Wojtyna et al., 2019, pp. 99-107), therefore, patients' opinions are important for assessing the quality of healthcare. Therefore, its research is justified in many studies.

### **3. Significance of the quality of medical services in hospital management**

Both in the Polish and world literature there are many works referring to the concepts and methods of management in medical facilities. This results from the dynamic development of medical entities, competitive struggle, and technological progress. These factors mean that medical facilities that are unable to meet the quality expectations of patients are eliminated from the market. Recently, we may also observe an increase in the awareness of patients and their needs regarding medical services, which means that the development of medical facilities depends on the quality they offer. Many authors indicate, that the patient's satisfaction with the treatment is, apart from the knowledge and experience of the personnel, as well as access to modern diagnostic methods, a prerequisite for obtaining good treatment results. Therefore, the implementation of high-quality medical services requires effective coordination of activities and the ability to adapt to constantly changing conditions.

Ensuring a high level of quality of medical services is expensive and therefore cannot be treated as an investment only. When investing in quality, marketing aspects should be taken into account, such as the prestige or image of the facility on the market, but also the possibility of building loyalty relationships between the patient and the facility.

A new approach to issues related to the quality of medical services results from changes in global markets, such as: strengthening the requirements in terms of safety and manufacturer's liability for a product or service, increasing requirements of recipients as to reliability, durability, ease of use, availability. The economic factor also influences the interest of medical facilities in the issue of quality. It was found that there is a direct correlation between the quality of services provided and the financial results of the organization that offers them (Cronin and Taylor, 1992; Hallowell, 1996; Chang, Chen, 1998; Lasser et al., 2000; Newmana, 2001; Rashid, Rokade, 2019 etc.). Increasing the level of quality should usually lead to strengthening the position of the medical facility and attracting additional patients, and thus to improving financial results.

For each healthcare service, patients are the main users, therefore, from the healthcare point of view the patient's opinion on the level of his expectations and satisfaction is an important parameter for assessing the quality of care and an indicator of the assessment of the standard of medical services. Therefore, the patient's experience is currently recognized as one of the three pillars (next to clinical effectiveness and patient safety) of good quality healthcare (Czartowski et al., 2020, p. 10).

At the end of 2020, there were 575 public hospitals in Poland. Most of them are run by counties (44%) and voivodships' self-governments (31%). Only 8 percent of the hospitals were run by cities, and only 2 percent were municipal hospitals. Other facilities are run by medical universities and the ministry ([https://www.portalsamorzadowy.pl/...](https://www.portalsamorzadowy.pl/)).

Hospital management, taking into account the quality of medical services provided by this entity, is to some extent determined by the recipient the service is addressed to and, what is also very important, which entity acts as the payer. Quality in itself is not a goal to be achieved. The primary goal is to provide services that bring maximum profits. We are talking here not only and not primarily about measurable profits that can be translated into the financial success of the hospital, but also about specific profits for the individual beneficiary and for the local community in which the given health care facility operates. Hospital management in terms of the quality of services provided cannot be conducted in isolation from the reality and applicable legal regulations. According to law, there are three entities significant for the health care system on the health services market:

- beneficiary – an entity using health services,
- service provider – an entity providing health services,
- payer – entity financing health services.

We should also remember that the quality management of health services in a hospital is multi-dimensional. The hospital can provide services financed by the National Health Fund (NFZ) and commercial services. Public hospitals are not entitled to collect fees from private payers, which has significant consequences in the provision of medical services. Financing being unsatisfactory for beneficiaries combined with the inability to finance services from other sources causes dissatisfaction of patients and medical personnel, and consequently long queues for services, certainly affecting the health condition of persons entitled to these services.

"Assumptions of the reform of healthcare entities performing medical activities such as hospital services" published in 2021 by the Polish Ministry of Health, drew attention to the "general tendency of deterioration of the financial situation of public hospitals with each passing year". Quoted data show that the total liabilities of public hospitals in 2017-2020 systematically increased from PLN 14,148 million to PLN 18,889 million. Due liabilities increased from PLN 1,617 million to PLN 2,148 million. Voivodeship hospitals had the highest level of total liabilities, followed by county hospitals, hospital run by medical schools and run by cities. The authors of the document also observed unjustified competition between hospitals for patients, medical personnel and material resources, unfavorable for the functioning of

hospitals. According to experts, this negatively affects hospitals that compete instead of complementing each other, which would provide the patient with comprehensive healthcare ([https://www.portalsamorzadowy.pl/...](https://www.portalsamorzadowy.pl/)).

Apart from the aforementioned financial problems affecting the quality of services in public hospitals, literature on the subject also indicates other factors, such as cases of misdiagnosis of patients, lack of interest in the patient during his stay, or problems with communication between healthcare professionals and patients (Laroche et al., 2004; Poon et al., 2004; Verboomoon et al., 2016).

The increase in the number of surveys of service quality - patient satisfaction over the last few years indicates that the concept of quality improvement is becoming more and more important in the service industry year by year, and emphasizes the importance of patient feedback as an important tool in the processes of monitoring and improving the quality of healthcare services (Kasprzyk, 2012, pp. 187-188; Grol et al., 2000, pp. 882-887; Blenkiron, Hammill, 2003; Kropornicka et al., 2003).

Therefore, the main purpose of this paper was to indicate the most important features of the quality of hospital services and to diagnose their expected and received level in the opinion of patients of public hospitals in the Silesian Voivodship.

The results of the conducted study are the basis for taking corrective actions in the field of improving the services provided. They also allow the managing personnel of public hospitals to gain knowledge about the needs of patients and areas requiring the use of solutions to improve the quality of services offered.

#### **4. Methodology**

Patient satisfaction with the services of a given hospital is one of the basic determinants of the success of the facility. However, we should remember that meeting customer expectations is not easy and conditioned by many factors. The quality of the service provided depends on the quality of the entire unit. Therefore, the management of public hospitals should take all measures to obtain information about the expectations and requirements of patients in order to better adjust services.

Various methods are used in research on the quality of medical services, e.g. patient surveys, clinical audits, risk analyses, healthcare process assessments and patient safety studies. Commonly used quality testing methods in health care include the Servqual method and its simplified version, the Servperf method (Cronin, Taylor, 1992).

For the purposes of this paper, the author decided to use the first of the mentioned methods developed by a team of American scientists led by Professor A. Parasuraman. SERVQUAL was the first concept developed to measure the quality of services by applying the method of

statistical inference based on empirical research (Parasuraman, Berry, Zeithaml, 1991, pp. 420-450). According to the aforementioned researchers, it is an instrument for assessing the quality of services made by the client (patient), taking into account the occurrence of five gaps in the sphere of service quality:

- gap 1 – is defined as the difference between the patient's expectations and the medical facility management's perception of these expectations,
- gap 2 – is the difference between the medical facility management's perception of these expectations and the specification of the quality of services,
- gap 3 – the difference between the quality of service specification and the quality of service provision,
- gap 4 – determines the difference between the quality of service provision and the information that the patient obtains about it,
- gap 5 – a measure of the difference between the level of meeting expectations and the patient's perception of the service (Parasuraman, Zeithaml, Berry, 1985, pp. 41-50).

The SERVQUAL method distinguishes five dimensions of services (Bonsalla et al., 2005):

1. material elements - understood as the external and internal appearance of the premises, facility, as well as the behavior and presentation of the personnel and its equipment,
2. reliability - ability to perform the service at the promised level and in the indicated time,
3. response time - quick action and response to patient expectations,
4. certainty - professionalism, appropriate behavior of personnel, and
5. empathy - individual approach to the patient.

Despite controversy over the validity and reliability of this model, it is widely used in healthcare (Newman et al., 2001; Teas, 1993, pp. 18-34).

The study is empirical and is based on primary data collected from patients hospitalized in six public hospitals located in the Silesian Voivodeship. 350 questionnaires were distributed to randomly selected patients who were hospitalized at that time at the hospitals selected for the study. The number of returned, correctly completed questionnaires amounted to 287, which gives a response rate of almost 82%. The survey, in accordance with the rules developed by A. Parasuraman's team, consisted of two questionnaires, a part concerning determining the weights of individual criteria, and particulars. The purpose of the first survey was to diagnose the expected level of services, while the second survey was to diagnose the received level of service quality (Wolniak, Skotnicka-Zasadzień, 2009, pp. 38-58). Each questionnaire contained 22 statements. The particulars included 5 questions. The assessment was made by awarding points on a Likert scale of 1-7, where 1 means "I strongly disagree" and 7 "I strongly agree". The use of an odd scale allows the respondent to maintain a neutral position. Due to the number of people surveyed, the study was conducted in the period: January-June 2023.

Referring to the most important issues discussed in the theoretical part, this paper attempts to identify the most important features of the quality of services related to the patient's hospitalization, and then, using the SERVQUAL method, to diagnose the expected and received level of quality of medical services in the opinion of patients of public hospitals in the Silesian Voivodship.

## 5. Study results

### Characteristics of the study group

In the study group (Table 1), men constituted the majority - 73% (210). Most of the respondents are city inhabitants - 65%. The study group was dominated by people married - 71% (203), who obtained vocational or secondary education - 42% (122) and primary education - 34% (96). Respondents with higher education accounted for 24% (69). Among the respondents, the largest group were people aged 56-65 - 29% (83). The second group consisted of people aged over 66 - 22% (64). The third group of respondents were patients aged 46-55 - 16% (46). Patients aged 25-35 accounted for 12% (35), while patients aged 36-45 accounted for 11% (32). The least numerous group in the study were patients - respondents under the age of 25 10% (27).

**Table 1.**  
*Socio-demographic criteria of public hospitals patient*

Variables	Socio-demographic criteria (n=287)		
		n	%
Sex	Women	77	27
	Men	210	73
Place of residence	city	186	65
	rural areas	101	35
Marital status	single	84	29
	married	203	71
Education	higher	69	24
	vocational/secondary	122	42
	primary	96	34
Age	< 25	27	10
	25-35	35	12
	36-45	32	11
	46-55	46	16
	56-65	83	29
	>= 66	64	22

Source: own study.



### Assessment of the quality of medical services in public hospitals

For the purpose of the study, author proposed a model of the quality of services in public hospitals, in which evaluation criteria were presented to diagnose the dimensions that, in the opinion of patients, are well perceived and those that, in their opinion, need improvement. In this model, the first dimension of material elements included: tidiness and order in hospital rooms, appropriate hospital equipment, modern equipment and neat, aesthetic appearance of the personnel. The second dimension - reliability - included the following statements: the attitude of medical personnel to the patient, the level of patient care, the reliability of the service at the promised level and at the indicated time, as well as the quality and aesthetics of served meals. The third dimension - response time - concerned such statements as: quick actions and responding to the expectations set by patients; informing the patient on an ongoing basis about the service provided (the course of the treatment process); efficient implementation of the service by the hospital's medical personnel. The fourth dimension - professionalism and trust - included: competence and qualifications of the personnel, information about the treatment process, information about the medicines administered and recommended use, personnel's dedication to best possible meeting the needs of the patient, and providing information about the purposefulness of performing tests and treatments. And final dimension – empathy – included the following statements: friendliness of the personnel, individual approach to the patient, willingness to help, sense of security and respecting patient's rights.

**Table 2.**

*Dimensions of assessing the quality of services in the field of patient care in registration*

Assessment dimensions	Detailed description
<b>Material elements</b>	Tidiness and order in hospital rooms; appropriate hospital equipment; modern equipment; neat, aesthetic appearance of the personnel.
<b>Reliability</b>	Attitude of medical personnel towards the patient; level of patient care; reliability of the service at the promised level and in the time indicated; quality and aesthetics of serving meals;
<b>Response time</b>	Quick actions and responding to the expectations set by patients; informing the patient on an ongoing basis about the service provided (the course of the treatment process); efficient implementation of the service by the hospital's medical personnel.
<b>Professionalism and trust</b>	competence and qualifications of the personnel, information about the treatment process, information about the medicines administered and recommended use, personnel's dedication to best possible meeting the needs of the patient, and providing information about the purposefulness of performing tests and treatments.
<b>Empathy</b>	Friendliness of the personnel, individual approach to the patient, willingness to help, sense of security and respecting patient's rights.

Source: own study based on Parasuraman, Zeithaml, Berry, 1985.

After familiarizing themselves with the model presented above, the surveyed patients assessed the weight of five criteria (from Table 2) dividing 100 points between individual dimensions at their discretion (Table 3)

**Table 3.***Determination of the weight of dimensions by the surveyed patients*

Service quality assessment dimensions	Average SERVQUAL dimension weights
Material elements	19
Reliability	20
Response time	21
Professionalism and trust	20
<b>Empathy</b>	20
Total:	100

Source: own study.

In the further part of the study, a seven-point Likert scale was used to measure individual service quality criteria. Respondents rated each of the 22 survey items twice to identify "quality gaps" to measure the difference between their expectations and their perception of various aspects of the service. The analysis of individual questions (Table 4) allowed to obtain the arithmetic averages of service quality assessments in the field of patient care in registration in the surveyed public hospitals and arithmetic averages of the surveyed patients' preferences for the said service. Respondents gave the highest scores to information about the medicines administered and recommended use, observance of patient's rights, keeping the patient informed about the service provided (the course of the treatment process), information about the purposefulness of performing examinations and treatments. The equipment of hospital rooms, quick actions and responses to the expectations of patients, as well as the quality and aesthetics of meals were rated the worst. In addition, the survey using the SERVQUAL method also allowed to calculate relative and absolute quality gaps. The relative qualitative gap is the difference between the respondents' assessment of the quality of services provided by the surveyed health care facilities and their preferences (the respondent's assessment minus the assessment of their preferences). The absolute qualitative gap is the difference between the respondents' assessment and their maximum preferences (the respondents' assessment minus the maximum assessment).

**Table 4.***Patients' preferences and assessments regarding the quality of services in public hospitals*

Item	Feature	Respondent's preference	Assessment of the respondents	Relative qualitative gap	Absolute qualitative gap
	<b>Material elements</b>				
1.	Tidiness and order	4.7	3.4	-1.3	-3.6
2.	Equipment of hospital rooms	5.2	3.1	-2.1	- 3.9
3.	Neat, aesthetic appearance of the personnel	4.7	3.4	-1.3	-3.6
4.	Modern medical equipment	5.3	3.4	-1.9	-3.6
	<b>Reliability</b>				
5.	Medical personnel attitude towards the patient	5.0	3.6	- 1.4	-3.4
6.	The level of patient care	4.9	3.5	- 1.4	-3.5

Cont. table 4.

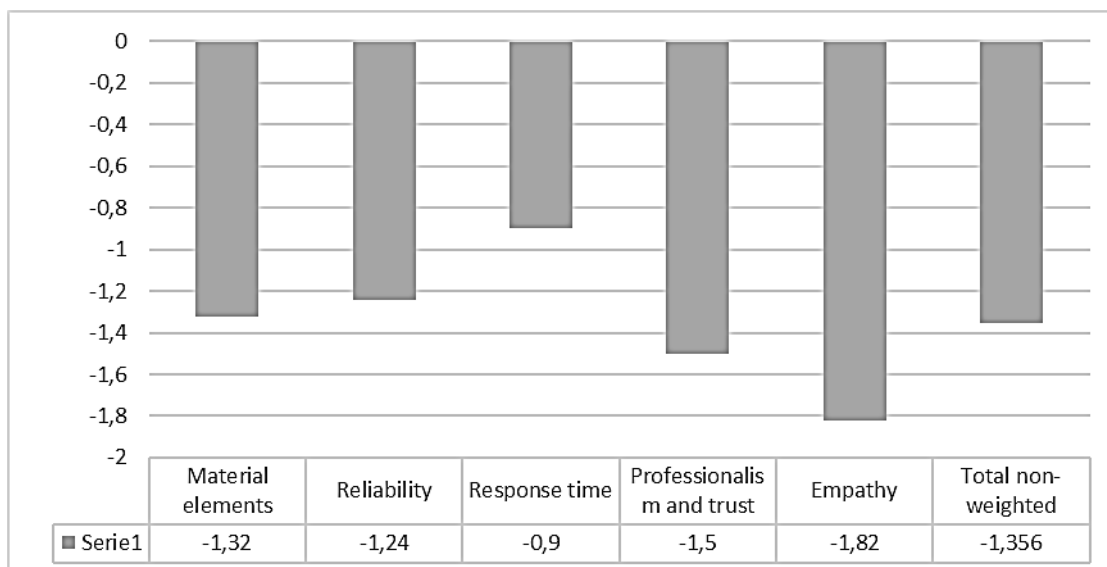
7.	Reliability of the service performance at the promised level and in the indicated time	4.8	3.5	-1.3	-3.5
8.	Food quality and aesthetics	5.2	3.1	-2.1	-4.9
	<b>Response time</b>				
9.	Quick action and response to patient expectations	4.6	3.1	-1.5	-3.9
10.	Keeping the patient informed about the service provided (treatment process)	5.1	3.8	-1.3	-3.2
11.	The hospital's medical personnel performs the service as efficiently as possible	4.9	3.2	-1.7	-3.8
	<b>Professionalism and trust</b>				
12.	Personnel's competence and qualifications	5.2	3.4	-1.8	-3.6
13.	Providing information about treatment	5.1	3.5	-1.6	-3.5
14.	The personnel is dedicated to best possible meeting the needs of the patient	5.3	3.4	-1.9	-3.6
15.	Information about the medicines administered and recommended use	5.1	4.2	-0.9	-2.8
16.	information on the purpose of performing tests and treatments.	5.1	3.8	-1.3	-3.2
	<b>Empathy</b>				
17.	Sense of security	5.0	3.6	-1.4	-3.4
18.	The friendliness of the personnel	5.2	3.4	-1.8	-3.6
19.	The understanding and patience of the personnel	5.3	3.4	-1.9	-3.6
20.	Willingness to help the patient	4.8	3.5	-1.3	-3.5
21.	Individual approach to the patient	5.1	3.5	-1.6	-3.5
22.	Respecting patient's rights.	5.0	3.9	-1.1	-3.1

Source: own study.

The largest relative quality gaps indicated by the respondents concern such criteria as: the quality and aesthetics of meals and the equipment of hospital rooms (-2.1 each), modern medical equipment, dedicated to best possible meeting the needs of the patient, and the personnel's understanding and patience (-1.9 each), or the competence and qualifications of the medical personnel and the friendliness of the personnel towards the patient (-1.8 each). The lowest relative qualitative gap was obtained by such criteria as: providing information about the medicines administered and recommended use (0.9), respecting patient's rights (-1.1), tidiness and order, neat, aesthetic appearance of the personnel, reliability of the service provided on the promised level and at the indicated time, informing the patient on an ongoing basis about the course of the treatment process, information about the purpose of performing tests and treatments, as well as the willingness to help the patient (-1.3 each) and the attitude of medical personnel to the patient, the level of patient care and the patient's sense of security -1.4 each). The largest absolute quality gap concerns the quality and aesthetics of hospital meals (-4.9), the equipment of hospital rooms and the speed of action and response to patients' expectations (-3.9 each) and the efficient implementation of the service by the hospital's medical personnel (-3.8). The lowest absolute quality gap was obtained by such criteria as: providing information about the medicines administered and recommended use (-2.8), respecting patient's rights

(-3.1), informing the patient on an ongoing basis about the course of the treatment process, information about the purpose of performing tests and treatments (-3.2) and the attitude of medical personnel to the patient, the level of patient care and the patient's sense of security (-3.4 each).

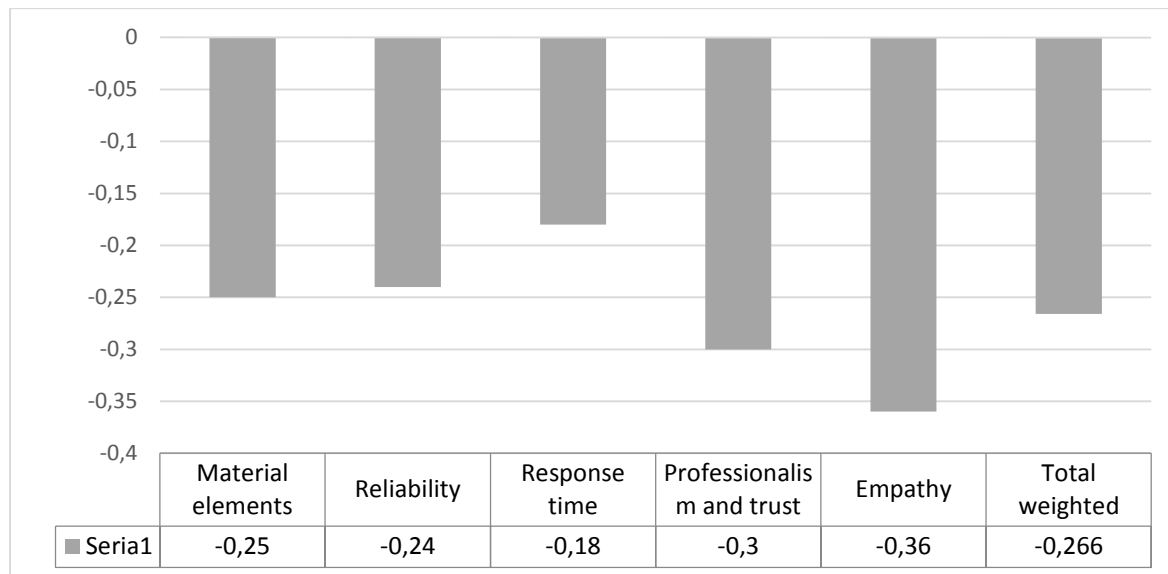
Subsequently, the individual SERVQUAL dimensions for the surveyed public hospitals were assessed. For this purpose, an analysis of non-weighted results was carried out by comparing the arithmetic average in an attempt to actually perceive the quality of hospital services with the result of the expected results for each respondent and for each of the assessment dimensions (figure 1). The best rated dimension is "response time" (-0.9) and the worst is "empathy" (-1.83). This result is a confirmation of the ratings given by the examined patients. The total non-weighted SERVQUAL score for the quality of services in the area of patient care in the registration was -1.35 and, according to the adopted criteria, this score can be considered as average.



**Figure 1.** Assessment of SERVQUAL dimensions calculated using the non-weighted method for the surveyed health care facilities.

Source: own study.

A weighted SERVQUAL score was then calculated. For this purpose, the data defining the average weights of dimensions assigned by the surveyed patients were multiplied by the assessment of dimensions calculated using the non-weighted method. The lower the value of the weighted average for a given dimension, the greater the improvement efforts it requires (figure 2).



**Figure 2.** SERVQUAL weighted average for individual quality dimensions of the surveyed health care facilities.

Source: own study.

For all results of the non-weighted and weighted average, the Servqual values were negative, which means that the quality of medical services expected by patients differs from that offered by the surveyed public hospitals and is unsatisfactory.

## 6. Discussion

This study aimed to assess the current quality of hospital services using the Servqual scale in relation to the opinions of public hospital patients. Regarding the results of the conducted study, it can be concluded that for patients using services in public hospitals, the biggest problem is the "empathy" dimension (-0.36). This may be the result of the personnel's lack of understanding and patience towards patients (-1.9), lack of kindness (-1.8) or lack of individual approach to the patient (-1.6). It can also be linked to the burnout syndrome, which is a natural phenomenon. Working in a hospital is very demanding and exhausting. Hospital employees encounter illness, suffering, and death on a daily basis, which can lead to the fact that at some point they become indifferent, start to perform their work mechanically, treating patients as objects. On the other hand, the cause of poor work can be fatigue and heavy workload. This is certainly an issue requiring further research. We should remember, that the medical personnel plays a key role in building a lasting relationship between the hospital and the patient. Therefore, shaping proper relationships with patients affects the entire service process, including the final satisfaction of the patient (Kunecka, 2010, pp. 451-457).

Personnel behavior affects the quality of work and the social image of the hospital (Krot, 2008, pp. 59-61). A characteristic feature of medical services is their low degree of complexity. In this case, apart from an accurate diagnosis, patients expect from the doctor understanding of their needs, support and reassurance, listening skills, acceptance of their suggestions, and thus developed interpersonal skills (Kapała, 2001, p. 17).

The second dimension requiring corrective action is "professionalism and trust" (-0.3). The biggest gaps between the assessment of patients and their preferences concern issues related to the personnel's efforts to meet the patient's needs (-1.9), personnel competence and qualifications (-1.8) and providing patients with information about the treatment process. Patients are interested in the effectiveness, urgency and safety of the treatment and care process. In this sense, the quality of medical services depends on the qualifications of medical personnel and the conditions in which medical services are provided, as well as on the course of procedures used and the atmosphere in which these procedures take place, and finally on recovery or improvement after leaving the health care facility. Therefore, when considering the quality of medical services from the patient's perspective, certain elements should be taken into account, which undoubtedly include the professionalism of the medical personnel, patient safety, but also: quick access to the right advice, effective treatment provided by trusted specialists, availability of clear, understandable information, participation in making decisions related to treatment and care, respect and maintaining intimacy in the process of diagnosis and treatment.

The third worst rated area requiring changes is the "material" dimension (-0.25). The largest gap (-2.1) between patients' expectations and their assessment concerns the social conditions and equipment of hospital rooms. Patients pointed out primarily the issues related to the availability of the press, television, the Internet, the number of patients in the room and its spaciousness. Another gap concerned the lack of use of modern medical equipment - (-1.9). According to the report of the Supreme Audit Office (NIK) from 2021, hospitals do not use modern medical equipment. The reason for this may be poorly planned purchase of medical equipment, lack of properly trained personnel, lack of contracts with the National Health Fund, or costs exceeding the amounts reimbursed by the National Health Fund ([https://www.prawo.pl/...](https://www.prawo.pl/)). When undertaking corrective actions in the indicated areas, it should be remembered that the patient does not base the assessment of the quality of medical services on the effect of treatment, but above all, he focuses on material elements, previous experiences and behavior of medical personnel. Therefore, we should remember that these factors will become more important only when the technical quality reaches a minimum.

These results are confirmed by earlier nationwide surveys, according to which 66% of adult Poles negatively assessed the functioning of the health service. Including 27% - definitely negative. 30% were of the opposite opinion (Public Opinion Research Center, 2018). Polish patients are more willing to choose private medical care. In 2022, their number increased by 17% compared to 2021 ([https://biuoprasowe.medicover.pl/..](https://biuoprasowe.medicover.pl/)). Also, international studies show

the weakness of the quality of health care in Poland compared to other European countries. In the Euro Health Consumer Index (EHCI) for 2018, Poland was ranked 32nd out of 35 countries assessed, scoring 585 points out of 1000 (Health Consumer Powerhouse; Euro Health Consumer Index 2023; [https://worldpopulationreview.com/...](https://worldpopulationreview.com/)). The lack of a long-term health policy strategy makes it difficult to find a model tailored to the needs and expectations of citizens (Feliksiak, 2016).

The patient's experience is shaped both by all the elements and situations with which he comes into contact while using hospital services, as well as by contact with its employees. This contact builds the patient's ideas and opinions about the quality of work of the entire entity. Therefore, the aim of the activities of medical facilities should be to achieve patients' satisfaction and gain their trust. The quality of medical services becomes one of the most important elements of the effectiveness of health care facilities in a competitive market (Horbaczewski, 2006, p. 10).

The use of the Servqual test method will allow to improve the services provided by public hospitals, identify areas that should be improved as soon as possible to be able to satisfy the patient as much as possible. Modern management concepts assume continuous improvement, which is why hospitals should not limit themselves to the proposed changes, but should systematically conduct patient satisfaction surveys and implement further changes. The conducted analysis allows us to conclude that in all five examined areas the results were negative, which means that public hospitals do not meet the expectations of their patients.

When reviewing the literature on the management of the quality of medical services, we can find examples of empirical studies that confirm the correlation between the management of the quality of medical services and the improvement of medical results and satisfaction of patients and medical personnel, along with their sources: For example, research conducted by Linda Aiken and her team in the United States showed that medical facilities that used advanced quality service management methods had better patient safety records than those that did not (Aiken et al., 2002, pp. 1987-1993). Study conducted in Switzerland showed that medical facilities using service quality management obtained higher patient satisfaction ratings than facilities that did not use them (Bühler et al., 2019, pp. 647-656). Also, study carried out in Poland confirmed that the introduction of quality management programs for medical services in hospitals led to reduction in the number of medical errors and to improvement in patient satisfaction (Grochowski et al., 2015, pp. 1-11).

These studies support the thesis that effective quality management of healthcare services is essential to ensure the best quality of healthcare for patients and for the satisfaction of healthcare professionals, and that SERVQUAL can help hospitals identify the characteristics of healthcare services considered important by patients (Alrubaiee et al., 2011; Pekkaya et al., 2019, pp. 340-347).

## 7. Summary

In conclusion, managing the quality of health services in public hospitals is a key element in providing patients with the best possible medical care. There are many tools and methods that allow for continuous improvement of medical processes and services. It is important that hospitals focus on providing the highest quality services to attract and retain patients and provide them with the highest level of medical care.

Therefore the quality of medical services is one of the main elements of the effectiveness of the functioning of hospitals on a competitive market, and patient satisfaction with the services they offer is a prerequisite for obtaining good treatment results. The results of the assessment of the quality of health services are one of the grounds for their improvement, and at the same time they determine the implementation of the principle of customer-patient orientation.

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## RELATIONS BETWEEN INTRA-GROUP SOCIAL CAPITAL AND ORGANIZATIONAL PROCESSES IN INNOVATION INDUSTRY COMPANIES

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**Purpose:** The importance of intra-group social capital, which supports the flow of knowledge and information necessary for the creation of innovations, by strengthening cooperation between employees, is increasingly pointed out in the search for factors that stimulate development of enterprises. The primary purpose of the article is to seek answers to the following research questions: *What is the level of intra-group social capital in innovation industry companies?; To what extent do the attributes of intra-group social capital affect organizational processes?; What effect do these attributes have on economic efficiency and enterprise development indicators?*

**Design/methodology/approach:** The stated objective was achieved through the use of a survey method which was used to identify the attributes of intra-group social capital and their impact on organizational processes in the surveyed the innovation industry companies.

**Findings:** As a result of the research, the influence of the intra-group social capital attributes on intra-group processes was demonstrated, in particular, on *Quality of performance of tasks in cooperation with employees of other teams and company departments, Sharing of knowledge with colleagues* and *Reducing opportunism in the team*. Also, inter-group processes were described, including the *Information flow between employee teams and departments* and *Cooperation between employee teams and departments in the company*, as well as *Development of innovations in cooperation with other teams*. Significant relations between social capital and indicators of economic efficiency and business development were also discovered.

**Research limitations/implications:** The research results, due to their quantitative nature (survey), provide a basis for limited conclusions.

**Practical implications:** The results of the research provide knowledge about the attributes of intra-group social capital and its importance in intra-organizational processes.

**Social implications:** The research results presented highlight the role of social capital in stimulating organizational processes that support employee innovation.

**Originality/value:** The results of the study contribute in a cognitive sense to the knowledge of the role of social capital in the development of the innovation industry companies.

**Keywords:** organizational social capital, inter-group social capital, enterprise, organizational processes.

**Category of the paper:** Research article.

## **1. Introduction**

The success of a company on the market is increasingly determined by intangible resources. Social capital is a distinctive intangible resource (Herrero, 2018) that enables access to resources which could not otherwise be accessed (Nahapiet, Ghoshal, 1998). It includes resources inherent in the structure of relations between individual actors (Bourdieu, 1986; Burt, 2000; Coleman, 1988). Actors as individuals and groups of people are connected to others, creating a network of interdependent social exchanges in which members become trusted exchange partners, enabling the acquisition of resources and support necessary to achieve individual and collective goals. The key element of social capital are the relations between participants in social networks. In order to examine how social relations influence effectiveness of group activities, it is worth introducing the concept of group social capital, which is based on cooperation, common values and norms, as well as trust, which determines its strength and the role it plays in the functioning of the organization. Although many researchers address the problem of social capital in organizations, there is a lack of a multi-level perspective that would focus simultaneously on intra-group relations and relations with other participants of employee groups within the social structure of the organization. For this purpose, a multi-level research perspective is needed, covering the internal and external context. The author decided to investigate the impact of intra-group social capital on organizational processes. The research intention was to identify the level of intra-group social capital in enterprises in the innovative industry, in order to determine the degree of influence of its attributes on organizational processes and the influence of intra-group social capital on economic efficiency and development of the enterprise.

The study aimed to make two main contributions to understanding the role of intra-group social capital in driving organizational processes. First, the study contributed to highlighting the impact of intra-group capital attributes on internal processes in enterprises. Secondly, the study identified the importance of social capital attributes in the development of the innovation industry companies.

## **2. Organizational social capital – theoretical background**

Social capital is widely described by researchers as a resource embedded in the relations between individuals, communities, networks or societies. Its concept is based on the belief that relational resources in a community can be used by certain actors to achieve desired results (Bourdieu, 1980). Analyzing the definitions of social capital, one can distinguish four approaches to its recognition. Firstly, the network theory, which assumes that social capital is

precisely a social network, i.e. the structure of relations between two or more participants (Coleman, 1988; Lin et al., 2022).

Secondly, the criteria theory which claims that social capital refers to integrity, criteria, and values embedded in a social network (Fukuyama, 1997). Thirdly, the theory of resources, according to which social capital is a set of actual and potential resources that are associated with having a permanent network, more or less institutionalized relations based on mutual knowledge and recognition (Bourdieu, 1986). Fourthly, the capability theory which shows that social capital refers to the connection between an actor and society and the ability to absorb scarce resources through such a connection (Portes, 1998). Fifthly, the theories of the properties of communities, which include networks, norms, and trust that facilitate coordination and cooperation for mutual benefit (Putman, 1994). In conclusion, social capital means the ability of humans to cooperate within social groups, organizations and institutions of various types to achieve common goals (Fuchs, 2006).

Social capital may be a resource of society, community, social group, institution or organization. In organizations, social capital occurs in the form of organizational social capital. If organizations can be considered “social communities in which individual and social knowledge is transformed into economically useful products and services” (Kogut, Zander, 1992, p. 384), then relations between members of the organization are potentially “a valuable resource for conducting social affairs” (Nahapiet, Ghoshal, 1998, p. 243). Organizational social capital is the subject of research at the level of both conceptualization and operationalization. At the conceptualization level, attempts are made to define it. Leana and Van Buren (1999) define organizational social capital as *a resource reflecting the character of social relations within the organization, realized through members’ levels of collective goal orientation and shared trust*. According to Inkpen and Tsang (2005, p. 151), organizational social capital is a public good because *members of an organization can tap into resources derived from the organization’s network of relations without necessarily having participated in the development of those relations*. Sometimes organizational social capital is defined as social capital in the workplace that is “as an ecological resource that concerns employees’ perceptions regarding trust, reciprocity (cognitive), and network interactions (structural) that exist both among peers (bonding) and among individuals across different hierarchical levels or organizations (bridging) (2023). In general, it can be said that the capital covers the form and nature of social relations between employees of a given enterprise, which influence the creation of a climate of cooperation and enable the achievement of common goals by the enterprise and its employees.

At the operational level, attempts are made to determine importance of the capital for the life of the organization. Important research on social capital in organizations includes, among others, research by Lin et al. (2006) on 125 companies using high-tech in Taiwan, which showed the need to include social capital in the strategy of enterprises. Research by Chuang et al. (2013, p. 678) found in their study on 161 participants that there was *a positive relationship between human resources management applications and organizational social*

*capital*. Interesting research was presented by Kemper et al. (2013, p. 589) who examined the relationship of social capital with marketing and corporate R&D) in 280 companies. The research suggests that *social capital is important not only because it is linked to organizational capabilities but also because of its link to superior performance, although indirectly through organizational capabilities*. And F. Di Vincenzo and D. Mascia (2012), while examining project implementation teams, discovered that through appropriate management of structural social capital, project units can improve coordination and efficiency of project implementation. Based on the qualitative methodology of Camps and Marques (2016), they described the impact of social capital on the development of various types of innovations in products, processes, marketing, strategies and behaviors. Social capital enables achieving a sustainable competitive advantage (García-Sánchez et al., 2019), improves the team's ability to innovate (Akhavan, Mahdi Hosseini, 2016), builds intellectual capital (Allameh, 2018), supports knowledge sharing (Bhatti et al., 2020; Cai et al., 2020; Lin, Huan, 2023).

When analyzing the organizational social capital in an organization, two approaches can be distinguished: external capital and internal capital (Leana, Frits, 2006). In the first case, social capital is created by the company's connections with its stakeholders, partners and competitors. In the second case, it is perceived as a resource that reflects the nature of social relations in the organization and manifests itself through information sharing, mutual trust and collective goal orientation (Leana, Pil, 2006). Ortiz et al. (2021) define intra-organizational social capital as organizational networks, trust, norms, shared goals, and collaboration among organization members. Many researchers point at organizational advantages of internal social capital, which include, among others, the creation of a climate of cooperation, more effective collective activities, affective organizational commitment and better organizational performance (Pastoriza et al., 2013; Andrews, 2010; Lindstrand et al., 2011). The development of strong and tightly knit links based on a common understanding and trust among company members lead the company to develop dynamic capabilities for transforming and exploiting knowledge acquired externally, which fosters innovation based on new product development (Ortiz et al., 2021). Organizational social capital has a positive impact on the creation of an innovative climate in enterprises (Bylok et al., 2019). It improves efficiency of enterprises (Strużyna, Bratnicki, 2001; Dyduch, 2003) as well as the CRM philosophy (Grzanka, 2008). The development of social capital in an enterprise manifests itself through an increase in the level of potential of its dimensions, including an increase in the level of trust in interpersonal contacts, establishing closer contacts with colleagues or developing new skills and competences by employees (Wyrwa, 2014). Within organizations, social capital can reduce transaction costs, facilitate the information flow between employee teams and departments and the creation and accumulation of knowledge (Lin, 2001). Therefore, internal social capital can become an asset that encourages employees to find, use and combine their skills, knowledge and experience in a productive way (Linuesa-Langreo et al., 2018).

Intra-organizational capital includes relations within work teams and inter-group relations connecting members of different teams. It can also be called “group social capital”. Oh et al. (2004, p. 861) define group social capital as *the configuration of a group’s members’ social relations within the social structure of the group itself, as well as in the broader social structure of the organization to which the group belongs, through which necessary resources or the group can be accessed*. Due to the internal and external dimensions of employee relations in a work group, we can talk about intra-group and inter-group social capital. This division is based on the concept of R.D. Putman (2000) who proposed recognizing social capital according to the prevailing types of bonds, inclusive social capital (bonding) and exclusive social capital (bridging). In the first case, social capital is based on personal bonds connecting members of the employee team. In the second case, social capital is based on subject-related ties constituting the basis of social networks built across work teams.

Well-developed intra-group social capital offers many benefits. It builds cooperation, identification with the group’s goals, loyalty to the group and communication within the team (Łopaciuk-Gonczaryk, 2008). Strong bonds created in the group reduce the likelihood of opportunism, reduce transaction costs and provide employees with mutual emotional support, especially important for employee effectiveness in moments of crisis (Oh et al., 2004). Social capital enables team members to take joint actions with coherent goals thanks to trust and common recognition (Wang et al., 2021). It induces reciprocity among employees and creates benefits that go beyond tangible, largely financial benefits (Parzefall, Kuppelwieser, 2012).

The intra-group social capital of an organization is therefore not only a resultant of the amount of knowledge and resources individually contributed to the group’s company by its members, but also reflects social relations and cohesion within the team.

### 3. Methods

Studies on intra-group social capital in enterprises are relatively rare in Poland. The author wants to fill the research gap by examining the social determinants of this form of social capital. He formulated the research goal, which was to seek answers to three research questions: *What is the level of intra-group social capital in innovation industry companies?; To what extent do the attributes of intra-group social capital affect organizational processes?; What effect do these attributes have on economic efficiency and enterprise development indicators?*

The survey method was used in the study. A standardized questionnaire was the research tool. The CATI (Computer Assisted Telephone Interview) survey was used to question employees of innovative companies. Spearman’s rank correlation coefficient was used to analyze the answers. The study was nationwide. The survey frame included innovative

companies employing over 50 persons. Based on the random selection method, a research sample was constructed consisting of 575 employees employed in enterprises from innovative industries: pharmacy (25.2%), energy (23.3%), automotive (26.4%) and IT (25%). The employees performed white-collar work (97.2%) and blue-collar work (2.8%). They represented various seniority groups: 4-8 years (10.3%), 9-13 years (23.8%), 14-18 years (33.7) and 19+ years (32.2%). As a result of random drawing, the survey was conducted on a representative sample according to the following parameters:  $\alpha$  error 4%, confidence interval 95%.

## Results

One of the main objectives of the study was to determine the extent of occurrence of intra-group capital attributes, the so-called “bonding”. This type of social capital builds group solidarity and promotes knowledge sharing (Adler, Kwon, 2002). Table 1 presents the results of research on the occurrence of intra-group social capital in enterprises. The level of intra-group capital in innovative industry enterprises is high. The analysis of intra-group capital attributes shows that the strongest of them is the *Good atmosphere/team spirit*, followed by *Good relations between team members* and the *Strong influence of social norms (mutuality, loyalty)*. The weakest attribute is the *Frequency of employees’ interactions with supervisors* and the *Employees’ identification with the team*. Most of the ratings of intra-group capital attributes were independent of the team size, except for *Strong influence of social norms (mutuality, loyalty)*, which attribute was rated highest in small teams (7-14) and lowest in large teams (25+) (Spearman’s rank correlation coefficient  $r_s = 0.198$ ,  $p = 0.018$ ).

**Table 1.**  
*Percent ratings of intra-group capital attributes*

Attribute	Rating				
	1	2	3	4	5
(INSC1) Good relations between team members	0	2.8	12	52.3	32.9
(INSC2) Frequency of employees’ interactions with supervisors	0	2.8	20.3	49.6	27.3
(INSC3) Strong influence of social norms (mutuality, loyalty)	0	5.4	15	41.4	38.3
(INSC4) Good atmosphere / team spirit	0	5.4	12.3	38.3	44
(INSC5) Employees’ identification with the team	0	8.2	15	42.1	34.8
Generalized indicator of social capital	0	4,92	14,92	44,74	35,42

Scale: 1 – I strongly disagree, 2 – I disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I strongly agree.

Source: Author's own study.

Intra-group social capital largely influences intra-group processes. Processes supporting the creation of innovations are important in innovative industry enterprises (Table 2). Among the internal processes in employee teams, the *Sharing of knowledge with colleagues* and *Communication within the team* were rated the highest (77.1% in the both cases). *Mutual*



*assistance within the team* is also important for the respondents (75.8%). The lowest ratings were given to the *Increase in the team's innovation* (30.6% of low and medium) and to the *Competition between team members* (30.4%).

**Table 2**  
*Percent ratings of intra-group processes*

Process	Rating				
	1	2	3	4	5
(IAGP1) – Sharing of knowledge with colleagues	0	5.4	17.6	55.5	21.6
(IAGP2) – Mutual assistance within the team	0	7.8	16.3	53.9	21.9
(IAGP3) – Communication within the team	0	5.4	17.6	55.5	21.6
(IAGP4) – Level of employee satisfaction	0	2.6	25.6	35.7	36.2
(IAGP5)– Reducing opportunism in the team	1.4	2.8	25.9	33.9	36
(IAGP6) – Speed of performing tasks requiring team cooperation	0	6.8	20.3	41.7	31.1
(IAGP7) – Quality of performing tasks requiring team cooperation	0	3.9	24	41	31.1
(IAGP8) – Increase in the team's innovation	0	5.2	25.4	34.6	24.8
(IAGP9) – Competition between team members	0	9.0	21.4	26.8	42.8

Scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high.

Source: Author's own study.

Social capital influences various organizational processes that support the achievement of organizational goals. From the perspective of research assumptions, it is important to examine the relationship between organizational social capital and intra-group processes (Table 3). The Spearman's rank correlation coefficient analysis was used to diagnose these relations. In the case of group processes, the strongest correlation was between the "*Employees' identification with the team*" attribute and the processes: *Quality of performing tasks requiring team cooperation*, *Reducing opportunism in the team* and *Sharing of knowledge with colleagues*. A slightly weaker correlation was between the *Good relations between team member* attribute and the processes: *Sharing of knowledge with colleagues* and *Quality of performing tasks requiring team cooperation*. The attribute of *Frequency of employees' interactions with supervisors* is positively correlated primarily with the processes of *Speed of performing tasks requiring team cooperation* and *Reducing opportunism in the team*. In the case of the attribute of *Strong influence of social norms (mutuality, loyalty)*, the correlation was strongest with the processes of *Reducing opportunism in the team* and *Speed of performing tasks requiring team cooperation*. Next, the attribute of *Good atmosphere/team spirit* affects the processes of *Reducing opportunism in the team*, *Communication within the team* and *Level of employee satisfaction*.

To sum up, intra-group social capital has a significant impact on group processes, in particular *Quality of performance of tasks in cooperation with employees of other teams and company departments*, *Sharing of knowledge with colleagues* and *Reducing opportunism in the team*.

**Table 3.**

*Spearman's rank correlation coefficients between inter-group capital attributes and intra-group processes*

	IAGP1	IAGP2	IAGP3	IAGP4	IAGP5	IAGP6	IAGP7	IAGP8	IAGP9
<b>INSC1</b>	0,312 0,000	0,151 0,046	0,174 0,019	0,146 0,050	0,141 0,056	0,144 0,053	0,183 0,015	0,149	0,143 0,054
<b>INSC2</b>	0,139 0,059	0,139 0,059	0,145 0,052	0,167 0,023	0,187 0,016	0,327 0,000	0,148 0,049		0,131 0,067
<b>INSC3</b>	0,187 0,016	0,141 0,056	0,173 0,020	0,182 0,019	0,343 0,000	0,298 0,000	0,297 0,000	0,167 0,023	0,158 0,034
<b>INSC4</b>	0,179 0,016	0,168 0,022	0,292 0,000	0,173 0,023	0,324 0,000	0,174 0,019	0,109753 0,008438	0,149 0,048	0,137 0,061
<b>INSC5</b>	0,189 0,013	0,175 0,018	0,177 0,026	0,170 0,021	0,294 0,000	0,150 0,047	0,346 0,000	0,178 0,016	0,183 0,015

Source: Author's own elaboration.

Inter-group processes have a significant impact on the degree to which the organization's goals are achieved (Table 4). Among them, the highest scores were given to *Information flow between employee teams and departments* (37.1% of high and very high ratings), *Flow and creation of knowledge thanks to cooperation between employees of different teams* (34.8%) and *Cooperation between employee teams and departments in the company* (33, 4%). However, the lowest ratings were given to *Development of innovations in cooperation with other teams* (33.9% low and very low) and the *Speed of performing tasks requiring cooperation with employees of other teams and company departments* (27.1%).

Thus, inter-group processes are rated lower than intra-group processes. This indicates the existence of significant organizational barriers, in particular in the development of innovations, because cooperation between teams and the flow of knowledge between them are necessary when creating new solutions and improving existing ones.

**Table 4.**

*Percent ratings of inter-group processes*

Process	Rating				
	1	2	3	4	5
(IRGP1) – Information flow between employee teams and departments	0	23.1	39.8	31.7	5.4
(IRGP2) – Development of innovations in cooperation with other teams	0.9	33	36.2	29.4	0.5
(IRP3) – Flow and creation of knowledge thanks to cooperation between employees of different teams	0.5	33.2	31.5	34.3	0.5
(IRGP4) – Cooperation between employee teams and departments in the company	2.6	13	51	27	6.4
(IRGP5) – Speed of performing tasks requiring cooperation with employees of other teams and company departments	2.8	24.3	44.7	26.8	1.4
(IRGP6) – Quality of performance of tasks in cooperation with employees of other teams and company departments	2.8	13.6	52.7	27	4

Scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high.

Source: Author's own study.

In addition to identifying the relationship between intra-group social capital and group processes, one of the research goals was to determine the degree of impact of bonding social capital on the course of inter-group processes conducive to the achievement of organizational

goals (Table 5). Research shows that the attribute of *Strong influence of social norms (mutuality, loyalty)* affects the largest number of inter-group processes, including primarily the *Information flow between employee teams and departments* and the *Cooperation between employee teams and departments in the company*. Also, the attribute of *Good atmosphere/team spirit*, affects most of the examined inter-group processes, primarily the *Information flow between employee teams and departments* and the *Development of innovations in cooperation with other teams*. Similarly, the *Employees' identification with the team* attribute affects a significant number of inter-group processes, but the strength of the impact varies. The strongest impact was observed in the case of the *Information flow between employee teams and departments* and the *Development of innovations in cooperation with other teams*. Next, the *Good relations between team members* attribute affects primarily the *Information flow between employee teams and departments* and the *Mutual assistance within the team*. On the other hand, the *Frequency of employees' interactions with supervisors* primarily affects the *Cooperation between employee teams and departments in the company* and the *Quality of performance of tasks in cooperation with employees of other teams and company departments*.

**Table 5 .**

*Correlation between intra-group capital attributes and inter-group processes*

	<b>IRGP 1</b>	<b>IRGP 2</b>	<b>IRGP G3</b>	<b>IRGP G4</b>	<b>IRGP G5</b>	<b>IRGP 6</b>
<b>INSC 1</b>	0,132 p=0,066	0,153 p=0,050				
<b>INSC 2</b>		0,150 0,047		0,171 p=0,022	0,122 p=0,079	0,148 p=0,050
<b>INSC 3</b>	0,128 p=0,070	0,137 p=0,061		0,281 p=0,000	0,154 p=0,051	0,121 p=0,080
<b>INSC 4</b>	0,133 p=0,065		0,113 p=0,072	0,130 p=0,068	0,112 p=0,075	0,124 p=0,074
<b>INSC 5</b>	0,144 p=0,053	0,139 p=0,059		0,113 p=0,072	0,128 p=0,069	0,123 p=0,075

Source: Author's own elaboration.

From the perspective of the research questions, it is important to analyze the impact of intra-group social capital attributes on economic efficiency and enterprise development indicators. The results presented in Table 6 show that the economic efficiency of enterprises is at an average level. The highest ratings were given to the *Increase in the company's revenues vs. the previous year* (52.3% of high and very high ratings), the *Increase in the market value* (52.3%) and the *Increase in the company's productivity* (50.6%). The *Increase in the value of equity capital vs. the previous year* was rated relatively low (26.2% low and very low), the *Increase in the value of the company's assets* (24.2%) and the *Achievement of a net profit* (23.5%).

Next, Table 7 presents the assessment of enterprise growth indicators over the last year. Among the analyzed indicators, the highest ratings were given to the *Growth of R&D activities* (54.5% very high and high), *Introduction of new products* (51.8%), *Acquisition of new sales markets* (51.3%) and the *Emergence of new investments* (50.8%). The most negative ratings

were recorded in the case of the *Implementation of new technologies* (26.7% low and very low), *Increase in product sales* (26.2%) and *Intensification of market activities* (26.1%).

**Table 6.**  
*Percent ratings of enterprise economic efficiency*

Specification	Rating				
	1	2	3	4	5
EF1 – Increase in the company's revenues compared to the previous year	0	23,1	39,8	31,7	5,4
EF2 – Increase in the market value	0,9	33	36,2	29,4	0,5
EF3 – Increase in the company's productivity	0,5	33,2	31,5	34,3	0,5
EF4 – Increase in the value of equity capital vs. the previous year	2,6	13	51	27	6,4
EF5 – Increase in the value of the company's assets	2,8	24,3	44,7	26,8	1,4
EF6 – Achievement of a net profit	2,8	13,6	52,7	27	4

Scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high.

Source: Author's own study.

**Table 7.**  
*Percent ratings of enterprise growth*

Specification	Rating				
	1	2	3	4	5
EG1 – Introduction of new products	1,2	24,2	22,8	25	26,8
EG2 – Emergence of new investments	0,7	20,2	28,3	25,2	25,6
EG3 – Implementation of new technologies	1,7	25	24,2	26,3	22,8
EG4 – Increase in product sales	1,7	24,5	26,1	25,4	22,3
EG5 – Increase in enterprise resources	0,9	24,5	25,6	24,2	24,9
EG6 – Growth of customer portfolios"	1,2	23,8	25,2	25,7	24
EG7 – Increased employee innovation	0,9	21,7	25,7	27,7	24
EG8 – Intensification of market activities	0,9	25,2	24,9	27	22,1
EG9 – Increasing the company's competitiveness on the local market	0,7	25,2	28,7	22,6	22,8
EG10 – Acquisition of new sales markets	1	22,8	24,9	27,8	23,5
EG11 – Growth of R&D activities	1,4	21,9	22,3	30,3	24,2

Scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high.

Source: Author's own study.

It seems interesting to examine the relations between intra-group social capital and the economic situation of enterprises. For this purpose, the relations between the bonding capital attributes and the economic efficiency of enterprises and their development indicators were analyzed. As can be seen from Table 8, the strongest impact on the economic efficiency of the surveyed enterprises, in particular, the *Increase in the company's revenues vs. the previous year* and the *Increase in the market value* was exerted by the *Strong influence of social norms (mutuality, loyalty)* attribute. Also important for the *Increase in the company's productivity* is the *Good atmosphere/team spirit*, which significantly influences the *Increase in the company's revenues vs. the previous year*, the *Achievement of a net profit* and the *Increase in the market value*. Moreover, the attribute of *Good relations between team members* has a significant impact on the *Increase in the value of the company's assets* and *Increase in the market value*.

A broader picture of the importance of social capital attributes on the development of an enterprise is presented by the analysis of the relations between its attributes and development indicators (table 9). The strongest impact was observed in the case of the attribute of *Frequency of employees' interactions with supervisors*, which significantly influences the *Increase in product sales* and the *Intensification of market activities*. Next, the company's development indicators are influenced by the attribute of *Employees' identification with the team* – in particular, on the *Implementation of new technologies* and the *Intensification of market activities* – and by the *Strong influence of social norms (mutuality, loyalty)* – on the *Growth of R&D activities* and the *Emergence of new investments*.

To sum up, internal social capital affects primarily the *Increase in the market value*, *Increase in the value of the company's assets*, *Achievement of a net profit*, *Intensification of market activities*, *Implementation of new technologies* and the *Increase in product sales*. Therefore, enterprises should pay more attention to creating favorable conditions for development.

**Table 8.**

*Spearman's rank correlation coefficient between intra-group social capital attributes and economic efficiency*

	EE1	EE2	EE3	EE4	EES5	EE6	EE7
<b>INSC 1</b>	0,153 p=0,044		0,318 p=0,000	0,299 p=0,000			0,144 p=0,053
<b>INSC 2</b>	0,133 p=0,065	0,172 p=0,020	0,291 p=0,001			0,135 p=0,063	
<b>INSC 3</b>	0,181 p=0,051	0,135 p=0,063	0,121 p=0,080	0,309 p=0,000	0,394 p=0,000		0,153 p=0,044
<b>INSC 4</b>	0,284 p=0,000			0,283 p=0,000	0,291 p=0,000	0,141 p=0,056	0,150 p=0,047
<b>INSC 5</b>	0,162 p=0,028	0,149 p=0,048	0,171 p=0,021	0,153 p=0,044	0,141 p=0,056	0,161 p=0,027	

Source: Author's own elaboration.

**Table 9.**

*Correlation between intra-group capital attributes and enterprise development indicators*

	EG2	EG 3	EG 4	EG 5	EG 6	EG8	EG10	EG11
<b>INSC 1</b>							0,137 p=0,061	
<b>INSC 2</b>		0,123 p=0,072	0,290 p=0,000	0,132 p=0,068	0,159 p=0,035	0,276 p=0,001		0,137 p=0,061
<b>INSC 3</b>	0,252 p=0,002				0,147 p=0,50	0,169 p=0,021		0,303 p=0,000
<b>INSC 4</b>	0,153 p=0,048					0,159 p=0,035	0,131 p=0,067	
<b>INSC 5</b>		0,291 p=0,000			0,144 p=0,053	0,257 p=0,001		

Source: Author's own elaboration.

## Discussion and summary

From the point of view of research on social factors of enterprise development, this study allowed to identify the attributes of intra-group social capital in enterprises in the innovative industry and determine their impact on intra-organizational processes. The analysis of the results of empirical research shows that the general level of intra-group social capital is high in the studied enterprises in the innovative industry. Its strongest attribute is the *Good atmosphere/team spirit*, followed by the *Good relations between team members* and the *Strong influence of social norms (mutuality, loyalty)*. They create favorable conditions for employees to undertake innovative activities. Social capital attributes were rated highest in the case of small teams (7-14) and lowest in the case of large teams (25+).

One of the benefits of intra-group social capital is the strengthening of intra-organizational processes. This applies primarily to intra-group processes. Research shows that intra-group social capital affects primarily the *Sharing of knowledge with colleagues*. Also, research by Hu and Randel (2014) shows that social capital promotes knowledge sharing by providing tacit and explicit knowledge, knowledge exchange and innovation in the team. Moreover, it influences communication and mutual assistance within the team.

Intra-group capital also strengthens inter-group processes, in particular the *Information flow between employee teams and departments*, the *Flow and creation of knowledge thanks to cooperation between employees of different teams* and the *Cooperation between employee teams and departments in the company*. The author's research shows that three attributes of intra-group social capital have the greatest impact on these processes: the *Employees' identification with the team*, the *Good relations between team members* and the *Strong influence of social norms (mutuality, loyalty)*. Therefore, in order to improve organizational processes, managers should place emphasis on creating conditions for the growth of relations and their frequency between employees of different work teams.

The position of the company on the market depends, among others, on the increase in economic efficiency and the increase in the company's development indicators, among others on the *Growth of R&D activities*, the *Introduction of new products*, the *Increase in the team's innovation*, the *Acquisition of new sales markets* and the *Emergence of new investments*. Research by Liu, Ghauri and Sinkovics (2010) shows that social capital has a positive impact on the growth of the company's market position thanks to the dissemination of knowledge between the company's internal entities. Analyzing the impact of intra-group social capital attributes on economic efficiency and enterprise development indicators, it was shown that the *Strong influence of social norms (mutuality, loyalty)*, the *Good atmosphere/team spirit* and the *Good relations between team members* are important factors in its growth, in particular in the case of the *Achievement of a net profit* and the *Increase in the market value*. Similarly, in the analysis of enterprise development indicators, the strongest impact was observed in the

case of the attributes: *Frequency of employees' interactions with supervisors, Employees' identification with the team and Strong influence of social norms (mutuality, loyalty)*.

The research results confirmed the influence of intra-group social capital on both intra-organizational processes and the development of enterprises, therefore it seems important to strengthen social capital by company managers.

The author of the article would like to point out the limitations in the use of research results on intra-group social capital in enterprises resulting from the quantitative research method used. The presented research results were intended to outline the complex issue of intra-group social capital in organizations and become a starting point for broader research on its function in contemporary enterprises.

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## THE IMPORTANCE OF THE PROJECT MANAGER IN PROJECT DEVELOPMENT

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**Purpose:** The purpose of this article is to examine the role of the project manager in project creation and investigate the multifaceted dimensions of effective project management. The article aims to provide scholarly insights into the requisite attributes and competencies for project managers to effectively and efficiently fulfill their responsibilities.

**Design/methodology/approach:** A survey was conducted by the method of questioning among 41 people.

**Findings:** The findings of the research indicate that the effectiveness of project management extends beyond the mere execution of tasks, encompassing the manner in which they are undertaken. The demeanor and conduct of project managers towards stakeholders significantly impact their support and motivation. Crucial attributes and competencies identified for effective project management encompass a sense of inquiry, viewing challenges as opportunities, holistic thinking, meticulous attention to detail, prudent avoidance of premature assumptions, fostering collaborative alliances, proficient and unambiguous communication, demonstrating respect for others, acknowledging exemplary performance, and assuming leadership roles in navigating information, procedures, systems, and personnel.

**Research limitations/implications:** This study's scope is confined to the exploration of the project manager's role in project creation and the examination of essential attributes and competencies for effective project management. Future research endeavors could delve deeper into specific project management methodologies, tools, and techniques, as well as explore the impact of diverse project management styles on project outcomes.

**Practical implications:** The research findings have practical implications for organizations and project managers alike. Comprehending and implementing the identified attributes and competencies can enhance project manager efficacy and contribute to successful project outcomes. Organizations can employ these insights to develop training programs and guidelines for project managers, thereby augmenting their performance.

**Social implications:** Effective project management carries social implications by virtue of its contribution to the successful completion of projects, which, in turn, can foster organizational growth, innovation, and positive societal impacts. Through emphasis on collaboration, communication, and leadership, project managers can cultivate a positive work environment, promoting teamwork and creativity among project team members.

**Originality/value:** This article offers originality and value by providing a comprehensive examination of the project manager's role in project creation and highlighting key attributes and competencies essential for effective project management. The identified insights serve as a valuable resource for project managers, organizations, and scholars in the field of project management.

**Keywords:** effective project management, organizational success, project methodologies, project tools, project techniques, project management styles, societal impact.

## 1. Introduction

The current conditions of the business world are unstable, changeable and constantly evolving. The dynamics of change often determine the methods and strategies of managing an organization – we manage something, we direct someone through someone or something for a specific purpose or for specific reasons. It is the goal and the conditions for its achievement that are the basic determinants reflecting the efficiency of an organization. It should be noted that access to appropriate resources is one of the conditions for the success of various projects, not only those of economic nature. There is a strong correlation between the process of allocating specific categories of resources and their skillful use. Hence, the management process should be viewed from a systemic perspective, i.e., combining various types of resources into one organism to achieve the set goals in constantly changing conditions. It also must be mentioned that the level, quality and availability of resources determine the potential of a given organization. Assuming the fact that projects are one of the areas of basic activity in every organization, especially of a business nature, it can be stated that the above conditions also apply to project design and project management processes. The concept of a project is quite broad and includes both technical and construction activities, strictly design ones, e.g., making a new product, as well as complex economic projects.

Working on a project is a process that can be analyzed and improved with each instance. Projects are more challenging due to their unique nature – each of them is created in response to circumstances and problems that have never occurred before.

The person responsible for projects in an enterprise is usually the project manager (PM). He or she is responsible for completing the project on time and within the specified budget. They are also responsible for the decisions made in connection with the project. Therefore, without the right project manager, the implementation of the project could be very difficult, if not impossible. Therefore, the purpose of this work is to analyze the role of the project manager in creating a project.

With reference to the researched subject matter, the following research problems were formulated:

1. What is a project?
2. What are the project management methods?
3. What are the stages of project implementation?
4. Who is a project manager?
5. What are the competences and duties of a project manager?
6. How does the project manager influence the implementation of the project?

In order to obtain answers to the above questions and to verify the research hypothesis, the following research methods were used:

- an analysis of the available subject literature (included in the references),
- a survey.

As a result of formulating the research premise in this work, a hypothesis was formulated, assuming that the role of a project manager in creating a project includes all aspects of effective project management, and directly affects its effective and efficient implementation. Management of a project aims to lead to its most effective and timely implementation, while optimizing costs.

An additional hypothesis was also formulated, according to which even exemplary project management, in a professional manner, with 100% commitment to its implementation, exercising control activities in order to meet its end date, will not always protect the project from independent factors that affect the schedules and speed up the completion of individual stages.

The paper presents theoretical issues in the field of project management methodology – the definition of a project, project management methods and project environment are indicated. The issue of exercising control during project implementation was discussed and the results of the survey on the PM's role in project creation were presented. In the conclusions, an attempt is made to answer the above research questions, as well as to confirm the hypothesis whose proving was attempted.

## **2. Project management in the light of the subject literature**

### **2.1. The meaning of a project and its essence**

The word project comes from the Latin word *proiectus*, meaning "extended forward" (Fielding, 2021, p. 4). Thus, they can be interpreted as a proposal for a specific solution to a problem situation.

The word project can be understood both in a narrow way, as part of a whole - i.e. a specific undertaking related to the conception, preparation and production of a specific product or an undertaking aimed at achieving a strictly defined goal, and more broadly – as an unspecified group of activities aimed at achieving the assumed goals, e.g. conducting an advertising campaign in Central Europe in 2011-2013 by company "X" on behalf of company "Y"(O'Connell, 2009, p. 29).

According to A. Stabryła, a project in a broader sense means:

- 1) a model constituting an improvement of a specific system or organizational object,
- 2) an innovative solution, which is the basis for achieving a specific goal (Stabryła, 2006, pp. 30-31). In this case, the economic undertaking is of a comprehensive nature, and its components include: a study, models with documentation, as well as tangible (material) effects along with all solutions (e.g., technical and organizational).

A project in the narrow sense is perceived by A. Stabryła as:

- 1) analytical and research work,
- 2) the concept of creating a specific product/service/system of operations,
- 3) technical documentation,
- 4) action plan.

In recent years, the word project has become increasingly common in the business environment. Almost all feasible tasks, even elementary and/or repetitive ones, carried out on a routine basis, related to the standard scope of duties of the employee in a given position, are referred to as projects. Thus, the term project is often used to refer to undertakings that do not contain a creative element. According to K. Szwarc et al, this type of approach to the term is inappropriate and tends to cause distortions in interpersonal communication (Szwarc, Woźniak, Zaskórski, Tomaszewski, 2021, p. 15). What is more, project in Polish business terminology has different meanings. It can be understood as: a) an intended plan of action; b) a graphically developed plan of action; c) a preliminary version of something (Słownik języka polskiego...).

In other words, a project can be perceived in terms of activity (undertaking) and substance (material or intellectual product of a given system of operation). For example, both an undertaking aimed at carrying out a promotional campaign at a specific time and place, and a prototype of a new model of a family car, can be considered projects. It should also be noted that the identification of the noun project within the meaning of the above definition has strong connotations in the Anglo-Saxon culture, where the term project (noun) is understood as a piece of planned work or an activity which is done over a period of time and intended to achieve a particular purpose (Cambridge Dictionaries Online...).

In the literature on management and project management, there are a number of different approaches to the term project. Selected approaches to the definition of this term are presented in Table 1.

**Table 1.**  
*Selected approaches to the definition of the term project*

Author	Definition
T. Kotarbiński	"A project – according to the praxeological definition – is a complex, multi-subject action, carried out in accordance with a plan, which, due to its complexity, is sometimes prepared with the use of special methods"
B. Grupp	The project is a "one-time activity". A project is an activity "whose costs can be calculated and estimated"
R. Hammer	Projects are activities "in the planning, direction and implementation of which most often many departments of a given enterprise (or even many enterprises) are involved"
Project Management Institute	A project is a "timed action". "A project (venture) is a temporary activity undertaken in order to produce a unique product, provide a unique service or achieve a unique result"
K. Kukuła	A project is an activity "contained in a finite period of time, with a distinguished beginning and end"
G. Leśniak-Lebkowska	A project is "separated from the daily, routine work, is carried out in parallel with it or with the complete delegation of team members to the implementation of the project"

Source: own work based on: Trocki, Grucza, Ogonek, 2009, pp. 17-19.

The scope of a project includes planning and purposeful use of financial, physical and material resources, combined with human involvement – sharing knowledge, competences, and experience, for the purpose of performing joint work that must be completed within a specified time. Therefore, an important factor directly influencing the effectiveness of project implementation is the skillful management of the project team (Szwarc, Woźniak, Zaskórski, Tomaszewski, 2021, p. 17).

A very important element is the correct formulation of goals, which at the same time allows for an objective assessment of the degree of their implementation. We can distinguish the following dimensions that each correctly set goal has:

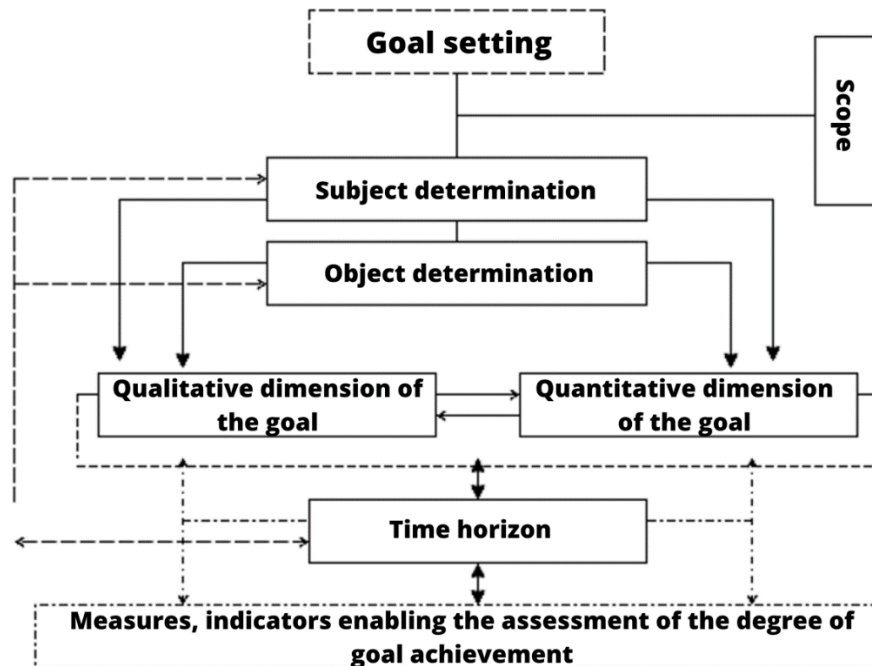
- quantitative dimension,
- qualitative dimension,
- the area, activity and resources it covers,
- time in which it is to be carried out,
- parameters – factors based on which the degree of implementation can be measured (Pawlak, 2012, p. 36).

The goals set must be specific and as clear as possible. Foggy, underspecified goals cannot be guidelines for rational action and the basis for evaluating the work of others. Setting the goal must take into account a real analysis of the situation (resources, strengths, threats). The goal should be achievable, but not too easy in relation to the capabilities of the individual or team (Skalik, 2009, p. 13).

The rationality of the goal is related to the fact that the goal makes sense only in relation to the structure of the vital interests of the organization or individual and must be placed in a hierarchy of priorities. In addition, at each stage of implementation, it must be possible to determine whether and to what extent we are approaching the achievement of the goal.

Such monitoring enables corrective action to be taken. It should also be noted that all project goals can be set and defined:

- in terms of subject matter (the scope, the functional area for which we set the goal),
- in terms of target (to whom the goal is addressed),
- quantitatively (quantitative dimension of the goal),
- qualitatively (qualitative dimension of the goal) (Sońta-Drączkowska, 2018, pp. 27-30).



**Figure 1.** Main factors in the goal setting process.

Source: own work based on: Sońta-Drączkowska, 2018, pp. 27-30.

In management practice, these four dimensions are most often intertwined, because when formulating a goal, we try to explain what it will concern and to whom it is addressed; we also provide the desired results and effects which can be expressed quantitatively and qualitatively.

Every project is aimed at achieving a goal. It is therefore worth remembering that each objective must serve something or someone. This means that, against the backdrop of the interdependencies outlined earlier, a solution that will bring the greatest tangible benefit should be sought.

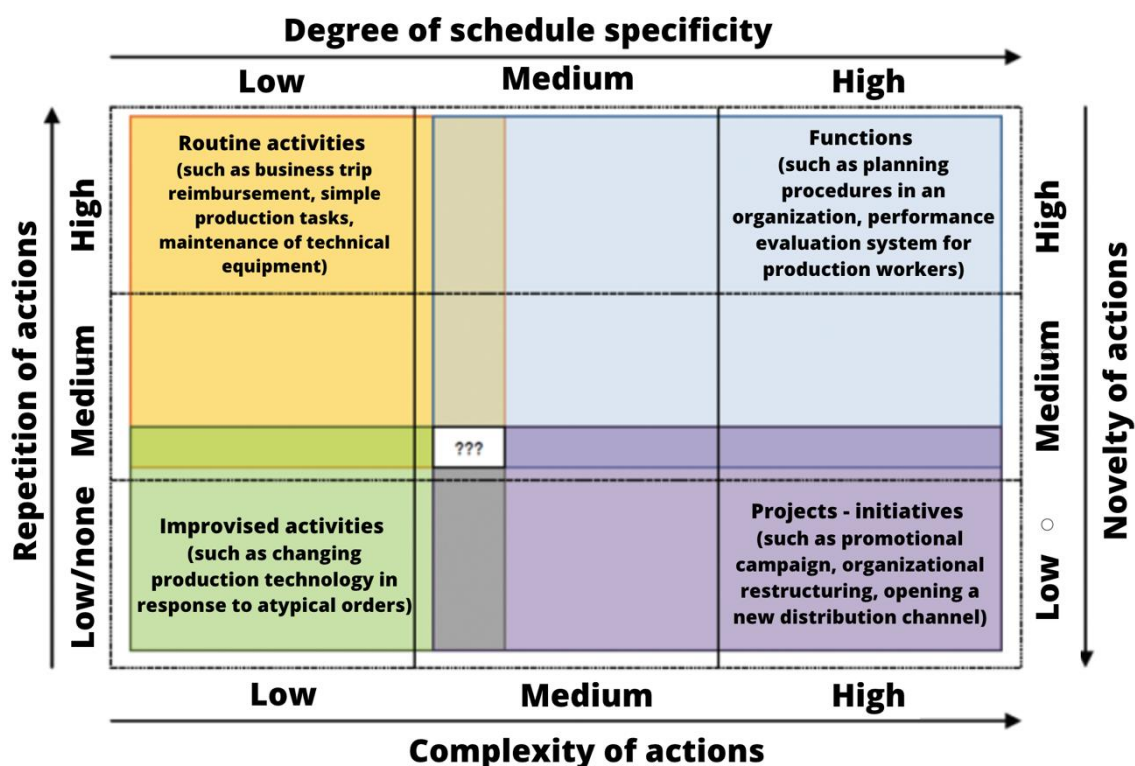
## 2.2. Project characteristics

Taking into account the fact that the term *project* can be understood in different ways, it can be seen that the universal determinants of a project (in the general sense, including e.g. for a business venture) are the following characteristics (Trocki, Grucza, Ogonek, 2009, pp. 13-15):



- 1) complexity – a project should be multi-faceted and multi-stage. It cannot, therefore, be a single and autonomous activity generating a specific effect. In a project, there must be a dependency between the various links responsible for carrying out predefined tasks (activities);
- 2) a defined purpose – projects must have a specific purpose and be carried out to achieve the assumed goal. Hence, the project must serve something or someone, support development by supporting goal-oriented activities (both operational and strategic);
- 3) a specified implementation time – the project must have a defined start and end time – which is directly linked to both the project timetable and the achievement of the goals. In order to determine whether a (final or stage) objective has been achieved, the end of the project (or its individual stages) must be precisely defined. Thus, the project must be implemented according to a defined plan;
- 4) innovative character – an undertaking must be characterized by some degree of innovativeness, as well as an element introducing a broadly understood novelty to an organization – an activity which has not been realized before in a similar form. Therefore, any activity of a routine nature cannot be referred to as a project.

The four criteria characterized above make it possible to distinguish projects from the other three categories of activities in the organization, which are: routine activities, improvised activities and functions (Fig. 2) (Trocki, Grucza, Ogonek, 2009, p. 18).



**Figure 1.** Project as a component of a business organisation's activities.

Source: Trocki, Grucza, Ogonek, 2009, p. 16.

Figure 2 clearly shows that it is difficult to clearly demarcate the boundaries between the different categories of activities. Thus, the four defined fields of the matrix overlap. Indeed, it cannot be unambiguously stated that routine activities are only characterized by low complexity or that the degree of novelty of projects can only be high and the repetitiveness of activities is negligible, etc. For example, a promotional campaign for brand 'X' is undoubtedly a business venture. The degree of novelty is high in this case, as newer (and thus more refined, more accurate) marketing methods and techniques are applied, new campaign goals and market segments are defined, the product is repositioned in the defined markets, etc. On the other hand, the repetitiveness of activities is rather at the 'medium' level, mainly due to the fact that a promotional campaign by its nature is usually an iterative undertaking, with a specific method of implementation (methodology). However, individual editions of a promotional campaign may differ in part from each other in certain (or even most) of the activities undertaken as part of it (Kapusta, 2013, p. 71).

By making a certain generalization of all the determinants of project undertakings discussed so far, it is possible to present a specification of their basic characteristics (Table 2). The considerations presented so far lead to the conclusion that the term *project* will be understood primarily as a specific, complex undertaking (e.g. economic), aimed at developing and improving existing solutions, as well as introducing specific changes (Mingus, 2009, p. 13).

**Table 2.**  
*Characteristics of a project*

No.	Project characteristics
1.	It creates a unique, inimitable product or service derived from knowledge, experience and potential. It uses specific resources, defined by the category of the project. Thus, they are innovative undertakings, aimed at development, progress.
2.	It is task-oriented and achieves precisely defined goals. It is characterized by relatively high complexity of activities and considerable complexity of solutions.
3.	It has a defined implementation schedule, with timed start and end points for activities. Tasks within a project can be sequential or can be carried out simultaneously.
4.	It is separated from the mainstream of the standard day-to-day work of an organization (or part of it) and carried out by a specially designated team of employees. Conflicts between line manager and project manager are thus possible (given the assumption of limited resources within the organization).
5.	It has an organizational configuration tailored to its specific characteristics.
6.	It is associated with risks and uncertainties.
7.	It is usually associated with considerable expenditure; thus, it can be said that a project is time and capital intensive. Furthermore, the project is conditioned to a large extent by the budget (costs).
8.	It can – and usually does – have an interdisciplinary character.

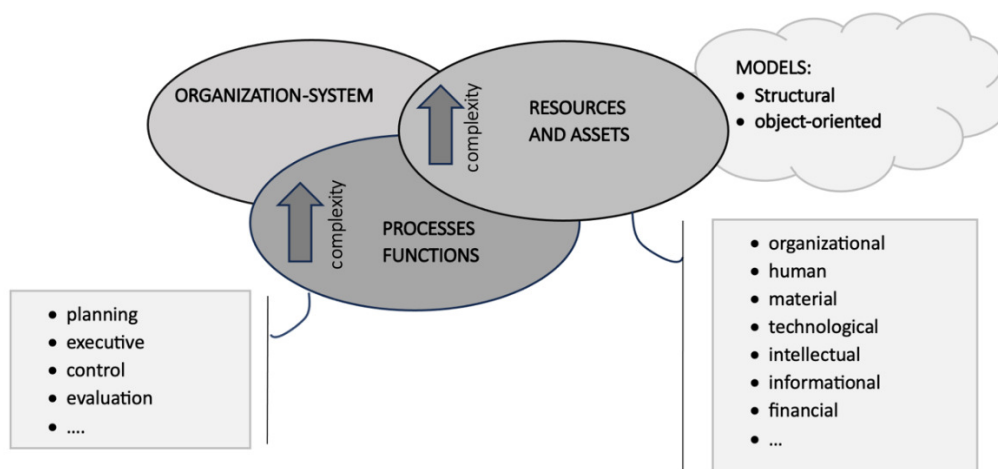
Source: own work based on: Skalik, 2009, pp. 13-15.

Referring to the relationships shown in Figure 2, special attention should be paid to the box with question marks. This is the area of the matrix where all four dimensions of the action categories overlap. This implies a rather peculiar situation rarely found in economic reality. This is mainly due to the aforementioned inconsistencies in the precision of the boundaries between the different categories of activities. It should also be mentioned here that in the situation of placing certain activities on this type of matrix, being in one of the overlapping

(borderline) fields, in case of doubts as to which category of activities to choose, reference should be made to the specifics of a given activity, as well as comparing it with other implemented activities. In creating and analyzing this type of matrix, it is also necessary to bear in mind the specifics of the organization in question and the conditions prevailing both inside the organization (available resources, goal structure, strategy, mission, etc.) and in the external environment (e.g., industry, socio-demographic conditions), as these very factors determine the nature of all activities carried out in the company. Confirmation of the above classification doubts may be found in the fact that in the management policy of one company, it is standard to run only one promotional campaign (therefore an innovative and unique activity) for each product (information function), because the turnover in the product portfolio is high and the product life cycle is short. In contrast, another company treats a promotional campaign for a specific product as an iterative activity, aimed at extending the maturity phase of that product's life cycle in the market (Wysocki, 2013, pp. 53-55).

The analysis of the project subject and project management processes should include many factors such as:

- 1) Organization (enterprise, business unit) – perceived in terms of a system of operation. A project can be both an element of an organization/system of operation and a comprehensive system. Moreover, the organization as a system can be both the subject of a project (creating a structural configuration, reengineering), and the ordering party of projects (modification and improvement of specific functions within the company – so-called internal projects) (Kapusta, 2013, p. 71).
- 2) Resources and assets – the basic categories of resources involved in project design and management processes are human resources, material resources, technical-technological resources, organizational resources (in terms of structural solutions), intellectual resources (human potential, knowledge) and information and financial resources. The set of resources can be more detailed and vary depending on the specifics of the business venture.



**Figure 2.** Subject of project design and management.

Source: Kapusta, 2013, p. 70.

- 3) Models – there are two basic categories of models: structural and subject-oriented. Subject-oriented models focus on the subject of a project and its components/resources in search of analogies between them – the so-called subject classes, which means that it involves a holistic view of the outcome of the project. Structural models, on the other hand, are based on the structure of the functions/tasks of the project subject and refer to the relationships between specific elements (of the system), variables – making visible the nature of the relationships between them and the trends of change. Modelling as a process is a certain simplification of reality and refers mainly to the identification and modelling of relationships between different categories of resources, in order to, among other things, exploit their synergies and ensure optimization of their utilization (Kapusta, 2013, p. 73).
- 4) Processes (functions, tasks) – the main process categories of both design and management of projects are planning, forecasting and simulation, executive (organizing activities, coordinating, motivating), control and evaluation (supervising, recording, reporting) (Kapusta, 2013, p. 74).

The organization of the project subject and project management processes should take into account the multidimensionality of project undertakings. This is because efforts (in terms of e.g., planning and organizational activities) should not be concentrated exclusively on the project subject. The holistic (comprehensive) approach requires taking into account other factors as well, among which one should distinguish the means and resources, relations between the elements of the project-system, the specificity of the organization (with particular emphasis on the place and role of a given undertaking in the structure of the enterprise), as well as its own development potential and that of the environment. It is also necessary to be aware of the fact that the increase in the complexity of the project structure (processes) and the number of resources may be a source of specific threats to the realization of the assumed goals, connected, among other things, with the problem of appropriate allocation of resources or the emergence of interpersonal conflicts at the stages of planning, organizing and coordinating activities in the project (Szwarc, Woźniak, Zaskórski, Tomaszewski, 2021, pp. 28-30).

### **2.3. Project environment**

Every project activity is very much a behavior of both first- and second-degree environments. By identifying a project with a specific, complex, time- and space-defined activity of an innovative nature, it should be emphasized that the input elements of the project process, its actual implementation, and the output effects are all derived from the conditions of the environment, which can even be called the project supersystem - for the project is created, materialized and undone in it. The project environment is as broad as the scope of the project. The project's environment is therefore determined both by each element feeding into the project and by each element gaining certain values from it (in a positive or negative aspect). It can thus be seen that the aforementioned "supersystem" can influence the project in an indirect or direct

way. Taking into account the principle of reciprocity, it can be expected that also the project influences the environment (indirectly or directly) (Flasiński, 2009, p. 122). Examples of the relation of the environment to a project, e.g., an economic project, are presented in Table 3.

**Table 3.**

*Examples of the relation of the environment to the business venture*

Type of relation	Nature of the interaction	
	Direct	Indirect
Environment affects the project	<ul style="list-style-type: none"> <li>- exchange rate fluctuations,</li> <li>- the number of suppliers of a particular service (or material, raw material, etc.) and the quality of their services,</li> <li>- the level of competition on the market,</li> <li>- availability of certain categories of resources, e.g., information and financial resources,</li> <li>- the decisions taken by the company's management and the degree of understanding of the project by its owners,</li> <li>- the number of risk factors and the value of risk for specific activities in the project.</li> </ul>	<ul style="list-style-type: none"> <li>- legal regulations e.g., labor law, commercial law, fair competition principles, development research, environmental protection,</li> <li>- development of tastes and preferences of buyers,</li> <li>- demographic conditions, the phenomenon of the so-called "brain drain", migration of specialists in various fields on a regional and global scale,</li> <li>- development of the education system including higher education,</li> <li>- innovation potential of industries and economic sectors</li> </ul>
The project affects the environment	<ul style="list-style-type: none"> <li>- launching an innovative solution (e.g. product, service) on the market,</li> <li>- development of qualifications of the organization's employees, their gaining experience,</li> <li>- reduction of unemployment in the region, city, or even nationally,</li> <li>- improvement or worsening of the financial condition of the enterprise,</li> <li>- changes in the organizational configuration of the enterprise for the purposes of the project implementation.</li> </ul>	<ul style="list-style-type: none"> <li>- contributing to the development of an industry or economic sector,</li> <li>- shaping the product mix and trends of an industry,</li> <li>- triggering population migration (in search of employment) and increased interest in retraining,</li> <li>- changes in organizational culture, e.g., in terms of senior management's approach to motivation,</li> <li>- the emergence and development of new banking products tailored to the specifics of certain business ventures.</li> </ul>

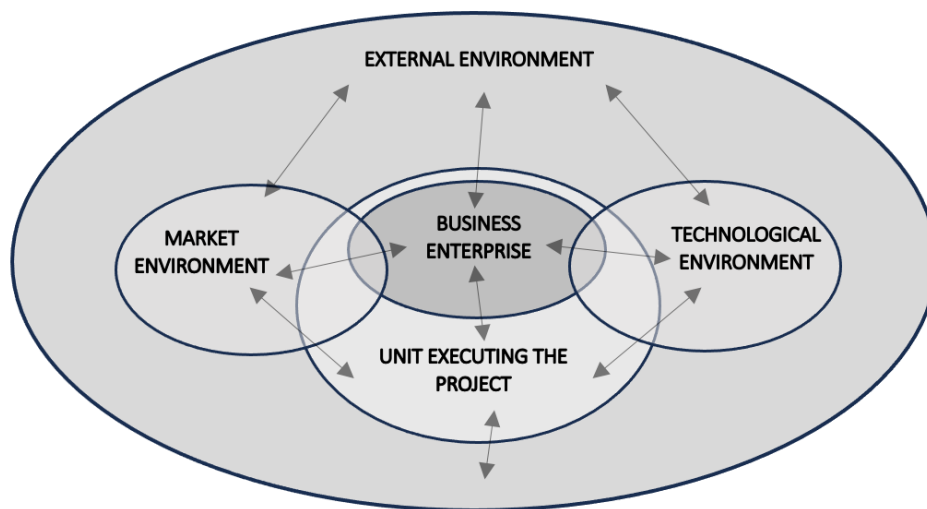
Source: Szwarc, Woźniak, Zaskórski, Tomaszewski, 2021, pp. 31-32.

The classification of the business environment can be done in the same way as in the management of economic organizations. Thus, an external environment and an internal environment can be distinguished. The internal environment mainly includes (Fielding, 2021, pp. 37-38):

- the project management team, the project support office (PSO),
- the implementation team,
- business strategists,
- internal customers,
- the physical environment and organizational (project) culture,
- other employees of the organization/department and the management and owners of the company.

The external environment can be divided into two categories:

- 1) task environment – i.e., specific groups or organizations influencing the way in which the project is implemented, e.g., market customers, suppliers, strategic allies, regulators (entities that can regulate and control by law the policy and course of action of the organization and thus the mechanisms for the implementation of specific business ventures or otherwise influence it), and competitors,
- 2) general environment – i.e., the set of broad forces and dimensions within which the project is implemented, forming the general context for the project management processes, e.g., the technical-technological, economic, socio-cultural, political-legal, demographic, natural environment, as well as the international and global dimensions of the environment (Fielding, 2021, p. 41).



**Figure 3.** Categories of the project implementation environment and the relationships between them.

Source: own work based on: Bizon-Górecka, 2002.

The external environment determines the nature of project and management instruments, e.g., in business projects the role of the marketing mix, which then directly and often powerfully influences the external effectiveness of the project – in other words, the acceptance of the project results by the environment, mainly by customers (and/or other entities in the defined market) (Trocki, Grucza, Ogonek, 2009, p. 93).

It must not be forgotten that a project is understood as an innovative, unique and complex undertaking – which additionally emphasizes the importance of proper penetration of the external environment already at the stage of project preparation (planning stage). Skipping this stage or carrying it out in a superficial way may result in certain risks during the realization and implementation phases of the project – and, in the end, cause the phenomenon of dissonance between possibilities, expectations and needs (conscious and unconscious) of particular factors of the external environment (mainly potential customers) and lack of interest/demand for the project results (outcomes) (Trocki, Grucza, Ogonek, 2009, p. 95).

The project environment, as already partly mentioned at the beginning of the chapter, can be presented according to a slightly different classification – as first- and second-level environment, which is in a way identical to the division into internal and external environment, but in contrast to it, it emphasizes the role of the project in influencing the environment. Indeed, the first-level environment is related to factors that are dependent on the company/organization creating the project. The second-degree environment includes factors related to the environment within which the project is implemented (i.e., within which the business organization operates), e.g., the country's economy, political system, level of wealth and quality of life of citizens (Bińczycki, Tyrańska, Walas-Trębacz, 2007, p. 23). Selected elements of the first- and second-degree environment are shown in Table 4.

**Table 4.**

*Selected elements of the first- and second-degree environment*

First-degree environment	Second-degree environment
<ul style="list-style-type: none"> <li>- project management structure,</li> <li>- executive and management staff, principles of motivation, personality and qualifications,</li> <li>- research and development work carried out in the field of product design, manufacturing technology and production organization,</li> <li>- the level of technology available for the performance of technological, control, transport, storage and information operations,</li> <li>- organization of supply and material management,</li> <li>- financial means at disposal and the rotation speed of these means,</li> <li>- method of calculating own costs and recording losses incurred by the enterprise in the area of production systems,</li> <li>- methods and forms of management of systems, e.g. production, scientific-technical preparation of production and auxiliary services – quality control, material management, tool management, overhaul, energy management, transport, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- suppliers' production capacities or other potential opportunities for easy procurement of intermediate products, energy, etc.,</li> <li>- level and capabilities of competition in the national or regional market (legal, administrative, technical restrictions, etc.),</li> <li>- economic condition of the country, region, stability of money, level of inflation,</li> <li>- the banking system and its functioning,</li> <li>- level of taxation, customs system,</li> <li>- methods and forms of production control by the authorities of the country or region,</li> <li>- the level of modernity and quality and the price of production equipment and machinery and technical means of processing and transmitting information,</li> <li>- the development of the country's or region's infrastructure – the development of the motorway network, the number of logistics centers, etc.,</li> <li>- the level of technology, distribution and service – i.e., the ability to purchase intermediate products.</li> </ul>

Source: Bińczycki, Tyrańska, Walas-Trębacz, 2007, p. 25.

Generalizing the previous considerations on the classification of the project implementation environment, a specification of the basic environmental factors can be made. The Project Management Institute (PMI) includes primarily:

- a) the structure of the organization and its processes, as well as the organizational culture,
- b) standards and norms (statutory or industry standards), e.g., quality standards, information security standards, codes of conduct,
- c) infrastructure in a broad sense, e.g., buildings, machinery, ICT infrastructure,
- d) human resources and personnel administration (HR processes), as well as existing communication channels within the organization,
- e) commercial databases and other thematic data repositories, e.g., with regard to risk level, standardized costing data, as well as IT systems supporting project management,

e.g., packages responsible for work scheduling and resource allocation, configuration management system, network interfaces to other on-line systems,

- f) the system for work authorization within the organization,
- g) market conditions (in terms of the internal market within the organization and the external market),
- h) tolerance of project stakeholders to the level of risk (Project Management Institute...).

However, regardless of the conditions resulting from the impact of the project environment on a particular project, it should be remembered that it is and will be an important determinant of the successful implementation of innovation and project undertakings, and its proper constructive analysis can be a guarantee of success. In case of neglect and poor knowledge of the environment, the main source of risks (risk factors) should be sought there.

### **3. Importance of the project manager in project development according to own research**

#### **3.1. Methodological assumptions**

The person responsible for a project in a company is usually the project manager. He or she is responsible for completing the project on time and within budget. They are also responsible for the decisions taken in relation to the project. Thus, without a suitable project manager, project implementation could be very difficult, if not impossible. Hence, the aim of this thesis was to analyze the role of the project manager in project development.

The following research problems were formulated in relation to the studied topic:

1. Who is a project manager?
2. What are the competences and responsibilities of a project manager?
3. How does a project manager influence project implementation?

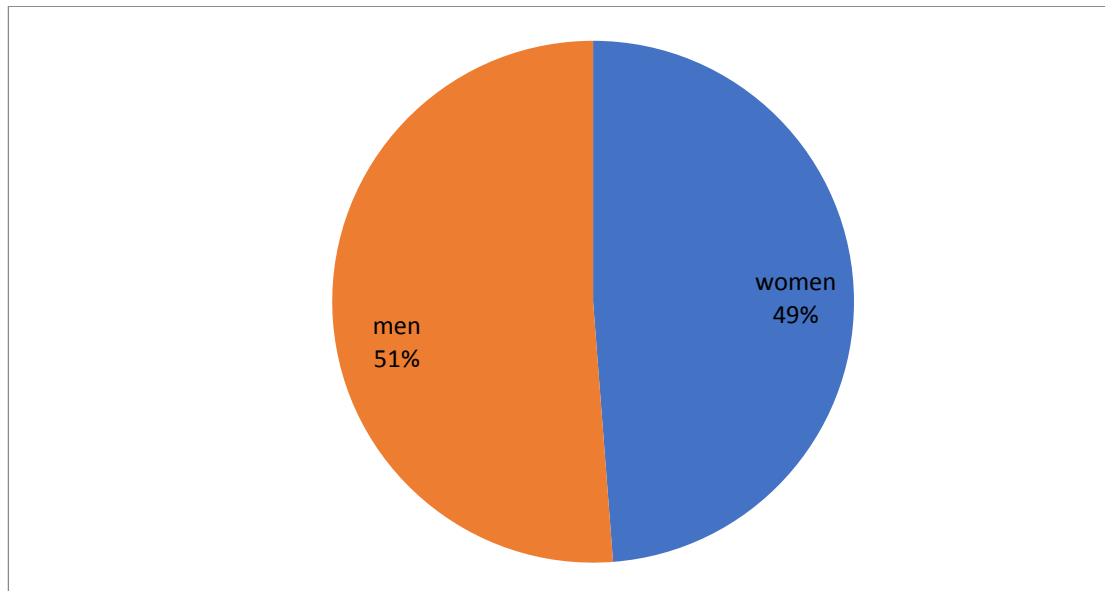
As a result of the formulation of research assumptions in this study, a hypothesis was formed, assuming that the role of the project manager in the creation of a project includes all aspects of effective management of this project, and directly influences its effective and efficient implementation. The aim of project management is to make the project as effective and timely as possible, while at the same time optimizing costs.

An additional thesis was formulated, according to which even exemplary project management, in a professional manner, with 100 per cent commitment to the project, exercising control activities to meet its end date, will not always protect the project from independent factors that have an impact on changing schedules and accelerating the completion of individual stages.



In order to obtain answers to the questions posed above and to verify the research hypothesis, a diagnostic survey was used as the research method, the tool being a questionnaire. The survey was addressed to members of project teams in manufacturing company X.

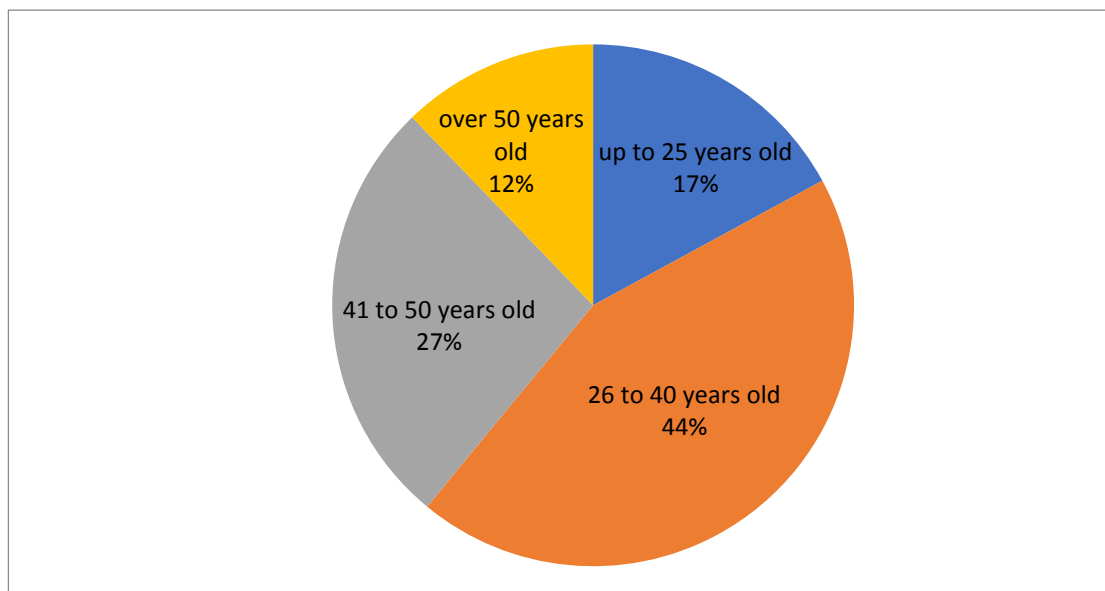
A total of 41 people took part in the study – 21 men (51% of the group) and 20 women (49%). The gender structure of the people surveyed is shown in Figure 1.



**Figure 1.** Gender of respondents.

Source: own work.

Data on the age of respondents is shown in figure 2.

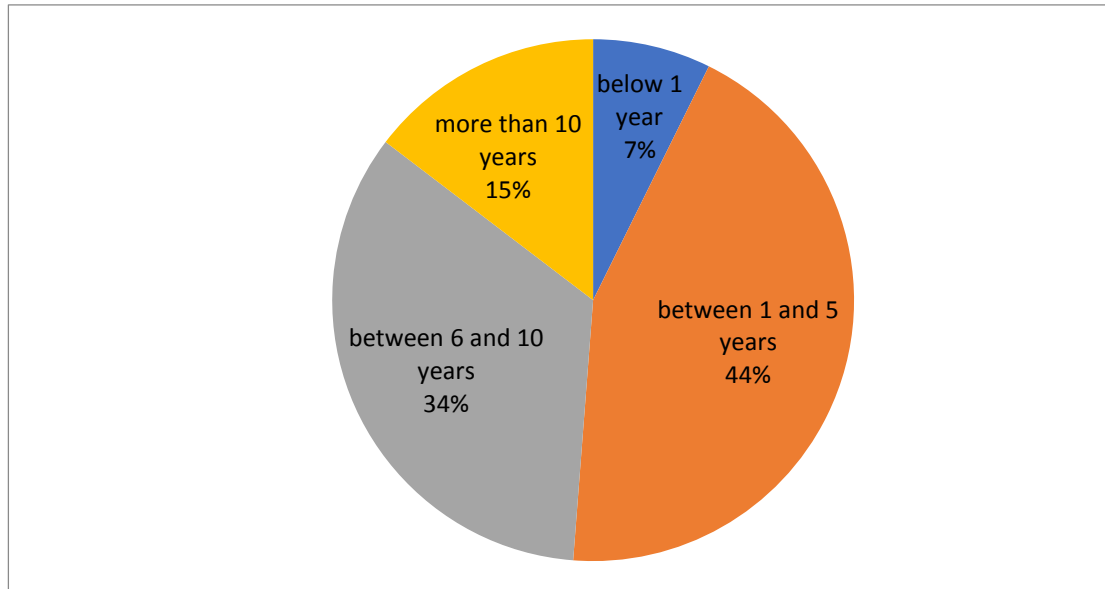


**Figure 2.** Age of respondents.

Source: own work.

It was found that 17% of the people surveyed were up to 25 years old; 44% were 26 to 40 years old; 27% were 41 to 50 years old; and 12% of the respondents declared that they were over 50 years old.

Respondents were also asked about their level of seniority in the company. This information is presented in figure 3.



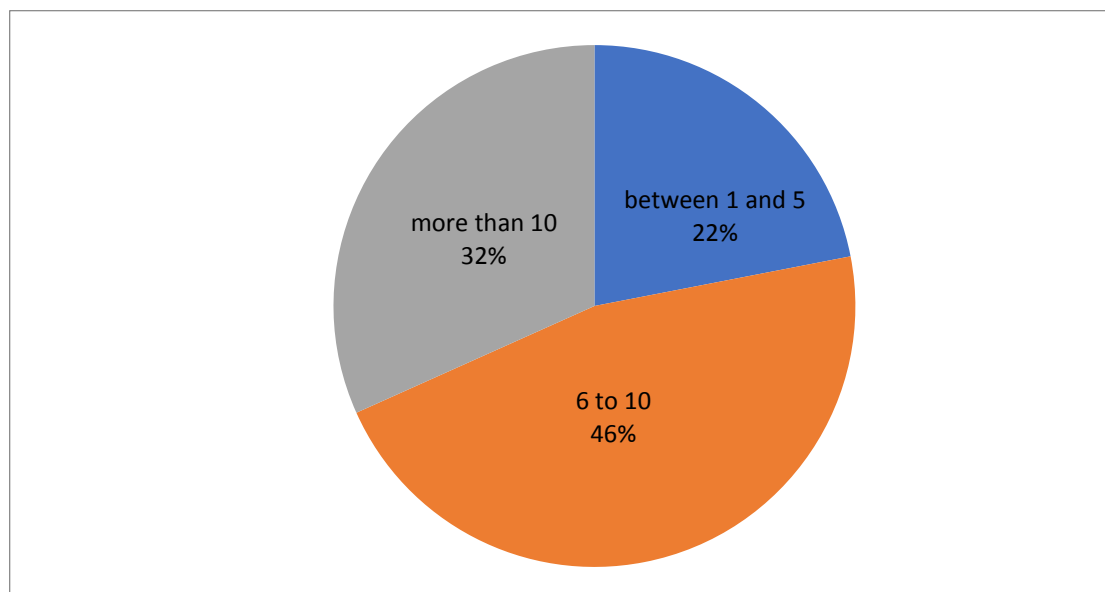
**Figure 3.** Job seniority of respondents.

Source: own work.

The largest group of people surveyed – 44% – declare a length of service of between 1 and 5 years; 34% of respondents indicate a length of service of between 6 and 10 years; 15% – more than 10 years and 7% – below 1 year.

### 3.2. Analysis of self-reported research

To begin the survey, respondents were asked how many projects they had participated in so far. The responses in this respect are presented in the chart below.

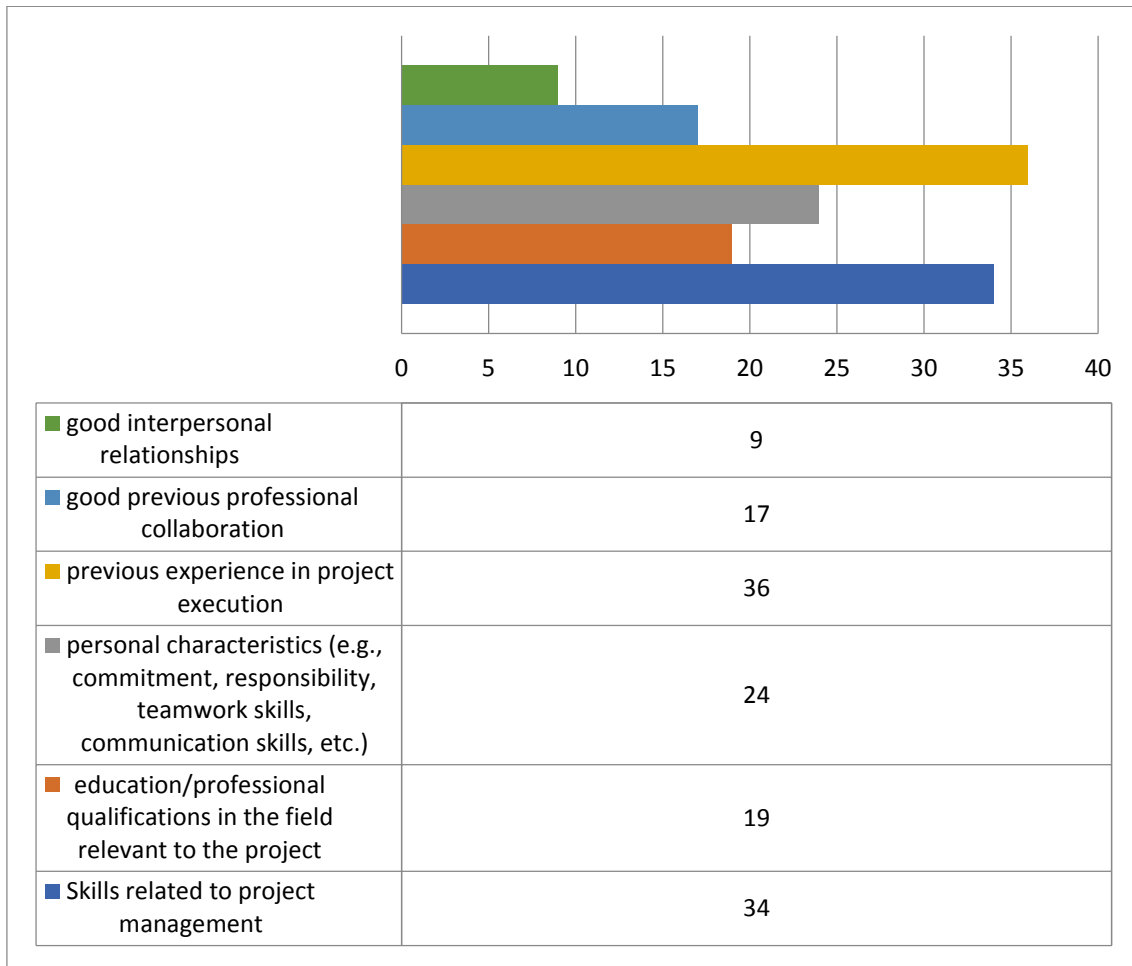


**Figure 4.** Number of projects in which respondents participated.

Source: own work.

46% of those surveyed were involved in the implementation of 6 to 10 projects; 32% participated in more than 10 projects, 22% participated in between 1 and 5 projects.

The respondents were also asked what criteria should guide the project manager when selecting project team members. The responses are presented in the chart below (multiple answers possible).



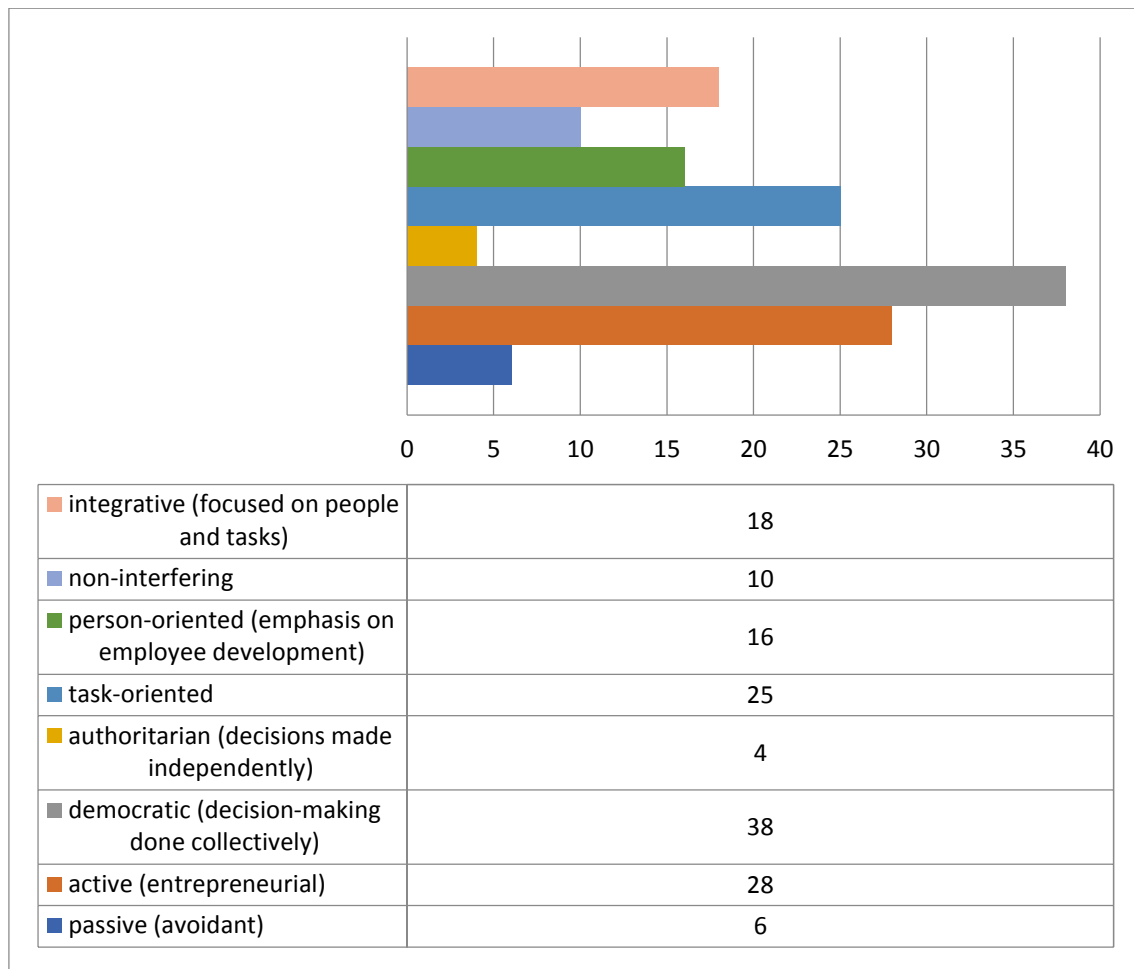
**Figure 5.** Criteria for selecting members of the project team.

Source: own work.

The research found that the most desirable qualities of project team members are:

- previous experience in project implementation – 36 indications,
- project management skills – 34 indications,
- personal qualities (commitment, responsibility, teamwork skills, communication skills, etc.) – 24 indications,
- education/professional qualifications in the field relevant to the project – 19 indications,
- good previous professional cooperation – 17 indications,
- good social relations – 9 indications.

Respondents were also asked what they believed to be the most effective way to lead a project team.

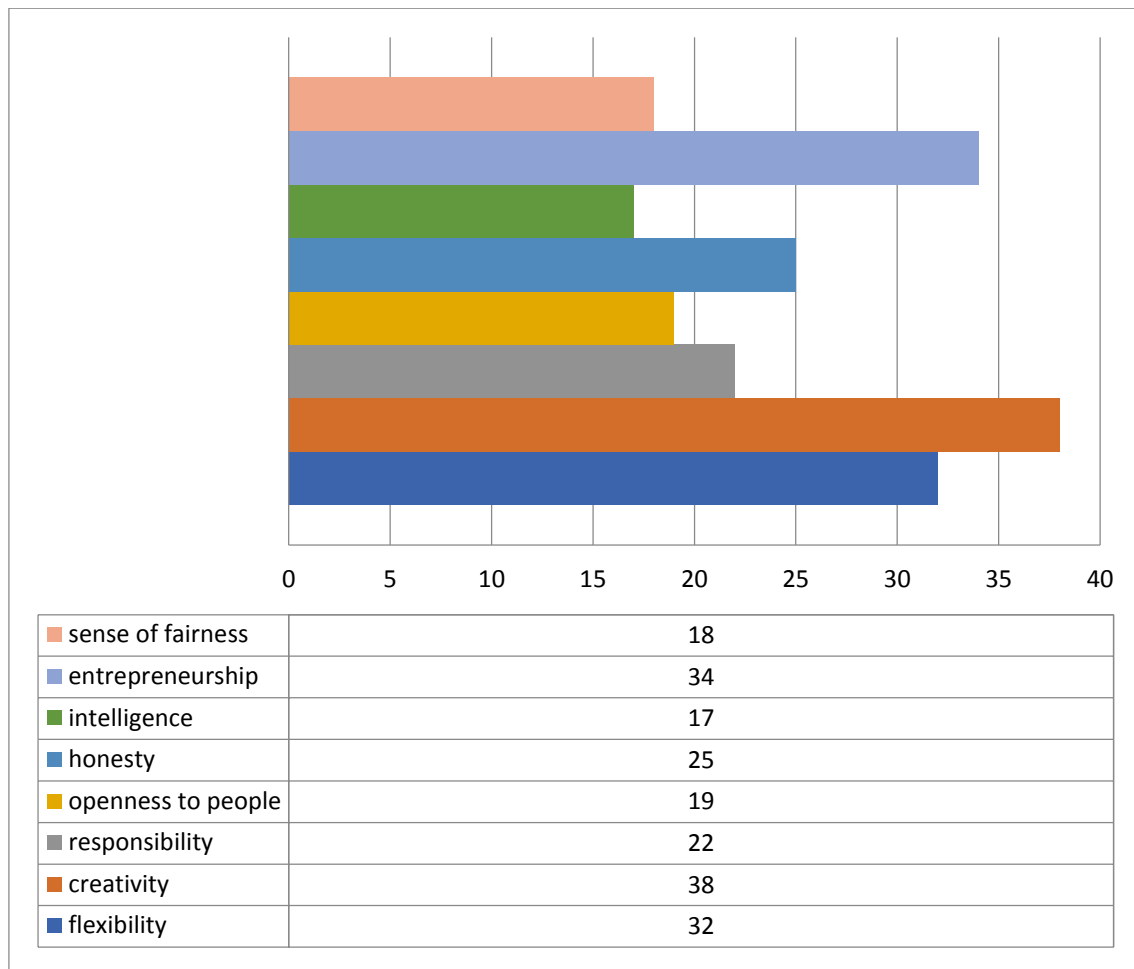


**Figure 6.** Distribution of answers to the question: Which way of project team management do you think is the most effective? (Multiple answers possible).

Source: own work.

In the opinion of project team members, the best team management style is the democratic style, in which the manager makes decisions together with the team (38 indications). The next styles indicated by the persons surveyed were: active style (28 indications), task-oriented style – 25, integrative style (focused on people and tasks) – 18, personal style (focused on the development of employees) – 16, non-interfering style (allowing for any way of performing tasks) – 10, passive style – 6, and authoritarian style – 4.

The respondents were then asked which of the following characteristics a project manager should have. The responses are indicated in the chart below.

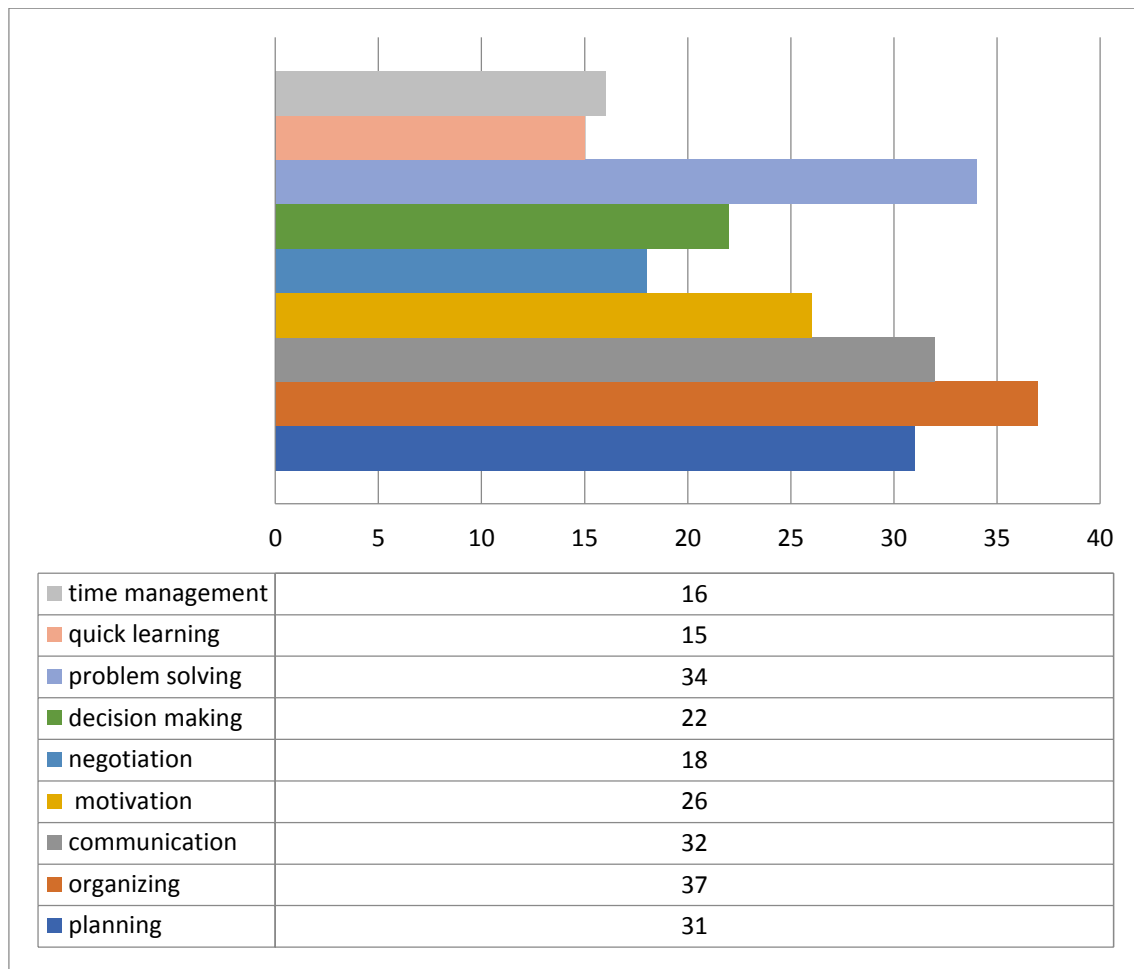


**Figure 7.** Distribution of answers to the question: What qualities should a project manager have? (Multiple answers possible).

Source: own work.

It was found that the most frequently indicated trait that, in the opinion of the respondents, a project manager should possess is creativity – 38 indications. This was followed by entrepreneurship – 34 indications, flexibility – 32 indications, honesty – 25, responsibility – 22, openness to people – 19, sense of fairness – 18, and intelligence – 17.

It was also determined what skills the respondents thought the project manager should have (figure 8).

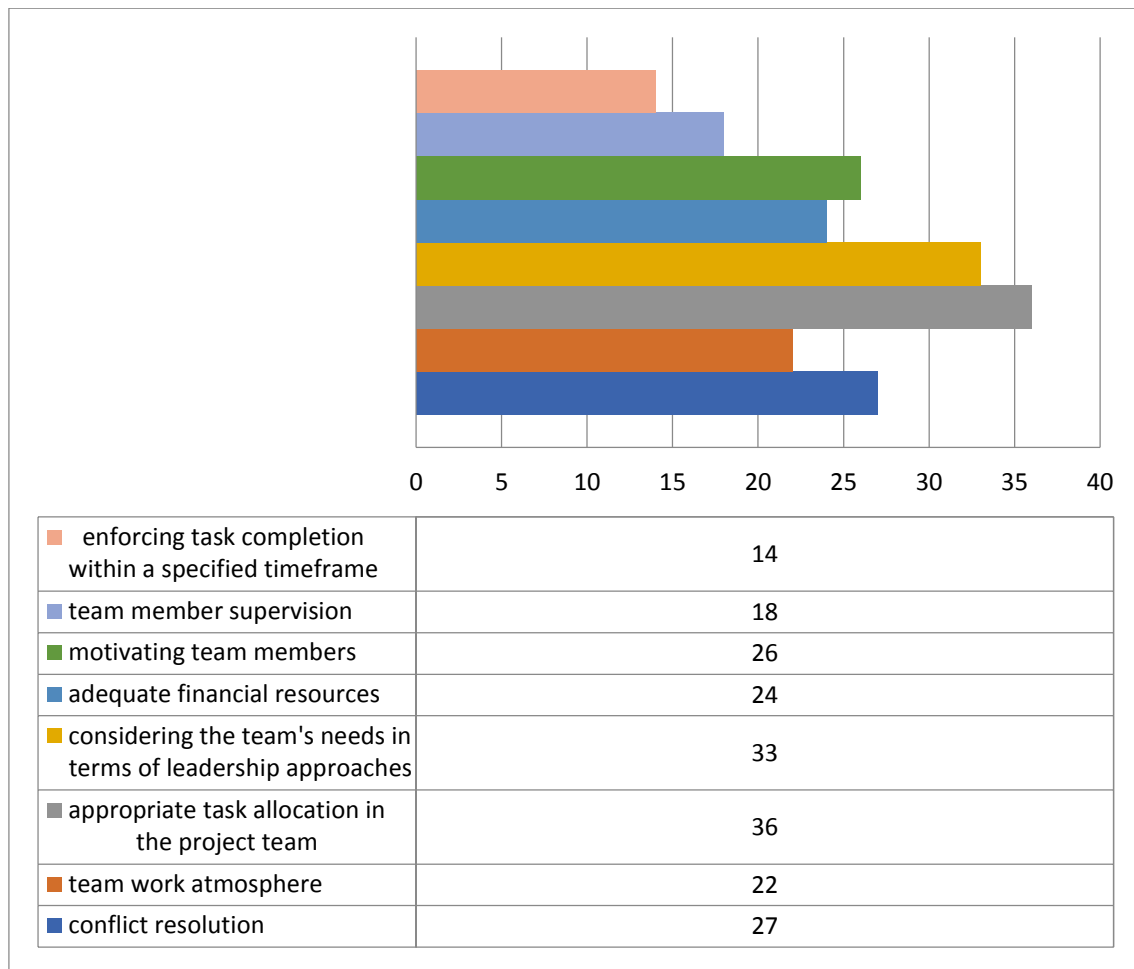


**Figure 8.** Distribution of answers to the question: What skills should a project manager have? (Multiple answers possible).

Source: own work.

Respondents, in the category of skills a project manager should have, indicated: organizing – 37 indications, problem solving – 34 indications, communicating – 32 indications, planning – 31, motivating – 26, decision-making – 22, negotiating – 18, time management – 16, quick learning – 15.

Finally, the surveyed group was asked which factors they believe influence the effective management of a project team.



**Figure 9.** Distribution of responses to the question: what factors do you think most influence project team management? (Multiple answers possible).

Source: own work.

In the opinion of the respondents, the proper division of tasks has the greatest impact on the effective management of a project team – 36 indications; next, it is very important to take into account the individual needs of team members in the ways of managing the project group – 33 indications, conflict resolution – 27, motivating team members – 26, adequate financial resources – 24, team work atmosphere – 22, control of team members – 18, enforcing the implementation of tasks – 14.

### 3.3. Conclusions

Effective project management is not only a matter of what the manager does, but also the manner in which it is done. The PM's attitude and behavior towards others determines their attitude towards him or her. In the course of the research, it was found that in order for a manager to effectively carry out the required tasks, he or she should have the characteristics/skills listed below:

- A manager should be inquisitive – try to understand the reasons behind the actions and wishes of others. This knowledge will allow him or her to respond in the right way to the actions and requests of team members, top management and all other recipients of the project (and this in turn will increase their motivation and support for the manager's actions). Once he or she manages to understand the underlying reasons for the actions and expectations of others, the manager should share the insights with those around.
- A manager should adhere to the principle of "it can be done" – treating all problems as challenges and trying to do whatever is possible to deal with them. Creativity, flexibility and persistence – delving into a problem until it is solved.
- A manager must think in the big picture – consider all events in a broader context, being aware of what he or she wants to achieve and how to accomplish it. The best way out is to analyze the impact of one's own actions on the current and future situation of the project, and this knowledge should be presented to others.
- It is advisable for the manager to focus on the details - to thoroughly analyze all issues. It is the manager's responsibility to think the project through to the smallest detail. The more precisely he or she describes the results to be achieved, the easier it will be for others to realize the benefits of the project. And the more clearly he or she describes the range of activities necessary to obtain these results, the more often the manager's colleagues will ask important and insightful questions about these activities, and the more strongly they will believe that they can successfully complete the tasks before them. Transparency of goals increases motivation and reduces the risk of mistakes (<http://abcjakosci.pl/...>).
- A manager should not make hasty assumptions - one should always try to establish the facts first, and treat assumptions as a last resort. With every assumption comes the risk of making a mistake. The fewer the number of assumptions on which an action plan is based, the greater the confidence in its feasibility.
- There is an advantage to treating others as allies, not as enemies - focusing on common goals rather than individual interests. Promoting a friendly atmosphere encourages employees to think creatively, to come up with new ideas and to test them in practice. All of these things are essential to project success.
- To achieve the desired goal, a manager must communicate clearly and understandably – try to be as specific as possible about his expectations of others and what they can expect from him or her. It is unwise to leave details unsaid. It may seem that conveying information in a vague manner gives more room for maneuver, but in fact it is only a potential cause of mistakes and misunderstandings.
- A manager must respect others – focus on the strengths of colleagues. It is a good idea to find some trait worthy of respect in every team member. People derive more satisfaction from their work and try harder if their skills and efforts are appreciated by their colleagues.



- It is advisable for a manager to appreciate a job well done – to make sure that employees feel appreciated. When someone succeeds in something, it is necessary to tell that person, their boss and other team members that their work and results have been appreciated. Recognition will prove to the employee that their work is being done properly and is valuable to the company and the team; praise from the manager will also encourage the employee and the rest of the team to work with him on future projects. When praising an employee for a job well done, mention what they have accomplished and how much effort they had to put into it. The manager should be specific about what they received his appreciation. Such information should be given immediately, without waiting for a longer period of time (Portny, 2013, pp. 323-325).
- The manager should also be a leader – dealing with information, procedures and systems as well as people. Putting in the effort to communicate your vision to your colleagues is extremely beneficial, but the manager must not forget to instill in them also the desire for order and efficiency. Employees should be motivated to set ambitious goals for themselves and support should be provided which they need to achieve them (Portny, 2013, p. 326).

#### **4. Conclusion**

Referring to the key role of decision-making in management, it can be stated that project management is a sequential, deliberate process of making decisions concerning all project resources (financial, physical, human capital) and coordinating the project team's tasks – the time and scope of their execution, taking into account risk mitigation, in order to effectively achieve the project goals with the highest possible quality. Project management consists of a sequence of logically organized and planned processes, which we can assign to the following groups (Portny, 2013, p. 50):

- initiation processes,
- planning processes,
- implementation processes,
- monitoring and control processes,
- project closing processes.

These processes are controlled and managed by the PM, who should have specific competencies, such as motivation skills, personality traits, self-esteem related to functioning in a group, knowledge that this person has acquired and uses, and other skills. The desirable competencies of a project manager consist of such qualities that allow him or her to manage the project effectively.

Answering the questions included in the research assumptions of this work, it can be said that the adopted research hypothesis was verified positively. The role of project manager in the development of a project includes all aspects of effective management of this project, and directly affects its effective and efficient implementation. Project management aims to bring the project to its most effective and timely execution, while optimizing costs. Thus, it is indisputable that the project manager has a key role in its development and implementation.

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## CASE STUDIES AS A RESEARCH METHOD IN MANAGEMENT SCIENCE

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**Purpose:** Article describes the case studies as a cornerstone research method in management science, offering the promise of profound insights, bridging theory with practice, and addressing the intricacies of organisational phenomena.

**Design/methodology/approach:** This study delves into the pivotal role of case studies as a research method, shedding light on their distinctive characteristics and contributions.

**Findings:** Case study research refer to positivist criteria for evaluation, namely, relevance and reliability. Although the questions they address are not novel, their relevance persists, prompting continuous research into their evolution.

**Research limitations/implications:** Case studies present inherent challenges, encompassing issues of generalizability and subjectivity. Researchers must meticulously contemplate case selection, data collection methodologies, and analytical techniques to uphold rigor and validity. When executed rigorously, they contribute to a more profound comprehension of management challenges and the formulation of effective strategies to confront them.

**Practical implications:** Case studies entail thorough investigations of specific instances or organisations, offering researchers a unique opportunity to deeply explore real-world challenges. They foster a comprehensive comprehension of multifaceted issues by incorporating diverse data sources, including interviews, observations, documents, and archival records. By scrutinising how management theories and strategies manifest in real-world contexts, case studies enable researchers to assess existing theories, formulate novel ones, and generate actionable insights to inform decision-making.

**Originality/value:** As management science evolves, case studies persists as an indispensable instrument for researchers navigating the complexities of the contemporary business landscape.

**Keywords:** case studies, research method, management.

**Category of the paper:** Literature analysis.

## 1. Introduction

Management is a practical activity, i.e., the conscious and purposeful action of people seeking to change existing economic and social realities. Consequently, the main function of management science is the projective function, i.e., formulating indications on how to improve the management process. The boundary between scientific research and activities of a practical nature appears to be small. This is particularly true for many nonroutinised engineering activities, which have all the basic characteristics of scientific activity, e.g., the implementation of research results into practice (Sudol, 2011).

While numerous scientific fields employ unique and inherent cognitive approaches for addressing research challenges, the discipline of management lacks a fixed, universally applicable methodology. Instead, management integrates techniques borrowed from various other fields, including statistics, econometrics, economics, sociology, and psychology. The methodology within the realm of management functions as a reflection of the evolutionary changes that have unfolded over time in managerial practices, providing insights into the current state of an organisation. It remains in a constant state of expansion as fresh methods emerge, each characterised by varying degrees of cognitive and practical effectiveness. The continuous proliferation of diagnostic tools primarily stems from evolving environmental factors and the increasing demand for more sophisticated and efficient instruments (Dul, Hak, 2008; Patil, 2016; Tandukar, 2018; Sieklicki, Tanev, 2021; Kharazishvili et al., 2020; Moskalenko et al., 2020; Trushkina et al., 2020; Hryhorak et al., 2021; Dźwigoł, 2001; 2003; 2009; Dźwigoł-Barosz, Dźwigoł, 2020; Dźwigoł, Wolniak, 2018; Dźwigoł, Trzeciak, 2023; Dźwigoł et al., 2019a; 2019b; 2019c; 2020a; 2020b; 2020c; Kwilinski, 2023; Kwilinski et al., 2020; 2021; 2022a; 2022b; 2023a; 2023b; 2023c; 2023d; 2023e; 2023f; 2023g; Peffers et al., 2007; Aguinis, Solarino, 2019; Kogetsidis, 2023; Xiang, Hou, 2023).

In the discipline of management science, historically speaking, four fundamental types of methods can be distinguished. These include pragmatic, empirical, formal and understanding (Ostasz, 1999).

Management methodology can sometimes be full of contradictions and divergent results. Its task is to combine utilitarian and practical objectives, and this in itself can produce convergent or even contradictory results. The discipline of management science relies on methodologies from other sciences, most often from the natural sciences and the social sciences (Dźwigoł, 2018; 2023).

The contemporary importance of case studies to the development of the discipline of management science is highlighted. As the most widespread achievements in this field, one should mention the studies of H. Fayol, K. Adamiecki, and A. Sloan and, in recent years, the works of A.D. Chandler (1962), R.M. Kanter (1977), R. Eccles & D. Crane (1988), K. Eisenhardt & M. Zbaracki (1992) and H. Mintzberg & J. Waters (1985). The use of case

studies in published works oscillates at a level of less than one in ten published works, but this level may be misleading, as some studies, e.g., organisational ties (Oliver, Ebers, 1998) and the ambidextrousness of organisations (Raich et al., 2009), make significant use of this method. Therefore, the usefulness of case studies in the early identification of a scientific problem is often noted.

In the paper, the author emphasises the importance of the case study method in research processes. He emphasises that the usefulness of case studies is limited to a specific type of hypothesis being tested and is gradable and that their use should be a second or third choice of research strategy.

## **2. Applying a qualitative approach to management science research**

According to W. Czakon (2009), in management science publications, despite perceived growth, qualitative research, which is very useful and can provide knowledge that cannot be obtained using a quantitative approach, is still too rarely used.

A set of certain assumptions, also known as paradigms, determines the choice of a particular research approach. According to Ł. Sułkowski (2015), a paradigm refers to a set of concepts and theories that are generally accepted by the scientific community of specialists in a particular field.

The relationship between paradigm and methodology is very important. Researchers must use a method that is consistent with the assumptions and objectives of the theoretical views expressed by the author (Gephart, 2004).

There are many classifications of paradigms. The division proposed by G. Burrell & G. Morgan (1978) is referred to by many researchers. These authors distinguished four paradigms in the social sciences: functionalism, radical structuralism, interpretative-symbolic paradigm and postmodernism. They adopted the following criteria to distinguish them:

- epistemological assumptions regarding science (objectivism and subjectivism refer to a vision of science that uses either methods that enable objectively existing elements of reality to be identified and described or methods that enable the elements of reality to be understood and assessed),
- perfectionist social orientation (regulation or radical change refers to the ideal of science chosen by the researcher - a passive description of reality or integration into reality that leads to change).

In turn, R. Gephart (2004) made a distinction between positivism and postpositivism (positivism and postpositivism take into account not only assumptions about the reality under study but also the aim and objectives of the research, the unit of analysis and the emphasis of the methods used), interpretative research (understanding meaning) and critical postmodernism (pointing out contradictions and inequalities).

Ł. Sułkowski (2013) made a synthetic division into so-called paradigms (Czernek, 2016, pp. 168-169):

- dominant in science (includes functionalism, neo-positivism and systems theory) - researchers look for recurring causal relationships that occur between the components of the reality under study. The main aim is to generalise and verify the assumptions made, including hypotheses, analyse and forecast change. The researcher adopts the position of the so-called outsider, i.e., an external subject, for whom the reality under study has an objective character, existing independently of the researcher,
- alternative (i.e., interpretivism and the critical current) - researchers focus on analysing not only recurrent but also unique/contextual relationships between the components of the studied reality. The aim is not so much to generalise or verify, but more to understand, describe, synthesise and indicate changes in the studied reality. The researcher is treated as a participant in the analysed processes, the so-called insider, and is therefore aware that he or she is part of this reality and adopts an axiological (valuing) stance.

Given the paradigm adopted by the researcher, the research methods used should be adapted to it. Thus, the choice of quantitative or qualitative approach first depends on the research problem posed by the researcher, then on the paradigm adopted (Czernek, 2016, pp. 169-170).

J. Suddaby (2006) argues that new developments are always the result of expectations of an unknown theory, and it is qualitative research that serves, among other things, to build theory. However, it should be noted that there is still a misunderstanding as to what this research actually is. According to Van Maanen (1998), qualitative research is difficult to define, given its flexibility, as it is often designed simultaneously with its implementation. Qualitative research addresses questions about the creation of social experience and the meaning that is given to it by social actors in order to better understand it (Gephart, 2004). They are therefore explanatory rather than conclusive in nature (Silverman, 2008).

M.E. Graebner, J.A. Martin and P.T. Roundy (2012) identify five key rationales for using qualitative research and these include:

- the construction of a new theory (when the theory explaining the phenomenon in question does not exist, or is insufficiently developed or has certain deficiencies),
- capturing the subjects' lived experiences in their natural environment and interpreting these experiences,
- a full, holistic understanding of the processes under study (may result in theory testing),

- an illustration of some abstract idea, derived solely from theory (illustration makes the research credible and convincing to the reader),
- the study of narratives, discourse or other linguistic phenomena (the subjects of the research may include statements collected during face-to-face interviews, as well as media statements, reports, websites, etc.).

The distinctiveness of the essence of qualitative research can also be achieved by comparing it with quantitative research (Czernek, 2016, p. 172).

The first difference is related to attribution to the paradigm in management science adopted by the researcher, i.e., the way in which the phenomena under study are understood and the belief that they can be influenced (Sułkowski, 2013).

Another difference is the stated research objective. A qualitative researcher mainly pursues the goal of building or refining theory and testing it. In quantitative research, on the other hand, the aim is to verify existing theory, most often by testing accepted hypotheses (Czernek, 2016). Furthermore, qualitative research, by focusing attention on socially constructed reality, requires knowledge of the context of the phenomena being analysed, unlike quantitative research (Chell, Baines, 2000).

A fourth difference is the importance of context in qualitative research and quantitative research - it is related to the role of the researcher. In qualitative research, according to A. Strauss & J. Corbin (1998, p. 69), the personality, experience and character of the researcher become important components of the research process and should be an explicit part of the analysis. In contrast, in quantitative research, the researcher does not influence the cognitive results achieved, as he or she investigates reality in an objective manner, devoid of axiological valuation and interpretation of the subjects themselves (Czernek, 2016, p. 174).

Qualitative research relies on text (words, conversations, etc.) and images to give meaning to concepts - it is literary and humanistic in nature (Nelkin, Brown, 1984). Quantitative research, on the other hand, counts and measures phenomena in order to give them meaning - it is grounded in mathematical and statistical knowledge (Gephart, 2004; Meißner, Oll, 2019).

A sixth difference concerns the presentation of a compelling story. This applies to both qualitative and quantitative research; however, it should be emphasised that for the first type of research, the story is crucial. For qualitative research, as in K.G. Corley & D.A. Gioia (2011), in addition to the scientific contribution, the discovery of new aspects of the analysed reality is particularly important, as the research should intrigue and inspire the reader (Czernek, 2016, p. 175).

Data and qualitative variables have certain characteristics that offer potential advantages over data and quantitative variables. It should be noted that qualitative data are highly malleable, which activates cognitive processes (Paivio et al., 1998), and rich and detailed, which provides the opportunity to show nuances or details often overlooked in quantitative research (Czernek, 2016).

The eighth difference comes down to the research procedure. In quantitative research, it is strict and specific - the researcher relies on accepted data sets and statistical tests and follows accepted research procedures. In qualitative research, on the other hand, its cyclical nature (iterative) becomes crucial; hence, it is difficult to have one universally accepted research procedure (Czernek, 2016).

Due to the different purpose of quantitative and qualitative research, the two approaches require a different presentation in terms of text structure and graphic presentation. Regarding the structure of the text - in qualitative research, especially based on grounded theory methodology, the structure of the text may be atypical (introduction, research results, formulation of new theory/hypotheses, etc., against the background of existing knowledge included in the literature, conclusion). In quantitative research, on the other hand, theory is often presented at the beginning of the paper (to develop hypotheses that are further tested on this basis), while empirical research is presented later in the paper (Islam, Widen, 2023). The differences that apply to the structure of the text also apply to the discussion and conclusion sections. In qualitative papers, the discussion section should be exhaustive - it should not just summarise the results and present theoretical as well as practical implications, as in quantitative papers. In addition, often in qualitative research, the discussion section is not distinguished because the strong link between empirical data and theory makes it difficult to distinguish different narratives within the 'research results' section. The conclusion in papers based on qualitative research is relatively elaborate - the opposite is true for papers based on quantitative research (the conclusion is relatively synthetic and short) (Czernek, 2016).

When presented graphically, qualitative data, unlike quantitative data, cannot be simply synthesised or reduced to tables or graphs. Qualitative researchers should think creatively about showing their results (Czernek, 2016).

The generalised qualitative research procedure consists of the following phases (Czernek, 2016):

- 1) The initial phase includes:
  - a) Formulation of the research problem.
  - b) A review of the literature on the subject.
  - c) Defining the research sample.
  - d) Selection and preparation of research tools.
  - e) Pilot field studies.
  - f) Modifications (if necessary) of research tools.
- 2) Phase I - Proper research and analysis of the material during fieldwork includes the following:
  - a) Field research.
  - b) Analysing the data during the research, keeping notes and at the same time (if necessary) further modifying the research tools.



- 3) Phase II - Analysis of the material after the fieldwork includes the following:
  - a) Analysis of documents, notes and any other material collected in the course of the fieldwork.
  - b) Transcription of interviews.
  - c) Coding interview data.
  - d) Interpretation of the content of the interviews and other materials collected.
  - e) Possible return to the field and consultation of results with respondents.
  - f) Possible interpretation of the material collected.
- 4) Phase III - Development of research results includes the following:
  - a) Formulation of research conclusions regarding theory and practice.
  - b) Preparation of a publication (research report).
- 5) Final phase - Submission of the study for review and presentation of its final form includes:
  - a) Taking into account the reviewers' comments and revisiting the concept as well as the conclusions of the research. If necessary, return to the field to conduct additional research.
  - b) Presentation of successive versions of the study, modifications.
  - c) Final version of the publication (research report).

Given the difficulty of conducting qualitative research, any researcher who has attempted this type of research at least once should ask themselves if this is the path for them (Czernek, 2016).

### **3. Case studies in the research process**

Case study research involves an in-depth analysis of phenomena and processes in their actual setting (Beach, Pedersen, 2016; Tight, 2017). It does not serve to test theories, except to falsify existing hypotheses, and contributes to a better understanding of the object of study (Czakoń, 2016, p. 208). The essence of using a case study is not to obtain universal regularities, but to anticipate the impact of the environment and the conditions of a given circumstance on the shape of the results obtained. The contextuality of the case study has consequences (Czakoń, 2016, p. 191):

- procedurally, because the researcher does not know the impact of the circumstances when he or she enters the study, making the case study procedure repetitive,
- cognitive, because the knowledge gained is situational - a given situation may not be repeated,
- tools, as research requires consideration not only of the research object but also of its environment and the impact of that environment on the object under study.

The essence of a case study is determined by the use of exploratory methods to gain an in-depth understanding of the phenomenon being analysed. The size or given characteristics of the object are not relevant here, as the object of study can be either a single decision (Mintzberg, 1979), a process (Dyer, Nobeoka, 2000), a cluster (Saxenian, 1996) or an entire country (Buck, Shahrim, 2006). In this context, J. Dul and T. Hak (2008) even point out that some authors indicate that interpretative methods determine the essence of the case.

Case studies in management science can be used for three purposes (Dźwigoł, 2018, p. 66; 2022a): theorygenic, theory testing, and executive research.

Theorygenic case studies enable the development of existing theory and understand the course of processes over time or provide explanations for previously unrecognised phenomena (Rajesh, 2023). Their use can lead to the definition of phenomenon features, the relationships between them and the course of phenomena. Theorygenic nature here involves two aspects: for, on the one hand, it provides hypotheses for quantitative research and, on the other hand, it opens up fields of exploration previously not considered at all or considered differently. Three conditions under which there is justification for the use of the case study method are indicated here (Yin, 1984):

- an early stage in the development of knowledge in a specific area of research,
- learning about a current phenomenon in a real-life setting,
- unclear boundaries between the phenomenon and the conditions for its occurrence.

All of these circumstances clearly highlight the shortcomings of theoretical clarification at the start of the research. Studying cases in such a situation leads to addressing these deficiencies (Czakon, 2016, pp. 192-195):

- 1) when knowledge development in an area is low, i.e., when:
  - vague description of the phenomenon or research area, case studies provide empirical data and an interpretation of the participants in these dynamics,
  - the results of empirical studies are contradictory or insufficient, case studies prompt the search for complementary or competing explanations that increase the explanatory power of proposed models,
  - there is an incomplete list of determinants or characteristics of the phenomenon under study, case studies complement the knowledge obtained and provide the knowledge needed to make decisions or even conduct further research or provide a more complete picture of the phenomenon under study.
- 2) when the recognition of a contemporary phenomenon in real-life circumstances is legitimate, i.e., when:
  - the phenomenon under study is new at all or has dynamics that differ from previous conditions, the usefulness of case studies is related to the timeliness of the phenomenon and its extent,

- there is a multidirectionality and dynamics of interactions, case studies help to understand and explain the causes of a phenomenon,
  - there is economic cyclicity and product, technology and organisations.
- 3) when the boundaries between the phenomenon and the circumstances of its occurrence are vague, i.e., when there is a problem in precisely identifying the phenomenon under investigation, case study research can be used for in-depth research to complement the research conducted.

Theory testing in the management sciences is captured as the quantitative determination of the validity of a hypothesised relationship between variables using statistical techniques, i.e., to obtain correlation coefficients and consequently confirm the relationships identified in the hypothesis. The primary argument for using case studies to test theory is falsificationism. Falsifying a theory using case studies that contradict it or indicate that the theoretical explanation does not enable an understanding of organisational reality (Czakon, 2016, p. 196). A further argument for the usefulness of case studies relates to the nature of the hypotheses being tested (Dul, Hak, 2008, p. 66), as testing a theory is really a juxtaposition of hypothesised relationships between variables with the actual behaviour of those variables (Czakon, 2016, p. 196). Four types of hypothesis testing are identified (Dul, Hak, 2008; Czakon, 2016, pp. 196-197):

- the hypothesis presupposing the existence of a necessary condition (it states that in each case the relationship presented by the hypothesis will occur - variable A must appear for phenomenon B to occur) - one case is sufficient to test it,
- the sufficiency-condition hypothesis (states that the occurrence of variable A leads to the occurrence of phenomenon B), for which a single-case study or replication of single cases is sufficient,
- the deterministic relationship hypothesis (meaning that for each explanatory variable there will in fact be a relationship to the dependent variable as predicted by the hypothesis, the least frequently used in management science), when testing this hypothesis, longitudinal studies or paired case studies are recommended,
- the stochastic relationship hypothesis (contains the assumption that a change in the value of the independent variable will affect a specific change in the dependent variable, the most common type of relationship in management science), for which case studies are not a recommended research strategy.

In conclusion, it should be noted that the usefulness of case studies is limited to the specific type of hypotheses being tested and is gradable and that their use should be a second or third choice of research strategy rather than the first (Czakon, 2016, p. 197).

Application case studies, on the other hand, focus more on the preparation of the decision maker's action than on understanding general regularities. The didactic use of case studies originates from Harvard Business School, where they were first used in the 1920s. Because

they allow students to discuss real-world problems by simulating real-world decision-making problems, they should consist of two elements: (1) a description of the case and (2) a description of the technique for conducting the discussion. This implies, for applied studies, that the following conditions are met: a) definition of the managerial problem, which is illustrated by the case, b) definition of the way of studying the case (most often descriptive techniques are used here, allowing us to present a description of the conditions and the process of solving the problem in concrete conditions). Thus, it can be concluded that applied studies play an exploratory role, explaining what brings the desired result in the given conditions and allowing an in-depth understanding of the phenomenon and its conditions, while on the other hand, they do not offer the possibility to generalise (Czakon, 2016).

A research methodology is a general way of dealing with a class of problems, while a research procedure is related to a specific study. The research procedure for conducting a case study is as follows (Dźwigoł, 2018, p. 68; 2019a; 2020):

- the formulation of a research problem, where ignorance is the starting point of the case study and needs to be confirmed by literature recognition. Research questions here can be exploratory, descriptive or explanatory, the latter being the most common. The appropriate formulation of a research question should meet two conditions: the first is related to its location in the existing state of knowledge, and the second is related to the expected results (Dźwigoł, 2018, p. 200; 2021b; 2020b);
- case selection, which is a fundamental stage of case study and on which the whole model, or whole proposals for generalisation, are based. This selection involves the use of specific data sources to ensure the reliability of the research results. Purposive and theoretical case selection are indicated, but purposive selection is mostly used (apart from the use of case studies to test theory) (Dźwigoł, 2018, pp. 191, 200-202; 2019b; 2021a). Purposive selection is described by five criteria (Flyvbjerg, 2004): availability of data, clarity of the case, illustrating the extremes, but allowing for unambiguous interpretation, of the regularities analysed, diversity, concerning the analysis of multiple cases that illustrate diverse or contrasting circumstances, and which, as K. Eisenhardt (1991) points out, should be between four and ten cases, a critical phenomenon whose deviation from accepted standards or extreme course makes it possible to define a generalisation, and a metaphor, which directs the researcher to a given course of a particular phenomenon and makes it possible to adopt a given research position. Purposive selection in each case requires justification, which becomes an integral part of the case study and an area for assessing methodological rigour (Czakon, 2016, p. 202);

- the development of data collection tools, where the cyclical nature of the data collection procedure is typical, as well as the diversity of data sources (achieved through triangulation) to ensure the reliability of the research. Qualitative data include but are not limited to interviews, observations, participant observations, photographs, and archival material (Czakov, 2016, p. 203);
- conducting field research to collect primary data. The methodological rigour of case study research obliges the use of a deliberately prepared data collection protocol. Here, however, the researcher is open to unanticipated information, and research methods such as semistructured interviewing, observation, or participant observation allow the researcher to access the nature of the phenomena and the perceptions of the phenomena by their participants (Czakov, 2016, p. 203);
- analysis of the data collected, which includes both quantitative and qualitative data. With regard to qualitative data, it should be noted that accessing a large amount of low-order data requires structuring at the data collection stage, which can be carried out using one of seven data structuring and analysis techniques (narrative, quantification, multiple patterns, grounded theory, mapping and visualisation, temporal extraction, synthesis). As a result, the objective is to achieve as synthetic a presentation as possible of the wealth of empirical data by emerging a pattern of (logical, temporal or spatial) and then analysing it (Czakov, 2009, pp. 13-19; Czakov, 2016, pp. 203-204);
- the formulation of generalisations, which ranks as the most creative part of the case study and requires the ability to think synthetically, a great deal of intellectual effort and a deep understanding of the problem being analysed (Czakov, 2016, p. 205);
- confrontation with the literature, the purpose of which is to compare the models or explanations available in the literature with the generalisations generated by the analysis of empirical data and to illustrate the contribution of the study to the development of knowledge, as well as to bear on the credibility and reliability of the research conducted (Czakov, 2016, pp. 205-206);
- study closure - a generalisation that seeks to define sentences that define features, relationships or patterns of event dynamics and takes the form of a so-called proposition. In the event that the researcher considers that these propositions require testing using quantitative methods, he or she should formulate them in the form of hypotheses, which are the basis for future research (Czakov, 2016, p. 206).

Iterations of the individual steps are possible, except for the first and last step (Czakov, 2016, p. 200).

## 4. Summary

It should be pointed out that case studies also have some limitations. The first is related to the research objectives to which case studies can be applied. This is because it is common to expect the results of a case study to be confirmed on a collective. Such an allegation, however, stems from a cursory knowledge of the case study procedure.

After all, for some types of hypotheses, it is possible to test on individual cases. However, research practice in the management sciences allows the conclusion that case studies usually lead to hypotheses or theories, which are then tested using quantitative methods (Czakon, 2016, pp. 206-207). A second limitation of case studies concerns qualitative methods. Several objections are pointed out in this aspect, including unsystematic data analysis or failure to meet the criterion of intersubjective testability, but a rigorous case study procedure avoids these issues (Czakon, 2009, pp. 13-19). The third limitation is related to the case study procedure, as some of its important stages, e.g., case selection and formulation of generalisations, may narrow the cognitive value of the research results or reduce their reliability (Czakon, 2016, pp. 207-208). Hence, it is necessary to refer to the criterion of research reliability, the assessment of which, in the case of a case study, can be the same as in the case of qualitative research, i.e., using criteria such as fidelity, transitivity, robustness and confirmability (Czakon, 2009, pp. 13-19). It should be noted that despite the existence of criteria for assessing the rigour of case study research, authors using this method in papers published in top-ranked English-language journals between 1995 and 2000 refer to positivist criteria for evaluation, namely, relevance and reliability (Gibbert et al., 2009). This duality of evaluation of case study research emphasises the need to take into account their specificity, while on the other hand, it confirms the concern to evolve the traditional requirements for scientific research (Czakon, 2016, p. 208).

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## RESTRICTIONS OF ACCESS TO SERVICES AND A DECREASE IN THEIR QUALITY UNDER CRISIS CONDITIONS – STUDY RESULTS

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**Purpose:** The study presents and discusses the results of a survey, the primary objective of which was the Generation Z representatives' perception of the impact of destabilizing factors, such as COVID-19, Ukraine-Russia war and energy crisis on access to or quality of technologies, goods and services.

**Design/methodology/approach:** The survey was carried out in 2022/23 using a CAWI technique and involved a sample of 631 students from Warsaw universities, Generation Z representatives.

**Findings:** The respondents noticed the restrictions resulting from multi-crisis conditions and expressed concerns about the impact of the crises on energy infrastructure and, in consequence, on the lack of or restricted access to goods and services or decline in their quality. The findings indicate a gradation in assessing potential losses. Respondents rated the probability of losses in a pandemic as significant, and even higher for war.

**Research limitations/implications:** The study was carried out at a specific moment in time and under crisis conditions. The sample was limited as well, covering exclusively representatives of the academia.

**Practical implications:** The assessment of the impact of multiple crises on individuals and communities is needed to address the issue of the supply of energy, technology, products and services. The findings of the study may be used by policymakers to cater for the needs of individuals and communities who are most vulnerable in the case of crisis conditions.

**Social implications:** It is crucial to understand that crises may have a direct impact on the energy infrastructure, limited accessibility and decline in the quality of products and services. These losses, in turn, may influence the perception of the comfort and quality of life of individuals and communities.

**Originality/value:** This may be the first study which analyses multiple crisis factors and compares them against the losses which are the result of the flow of time. The research assesses the perception and significance of the impact of the pandemic, war in Ukraine and energy crisis, as perceived by respondents.

**Keywords:** restrictions, loss of access, loss of quality.

**Category of the paper:** Research paper.

## 1. Introduction

Our increasing reliance on technology and digital services in the era of Industry 4.0 (Da Silva et al., 2020) and the new work practices and organizational innovations focusing on the principles of collaboration, openness, community and sustainability enabled by digital tools (Ortar, Flipo, 2023; Przegalinska, Grippa, Gloor, 2020; Camarinha-Matos et al., 2019) have transformed the way we live, work, and connect with each other. However, this dependence examined in many studies (Păvăloaia, Necula, 2023; Lee et al., 2018; Almufarreh, Arshad, 2023; Wang, Li, 2023; Sá et al., 2021) also exposes us to potential consequences when energy crises occur since “electricity is a resource of strategic importance to the entire world”. It is important to note that “most industries, critical facilities, as well as institutions and households cannot function without access to electricity” and “an unstable electricity market affects every area of life and industry (Niestabilna sytuacja..., 2023). The latter is particularly true during times of crisis, the COVID-19 pandemic, geopolitical or economic instability and uncertainty as well as energy crises.

The Ukraine-Russia war has shown that the previously functioning energy infrastructure has been destabilized as a result of the destruction of the supply chain and rising prices due to sanctions and geopolitical conditions. The COVID-19 pandemic has stressed how reliant individuals and communities have become on technology and, as a consequence, also on energy resources. The above conditionings prove that seeking sustainable solutions such as local and alternative energy sources should be seen as a priority for policymakers. On the one hand, the transition towards more sustainable alternative energy sources may be seen as positive. However, the pace and scope of the changes taking place are not in line with the increased demand related to energy supply as well as the availability and quality of technology-based products and services.

As H. Lovell indicates, “people-technology interaction innovation theories relevant to the energy sector cover two main topics: innovation in large-scale sociotechnical systems (electricity networks, transport infrastructures, gas networks), and small-scale human-technology interactions” (Lovell, 2022). This paper will focus on the second area of energy-technology interactions.

The implementation and use of technologies depend on stable and sustainable energy supplies, on the other, technologies can provide alternative solutions to better manage available energy resources, even under crisis conditions (Gitelman, Kozhevnikov, 2023). This article explores the consequences of energy crises on our technology-dependent society, aiming to foster discussions and strategies for a sustainable and resilient future.

The COVID-19 pandemic, economic crises and energy shortages have significantly impacted societies worldwide, causing disruptions and limitations in accessing essential services and technologies. According to the PwC Report, the energy sector has also been

affected by the coronavirus (PwC COVID-19 US CFO Pulse Survey, 2020), which was further exacerbated by the Russia-OPEC price war (EU energy security and the war..., 2023). Zakeri et al. indicate that the geopolitical crisis related to Russia's invasion on Ukraine on 24 February 2022 also "triggered concern over the EU's energy security" (Zakeri, Paulavets, ..., 2022), and further exacerbated the situation related to energy pricing, supplies and **stability**. Another study (Basdekis, Christopoulos, ..., 2022) suggests that "the coronavirus pandemic and the war in Ukraine constituted the first generalized cases of black swans for the global economy in the 21st century". According to Baskedis et al., "after the end of the lockdown due to the pandemic and the return to 'normality', the war broke out in Ukraine, followed by the imposition of serious sanctions between the Western states and Russia, resulting in the beginning of a new crisis, the energy crisis, with concern about the emergence of another severe recession[...]". The article published in April 2022 (What the war..., 2022) suggested that Russia's invasion on Ukraine "has caused a short-term spike in prices, but could prompt a long-term shift towards sustainability". However, these forecasts were not fulfilled since, according to World Economic Forum, the consequences were much more serious than expected since "energy prices have surged since the Russia-Ukraine war, leading to an increase in household energy costs" and "the slow progress in the energy transition and dependence on fossil fuel imports have amplified the severity of the cost-of-living crisis" (Energy Transition..., 2023). The author of another paper (Sadowska, 2022) stresses that "the increase in energy prices also impacts the overall economy because energy is a price-affecting factor. Growing energy prices are a major contributor to the widespread inflation and the slowdown in the economic growth in the EU". E. Sadowska also claims that "in order to increase the security of energy supplies, it is important to finalize and streamline the interconnection of European gas and electricity networks, fully synchronize the different energy networks across the EU, and strengthen EU contingency planning".

The PwC report states that "for companies in all parts of the energy, utilities and resources sectors, it will be vital to combine effective scenario-planning with an examination of how different developments could affect their business in the short, medium and long term" (Energy industry...). Also, individuals and communities experienced difficulty in accessing vital services, leading to disruptions in education, healthcare and economic activities. Thus, the COVID-19 pandemic can be seen as a significant obstacle to accessing new technologies and high-quality services by different entities and across various sectors.

Increasing energy costs make it difficult for individuals and organizations to afford and maintain technological devices. Low-income households and marginalized communities may find it even more challenging to access essential technologies, increasing existing socio-economic disparities (Pryce et al., 2021). According to recent reports, the present geopolitical crisis, i.e. the war in Ukraine further contributed to already challenging circumstances due to uncertainty (Global Energy..., 2022) and the fact that "rising energy prices may price out many developing countries, with a high level of impact on the most vulnerable citizens, from energy

markets” (Brief No. 3..., 2022). Additionally, businesses heavily reliant on technology for their operations may face financial constraints that restrict their ability to invest in the necessary equipment and infrastructure, adversely affecting their productivity and competitiveness.

These interconnected and multifaceted crises have created significant challenges, affecting various aspects of daily life and strengthening existing inequalities. As individuals and communities face the consequences of these crises, understanding the limitations as regards accessing services and technologies becomes vital for addressing the increasing socio-economic disparities and implementing practical and timely solutions.

## 2. Literature review

To date, the impact of COVID-19 and other interconnected or concurrent crises has been extensively explored from various perspectives, across different sectors, and in numerous countries (Malec et al., 2021; Ghiani et al., 2020; Zhang et al., 2020) and regions (Narajewski, Ziel, 2020; Akrofi, Antwi, 2020). However, to the authors’ knowledge, there are still very few articles which would focus on the impact of the COVID-19 pandemic, economic and energy crises leading to limitations and barriers to access to advanced technologies and high-quality services.

The works have mainly focused on the impact of the abovementioned crises on the electricity systems in Europe and particular countries, examining the changes and consequences in the form of fluctuating power demand, generation capacity, consumption levels, general stability of the sector or forecasts related to the immediate and more distant future. These works (Bompard et al., 2020; Bahmanyar et al., 2020; Abu-Rayash, Dincer, 2020) have shed light on the challenges faced by the European electricity sector and provided insights into potential strategies for enhancing resilience in the face of future crises.

It is important to indicate that the times of pandemics are characterized by certain specificities in the energy market due to the fact that “industrial demand for energy falls, but household consumption rises”. In consequence, at that time, according to sources, CO<sub>2</sub> production also decreased. For example, “during the pandemic, demand for electricity in the German economy fell by 20%, while CO<sub>2</sub> emissions were reduced by around 25 million tonnes (W czasie pandemii..., 2020). During the pandemic, electricity consumption in private households increased. When individuals need to stay at home due to the coronavirus threat, they spend entire days at home and the Internet is one of the few leisure activities still available to them. The amount of time they spend using both devices, mainly laptops and smartphones (Jak COVID-19..., 2020), and the Internet is increasing and, in consequence, also the level of energy consumption, i.e. electricity is higher.



Another study (*Pandemia przyspieszy...*, 2020) conducted by the Polish Economic Institute (Polski Instytut Ekonomiczny) involving energy market experts focuses on the importance of renewable energy under the conditions of the COVID-19 pandemic. As many as 95 per cent of experts claim that “increasing the share of renewable sources in the so-called 'energy mix' to 30 per cent will greatly assist Poland's development” and 67 per cent of respondents are of the opinion that “the pandemic will accelerate the decarbonisation of the energy sector”. The research carried out by EY indicated that the COVID-19 pandemic has posed significant threats to both the energy sector and the services it provides. They include “falling energy demand, particularly for electricity, higher price volatility, due to increased uncertainty” (Wajer, 2020)

Due to the planned transformation towards a low-carbon economy, new projects are expected to be implemented in Poland in the near future in the energy (e.g. photovoltaic power plants, onshore and offshore wind farms, etc.) and hydro-technical segments. Irrespective of the coronavirus pandemic, in the coming years, we may observe a significant impact of ecology and technological changes on the design and implementation of construction investments, with smart home solutions and energy efficiency improvements becoming more and more popular (*Wpływ pandemii...*, 2021).

Every year, global electricity consumption is increasing and there is no indication that this trend is likely to change in the near future. Unsurprisingly, the production, sale, and distribution of energy play a critical role in ensuring the energy security of the European Union and individual countries. The energy systems within the European Union (EU) and individual countries are complex, comprising a diverse range of sources, infrastructure, and policies. It is important to examine specific countries also with regard to their access to technology and services, which are related to the energy ecosystem and transformation. This perspective becomes particularly important due to our increasing reliance on energy systems and their technological advancements, as it highlights disparities and opportunities that exist, ultimately shaping the energy landscape and its sustainability. The present study aims to address the issue and considers the opinions of young people, Generation Z representatives, who are not only highly skilled and open to using new technologies and services but also, according to research findings, aware and concerned about the present circumstances and future development of the society, environment and technology, all of which are considered in this study.

### **3. Methodology**

#### **3.1. Research methods, techniques, and tools used**

The research presented in this study aims to analyze the limitations experienced by users in accessing services and technologies under the conditions of the COVID-19 pandemic, economic crises, and energy shortages. By analyzing the findings of the survey carried out in 2022/23 involving a sample of 631 students at the University of Warsaw, and other capital universities, the authors aimed to identify the main problems and barriers encountered by individuals and communities. The study was conducted with the application of a CAWI technique using convenient and purposeful sampling.

The obtained results were analyzed using the SPSS software. First of all, the methods of descriptive statistics were used, and the significance of differences between the groups was tested.

The research aims to recommend strategies that promote general and inclusive access to services and technologies, mitigating the impact of the abovementioned crises and strengthening socio-economic resilience in the face of adversity.

#### **3.2. Characteristics of the research sample**

A total of 821 questionnaires were collected, but some of them were not fully completed. Therefore, the authors decided to use only 631 questionnaires for further analysis. The vast majority of people (97%) are representatives of the Z Generation. It was assumed for the purposes of the study that these people were born between 1995 and 2009. They were all students, i.e. individuals with at least secondary education. Their specific characteristics included:

- gender,
- place of residence (divided into the following categories: village, a town with up to 20,000 inhabitants, a town with 21-50,000 inhabitants, a town/city with 51-200,000 inhabitants, a city with a population of more than 200,000),
- field of study (indicated here: social sciences, exact sciences, humanities, technical sciences and others),
- attitude towards respondents' current material situation (which could be described generally as: very good, good, satisfactory, rather satisfactory, bad).

On this basis, the following variables were distinguished:

- gender,
- place of residence,
- field of study,
- material situation.

A detailed overview of the numbers of answers and individual homogeneous groups is presented in Table 1-5.

**Table 1.**

*Number of answers*

		ID	Gender	Place of residence	Field of study	Material situation
N	important	631	631	631	631	631
	no data	0	0	0	0	0

Source: own study.

**Table 2.**

*Number of groups by gender of respondents*

	N	%
no answer	1	0,2%
man	251	39,8%
woman	379	60,1%

Source: own study.

**Table 3.**

*Number of groups by respondents' place of residence*

	N	%
village	107	17,0%
small town (<20.000)	47	7,4%
medium town (<50.000)	70	11,1%
town/city (50.000-200.000)	39	6,2%
city (>200.000)	368	58,3%

Source: own study

**Table 4.**

*Number of groups by field of study*

	N	%
humanities	3	0,5%
social science	463	73,4%
exact sciences	147	23,3%
technical sciences	18	2,9%

Source: own study.

**Table 5.**

*Number of groups by respondents' material situation*

	N	%
rather satisfactory	32	5,1%
satisfactory	122	19,3%
good	357	56,6%
very good	120	19,0%

Source: own study.

Thus, the study sample consisted of 60.1% women and 39.8% men, more than half of respondents (58.3%) are residents of a large (by European standards) city with over 200,000 inhabitants. Most of them were students of social sciences (73.4%). Most individuals who participated in the study (56.6%) assessed their financial situation as good. Among the respondents, there was not a single person who would negatively assess their financial situation.

### **3.3. Dependent variables**

Respondents were asked how they assessed the probability of broadly defined losses. These losses would be caused by two very specific crisis situations, namely: pandemic and war. In addition, they were asked about the losses that may result from the natural passage of time.

Respondents had a chance to express themselves using a 10-point scale. This study focuses on the analyzes that concern the possible loss of access to various types of services (including generally understood energy) and the deterioration of the quality of these services. Here are the dependent variables:

1. Loss or limitation of access to goods and services due to the pandemic.
2. Loss or limitation of access to goods and services due to the war.
3. Loss or limitation of access to goods and services due to the passage of time.
4. Loss of quality of goods and services due to the pandemic.
5. Loss of quality of goods and services due to the war.
6. Loss of quality of goods and services due to the passage of time.

The obtained results were examined using the methods of descriptive statistics.

## **4. Results**

This study focuses on analyses that address the issue of a possible loss of access to various types of services (including those relating to energy in general) as well as the deterioration in the quality of these services. Respondents were given the opportunity to provide their responses using a 10-point scale. A value of 1 indicated the lowest and a value of 10 the highest probability. The results were tested using popular descriptive statistics methods.

## 4.1. Descriptive statistics

**Table 6.**

*Loss or limitation of access to goods and services – descriptives*

	N	Min.	Max.	Mean		Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Standard deviation	Statistics	Standard deviation	Statistics	Standard deviation
Due to the pandemic	631	1	10	4.95	2.375	.164	.097	-.662	.194
Due to the war	631	1	10	7.27	2.305	-.836	.097	.158	.194
Due to the passage of the time	631	1	10	3.40	2.241	.820	.097	-.077	.194
N Important (exclusion by observations)	631								

Source: Own study.

**Table 7.**

*Loss or quality of goods and services – descriptives*

	N	Min.	Max.	Mean		Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Standard deviation	Statistics	Standard deviation	Statistics	Standard deviation
Due to the pandemic	631	1	10	6.72	2.045	-.323	.097	-.429	.194
Due to the war	631	1	10	8.50	1.810	-1.754	.097	3.588	.194
Due to the passage of the time	631	1	10	2.58	1.785	1.296	.097	1.217	.194
N Important (exclusion by observations)	631								

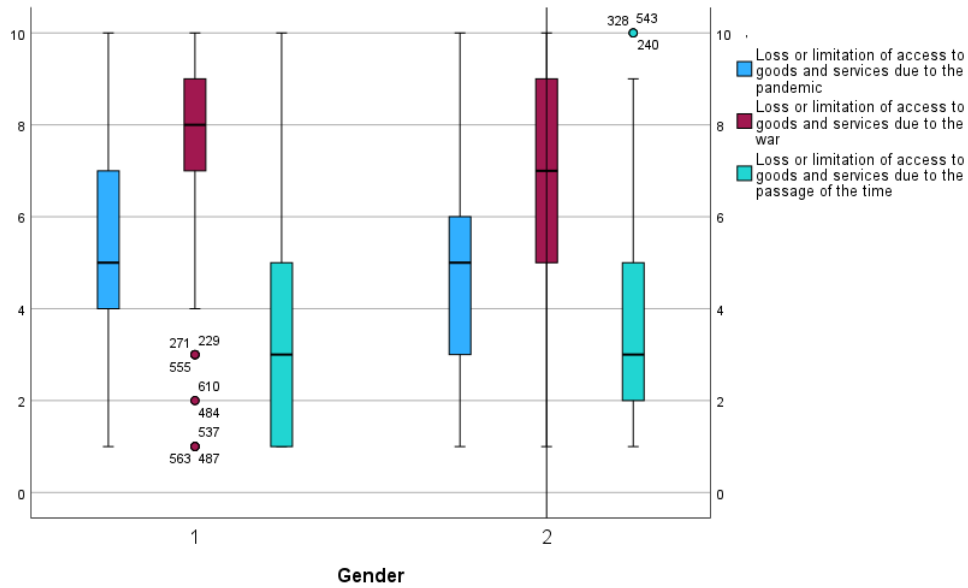
Source: Own study.

## 4.2. Separation by homogeneous groups

Next, the obtained data was analyzed, broken down into four groups: by the respondents' gender, place of their residence, field of study and financial situation. First, questions about difficulties in access to goods and services were checked, and then questions about the loss of quality of goods and services.

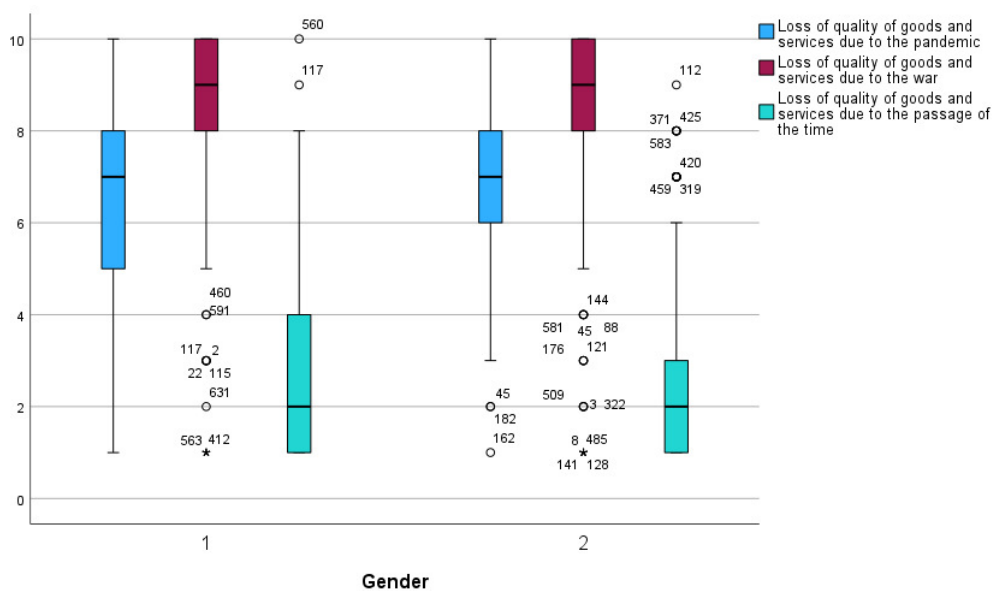
### 4.2.1. Gender

Fig 1, and Fig 2 show the distribution of results in groups separated by gender. Fig. 1 illustrates the loss or limitation to goods and services. Fig. 2 describes the expected loss in quality of goods and services. The greatest concern is war, while the pandemic may also have a significant impact on the described losses.



**Figure 1.** Loss or limitation of access to goods and services according to gender: 1 – men, 2 – women.

Source: own study.



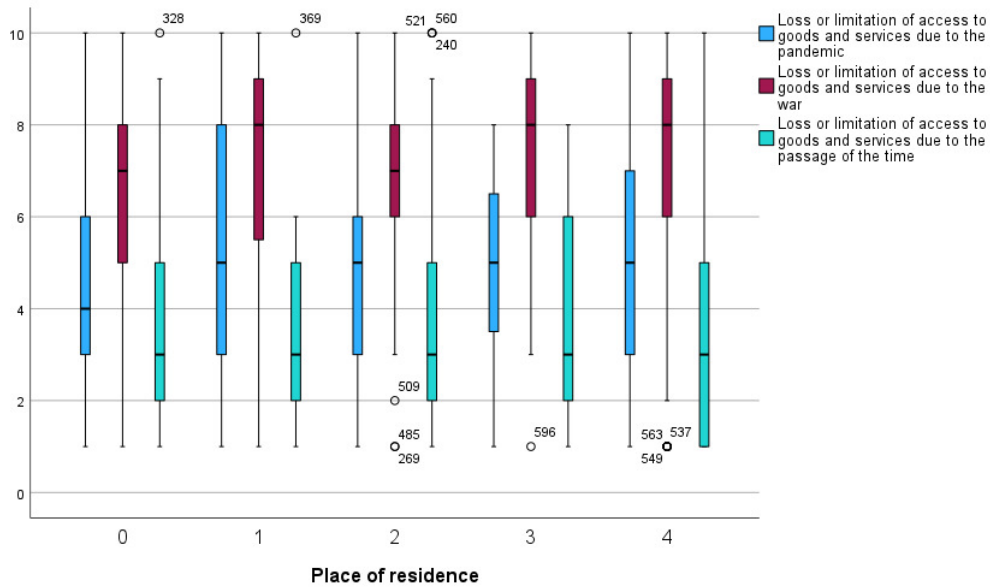
**Figure 2.** Loss in quality of goods and services according to gender: 1 – men, 2 – women.

Source: own study.

The data was tested for normal distribution using the Shapiro-Wilk test and z score. In each case, the distribution wasn't normal (p was even less than 0.01). Therefore, the Kluskal-Wallis test was used.

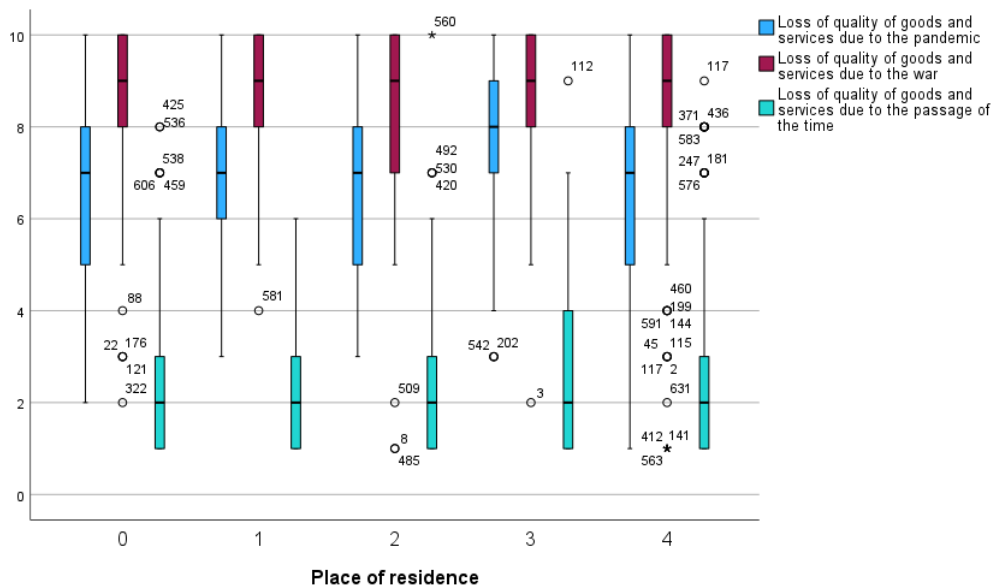
#### 4.2.2. Place of residence

Fig 3, and Fig 4 show the distribution of results in groups separated by place of residence. Fig. 3 illustrates the loss or limitation to goods and services. Fig. 4 describes the expected loss in quality of goods and services. And again: the greatest concern is war, while the pandemic has also a significant impact.



**Figure 3.** Loss or limitation of access to goods and services according to place of residence: 0 – village, 1 – town (<20,000), 2 – town (20,000-50,000), 3 – town/city (50,000-200,000), 4 – city (>200,000).

Source: own study.



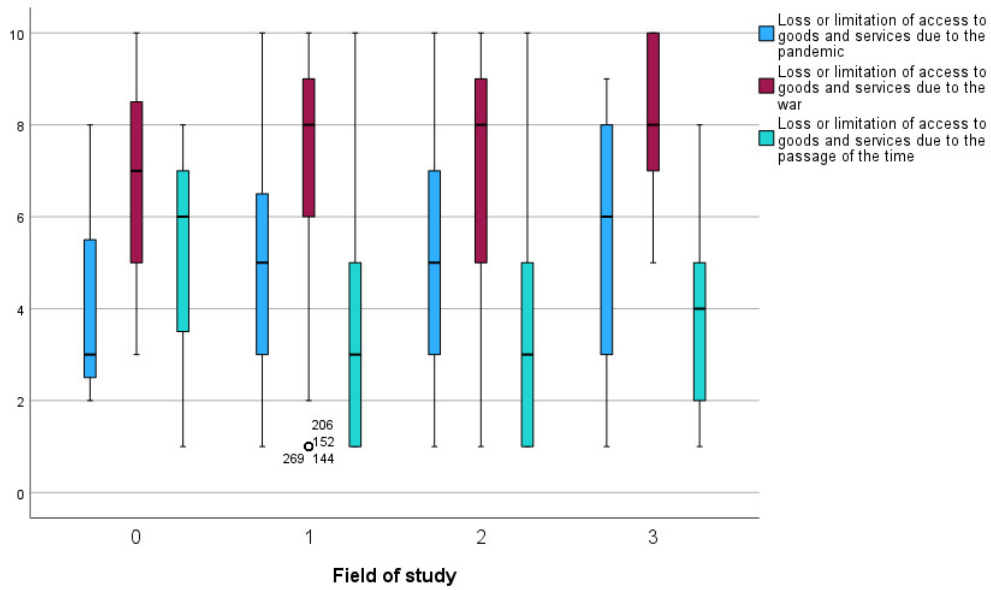
**Figure 4.** Loss or limitation of access to goods and services according to place of residence: 0 – village, 1 – town (<20,000), 2 – town (20,000-50,000), 3 – town/city (50,000-200,000), 4 – city (>200,000).

Source: own study.

In this case and in the following cases, it was decided to use the Kluskal-Wallis for independent groups test, as well.

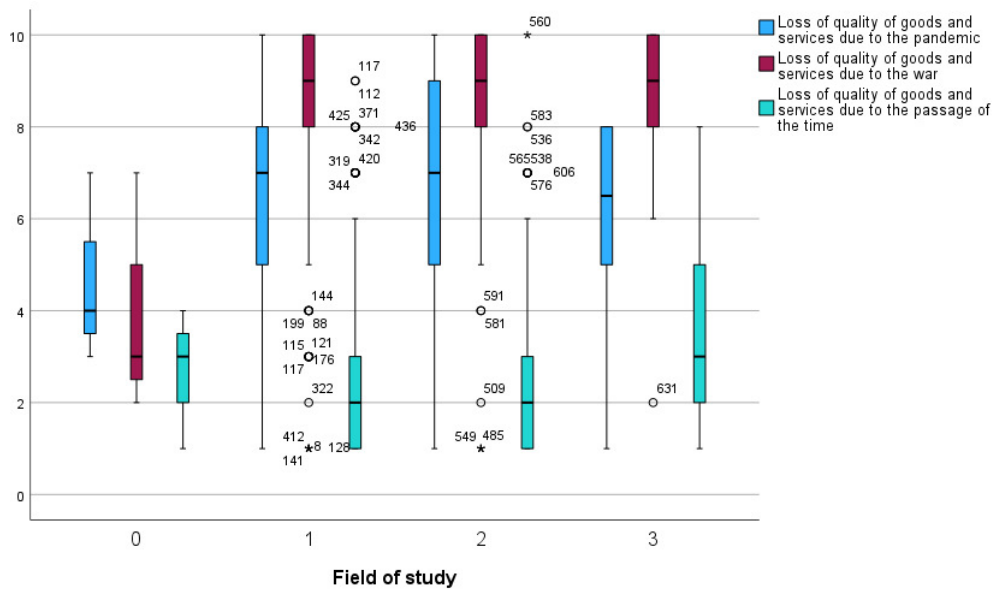
**4.2.3. Field of study**

Fig 5, and Fig 6 relate to the place of study. Fig. 5 illustrates the loss or limitation to goods and services. Fig. 6 describes the expected loss in quality of goods and services. At Fig. 5 results seems to be quite similar as it was above. But Fig 6. indicates that students of humanities rather ignore influence of war and pandemic on quality reduction. But because the group was not numerous, it can be assumed that it is within the statistical error.



**Figure 5.** Loss of quality of goods and services according to field of study: 0 – humanities, 1 – social, 2 – science, 3 – technical.

Source: own study.



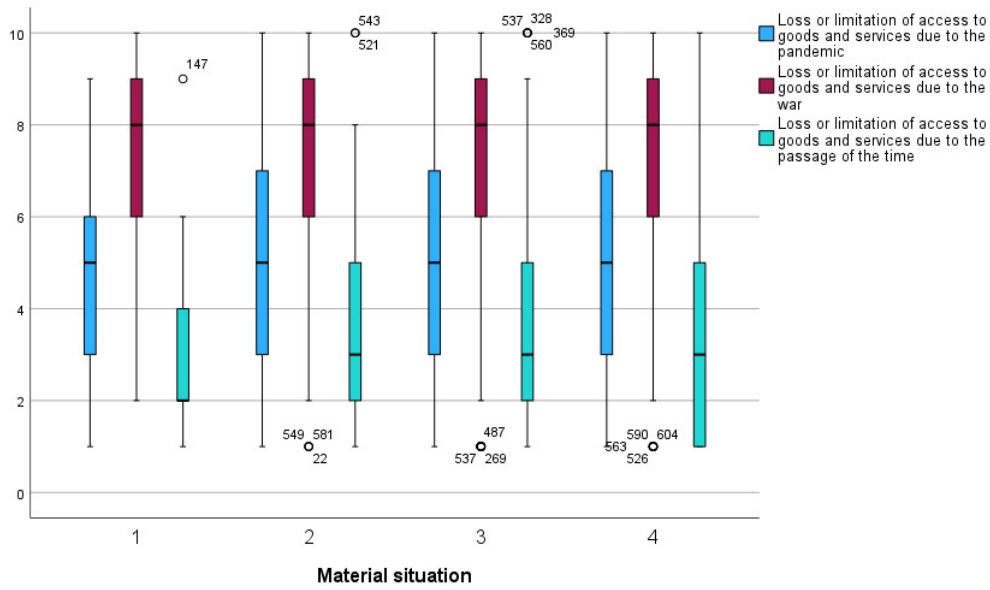
**Figure 6.** Loss of quality of goods and services according to field of study: 0 – humanities, 1 – social, 2 – science, 3 – technical.

Source: own study.

**4.2.4. Material situation**

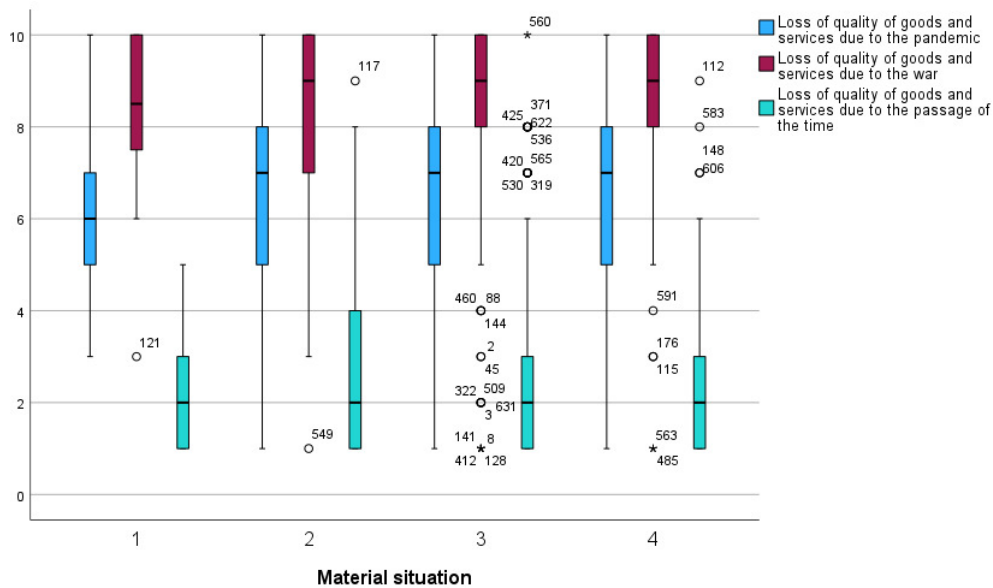
Fig. 7, and Fig. 8 relate to the actual material status. Fig. 7 shows the loss or limitation to goods and services. Fig. 8 describes the expected loss in quality of goods and services. The results do not seem to differ from those obtained for the previous variables.





**Figure 7.** Loss of quality of goods and services according to material situation: 1 – rather satisfactory, 2 – satisfactory, 3 – good, 4 – very good.

Source: own study.



**Figure 8.** Loss of quality of goods and services according to material situation: 1 – rather satisfactory, 2 – satisfactory, 3 – good, 4 – very good.

Source: own study.

### 4.3. Statistical significance tests

Below (in Table 8) there are lists of rejection of zero hypotheses for various variables. For reasons of volume, only the H0 rejections were quoted, because the rejection clearly indicates the occurrence of statistically significant differences between the variables from different groups. All adopted H0 indicate no statistically significant differences.

**Table 8.**  
*Rejected zero hypotheses*

No.	Zero hypothesis (H0)	Significance <sup>ab</sup>	Test	Decision
1	Distribution Loss or limitation of access to goods and services due to the pandemic is the same for category Gender.	,019	Kruskal-Wallis' test for independent groups	Rejected H0
2	Distribution Loss or limitation of access to goods and services due to the war is the same for category Gender.	,009		
3	Distribution Loss of quality of goods and services due to the pandemic is the same for category Gender.	,033		
4	Distribution Loss of quality of goods and services due to the passage of the time is the same for category Gender.	,028		
5	Distribution Loss or limitation of access to goods and services due to the war is the same for category Place of residence.	,006		

a. The significance level is .050.

b. Asymptotic significance is shown.

Source: own study.

As can be seen, statistically significant differences appeared only in some of the respondents' answers. Categories: Gender and Place of residence showed differences in respondents' assessments of losses only in some contexts. On the other hand, belonging to different groups within the Field of study and Material situation categories did not cause statistically significant differences in the answers.

#### 4.4. Limitations

The proposed study has certain limitations that cannot be underestimated. The study was carried out at a specific moment in time, and it was a time of uncertainty caused by two situations: (1) the ongoing or subsiding Covid-19 epidemic and (2) the aggression of the Russian Federation against Ukraine - a country directly bordering Poland. The survey covered almost exclusively representatives of the Z Generation. The respondents were students of Warsaw universities. Thus, the conclusions of these analyses are closely related to people, specific circumstances, time and place.

## 5. Discussion

The global impact of the COVID-19 pandemic, coupled with economic crises and energy shortages, has led to considerable repercussions on societies across the globe. These effects have brought about disruptions and constraints in accessing crucial services and technologies. Energy shortages, fluctuating fuel prices or power failures also directly impact the availability

and reliability of services dependent on electricity, such as internet connectivity, communication networks, and digital platforms.

This study is the first one that concerns the study conducted in 2022/23. The study had a much broader context. It covered not only the estimation of losses related to the lack or limitation of access to goods and services and the access to high-quality products and services in crisis situations. Other social, economic, psychological and technological aspects were also included in the study. Not only the context of extreme crisis situations (such as warfare and a pandemic) was analyzed, but also the emergence of new technologies and the natural passage of time. The passage of time and disruptive technologies replacing those currently existing and functioning are also important aspects to be considered in the context of access to technology and high-quality services for individuals in time of multifaceted crises, such as pandemics or war, economic and energy crises. Further analyses related to this study are expected in the near future.

## 6. Conclusions

The analyses conducted lead to the conclusion that there is a clear gradation in the context of estimating losses related to lack of or reduced access to goods and services and a decline in the quality of goods and services in crisis situations. The results for the natural passage of time should be taken as a reference point here. It can be assumed that some losses are inevitable. They will simply take place over time.

Wars and pandemics are tragedies that undoubtedly have a considerable adverse impact on all aspects of human life. This is beyond dispute. However, can these extreme emergencies be compared with each other? In a broad context, certainly not. But in the context of loss or limitations to access to goods and services and a decline in their quality. This difference - derived from respondents' views - is apparent. Namely, the probability of incurring losses in the event of a pandemic was rated as significant by respondents. But an even higher probability of incurring losses was indicated in the face of a war crisis. Accordingly:

- 4.95 (standard deviation is 2.38) for the pandemics and 7.27 (standard deviation is 2.3) for war - in the case of losses associated with restrictions of access to products and services;
- 6.72 (standard deviation is 2.24) for the pandemics and 8.5 (standard deviation is 1.81) for war - in the case of losses related to the decline in the quality of products and services.

Both the nightmare of a pandemic and war are among the hardest experiences. Each can bring significant reductions in consumption. On the basis of this survey, it is war - according to respondents, of course - that impacts countries' critical infrastructure harder than

even a pandemic. We are also talking about the energy services sector. And this could translate into a very high probability of loss of access to goods and services and a decline in their quality. The obtained research results are so promising that it is reasonable to repeat the study in the near future on a different group of respondents.

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## MEASURING THE ENTREPRENEURIAL LEVEL OF A UNIVERSITY USING THE HEINNOVATE TOOL – A CASE STUDY

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**Purpose:** The main purpose of this paper is to assess the entrepreneurial level of a selected higher education institution (HEI) using the HEInnovate questionnaire, which is a tool of the European Commission's Directorate-General for Education and Culture in cooperation with the OECD. The research hypothesis is that the HEInnovate tool can help university executives diagnose the level of entrepreneurship (stagnant level) and design corrective actions to help raise it to a higher level.

**Design/methodology/approach:** The HEInnovate tool is a European Commission initiative aimed at self-assessment of universities. Its overarching goal is to inspire actions that support innovation and entrepreneurship in European universities in the areas of: education, research, engaging the socio-economic environment, institutional partners and the third sector. This article presents research utilizing this tool at the University of Silesia in Katowice, which served as a case study.

**Findings:** The use of the HEInnovate self-assessment tool allows higher education institutions (HEIs) to examine their innovative and entrepreneurial potential. It aims to encourage HEIs to reflect on their own practices in order to stimulate an entrepreneurial culture and mindset that inspires people to transform their knowledge into a tangible social values. Today's complex world requires dialogue with representatives of many disciplines. As a result of an analysis of the region's needs and an assessment of the level of entrepreneurship at the University of Silesia in Katowice, measures have been proposed to develop the competencies of academics, non-academics and students in learning and teaching entrepreneurship.

**Research limitations/implications:** In the process of conducting the research, an opportunity was seen to further improve the tool, which is the HEInnovate questionnaire regarding the implementation of international projects. The results novelty lies in using the HEInnovate tool to examine, analyze, and attempt to predict potential entrepreneurial directions at universities further down the international rankings.

**Practical implications:** The research team sees an opportunity to use this tool to identify strategic activities related to the development of entrepreneurship and innovation at universities as part of a project to ensure synergies and cooperation of partner universities.

As a result of the survey, it can be concluded that measuring the level of entrepreneurship using the HEInnovate tool can be an important starting point for implementing a new strategy for entrepreneurship development at a higher education institutions. The HEI questionnaire

contains eight areas of different university activities and can serve as a valuable self-assessment tool. With the help of this tool, it is possible to identify the university's strengths and weaknesses in its entrepreneurship teaching strategy as well as any other elements of the assessment, and use the results to base the university's strategy for developing future entrepreneurship and innovation initiatives.

**Keywords:** case study method; HEInnovate questionnaire; competencies; entrepreneurial university; entrepreneurship; innovation.

**Category of the paper:** Research paper, Case study.

## 1. Introduction

In recent decades, rapidly changing socio-economic and technological developments have led to the transformation of universities, whose main role has become to commercialize their research activities to the overall economy and base of knowledge (Borch, Rasmussen, 2010). Modern higher education is attempting to find a balance between the traditionally perceived management hierarchy and an approach that gives autonomy to lower organizational structures encouraging individual innovation and entrepreneurship (Friedman, Silberman, 2003).

The concept of entrepreneurship is a relatively new word. It usually appears in combination with the word: entrepreneur, i.e., a person who manages an enterprise, runs a business on his own account, and with the word preenterprise, meaning "to make a decision to do something, to proceed to implement something" (Polański, 2008). Nowadays, the concept of entrepreneurship is associated with someone who is enterprising, has a lot of initiative and boldly takes and carries out actions (Bańko, 2000). Entrepreneurship can also be expressed as the willingness and ability to undertake various tasks in the fields of industry and commerce: especially in terms of: ingenuity, resourcefulness and operativeness. It also designates forms of social entrepreneurship: distinguishing oneself, showing entrepreneurship, stimulating, urging, encouraging someone to be entrepreneurial (Markowiecki, 2000).

Entrepreneurship is connected with the process of novelty (change), and the basic element that facilitates change is innovation. The concept of innovation (Latin *innovatio* - to renew and *innovare* - to renew) continues to evolve as a result of dynamic social and economic changes in the modern world. Entrepreneurial universities are considered to be those that implement modern teaching methods and technologies that improve digital competencies required in the labor market (Glachant, Haywood, Zorn, 2018), as well as those that make the required flexible changes in administration, organizational culture and the work system (Gjerding, Wilderom, Cameron, Taylor, Scheunert, 2006; Sporn, 1996). A common feature of a modern university is the concept of the university's social responsibility. Hence, the university is no longer treated not only as a center of innovation and knowledge playing an important role in determining the dynamics of growth in national and regional economies and as a source of effects and benefits

for the industry (Acs, Braunerhjelm, Audretsch, Carlsson, 2009; Altmann, Ebersberger, 2013), but also as a key element of social change. Given the dynamically changing labor market, the strategies of modern universities should take into account the impact of its educational programs on the labor market, such as: employability, development of entrepreneurial skills and alignment of graduates' education with employers' requirements (Andrews, Nicoletti, Timiliotis, 2018). In order to better prepare and develop the university's ecosystem for innovation, technology transfer and the entrepreneurship of employees and students, the Silesian University should make a number of changes adapting it to the new challenges facing science and the economy while taking into consideration social needs. Innovation is the visible result of externally invisible processes, and practice confirms that there is a very close connection between the development of organizations and the emergence of innovation (Micieta, Turekova, 2011).

Today, universities are no longer seen only as an element of the triple (Etzkowitz, Leydesdorff, 1999), but also quadruple (Kusio, 2019), or even quintuple helix model (Carayannis, Barth, Campbell, 2012). The purpose of the new set of players: university - economy - government - society - environment is to create a "socio-technical world". However, today's world does not allow action in isolation. In the development of spatial arrangements (local, national and international), European universities are a part of an ecosystem of education, knowledge and information transfer (Kwiek, 2015), the focus of which is now shifting towards fellow European educational and research institutions. Today, the dissemination of information and knowledge at the local level and through local universities and social networks is very relevant and useful (Agrawal, 2006). However, universities are also under increasing pressure to develop international contacts and implement joint European research programs and projects. This will not be possible without the ability of students, researchers, administrative staff and support to implement entrepreneurial activities.

In this paper, the concept of entrepreneurship is considered in connection with innovation and social responsibility, and research sources were subordinated to this definition. The main purpose of this article is to assess the level of entrepreneurial development at the Silesian University in Katowice (UŚ) using HEInnovate, a tool developed by the European Commission's Directorate General for Education and Culture in cooperation with the OECD.

Methodology of this paper presents a case study of the UŚ based on direct (questionnaires among university management) and indirect (review of documentation) research. The research tool used was the HEInnovate questionnaire. In November 2013, they launched [www.heinnovate.eu](http://www.heinnovate.eu), an online platform with the research tool used the HEInnovate questionnaire. Higher education institutions can use a free self-assessment tool to learn from their peers and develop their organizations. A case study conducted enables the examination of the level of entrepreneurship and innovation in the example of a higher education unit.

The research hypothesis is that HEInnovate can help university executives diagnose and improve the level of entrepreneurship. Entrepreneurship is crucial for individuals, teams, organizations, and legal regulations.

The gap into which the research fits includes the use of a tool for raising the level of entrepreneurship and innovation of the university in terms of the effectiveness of intersectoral cooperation between science and the economic environment - crucial, among other things, for conducting and supporting the implementation of innovative applied research and development work, serving the development of Polish enterprises and the national economy. The study is centered around the achievements of social and humanities fields and benefits the researcher.

The novelty of the results lies in using the HEInnovate tool to study, analyze, and attempt to predict the potential directions of entrepreneurship development at universities further down the international rankings. Using the humanities-systems paradigm to create tools for managing universities will benefit other areas of science and the economy.

The novelty of the results lies in using the HEInnovate tool to study, analyze, and attempt to predict the potential directions of entrepreneurship development at universities further down the international rankings. The use of the humanities-systems paradigm to create tools to support the processes of subjective entrepreneurial management of universities will translate into the development of other areas of science (through the possibility of their adaptation, for example, in the process of training young cadres) and the economy (through the commercialization of the results of the project).

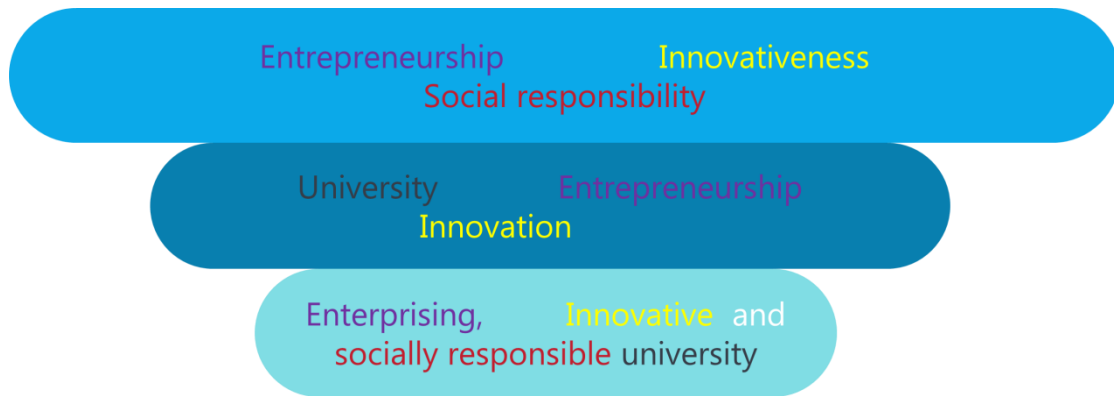
The study conducted by the authors also has a supporting function (Mizerek, 2017). The key question the authors attempt to answer is at what level does UŚ implement the concepts of an entrepreneurial university and whether it does so in accordance with the dimensions proposed in the HEInnovate questionnaire. The study also aims to identify areas in need of corrective processes and to prepare proposals for organizational changes.

The participants in the study are described in more detail at the beginning of section 3. Research methodology.

## **2. Literature review**

### **Entrepreneurship and innovation**

In this paper, the concept of entrepreneurship is considered in relation with innovation and social responsibility (Fig. 1).



**Figure 1.** Literature review research scheme.

Source: own study.

The concept of entrepreneurship was coined by the French economist J.B. Say, who recognized entrepreneurship as the fourth factor of production next to such classic factors as work, capital and nature (Dogan, 2015). Schumpeter, on the other hand, defined entrepreneurship according to its innovative features, claiming that economic development is stimulated by innovation in a process called "creative destruction", in which new technologies dynamically replace older ones (Schumpeter, 1994). Kirzner defined entrepreneurship according to its business opportunity potential (Abiyev et al., 2013) as "factories of thought and hope that undertake activities aimed at creating the future in terms of strategic competition and creating value by building resources and skills" (...). Concepts such as flexibility, risk-taking, innovation, creativity, dynamism and development-oriented mindset also appear here (Güney, 2008).

Despite the lack of an unequivocal definition, entrepreneurship can be characterized as:

- the process of creating something new, e.g. a company focused on achieving benefits on the market,
- method of management related to effective management of available resources and appropriate adaptation of the strategy to the prevailing market conditions,
- a set of characteristics of the entrepreneur's conduct, such as willingness to take risks or be flexible,
- innovation, related to the implementation of a novel idea (Augustyńczyk, 2020).

It is widely believed that innovation is one of the most important driving forces of entrepreneurship. Innovation is at the heart of the process of renewing what an organization offers (products and/or services) and how they are generated and delivered (Tidd, Bessant, 2011). R. Rothwell, emphasizing the relationship between knowledge and innovation, defines innovation as a process of know-how accumulation as well as internal and external learning (Szajt, 2008).

Research on the concept of innovation has a relatively short tradition, and the first publications on it began to appear in the 1960s (Romanowski, 2011). The term innovation is understood broadly and refers to all spheres of life, from economic or social life to new thinking

or cultural trends (Janasz, Koziół, 2007). From this perspective, innovation is understood as an interactive learning process that has a social and territorial reference as well as a cultural and institutional context (Vertova, 2006).

It is now accepted that innovation is "the first practical (commercial) introduction (application) of a new product, process, system or device" (Freeman, 1982). It is assumed that it should be a novelty on at least a national scale (OECD (2005). This definition was based on the theory of innovation by J.A. Schumpeter (Schumpeter, 1960). There is a very close connection between the development of an enterprise and the emergence of innovation. Through innovation, the development of an organization can be supported, and its development generally creates the right environment for innovation (Micieta, Turekova, 2011). Most often, three main types of innovation are distinguished: product (new products), process (new production processes) and service (new services) (Tidd, Bessant, 2011). Under market conditions, a broader division of innovation is used:

- product, consisting in the production of a new or modernized products,
- processes, improving manufacturing methods and technologies,
- technology, introducing changes and improvements in the processes, products and systems used,
- marketing, introducing changes to the company's market policy and business model,
- organizational changes, involving changes in the internal and external relations of enterprises (OECD, 2005).

The above various innovations possess the following characteristics:

- complementary, extending or supplementing the range of possibilities for change and improvement in technological and organizational processes,
- radical, resulting from scientific research, creating completely new goods, products or services on the market,
- social, i.e. innovative organizational solutions meeting a wide range of societal needs (Janasz, 2002).

The basis of every innovation is new knowledge. The ability to innovate depends not only on the ability to create new knowledge, but also to transfer it (share it), as well as to absorb it and use it in practice (Jasiński, 2021).

The OECD – Organization for Economic Cooperation and Development, which includes 30 highly developed countries, has made the greatest contribution to innovation research methodology. More than forty years of experience in the development of indicators useful for international comparisons and assessment of individual countries has resulted in a series of methodological manuals called the Frascati Manual. The series includes manuals on: R&D research methodology (Frascati Manual); innovation research methodology (Oslo Manual); innovation in developing countries (Bogota Manual); scientific and technical staff (Canberra

Manual); technical balance of payments (TBP Manual); patent statistics (Patent Manual) (Toczyńska, 2015).

Today, we distinguish three basic models of university operations, which represent their way of functioning on the market and in society. First generation universities are based on the development of science. Second generation universities are based on activities related to the development of science and the implementation of scientific research. On the other hand, the third generation university, apart from science and research, also engages in the commercialization and transfer of knowledge from the university to the socio-economic market (Makiela, 2017). Concepts such as an entrepreneurial university, academic (university) innovation and the concept of university social responsibility are related to how universities function.

### 3. Entrepreneurial University

The concept of an entrepreneurial university is associated with the concept of the knowledge production mode (Gibbons et al., 1994). Although they did not directly use the term "entrepreneurial university", they indirectly identified the university as the main place for creating new scientific and technical knowledge in highly industrialized countries. This concept was the basis for the emergence of the idea of an entrepreneurial university. The term "entrepreneurial university" was first used by B. Clark in 1998 (Clark, 1998). He pointed to the problem of diversification of sources of financing. According to Clark, a wide range of commercialization of research results and intensive cooperation between the university and the business sector are the two interrelated and essential features of an entrepreneurial University which constitute a significant sources of revenue (Jasiński, 2021). The concept of an "entrepreneurial university" was popularized by H. Etzkowitz who based his concept on the following four pillars:

- academic leadership capable of formulating and implementing strategies,
- supervision over the correct use of university resources,
- ability of the university to transfer technology/knowledge, produce patents and create business incubators,
- ethos of entrepreneurship in the academic environment (Etzkowitz, 2002).

An entrepreneurial university is a modern, multi-dimensional institution, operating in many areas, looking for new opportunities and actively co-creating its future. It is primarily characterized by flexibility in adapting to the changing conditions of the education and research market (Pluta-Olearnik, 2009). In Poland, the concept of an entrepreneurial university appeared in 2002. Four models of coordination of the higher education system and academic research have been identified, including a model of market coordination. It assumes the independence

of researchers and universities in relation to the overall market conditions. For the provision of external education and research services, they receive funds and/or other resources for their activities (Jabłeczka, 2002). It was the market model that served to crystalize the concept of an entrepreneurial university as the recommended model of the 21st century university.

A state university is both a public institution and a unit of the state budget. Hence, attention should be paid not only to the "classic" entrepreneurship (external, directed to the environment), but also to the role of intrapreneurship (Jasiński, 2021). Polish universities have just completed the first stage of the transformation consisting in an increase in the number of students. The second stage is in progress - improving the use and efficiency of public financing received, and the third stage - partnerships with the business sector - is still ahead of it (Leja, 2013).

#### **4. Academic innovation**

Reflections on the ongoing changes of the university as higher education institution cover many levels. These include the effects of universal access to higher education, low level of knowledge of secondary school graduates, differentiated level of education in higher education institutions, as well as ensuring high quality education, adapting educational programs to the labor market, shortages in financing scientific research, limiting non-compliance in the process of academic advancement, etc. The deteriorating assessment of higher education institutions by the public is also a source of concern. This is caused, among others, by improper supervision over the functioning of some public and private universities and non-compliance with formal and legal procedures (Wawak, 2017).

An element of the discussion on the functioning of a university is how to better use the greatest value of the university, which is its employees, students, graduates and the knowledge they possess. Under the influence of the challenges of the modern world and the knowledge-based economy, there is a conviction about the need to create an entrepreneurial/innovative university (Andrzejczak, 2015).

In the process of managing an innovative university, the rector and the senate are of decisive importance. It should take into account the principles that strengthen the activity and flexibility of organizational units. The leading principles, the application of which is a condition for managing an innovative university, include the following:

- redundancy or excess, indicating that an excess of unnecessary or harmful regulation of the work of teams (e.g. research teams, individual employees) leads to unintentional consumption of resources, without the possibility of obtaining rational effects,
- interdisciplinarity, based on: "breaking down the boundaries between disciplines, not on summing up knowledge",



- flexibility, enabling management to introduce solutions deepening the university integration process by means of statutory and institutional instruments that do not necessarily cover all teams/employees. Flexibility can be provided through procedures for mechanisms to deal with different scenarios,
- self-organization, which says that managers should be flexible and should facilitate self-organization of teams, not organizing them,
- self-regulation enabling the use of explicit and tacit knowledge to achieve the assumed goals of the organization, research teams, and university employees,
- self-control that allows you to build positive relationships in the team, tolerance, openness and substantive discussion (Leja, 2011).

Taking into account the state of research as of date, the specificity of innovative activity in service organizations, including educational organizations, it is possible to define the features that an innovative university should have. These are as follows:

- competitiveness. This means that the university has the ability to create its own integrated diploma programs, is capable of providing educational services for which there is a demand and there is a demand for its services, is equipped with modern equipment and highly qualified research and teaching staff, cooperates with the broadly understood economic and social environment, and has a strong brand against the background of competition,
- leader on the market of educational services. This can be seen by its active role and significant position in the educational space of the city/commune, country, systemic relations and cooperation with external partners, including abroad,
- secure environment i.e. safe, ergonomic, with full infrastructure in the field of health, sports, food, cultural facilities, information services, IT, psychological support and material assistance. It has Social Activity Centres, and or which are is open to the participation of scientific, professional and social organizations,
- carries out innovative activities, i.e. conducts research, implements projects, publishes research results and transfers knowledge into market practice in cooperation with business partners, participates in public-private partnerships, and integrates into the European research area,
- develops and implements innovative education technologies, new, flexible study programs in standard and extended modes, including the summer semester. It takes into account mobility in the organization of studies, popularizes the three-stage study system, introduces new methodologies and active teaching methods such as the project method, e-learning, blended learning, case working, case study, and others. At the same time, an innovational university is not only an educating entity but is also a learning organization. It creates and transfers knowledge, shapes skills and qualifications, disseminates its own experience and implements best practices of other universities,

- implements organizational and marketing innovations in university management processes, internal and external communications. It creates infrastructure and new technology to support and develop all participants of the educational and research process, develops new strategies, methods and tools in the field of promotion, distribution and pricing policy, offers additional benefits for participants of the education process and implements flexible systems of their adaptation within the university, and has beneficial affects on professional and private activities of students and staff,
- it is creative, where work at the university is a passion for the employees and inspires students and listeners alike. Innovation starts with creative ideas, which over time translate into inventions, products, services, processes and methods. There is no innovation without creativity. The latter is about making connections. Innovation cannot happen if actors lack passion. Innovational success is determined by the following conditions: the scope of using new ideas, feasibility, market justification, focused on student and markets, and an environment and organizational solutions conducive to innovation (Toczyńska, 2015).

It should also be emphasized that the system of measuring innovation in industry, recommended by the OECD and used for years, completely fails in the service sector. Therefore, various university innovation rankings based on indicators such as:

- the number of patents, protection rights and licenses filed,
- the value of EU funds obtained,
- innovative facilities in the form of the Knowledge and Technology Transfer Center (or similar) can be described as insufficient.

The specificity of services results from their nature, and they are defined by: immateriality, non-uniformity, impermanence, simultaneous process of providing and consumption. Knowledge-based services, such as education and university services, are particularly unique (Toczyńska, 2015).

## **5. The concept of social responsibility of the university**

The multiplicity of roles played by universities makes it difficult to formulate a single, coherent answer regarding its responsibilities, even when limited to just "social responsibility". These roles include:

- direct easement (meeting the needs of students, staff or the social neighborhood of the university),
- cognitive functions - multiplication of knowledge, not necessarily directly useful,

- education in view of not only the labor market,
- preparing graduates to fulfill the role of social leaders,
- preparing graduates to propagate civic culture and good habits.

Attempting to summarize these various functions with one term, we think of the academic ethos, understood as a set of values to which the life of a university in all its dimensions is subordinated and adopted as an axiological justification for attitudes and actions. A responsible university, therefore, can be said to be a university that cultivates the desired values of the academic ethos and acts in accordance with its values (Chmielnicka, 2008).

The university carries out activities in three areas:

- market provision of educational services,
- provision of public (moral) goods,
- provision of knowledge (Sulejewicz, 2003).

It can therefore be said that in the first sphere, a university is a kind of business organization which, after developing certain knowledge/technology, produces educational services for a strictly defined market segments. In the second sphere, it is seen as an educational institution reproducing, among others, the political functioning of the state and civil society (national interest, social service), which, through techniques of raising generations, creates a coherence of value systems, culture, and shapes civic attitudes. In the third sphere, namely the sphere of knowledge, the university implements the values and methodological postulates within the sociologically defined conditions of the existing paradigm, i.e. the general conceptual framework. This existing paradigm, by its very nature, generates classical science, i.e. the process of solving puzzles constantly undertaken by scientists (Sulejewicz, 2008).

Universities, while conducting teaching and research activities, bear social responsibility, which is more and more clearly perceived, both in the academic environment and in the broadly understood overall environment. This concerns both the preparation of graduates to perform the roles of knowledge workers in the knowledge-based economy, as well as the creation of close relationships with the business community and local government. This also applies to the need to improve the efficiency of spending public funds allocated to the operation of universities. So what is the social responsibility of the university? How to achieve a symbiotic relationship between the university and the overall environment? What can be the activities "from the university to the environment" and what are those directed "from the environment to the university". These are the basic questions that K. Leja tries to answer (Leja, 2008).

Judith Sutz sees the transformation of universities, which, in addition to two traditional roles, i.e.:

- educating students,
- conducting scientific research (Sutz, 1997)

universities play a third and increasingly important role, namely creating mutual relations with the overall environment.

Bogdan Wawrzyniak puts forward the thesis that the university of the future is one that is looking for a system of values different from the current one (i.e. based on global competition), namely a system built around social responsibility. In order to become an organization that serves the overall environment, such a university must positively, but not uncritically, respond to the expectations of stakeholders, and the degree to which these expectations are met is a measure of its social responsibility (Wawrzyniak, 1999). Understanding the importance of the university's social responsibility depends on the good will of the management and the employees' conviction of the importance of the problem. This certainly requires a broad debate among the academic community. The suggested changes require the adoption of the axiom for the need to implement knowledge management processes in universities, so that these organizations can become the leaders in the journey of knowledge, setting its direction and dictating the pace (Leja, 2008).

The most courageous method of shaping the future of the university would be to use the model created by Russell Ackoff (Ackoff, Magidson, Addison, 2007). The starting point of this method is the diagnosis of the current state of the university and the determination of the shortest possible way to reach the ideal. However, in both Polish and European academic institutions, the conditions are so complex that it would be difficult to use the method used in American commercial and non-commercial enterprises.

## **6. Research methodology**

The research was conducted in the form of a case study. The methodology proposed by W. Czakon (2006) was used, which consists of the following stages: defining research questions, selection of cases, selection of data collection tools, data collection, data analysis, shaping generalizations, checking research results with literature and formulation of generalizations.

The University of Silesia in Katowice was selected for the case study. The university consists of 4 campuses (Katowice, Sosnowiec, Cieszyn, Chorzów), containing 8 faculties (Faculties of Humanities, Natural Sciences, Social Sciences, Exact and Technical Sciences, Law and Administration, Arts and Educational Sciences, Theology and the Film School) and 2 doctoral schools (Doctoral School at the UŚ and the International Environmental Doctoral School at the Center for Polar Studies). It offers 25 scholarly disciplines in 84 fields of study and 218 specialties. The university operates 17 research centers and over 200 laboratories, has over 600 research teams and organizes about 60 scientific conferences each year. It grants undergraduate, graduate and doctoral degrees. Thus, it plays an extremely important role in the transformation of the region - from an industrial past to an innovative future. In addition, since 2022, the UŚ, together with 7 European institutions, has been implementing the „Entrepreneur

- Entrepreneurial Preparation for Notable and Engaging Universities” project. It is a project supporting European universities in becoming more entrepreneurial and innovative. By fostering the competencies of the future, it will provide a new generation of student-entrepreneurs and innovators. It will bring about a radical change by creating student-centred, non-elitist, open and inclusive universities based on cooperation between higher education institutions, the public and private sectors and citizens.

The key research tool used to collect information and determine the level of implementation of the entrepreneurial university concept was the **HEInnovate** questionnaire. The results of direct research (interviews, participant observations) and indirect research (review of EU and national documentation) were used. The authors chose the research sample deliberately. For the study, on behalf of the Rector of the University of Silesia - prof. dr hab. Tomasz Pietrzykowski (Vice-Rector for International and Domestic Cooperation of the University of Silesia in Katowice - the management staff of the university was invited to participate. Among the 16 evaluating judges there were, among others, persons performing the functions of deans (31%), directors (25%), department heads (37.5%) and personnel performing other functions who did not indicate their specific position (6.5%). In the second stage, the team of researchers conducted training for all those willing to participate in the study. The training was conducted on 8.12.2021 and its aim was to familiarize all interested parties with the tool and answer all questions about its functioning. The third stage consisted in collecting answers. The HEInnovate questionnaire was completed by respondents on the HEInnovate platform (<https://heinnovate.eu/en>). The author participated in the training as expert support for respondents.

Participants of the study were asked to indicate to what extent the University of Silesia applies the proposed model solutions (on a scale of 1.0 to 5.0). The next step in the research procedure was analysis of the collected data, consisting in organizing the collected material, and then its hierarchization in accordance with the rating assigned to individual dimensions. The results of the study allowed the development of a preliminary diagnosis of the University of Silesia in Katowice in relation to the concept of an entrepreneurial university and the university's social responsibility. Strengths and weaknesses, opportunities and threats for the university in the context of entrepreneurship development, key conclusions and recommendations were indicated.

The **HEInnovate** tool is an initiative of the European Commission aimed at self-assessment of higher education institutions. Its primary goal is to inspire activities supporting innovation and entrepreneurship of European universities in the areas of: education, research, engaging the socio-economic environment, institutional partners and the third sector. The use of the HEInnovate self-assessment tool allows higher education institutions (HEIs) to examine their innovation and entrepreneurial potential. It aims to encourage universities to reflect on their own practices in order to foster an entrepreneurial culture and mindset that inspires people to transform their knowledge into tangible social value. The interactive form is available in various

languages, including Polish. It evaluates eight areas of the university's activity, in which the respondent determines how much he agrees or disagrees with a given statement in accordance with his experience, knowledge or intuition. These areas are:

- **Leadership and Administration** - This section lists some of the most important factors that a HEI can consider to enhance its entrepreneurial action plan, such as: institutional strategy, implementation of the action plan, model for coordinating and integrating entrepreneurial activities across the institution, incentives for faculties and units, and the driving force for entrepreneurship and innovation in regional, social and community development;
- **Organizational capacity** - funding, people and incentives – this addresses key resources such as funding and investment, people, expertise and skills, and incentive systems that are needed to sustain and develop the institution's entrepreneurial capacity. The factors examined are: Objectives supported by a wide range of sustainable financial and investment resources, Capabilities and culture for building new contacts and synergies across the institution, Openness to engaging and hiring people whose approach, behavior and experience are related to entrepreneurship, Investing in developing employees, and incentives and rewards for employees;
- **Measuring the impact of change** - Entrepreneurial/innovative HEIs need to understand the impact of the applied changes within their structures. This section identifies areas where an institution can measure the impact of change: regularly assessing the impact of its entrepreneurship action plan, how much staff and resources support its action plan, assessing entrepreneurship teaching and learning across its structure, assessing the impact of support for start-up businesses, assessment of knowledge exchange and cooperation, and assessment of international activities in relation to the entrepreneurial roadmap;
- **Entrepreneurship teaching and learning** - involves the search for innovative teaching methods and ways to stimulate entrepreneurial thinking. This section measures whether the institution provides a variety of formal and informal learning opportunities, validates entrepreneurial learning outcomes, develops and delivers a curriculum together with external stakeholders, and integrates research into entrepreneurship education;
- **Internationalized institution** - Internationalization is the process of integrating an international or global dimension into the design and delivery of education, research and knowledge exchange. It is measured whether internationalization is an integral part of the higher education institution's entrepreneurial agenda, whether it openly supports the international mobility of its staff and students, whether it seeks out and attracts international staff from the business community, whether the institution's approach reflects international perspectives, and whether its approach to research reflects international standards;

- **Preparing and supporting entrepreneurs** - A higher education institution can help students, graduates and staff consider starting an enterprise as a career development step. It examines whether the Higher Education Institution raises awareness of the value of entrepreneurship and stimulates entrepreneurial intentions, supports the transition from concept to enterprise creation, offers training to help them start, run and grow their businesses, whether experienced people from academia or industry offer mentoring and other forms of personal development, whether the institution facilitates access to finance for its entrepreneurs and whether it offers or facilitates access to business incubation;
- **Knowledge exchange and cooperation** - is an important catalyst for organizational innovation, progress in teaching and research, and regional development. It is an ongoing process that encompasses the 'third mission' of higher education institutions, defined as the stimulation and direct application and exploitation of knowledge for the social, cultural and economic development of society. It is examined by assessing whether the institution undertakes to cooperate and exchange knowledge with industry, the public sector and society, whether it shows active involvement in partnerships and relations with various stakeholders, whether there are strong ties between the university and incubators, science parks and other external initiatives, whether it enables staff and students to participate in innovative activities involving enterprises/external environment and whether it combines research, education and industry (wider community) activities to exploit new knowledge;
- **Digital transformation and potential** - the self-assessment section contains a number of statements describing the digital potential of higher education institutions, defined as the ability to integrate, optimize and transform digital technologies to support innovation and entrepreneurship. It examines whether the institution develops digital culture and implements and monitors a digital strategy to support innovation and entrepreneurship, whether it invests, manages and constantly modernizes specialized digital infrastructure, whether it supports the use of digital technologies to increase the quality and equality in teaching, education and assessment, whether it uses open educational resources, open science and open methods of data processing to increase the institution's effectiveness and increase its impact on the existing ecosystem, and whether it makes full use of its digital resources to promote innovation and entrepreneurship in a sustainable and inclusive way.

In addition to the score from 1-5, it is possible to select the N/A option (not applicable). Each respondent can evaluate any number of areas/ranges. Link to the tool's website: <https://heinnovate.eu/en>.

The choice of the tool was dictated by several considerations. First of all, the desire to test the research model in relation to a specific university, the desire to better understand the factors that affect the current condition of the university and its level of entrepreneurship and

innovation, and the possibility of modifying and filling cognitive gaps and refining the theory (Ćwiklicki, Pilch, 2018). The study conducted by the authors has an auxiliary function - this form of research was chosen to illustrate an issue important to researchers (Mizerek, 2017). The key question the authors tried to answer was: at what level does the University of Silesia implement the concepts of an entrepreneurial university and whether it implements it in accordance with the dimensions proposed in the HEInnvention questionnaire. An additional aim of the study was to identify areas requiring correction and/or improvement and to prepare proposals for changes for the organization. The study was deliberately limited to the University of Silesia, as it participates in the "Entrepreneur" project (an obligatory activity under this project was to carry out a study using the HEInnovate questionnaire). This increased the chances of: 1) using practical knowledge and experience in the study, 2) wider access to documents, 3) broadening the group of management staff in the study. The preparation of the theoretical layer of the study consisted in studying secondary sources published in national and foreign scientific journals: previous research and analyses, in particular data obtained from the research carried out earlier by the Czaja, Kafel et.al from the Krakow University of Economics (Czaja, Kafel, 2020), EU and Polish state documents and articles related to the concept of entrepreneurial universities such as social responsibility and innovation. In the first stage of research, through direct interviews with the management of the University of Silesia, a group of respondents was identified. They were then selected from key university staff responsible for the quality of education and the development of entrepreneurship: (Industry Cooperation Office, Office for International Cooperation, Faculty of Life Sciences, Faculty of Science and Technology, Faculty of Humanities, Faculty of Social Sciences, Institute of Art Sciences, University Press Śląskie, Department of Education).

## 7. Research Results

The HEInnovate self-assessment tool was a mandatory step in the application process by the University of Silesia to the **Inicjatywy EIT HEI Initiative** "Innovation Capacity Building for Higher Education", which is a joint action of the EIT Community. This initiative is a key objective of the European Institute of Innovation and Technology (EIT) as part of its new strategy, the EIT Strategic Innovation Agenda 2021-2027. The initiative aims to support higher education institutions through expertise and coaching, access to the EIT innovation ecosystem and funding, enabling them to develop innovation roadmaps that complement the needs of participating individual higher education institutions.

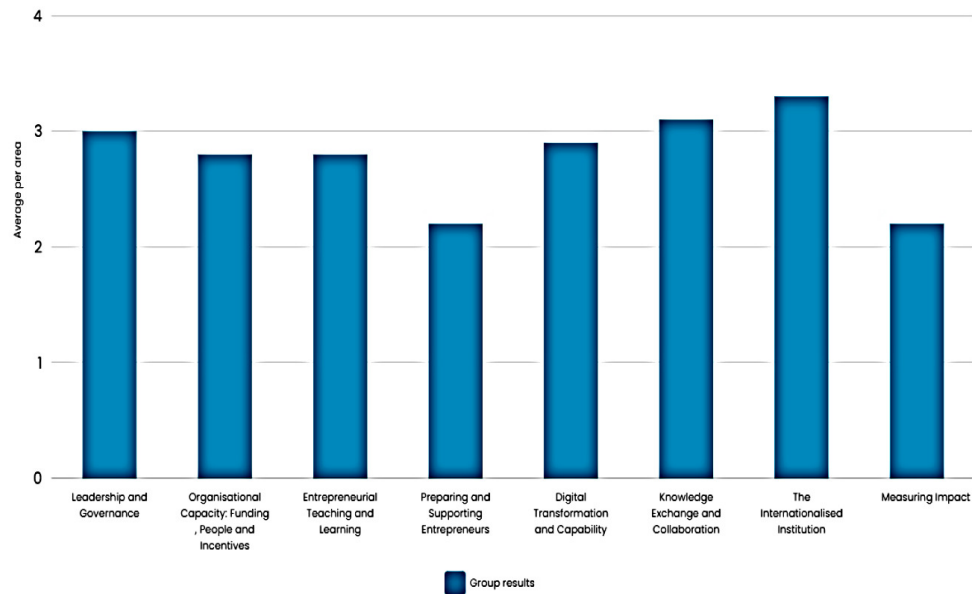


All pilot projects selected for funding under the HEI Initiative were required to create an Innovation Vision Action Plan (IVAP) as part of their application. The IVAP should present a long-term vision to increase the innovative and entrepreneurial capacity of the relevant HEIs at the institutional level. The IVAP was developed on the basis of HEInnovate's self-assessment for the University of Silesia in Katowice, in order to guide the selection of activities proposed for funding and potential institutional changes at the university (<https://heinnovate.eu/en>).

The results of the survey on the implementation of the entrepreneurial university concept at the UŚ seems unsatisfactory. The results are as follows:

- Leadership and governance – 3.0.
- Organisational capacity: funding, people and incentives – 2.8.
- Measuring impact – 2.2.
- Entrepreneurial teaching and learning – 2.8.
- The internationalised institution – 3.3.
- Preparing and supporting entrepreneurs – 2.2.
- Knowledge exchange and collaboration – 3.1.
- Digital transformation and capability – 2.2.

The results are shown in Figure 2. The final scores ranged from 2.2 when measuring impact, 2.2 when measuring preparation and support of entrepreneurs to 3.3 when measuring the internationalization of institutions. In this survey, from among eight dimensions studied, one dimension was singled out for detailed analysis, namely: **Entrepreneurship teaching and learning**. This choice was dictated by the fact that the UŚ is in the process of implementing a new strategy to improve the programs for undergraduate and graduate degrees entitled: "A new concept of studies at the University of Silesia in Katowice". The intention of the research team was to propose solutions to strengthen the entrepreneurship component of the new curriculum. As the Rector of the UŚ stated, a new concept of university studies is needed to address the changes in the cultural paradigm, demographic reality, new technological opportunities for students and the need to instill in students the joy of creating and innovating. According to the definition proposed by the authors of the **HEInnovate** tool, Entrepreneurship teaching and learning should be understood as a search for innovative teaching methods and ways to stimulate entrepreneurial thinking. It is not only about learning entrepreneurship, but also about gaining entrepreneurial experience and acquiring skills and competences to develop entrepreneurial thinking.

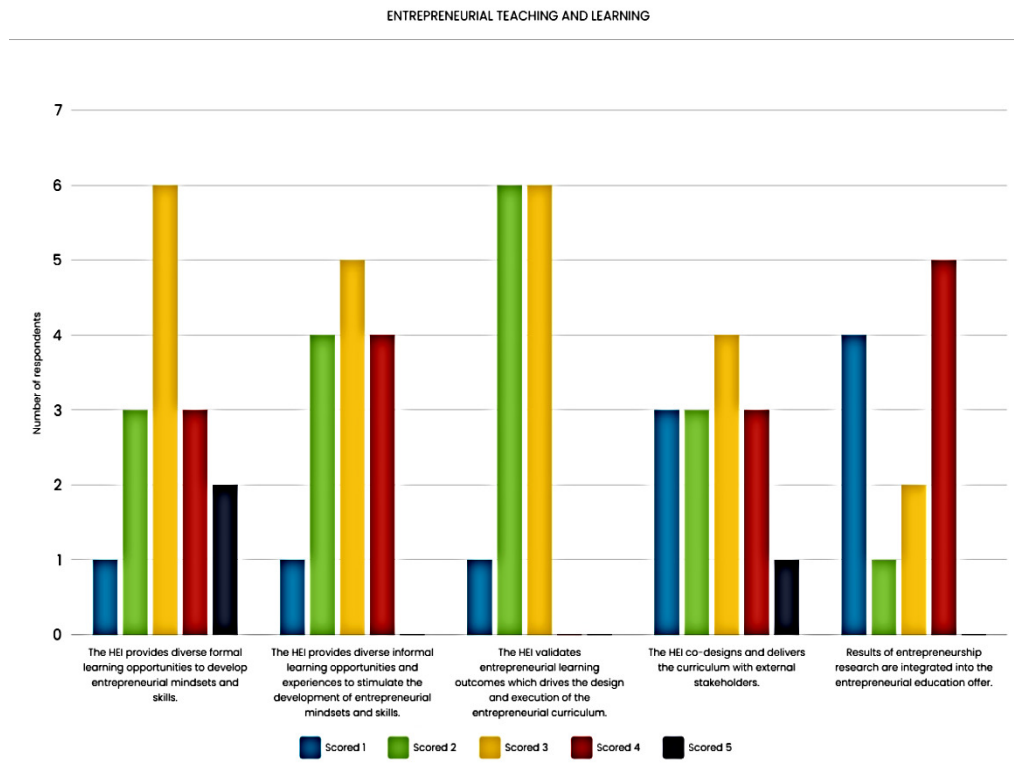


**Figure 2.** The result of the study of the level of entrepreneurship with the HEInnovate tool for the University of Silesia in Katowice.

Source: own study.

The HEInnovate tool then indicated an assessment of the five elements that make up the area: **ENTREPRENEURIAL TEACHING AND LEARNING** (Figure 3):

- The university provides various opportunities for formal education in order to develop entrepreneurial attitudes and skills. (-3.1).
- The university provides a variety of informal learning opportunities and experiences that stimulate the development of entrepreneurial attitudes and skills. (-2.9).
- The university validates the learning outcomes of entrepreneurship, which drives the design and implementation of the entrepreneurship curriculum. (-2.4).
- The university co-creates and delivers the curriculum with external stakeholders. (-2.7).
- Entrepreneurship research results are integrated with the educational offer in the field of entrepreneurship (2.7).



**Figure 3.** The result of the study of the area entitled: "ENTREPRENEURIAL TEACHING AND LEARNING" with the HEInnovate tool for the University of Silesia in Katowice.

Source: own study.

The highest score (score of 3.1) was given to the first area: "The higher education institution provides a variety of formal learning opportunities to develop entrepreneurial thinking and skills." By this it is meant that an entrepreneurial higher education institution provides a range of opportunities to facilitate innovative teaching and learning across all faculties. Such a higher education institution should foster innovation and diversity in the approach to teaching and learning in all departments, as well as the development of an entrepreneurial mindset and skills for all programmes. To earn a high score, a higher education institution might, for example:

- support changes in curriculum to stimulate and develop entrepreneurial thinking and skills through new teaching methods and student-centred, interdisciplinary and practice-based learning (e.g. living labs, use of case studies, games and simulations),
- support employees in developing a new entrepreneurship curriculum,
- provide students with ways to evaluate and provide feedback on the course,
- introduce new mechanisms to support students, including those that enable them to gain experience in setting up new ventures as part of a formal education or providing entrepreneurship education with active entrepreneurs.

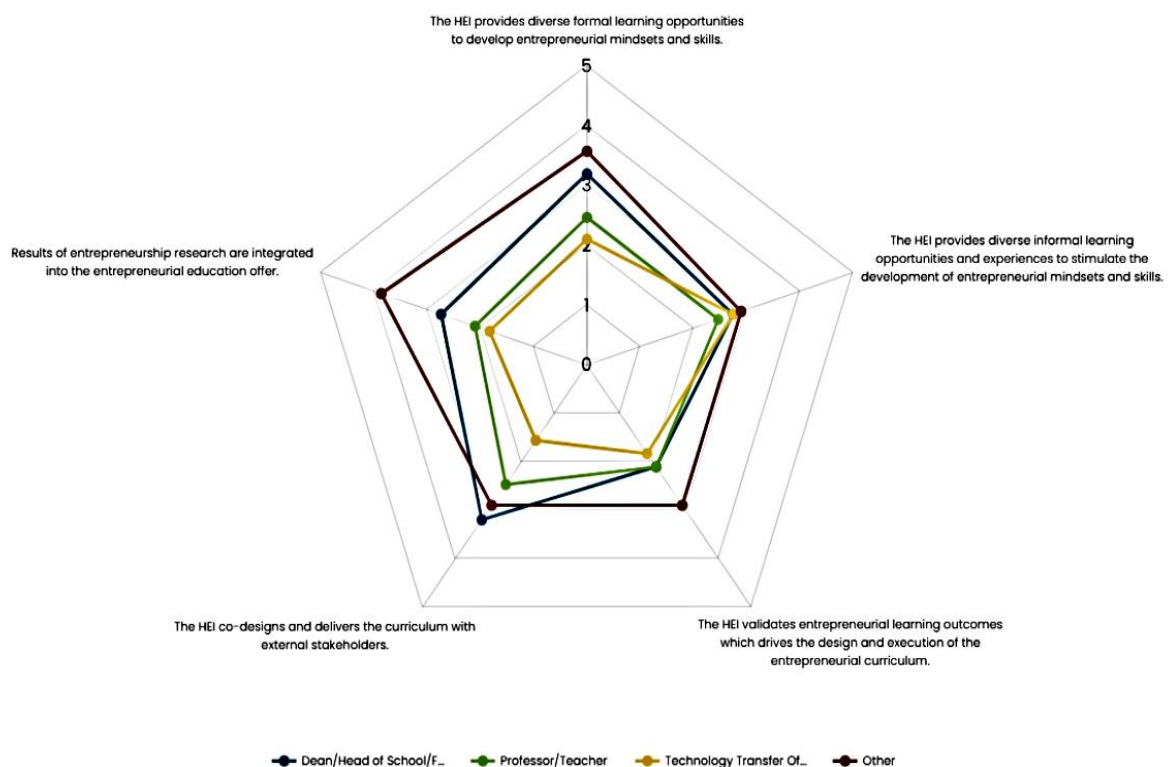
The area related to the assessment and evaluation of learning outcomes received the lowest score: "The higher education institution validates the entrepreneurial learning outcomes that drive the planning and implementation of the entrepreneurship curriculum" (rating 2.4). In this area, attention is paid to the development of important skills and competences.

They are necessary both for graduates who run enterprises and for entrepreneurial graduates who enter the the workforce. A higher education institution that places a high value on entrepreneurial learning commits to regularly reviewing, recognizing and updating course content and learning outcomes for all study programmes. To earn a high score, a higher education institution might, for example:

- codify the expected outcomes of entrepreneurship learning in terms of knowledge, skills and competences for all study programmes,
- ensure that students can fully understand the expected and achieved outcomes of entrepreneurship learning,
- validate entrepreneurship learning outcomes at institutional level,
- recognize entrepreneurial learning outcomes by including them in student achievement records.

As shown in Figure 4, the persons who assessed the indicated area are:

- deans,
- professors,
- employees of technology transfer offices (in the case of the University of Silesia, it is the Industry Cooperation Office),
- others (personel performing other tasks).



**Figure 4.** The result of the study of the area entitled: "ENTREPRENEURIAL TEACHING AND LEARNING" with the HEInnovate tool for the University of Silesia in Katowice with an indication of the job position of the examined person.

Source: own study.

These results indicate that the surveyed institution implements activities for teaching and learning entrepreneurship, albeit to a moderate or low degree, but it is not a permanent process and long-term results and effects are not examined. In addition, deans and professors holding managerial positions participating in the study strongly indicated the lack of validation and evaluation of the results related to teaching entrepreneurship. This result strongly corresponds to the weakest area obtained by the university in terms of impact measurement. Interestingly, the worst ratings in the field of teaching entrepreneurship were received by employees associated with technology transfer, whose functions in the university are performed by the Industry Cooperation Office.

The results of the research point to the need to take action leading to changes in this area. Corrective initiatives may consist of:

- introducing organizational changes,
- setting goals,
- strengthening the competences of employees.

The following part of the article presents an analysis of the area related to teaching and learning entrepreneurship. The proposed activities are also presented, which are a compilation of both the proposals and suggestions of the study participants, as well as the authors' own experiences, and above all, the model solutions presented in the HEInnovate questionnaire.

## 8. Discussion

The introduction of organizational changes at the University of Silesia should lead to a fundamental reconstruction of educational curriculum towards the development of entrepreneurship. An extremely important clue in terms of reducing the differences in the level of entrepreneurship education between Polish and European universities may be the use of elements contained in the document of the European Commission entitled "(The European Entrepreneurship Competence Framework (EntreComp))" (European Union, 2018). The document describes 15 competences in 3 areas, which make up the so-called entrepreneurial mindset – namely, the intellectual ability to undertake entrepreneurial ventures, which are the core of learning about entrepreneurship. It also seems extremely important that the new study program should be based on the concept of entrepreneurial universities. It should equip students primarily with the ability to adapt to changing local and global market conditions and the ability to commercialize the acquired know-how. This model should also enable the inclusion of stakeholders from the business community in the management of the study program, the inclusion of "entrepreneurial achievements" in the evaluation criteria of academic teachers, as well as added value for students and cooperating businesses. Experiences from international cooperation also show that entrepreneurship education based on soft-skills in the

areas indicated by EntreCamp and project work on challenges and problems reported by companies cooperating with universities is common. The proposed module should include, among others: topics such as:

- business modeling, strategic thinking,
- practical team work on solving real problems,
- knowledge selling skills, self-presentation (the ability to make short speeches, so-called pitches),
- creative problem solving,
- time and self management,
- techniques for managing stress and taking care of mental well-being.

Managers of faculties related to the development of entrepreneurship should also strive to include stakeholders and business representatives in the management of studies and to engage in active cooperation with them in education. Enabling the development of students in the above areas will guarantee them a better start in their professional life, not only in their own company, but also in full-time work or freelance work.

The aim of activities in the context of entrepreneurship development should be to offer students and doctoral students the opportunity to prepare for work and life in an environment of diverse, interdisciplinary knowledge. The key competence offered to students and graduates, especially from humanities universities, should be the ability to:

- cooperation with graduates of other disciplines,
- the ability to understand their professional languages and
- adapting the languages of other disciplines for effective communication and collaboration.

When defining the goals of corrective actions, a modern university should always refer to the socio-economic environment. In the analyzed case, it may refer to the DEVELOPMENT STRATEGY OF THE SILESIA VOIVODESHIP (Wrana, 2013), which, as part of the SWOT analysis, developed priority areas for the development of a modern economy in the region.

The SWOT analysis conducted for the University of Silesia shows that a fairly large group of areas concerns the functioning of Silesian universities in the region, and thus the University of Silesia in Katowice. Table 1 summarizes those that have the strongest impact.

**Table 1.***SWOT analysis, Priority areas of the Silesian Voivodeship regarding the Modern Economy*

<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
A strong scientific center and staff concentration scientific and a large number R&D institutions	Low level of cooperation and weak sector links R&D with other sectors (knowledge transfer)	Economy development based on knowledge	Growing competition between centers scientific
Significant position industry, ICT, and energy sectors, medicine, automotive, environmental protection using and creating new ones technologies	Low level of implementation Patents	"Fashion" for products regional	Downgrade education at universities higher caused commercialization of services educational
A growing sector creative industries (e.g. music, design)	Low tide high qualified staff	Perception of the region as possible location for European centers scientific	Rising labor costs and limiting tax investment opportunities companies
Big number registered regional products	Low "survivability" new enterprises	Role empowerment social economy as alternative form professional activity	The downturn caused economic crisis in world markets
A large and absorbent market sales	Weak correlation between fields of study a I need Employers	Easy flow of knowledge and solutions technological	Production relocation to other countries, e.g. parent companies or to lower countries production costs

From this analysis, it can be concluded that:

- the region develops creative industries, and the University has a faculty of Arts and Educational Sciences and the Film School,
- the university offer programs in the ICT, environmental protection and energy sectors (Faculties of Science and Technology, Life Sciences),
- current education does not give students the tools to develop their initiatives and proactive attitudes,
- the problem of the region that the university can partially solve is the education of future entrepreneurs in order to increase the "survivability" of start-ups,
- social economy can provide new jobs for graduates of non-technical universities such as the Faculty of Social Sciences, Humanities, Law and Administration),
- growing competition and labor costs require a new approach based on interdisciplinarity and innovative solutions.

The modern, complex world needs dialogue with representatives of many disciplines so that the best decision can be made. As a result of the analysis of the needs of the region and the assessment of the level of entrepreneurship at the University of Silesia in Katowice, actions were proposed to develop the competences of academic and non-academic employees and students in the field of learning and teaching entrepreneurship (Table 2).

**Table 2.**

*Proposed activities to develop the competences of the University of Silesia in the field of learning and teaching entrepreneurship*

Dimension and rating	Organizational changes	Objective	Actions
<p>The higher education institution provides a variety of formal learning opportunities to develop entrepreneurial thinking and skills. <b>Rating 3.1</b></p>	<p>Implementation of a study concept based on new student-centred pedagogical methods and interdisciplinary and practice-based learning</p>	<p>Stimulation and development of entrepreneurial thinking and skills</p>	<p>Development of 15 competencies that make up the so-called entrepreneurial mindset – intellectual ability to undertake entrepreneurial ventures, which are the core of learning about entrepreneurship.</p> <p>Training program in the field of innovation and entrepreneurship based on the "flip class" method, thanks to which students learn and gain experience as part of the implemented business project and during classes, which helps to consolidate knowledge and look for answers to questions arising during the ongoing business project.</p> <p>Use Design thinking and interactive visual collaboration tools to develop creativity and innovative thinking - experimenting and learning through business simulations, practical application of knowledge</p>
<p>The higher education institution provides a variety of informal learning and experience opportunities to stimulate the development of entrepreneurial thinking and skills. <b>Rating 2.9</b></p>	<p>Offer students informal learning opportunities consolidation and integration of research and development potential and competences in the scientific areas of Silesian universities</p>	<p>Stimulating the individual to entrepreneurship</p>	<p>Establishing an entrepreneurship club serving as a platform for members to find mentors, network or launch a startup.</p> <p>These clubs should host speakers, pitching events and entrepreneurial skills workshops.</p> <p>All undergraduate and graduate students, academics and non-academics will be welcome.</p> <p>Clubs are a learning-by-doing environment where members can develop their Design Thinking, Innovation and Entrepreneurship skills.</p> <p>Clubs should include three main activities: 1) lectures, 2) mentoring, 3) internships.</p>
<p>The higher education institution validates the entrepreneurial learning outcomes that drive the planning and implementation of the entrepreneurship curriculum. <b>Rating 2.4</b></p>	<ul style="list-style-type: none"> <li>• Regular review, recognition and updating of course content and learning outcomes for all study programmes.</li> <li>• Implementation of monitoring and quality assurance procedures</li> </ul>	<p>Codification of entrepreneurship learning expectations in terms of knowledge, skills and competences</p>	<ul style="list-style-type: none"> <li>• Conducting training in the field of start-ups by students and new employees start-ups.</li> <li>• Conducting a continuous process of evaluating learning outcomes. <ul style="list-style-type: none"> <li>• Tracking and registration of emerging companies and partnerships.</li> </ul> </li> <li>• Identification of ideas, opportunities and business models implemented as Hackathons.</li> <li>• Base of social challenges to solve</li> </ul>



Cont. table 2.

<p>The higher education institution prepares and delivers the curriculum together with external stakeholders. <b>Rating 2.7</b></p>	<p>Formal mechanisms enabling the employment of business practitioners. Establishing close cooperation with other Silesian universities in the form of consolidation of activities in the field of teaching entrepreneurship</p>	<p>Learning skills necessary in the labor market. Creating cooperation spaces and internal communication tools for effective cooperation</p>	<p>Conducting a stakeholder analysis, i.e. identifying the most important groups that will have an impact on the operation of the university in the field of entrepreneurship science. Preparation of the scope, issues and tools for the implementation of research in all selected groups of recipients and participants of activities. Involvement of business in educational activities and in the university structures</p>
<p>The educational offer in the field of entrepreneurship includes the results of research in the field of entrepreneurship <b>Rating 2.7</b></p>	<p>Appointment of the updating team</p>	<p>Integrating entrepreneurial research into learning</p>	<p>Development of competences of people related to the implementation of university strategy in the field of entrepreneurship. Innovation and entrepreneurship training came to bring together innovational talent from different countries to innovate and create new companies through cooperation</p>

## 9. Summary/Conclusion

The University of Silesia in Katowice has an enrollment of 16,520 full-time students and 3,460 part-time students and 1,135 doctoral students. It is staffed by 1,883 academic teachers and 1,369 administrative employees. It also provides initiatives for the broadly understood society, such as: University of Silesia for Children, Unibot (robotics and programming for children aged 7-12), University of Silesia of Youth, postgraduate studies, MBA programs, Teacher Training Block, University of the Third Age. It cooperates with foreign universities thanks to e.g. 255 bilateral agreements concluded in 61 countries (scientific and educational cooperation), 826 Erasmus+ exchanges concluded with 48 countries and 3,500 international mobility programs (data from 2022). Increasing the innovativeness of university services, including the development of entrepreneurship and innovation among staff and students, is essential for the intelligent economic development of the Silesian region. In this context, it also seems necessary to increase public awareness of the transformative potential of services in the field of education and entrepreneurship education.

The obtained results indicate that, the surveyed institution implements activities for teaching and learning entrepreneurship, albeit to a moderate or low degree. These activities, however, are not a permanent process and long-term results and effects are not studied. In addition, the respondents point very strongly to the lack of validation and evaluation of the results related to learning entrepreneurship. This result strongly corresponds to the weakest area obtained by the university in terms of impact measurement. The worst marks in the field of teaching entrepreneurship were received by employees involved in technology transfer.

The results of the research indicate the need to take action in the teaching and learning entrepreneurship area. This paper presents initial suggestions for solutions.

As a result of the conducted study, it can be concluded that the measurement of the level of entrepreneurship using the HEInnovate tool can be an important starting point for the implementation of a new entrepreneurship development strategy at the university. The HEI questionnaire contains eight areas of various university activities and can be used as a self-assessment tool. With the help of the tool, it is possible to identify the strengths and weaknesses of the university in terms of the strategy for teaching entrepreneurship as well as any other element of assessment, and use the results to base the university's development strategy towards the development of entrepreneurship and innovation.

In the process of conducted research, the possibility of further improvement of the tool, which is the HEInnovate questionnaire, was noticed in the field of implementation of international projects. It may turn out to be crucial not only for individual universities, but also for consortia developing a common model of entrepreneurship development and for alliances of European universities. The team of researchers sees the possibility of using HEInnovate to define strategic activities related to the development of entrepreneurship and innovation in universities which should result in ensuring the effects of synergy and cooperation between universities.

The purpose of the study was to provide detailed feedback to stimulate debate on the various statements in the HEInnovate tool and to help universities establish a benchmark for entrepreneurial development in their structures. However, it should be emphasized that, according to the authors, any corrective action at universities should, in each case, be combined with social dialogue to determine the needs of the regional and local economy, the labor market, and the characteristics and demographic trends that are crucial to the development of entrepreneurship in the regions. However, there is a lack of systemic coordination in activities between universities and partners from the world of science and the economy. Gaps in the current system indicate that the current activities of universities may not consider the new needs of students, the new profiles of graduates, and the career ambitions of doctoral graduates and young researchers. For their role as sustainable development engines, higher education units need a high level of autonomy and accountability mechanisms that allow for flexibility and agility.

Close links with strategic partners and the region are essential. Transforming traditional higher education units into innovative and entrepreneurial organizations is a complex and long-term undertaking. It is because the main obstacles lie deep within the higher education system and should be changed from within. To this end, an analysis of strengths, weaknesses, opportunities, and threats is needed, with the participation of the entire university community, including students, alumni, and key external partners. The HEInnovate tool is a great starting point for starting such a broad discussion at universities, simultaneously confirming the research hypothesis.

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## FAMILY CONTROL AND CAPITAL STRUCTURE: EVIDENCE FROM POLAND

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**Purpose:** Identification of family firms' debt factors, considering the family's share in ownership, management, and supervision, as well as control factors, including sectoral and internal ones.

**Design/methodology/approach:** The analysis covered 163 family firms listed on the Warsaw Stock Exchange. For these companies, a linear model of cross-sectional data from 2023 was estimated using the quantile estimation method.

**Findings:** The relationship between the variables characterizing the family's share in ownership, management and supervision and the structure of capital is both positive and negative, which in both cases is in line with agency theory. The non-debt tax shield (NDTS) exerted a positive, statistically significant impact on all quartiles of total debt and the second and third quartiles of short-term debt. Moreover, the strength of this influence is the greatest among all explanatory variables selected for analysis. The positive relationship between the non-debt tax shield and the capital structure is consistent with the assumptions of agency theory. The influence of family share factors in ownership, management, and supervision was statistically significant for most variables for the first, second, and third quartile of total debt. In the case of short- and long-term debt this impact was statistically significant mainly for the first quartile of debt.

**Research limitations/implications:** In this study, we used only the listed family firms' data so we can interpret the results only for this kind of firms. We cannot generalize these results on the non-public family firms and specially on SMEs. The research is a contribution to further analyses which covers all types of family firms.

**Practical implications:** Knowing the characteristics describing the variables characterizing the family's share in ownership, management and supervision, analysts can determine based on estimated models what capital structure is typical for a given family firm.

**Originality/value:** This study, for the first time, provides comprehensive analyses of the capital structure of public family companies from Poland using unique dataset which highlights the relationship between financial decisions and corporate governance attributes such as family's

share in ownership, management, and supervision. It also considers the impact of sectoral and internal determinants on family firms' capital structure.

**Keywords:** corporate governance, family firms, leverage, capital structure, agency theory.

**Category of the paper:** Research paper.

## 1. Introduction

Family firms play a key role in the global economy. These entities are the most common business model in practice. Therefore, they are the driving force that stimulates development processes in individual countries (Tran, Nguyen, 2023). The literature emphasizes that due to the special form of ownership concentration (Wang, Shailer, 2017) and the so-called socio-emotional wealth (Gomez-Mejia et al., 2007), family firms are significantly different from other entities. Previous studies have proven that family firms are characterized by significant risk aversion, strong control incentives and place a high value on their reputation and image, important influences on decisions are not only economic goals but, uniquely, also non-economic ones (Williams, 2018). These unique characteristics of family firms shape the specifics of their activities in various areas (Albinzano et al., 2021). Thus, they influence the financial decisions of these companies, and it can also be said for (Gallo et al., 2004) that these entities follow a special logic of financing. Financial decisions of these entities have been defined by many theories such as trade-off, pecking order and especially agency theory. There are many empirical studies on family firms' capital structure in the literature, mostly from America and Western Europe. This research is inconclusive in terms of the driving factors that influence family firms' financial decisions and heterogeneous characteristics of family firms across different regions and endogeneity issues (Hansen, Block, 2021). Increasingly, the literature indicates that the reason for the different research results is the institutional setting in which family firms operate (Lohwasser et al., 2022). Formal national institutions determine the level of protection of property rights or minority stakeholders and, through this, can influence decision-making on the manner of financing, especially of family businesses. The purpose of the article is to identify the family firms' debt factors, considering the family's share in ownership, management, and supervision, as well as control factors, including sectoral and internal factors in a post-transitional country. The study, for the first time, provides comprehensive analyses of Polish listed family firms' financial decisions using unique dataset which exposes the relationship between capital structure and corporate governance. The research considers the impact of the identified factors on total debt and in terms of long-term and short-term debt. In the literature on Polish family firms, only a few studies on this topic can be found, so this article also aims to fill the gap in this area. In addition, the use of quantile estimation, which is new in this type of analysis, allowed us to identify the significance of individual capital structure factors by their quantile distribution.



The realization of the purpose of the article required the verification of two main research hypotheses:

1. As the family's share in ownership increases, the level of total, long-term and short-term debt changes significantly.
2. Family supervision of the company is the dominant factor in the level of total, long-term and short-term debt.
3. The family firms debt level behaves in accordance with the agency theory.

The verification of the hypotheses required answering questions about the links between the various capital structure factors and the amount of debt. Therefore, the influence of a set of factors reflecting the level of control of the company by family members, the business sector, and determinants of an internal nature on leverage was examined. So that it was possible to determine whether these companies make financial decisions in accordance with the theory of agency, pecking order or trade-off.

The above hypotheses were verified using appropriate statistical tests. The calculations were carried out using the Gretl software. The analysis included 163 family firms listed on the Warsaw Stock Exchange. For these companies, a linear model of cross-sectional data from 2023 was estimated using quantile estimation.

The article consists of an introduction, five parts, a conclusion, and description of future research proposals and limitations. Part one presents views on the family firms' capital structure formation in the light of agency, trade-off and pecking order theories. The second part reviews research on the family firms' capital structure in Poland. Then the methodology, results of the research and discussion are presented, and the conclusion summarizes the research.

## **2. Family firms' capital structure in the light of agency, trade-off, and pecking order theory**

In the light of agency theory, capital structure is shaped under the influence of the so-called agency conflict between company owners, managers, and creditors (Jensen, Meckling, 1976). In other words, the level of leverage is a product of the interaction between these stakeholders. Therefore, according to the agency theory, the level of debt of family firms can be both higher and lower compared to other non-family firms (Hansen, Block, 2021). Jensen and Meckling (1976) state that a firm's ownership structure influences its cash flow. It means that an appropriate mix of debt and equity can reduce overall agency costs. Therefore, family firms with concentrated ownership structures are less susceptible to agency problems than nonfamily firms (Saidat et al., 2019). In family firms, agency costs tend to be lower than in non-family firms, especially if family members hold management positions. Such a situation ensures a congruence of interests between the management and the owners of the firm. Therefore,

family firms with concentrated ownership structure are less susceptible to agency problems than nonfamily firms (Saidat et al., 2019). In addition, owners have a strong incentive to monitor the firm's activities due to the high value of their shares in the firm. This is also true in cases where owners are not actively involved in the management of the firm. Lower agency costs lead to a lower need for debt capital. Therefore, debt ratios are relatively lower in family firms than in non-family firms (Grossman, Hart, 1980). The reasons for low leverage in family firms can also be traced back to behavioural agency theory (Wiseman, Gomez-Mejia, 1998). The level of diversification of the firm's ownership structure is assumed to be positively related to the firm's investment risk (Lyandres et al., 2019). Family firms' owners show low levels of diversification. Moreover, they place a high value on so-called socioemotional wealth (SEW) (Gómez-Mejía, 2007). Higher leverage leads to an increase in the risk of bankruptcy, thus increasing the firm-specific risk. In this situation, the threat to the family's socioemotional wealth increases. The fear of losing SEW discourages family firms' owners from making risky strategic decisions, which explains lower leverage ratios (Jara, Pinto-Gutiérrez, Núñez, 2018). In extreme cases, this leads to a complete abandonment of the use of debt and, therefore, zero leverage (Strebulaev, Yang, 2013). In the context of concerns about the loss of SEW, it is important to mention the high-risk aversion in family firms and the associated reluctance to invest in the high-tech area, which translates into low R&D spending (Chrisman, Patel, 2012). This is tantamount to the fact that family firms prefer traditional activities. The above arguments explain the negative impact of the family status of a company on its leverage level.

Financing patterns in family firms can also be shaped by agency conflict between majority and minority shareholders. When a dominant shareholding is in the hands of a family and its members occupy the positions of chief executive officers (CEOs), there may be a preference for private interests over those of minority shareholders (Shleifer, Vishny, 1997). In an environment of such concentrated power, family members have the exclusive power to determine the strategic direction of the company and are reluctant to relinquish control of the company. In such a situation, taking on debt may be the preferred instrument for financing investment because, unlike issuing new shares, it does not lead to capital dilution and thus allows control of the firm to be maintained. Furthermore, a higher leverage ratio reduces the risk of a hostile takeover (Stulz, 1988). In such a situation family firm status has a positive effect on firms' capital structure.

Taking into account control of the firm, capital structure decisions in family firms can be considered according to the pecking order theory (Myers, 1984; Myers, Majluf, 1984). In this context, family firms, once retained earnings have been exhausted, will turn first to debt and only then to issuing new shares to finance new investments.

In both the trade-off (Jensen, Meckling, 1976; Myers 1977; Haugen, Senbet, 1978) and the pecking order theory, the level of debt is shaped by a range of factors, both internal and external. In this study, profitability, asset structure, liquidity, growth opportunities, risk, depreciation (non-interest tax shield) and company size were selected for empirical verification.

These variables with theoretical predictions as to the direction of their impact on debt ratio, are summarized in Table 1.

**Table 1.**

*Explanatory variables predicted influence on debt ratio*

Explanatory variable	Expected influence	
	Trade off-theory	Pecking order theory
TANG (Asset tangibility)	+	-
LIQ (Financial liquidity)	+	-
NDTS (Deprecation)	-	-
ROA, ROE (Profitability)	+	-
GR (Firm growth)	-	+
RISK (Risk)	-	-
SIZE (Firm size)	+	+/-

Source: own study.

### 3. Empirical studies on the capital structure of family firms in Poland

Only a few studies on Polish family firms' capital structure formation can be found in the literature. Depending on the sample, these studies find contradictory conclusions regarding the size of the debt of Polish family firms. Thus, Winnicka-Popczyk (2008), Stradomski (2010), Kaźmierska-Jóźwiak and Marszałek (2012), and Martyniuk (2015) showed that the debt ratio in family firms in Poland is significantly lower than in other entities. According to the authors, reluctance to debt financing is due, firstly, to fear of reduced financial independence and loss of control over the enterprise. Secondly, possible difficulties in repaying debts may lead to a worsening of the family's situation. Pernsteiner and Węclawski (2016), on the other hand, showed that family firms in Poland finance themselves with equity to a greater extent than non-family firms, but the difference is not large. It is also worth noting that family firms generally prefer to finance their operations and investments from retained earnings, only further opening up to debt financing and, as a last resort, external capital (Kawko, 2019). This means that these companies shape their capital structure according to the pecking order theory.

Hansen, Block (2021) conducted a meta-analysis on 869 effect sizes from 613 studies. They found an overall slightly negative but significant relationship between family firm status and leverage. Their results reveal a large amount of heterogeneity and considerable mean effect size differences across the 48 countries included in the study. According to these authors, in Poland, the family status of a firm has a statistically significant positive impact on the amount of debt. Furthermore, in Poland, family firms have on average higher leverage ratios than nonfamily firms. Similar conclusions were reached by Jewartowski and Kałdoński (2012). The authors proved that public family companies make strategic decisions on diversification of activities in close connection with decisions on capital structure. The primary motive for

decisions regarding both diversification of activities and capital structure is the desire to maintain control over the company while ensuring that activities are financed at a level adequate to the demand resulting from the company's development strategy. Diversification of activities favors increasing the share of debt in the capital structure by increasing the company's debt capacity. Moreover, among all diversified companies, family companies were more indebted than non-family companies.

Socha (2017) analysed the capital structure factors of family firms based on a research sample including Polish small and medium-sized family firms that provided data on ownership structure and composition of management board between 2010 and 2013. The author indicates that as family involvement in ownership increased, the degree debt in the capital structure increased. Family firms with moderate levels of family involvement in management made less use of debt. The same author (Socha, 2015) in an earlier study highlighted that family firms finance investment activities using internal sources of capital and use debt to cover operating expenses.

#### **4. Methods and dataset**

The exact definition of the notion of family firm is debatable and no single precise definition has been developed to date. The research uses the definition recommended by the European Commission (EC) (2009)<sup>1</sup>, based on which the definition of a family firm for the WIG Rodziny index was developed. In Poland listed companies meet the definition of the family firm if the person who established or acquired the entity (share capital) or their families or descendants possess 25% of the decision-making rights mandated by their share of wealth. According to EC recommendations we add to our definition that at least one representative of the family or relatives is formally involved in the management of the company.

The subjects of the analysis entailed family-owned companies listed in 2023 (as of June 10, 2023) on the main stock exchange market in Poland. The Warsaw Stock Exchange sample encompassed 166 family firms (39,9% of all listed companies). Three entities were excluded from the analysis. Two of them did not publish full financial statements during the period under examination. One of the companies was a bank. Due to the different financial statements, it was not possible to obtain data to verify capital structure internal determinants. Ultimately, 163 companies, i.e., 98% of the entities selected initially, were qualified for the study.

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<sup>1</sup> Polish family firms researchers affiliated to the FABERNET scientific network recommend similar criteria for family firms research.

The proposed model takes the form:

$$y_i = \beta_0 + \sum_{j=1}^{17} \beta_j x_{ji} + \varepsilon_i \quad (1)$$

where:

$y_i$  is the explained variables, represented by the debt ratio in three forms: as a total debt ratio (TDR), short-term debt ratio (SDR), and the long-term ratio (LDR),

$x_{ji}$  is the set of explanatory variables, such as OWN, INDUSTRY, GR, SIZE, TANG, ROA, ROE, LIQ, NDTs, RISK, FIO, CEO, MB, SB, CSB, FIM and FIS,

$\beta_0, \beta_1, \dots, \beta_{17}$  are the structural parameters,

$\varepsilon_i$  is the error term.

In the first step, the model was estimated by the ordinary least squares estimation method (OLS). Then quantile regression was in use quantile regression taking quantiles at 0.25; 0.5 and 0.75 with all variables and then with statistically significant variables, respectively. This method makes it possible to refer to the values of the assumed quantiles of the modelled variable. The main advantage of this approach over OLS is the resistance to the influence of outliers, as well as the lack of the need for assumptions as to the shape of the dependent variable. The application of quantile estimation to assess the impact of selected factors on the debt level of family businesses is a relatively new approach to this issue. This is because this approach will allow us to identify whether these factors change with a change in the modelled debt level quantile.

## 5. Results

In this section, we will present the results of descriptive statistics characterizing the level of debt (long- and short-term) among family firms in different quartiles and the impact of internal factors on capital structure. Table 2 presents the average values, standard deviation, median, first and third quartile and interquartile range of the indicators of total, short-term and long-term debt, i.e. the endogenic variables and all explanatory variables in family companies listed on the Warsaw Stock Exchange in 2023.

**Table 2.***Characteristics of the variables for family firms listed on WSE in 2023*

variable	mean	stand. dev.	median	Q1	Q3	interq. range
TDR (Total debt ratio)	0,573	0,802	0,469	0,272	0,624	0,352
SDR (Short debt ratio)	0,439	0,799	0,307	0,163	0,436	0,273
LDR (Long term ratio)	0,140	0,129	0,108	0,045	0,190	0,145
GR (Firm growth)	-0,034	0,968	0,139	-0,016	0,243	0,259
SIZE (Firm size)	17,084	1,649	17,212	15,987	18,031	2,044
TANG (Asset tangibility)	0,196	0,199	0,113	0,032	0,328	0,296
ROA (Profitability)	0,063	0,931	0,047	0,010	0,094	0,084
ROE (Profitability)	0,474	3,916	0,095	0,016	0,197	0,182
LIQ (Financial liquidity)	3,332	7,361	1,629	1,057	2,740	1,683
NDTS (Deprecation)	0,045	0,083	0,030	0,011	0,051	0,040
RISK (Risk)	4378070	12847148	1363924	510995	3138298	2627302
FIO (Family Involvement in Ownership)	50,49%	20,14%	49,9%	32,07%	64,65%	32,58%
FIM (Family Involvement in Management Board)	40,69%	36,83%	33,33%	0,00%	57,50%	57,50%
FIS (Family Involvement in Supervisory Board)	16,59%	16,18%	16,66%	0,00%	25,00%	25,00%
CEO (Chief Executive Officer)	-	-	1	0	1	1
MB (Management Board Member)	-	-	0	0	1	1
SB (Supervisory Board Member)	-	-	0	0	1	1
CSB (Chairman in Supervisory Board)	-	-	0	0	1	1
OWN (Direct* or Indirect Ownership**)	-	-	1	1	1	0
INDUSTRY (Traditional or Innovative)	-	-	1	1	1	0

\* Family members are the shareholders.

\*\* The shares of the family firm are held by another entity, which in turn is owned by family members.

CEO, MB, SB, SCB are the dummy variables with 1 for family members, and 0 otherwise.

OWN direct 1, 0 otherwise.

INDUSTRY Traditional 1, 0 Innovative.

Source: own elaboration.

As can be seen in Table 2, the values of the total debt ratio calculated for family companies listed on the WSE in 2023 were at varying levels. The median of this indicator was 0.469. This means that the total debt of 50% of the family firms surveyed was at this level or lower. In contrast, the remaining 50% of companies had a total debt ratio of 0.469 or more. The high variability of the total debt ratio in family companies is also evidenced by its values determined for the first and third quartiles, amounting to 0.272 and 0.624 respectively. This is also confirmed by the high value of the interquartile range (0.352) of the total debt ratio in relation to the interquartile range determined for the short- and especially long-term debt ratios (0.273 and 0.145 respectively). It can therefore be concluded that family firms listed on the WSE exhibit differing debt capital requirements. These differences relate to particular to the size of total debt and short-term debt. On the other hand, the small value of the interquartile range determined for the long-term debt ratio indicates similar values of this variable in all entities.

Among the internal factors shaping the capital structure, the largest variation concerns company size (SIZE). As can be seen in Table 2, the variation in the middle 50% of units after discarding extreme values is as high as 2.044 for this variable. On the other hand, the smallest

value of the interquartile range was recorded in the case of the investment tax shield (0.040), which indicates similar values of this variable in all companies.

Of the variables reflecting family participation in ownership, management and supervision, the highest variation in the middle 50% of units is found in the participation of family members in the company's management board (57.5%). In contrast, after discarding extreme values, the least differentiated variable is the share of family members on the supervisory board (25%). Due to the dichotomous nature of the variables, the mean and standard deviation were not calculated for the last six factors depicting the family nature of the company (Table 2).

In Tab. 3, 4 and 5 the proposed model for TDR, LDR and SDR was estimated first using the OLS method with all proposed variables (column 1) and omitting statistically insignificant variables (column 2). In the next step, quantile regression was used taking quantiles at 0.25; 0.5 and 0.75 with all variables and then with statistically significant variables, respectively.

The first quartile, i.e. the quantile of 0.25 of total debt (TDR), is significantly influenced by all the variables considered. When analysing the influence of factors on the second quartile of the TDR, i.e. the median, it is the variables in column 5 that have an influence, while for quartile III, i.e. the quartile of 0.75, it is the factors in column 7 (Tab. 3).

**Table 3.**

*Estimates of the total debt ratio for family firms listed on WSE in 2023*

Method	OLS		Quantile regression				
			0.25	0.5		0.75	
Quantile	(1)	(2)	(3)	(4)	(5)	(6)	(7)
model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	3.133***	3.402***	-0.730***	-0.561**	0.512***	-0.367	-0.174**
OWN	0.057		-0.069***	0.014		0.044	
INDUSTRY	0.359**	0.365**	0.046***	0.023		0.109	0.155***
GR	-0.118		0.057***	-0.006		-0.028	0.014**
SIZE	-0.164***	0.176***	0.061***	0.055***	0.052***	0.045**	0.035***
TANG	0.342		-0.086***	-0.208*	-0.131**	-0.261*	-0.227***
ROA	0.104		-0.336***	-0.001		-0.152***	-0.113***
ROE	-0.001		0.017***	0.015***	0.015***	0.012*	0.011***
LIQ	-0.017*	0.021***	-0.008***	-0.011***	-0.011***	-0.009**	-0.011***
NDTS	1.712	1.635**	1.087***	2.393***	1.802***	2.921***	2.959***
RISK	<0.001**	<0.001***	<-0.001***	<-0.001		<-0.001	
FIO	-0.001		-0.002***	-0.004	-0.004*	-0.005	0.006***
CEO	0.045		0.061***	0.025		0.032	
MB	0.021		0.139***	0.172***	0.101***	0.130*	0.081***
SB	-0.054		0.023***	-0.051		-0.069	
CSB	0.054		0.013***	-0.035		-0.022	
FIM	-0.500	0.448***	-0.083***	-0.120		-0.110	
FIS	-0.487		0.021***	0.411	0.172**	0.466	
R-squared	0.231	0.197					
Log-likelihood			-30.075	-47.739	-50.234	-99.798	-102.557
Sum sq. res.	0.750	76.413	42.946	96.218	96.672	101.127	96.657
Akaike crit.	351.764	336.170	96.150	131.479	118.468	235.595	227.114

\*) \*\*) \*\*\*) statistically significant at the level of 0.1, 0.05, and 0.01 respectively.

Source: own elaboration.

As can be seen in Tab. 3, the level of total debt significantly depends on the form of shareholding in the company considering indirect or direct ownership (OWN). This means that in companies with direct family ownership, the level of the first quartile of debt is lower than in other family firms. Another variable with a statistically significant impact on capital structure is the sector of activity (INDUSTRY) taking into account either traditional or innovative activities. This means that for traditional activities, the level of the first and third quartiles of debt is higher than in companies with modern activities. In contrast, no such impact was observed for the entities included in the median.

Growth opportunities (GR) had a statistically significant positive impact for the first and third quartiles of total debt. The size of the company (SIZE) exerted a statistically significant positive effect for all debt quartiles of the family firms studied. This means that the larger the company, the higher its leverage level. Asset structure, on the other hand, had a negative effect on the amount of total debt of the surveyed entities. This regularity was noted for all debt quartiles. Interestingly, profitability, depending on the measure used, had an impact on total debt in a different direction. Thus, for ROA, the impact was negatively statistically significant. By contrast, for ROE, the opposite relationship was noted. However, for the first and third quartiles of debt, the impact is stronger for ROA. Liquidity (LIQ) had a negative impact for all quartiles of total debt. However, its strength was low. Also, in the case of risk (RISK), there was a very weak, statistically significant negative impact for the first quartile of debt of the surveyed family firms. In the case of the non-interest tax shield (NDTS), there was a statistically significant positive effect of this variable on all quartiles of debt of the family firms studied. It is noteworthy that the strength of this impact is the highest among all explanatory variables selected for the analysis.

Positive effects of variables characterizing family participation in ownership, management and supervision were observed for the percentage of family involvement in ownership (FIO) for the third quartile of debt, the affiliation of the company's CEO to the family (CEO) for the first quartile of debt, the presence of a family member on the management board (MB) for the first, second and third quartiles of debt, the presence of a family member on the supervisory board (SB) to the first quartile of debt, the supervisory board chairman's family affiliation (CSB) to the first quartile of debt and the participation of family involvement in supervisory board (FIS) to the third quartile of debt. However, given the strength of influence and the impact of the variable on all debt quartiles, the most important factor of the above is the presence of a family member on the management board (MB).

The first quartile (quantile of 0.25) of short-term debt of family firms is significantly influenced by the factors in column (4). The median of short-term debt is influenced by the variables in column (6). The third quartile, on the other hand, is influenced by the factors in column (8), as shown in Tab. 4.



**Table 4.***Estimates of the short-term debt ratio for family firms listed on WSE in 2023*

Method	OLS		Quantile regression					
			0.25		0.5		0.75	
Quantile	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
const	3.510***	3.793***	-0.043	0.075***	0.161	0.277***	0.409	0.212***
OWN	0.097		0.042*	0.049***	0.036		0.114**	0.074***
INDUSTRY	0.356**	0.359**	0.048**	0.044***	0.038		0.164***	0.177***
GR	-0.107		0.048***	0.044***	0.026		-0.027	0.030***
SIZE	-0.195***	-0.205***	0.009	0.012***	0.004		-0.012	
TANG	0.339		0.103**	0.105***	-0.252***		-0.380***	-0.392***
ROA	0.086		-0.055***	0.054***	-0.001		-0.060***	-0.015***
ROE	-0.001		0.015***	0.015***	0.016***	0.014***	0.012***	0.013***
LIQ	-0.016	-0.020**	-0.006***	-0.006***	-0.013***	-0.014***	-0.009***	-0.009***
NDTS	1.610*	1.574**	-0.006		1.187***	1.615***	3.062***	3.166***
RISK	<0.001***	<0.001***	<-0.001	<0.001***	<-0.001		<-0.001	<-0.001***
FIO	-0.001		-0.003**	-0.003***	-0.003		-0.004	-0.004***
CEO	0.046		0.015		0.026		0.074	0.081***
MB	-0.021		0.071***	0.064***	0.126***		0.123**	0.094***
SB	-0.058		-0.030	-0.025***	0.045		-0.111	-0.156***
CSB	0.045		-0.056*	-0.053***	0.072		-0.083	0.081***
FIM	-0.523	-0.493***	-0.094**	-0.075***	-0.073		-0.223**	-0.177***
FIS	-0.413		0.272**	0.231***	-0.091		0.871***	0.944***
R-squared	0.246	0.218						
Log-likelihood			-14.621	-14.865	-42.335	-48.223	-99.572	-99.739
Sum sq. res.	71.241	73.927	104.163	103.997	94.878	91.387	93.142	92.774
Akaike crit.	347.796	331.275	65.242	61.215	120.670	104.447	235.144	233.479

\*) \*\*) (\*\*\*) statistically significant at the level of 0.1, 0.05, and 0.01 respectively.

Source: own elaboration.

As can be seen from Tab. 4, the amount of short-term debt is significantly influenced by the form of ownership in the company considering indirect or direct ownership (OWN). In entities where the family had direct ownership in the case of the first as well as the third quartile of short-term debt, its level is higher than in other family firms. The capital structure was influenced in an identical way by the sector of activity (INDUSTRY). In the case of traditional activities, the level of the first and third quartiles of short-term debt is higher than in those with modern activities.

Growth opportunities (GR) had a significantly positive impact on the first and third quartile of short-term debt of the family firms under study. In contrast, company size (SIZE) had a statistically significant positive effect only on the first quartile of short-term debt of the analysed entities. Asset structure (TANG) had a positive effect on the first quartile of short-term debt of the entities under study and a negative effect on the third quartile. The same patterns were noted for the impact of return on assets. On the other hand, in the case of profitability expressed by ROE, the impact was positively statistically significant for all quartiles of short-term debt of the family firms surveyed. Liquidity (LIQ) had a negative impact

for all quartiles of short-term debt. Risk (RISK) had a very weak, statistically significant negative effect for the first and third quartiles of short-term debt of the family firms surveyed.

The non-interest tax shield (NDTS) has a statistically significant positive effect on the second and third quartiles of short-term debt of the family firms studied, and the strength of this effect is the largest of all the explanatory variables selected for the analysis.

The impact of factors characterizing family participation in ownership, management, and supervision on short-term debt in our group of entities shows both a positive and negative direction. A negative effect of variables characterizing family participation in ownership, management and supervision was recorded for the percentage of family involvement in ownership (FIO) on the first and third quartiles of short-term debt, the presence of a family member on the supervisory board (SB) on the first and third quartiles of short-term debt, the supervisory board chairman's family affiliation (CSB) on the first quartile of short-term debt and the participation of family involvement in management board (FIM) on the first and third quartiles of short-term debt. In contrast, a positive effect of the variables characterizing family participation in ownership, management and supervision was observed for the CEO's family affiliation (CEO) on the third quartile of short-term debt, the presence of a family member on the management board (MB) on the third quartile of short-term debt, the supervisory board chairman's family affiliation (CSB) on the third quartile of short-term debt and the participation of family involvement in supervisory board (FIS) on the first and third quartiles of short-term debt.

In Tab. 5. in columns (4); (6) and (8) the factors significantly affecting the first, second and third quartiles of long-term debt of the Polish public family firms, respectively.

**Table 5.**

*Estimates of the long-term debt ratio for family firms listed on WSE in 2023*

Method Quantile	OLS		Quantile regression					
	(1)	(2)	0.25		0.5		0.75	
model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
const	-0.438***	-0.457***	-0.220***	-0.198***	-0.327**	-0.466***	-0.288*	-0.534***
OWN	-0.027		-0.020	-0.017***	-0.020		-0.053*	
INDUSTRY	0.020		-0.021	-0.012***	0.026		0.060**	
GR	-0.007		0.003		-0.003		-0.011	-0.025**
SIZE	0.033***	0.004***	0.017***	0.015***	0.024***	0.034***	0.026***	0.041***
TANG	-0.034		0.076**	0.083***	0.033		-0.075	
ROA	0.017		0.010	0.010***	0.013		0.015	
ROE	<0.001		0.001	0.001***	<0.001		-0.001	
LIQ	<0.0001		<0.001	<0.001***	<0.001		-0.001	
NDTS	0.093		-0.004		0.017		0.119	
RISK	<0.001		<0.001**	<0.001***	<0.001		<0.001	
FIO	<0.001		0.001	0.001***	0.001		-0.001	
CEO	0.034		-0.009		0.027		0.092**	
MB	0.074**	0.068***	-0.025	-0.023***	0.021	0.046***	0.137***	0.093***
SB	0.007		0.015		0.040		-0.033	
CSB	0.011		-0.012	-0.015***	0.011		-0.010	
FIM	-0.035		0.038	0.020***	-0.0003		-0.097	
FIS	-0.065		-0.027		-0.161		0.037	

Cont. table 5.

R-squared	0.262	0.228						
Log-likelihood			144.492	143.499	124.279	119.220	102.031	89.632
Sum sq. res.	1.832	1.916	3.260	3.290	2.014	1.990	2.597	2.552
Akaike crit.	-193.998	-217.322	-252.984	-262.999	-212.558	-232.440	-168.063	-171.263

\*) \*\*) \*\*\*) statistically significant at the level of 0.1, 0.05, and 0.01 respectively.

Source: own elaboration.

As can be seen in Tab. 5, the amount of long-term debt significantly depends on the form of ownership in the company considering indirect or direct ownership (OWN). In entities that were directly owned by the family, the level of the first quartile of long-term debt is lower than in other family firms. Another variable affecting long-term debt is the sector of activity (INDUSTRY). For the firms engaged in traditional activities, the level of the first quartile of debt is lower than in those engaged in innovative activities.

Growth opportunities (GR) had a statistically significant negative effect only on the third quartile of long-term debt. The size of the company (SIZE) proved to be an important variable shaping long-term debt. This factor exerted a statistically significant positive effect for all quartiles of long-term debt of the family firms surveyed, as it did for total debt. Asset structure (TANG) interacted positively with the amount of total debt of the entities studied, but this relationship was only recorded for the first quartile of long-term debt. The same patterns occurred for profitability (ROA and ROE), liquidity (LIQ), and risk (RISK). However, for the last variable, its impact, although statistically significant, was very weak.

Statistically significant positive effects of variables characterizing family participation in ownership, management and supervision were observed for the percentage of family involvement ownership in ownership (FIO) on the first quartile of long-term debt, the presence of a family member on the management board (MB) the second and third quartiles of debt, and the family involvement in management board (FIM) on the first quartile of debt.

## 6. Discussion

Relationship between family firm status and debt ratios is theoretically unclear. The overall low total-debt ratio of family firms supports the view that family firms are risk averse. On the other hand, control considerations also have a significant impact on debt ratios, as family firms adjust their capital structure depending on the rights of shareholders and creditors in the country. The values of the total debt ratio calculated for family firms listed on the WSE in 2023 varied significantly. This means that these entities have different approaches to financing themselves with debt capital. However, it is worth noting that the values of the total debt ratio even in the third quartile did not exceed the value of 0.67; i.e. the upper limit determining the level of acceptable financial risk related to the necessity of repayment of liabilities with

financial costs (Gabrusewicz, 2014). The relatively low level of the index is indicative of the low indebtedness of the Polish public family firms and their significant financial independence, as pointed out also by Pernsteiner and Węclawski (2016) in earlier studies for small and medium sized family firms. What seems interesting, the level of total debt, short-term and long-term debt significantly depends on the form of shareholding in the company considering indirect or direct ownership of the family. It is worth noting that conservatism in terms of shaping the financing structure leads to an increase in the resilience of these entities to threats arising, inter alia, from changes in the economic situation (Majerowska, Gostkowska-Drzewicka, 2021).

In the case of family firms listed on the Warsaw Stock Exchange, positive relationships between family shareholding in ownership, management and supervision and their total debt prevail, mainly in terms of the presence of a family member on the management board (MB) when the relationship is positive for all quartiles. This is consistent with agency theory and supports hypothesis 3. Polish publicly listed family firms prioritize the interests of the family over those of the other shareholders. This way they determine the strategic direction of the firm and seek to retain control of it. In such a situation, debt is the preferred instrument for financing investments. Higher debt ratios and an aversion to financing activities by issuing shares by family firms in world studies are indicated by Keasey et al., (2015), Ellul (2009), Santor (2008), among others. In turn, regarding Polish family firms, such a regularity was observed by Socha (2017). But negative relationships were also observed for the percentage of family involvement in ownership (FIO) and the family involvement in management board (FIM) for the first quartile of total debt. Similar findings were obtained by Haider et. al (2021), who highlight that the family firms are less leveraged when the owners are part of management, for example CEO or Chairman. However, in this case, they are related to reducing the bankruptcy risk and the associated fear regarding the loss of socioemotional wealth. This finding is consistent with the studies of Moh'd et al., (1998) and Mulyania et al. (2016).

The variables characterizing FIO and MB turned out to be statistically significant for all total debt quartiles. In contrast, the other factors were significant in all cases just for the first quartile of this indicator, and the family involvement in supervisory board (FIS) was also significant for its median. Thus, regardless of the direction of the influence of the variables depicting the family's share of ownership, management, and supervision on the total indebtedness of the Polish publicly listed family firms, our results provide a strong argument supporting hypotheses 1 and 2.

The impact of factors characterizing family participation in ownership, management, and supervision on short-term debt shows both a positive and negative direction. It should be noted, however, that the negative relationship is more frequent than in the case of general indebtedness. This means that the family firms are trying to reduce short-term debt. As in the case of total debt, these actions are probably aimed at reducing the risk of bankruptcy and protecting the socioemotional wealth held. The diagnosed relationships are in line with previous research (Kawko, 2019). Due to the strength of its influence, family involvement in supervisory

board (FIS) is the most important factor influencing short-term debt size formation decisions. Therefore, in terms of short-term debt our results partially confirm our hypotheses. This is because the relationships described turned out to be statistically significant only for the first and third quartiles of short-term debt. However, they were not diagnosed for the median of this indicator.

Our studies confirm that for long-term debt positive relationships between family participation in ownership, management and supervision prevail. The presence of a family member on the management board is the most important factor what confirms hypothesis 1 and 2. The impact of the other variables characterizing family participation in ownership, management and supervision was only found to be significant for the first quartile of long-term debt, which only partially supports hypothesis 2.

Considering the direction and strength of the internal factors influence on the different total debt quartiles of family firms, it can be concluded that these entities, when shaping their capital structure, make decisions in line with the assumptions of the pecking order theory. This conclusion is in line with previous studies of capital structure factors of Polish family firms (Martyniuk, 2015; Kawko, 2019). The positive relationship between the non-interest tax shield and leverage is consistent with the assumptions of agency theory. Increasing depreciation leads to an increase in the value of free cash at managers' disposal. The way to reduce their irrational use by managers is to increase debt. Consequently, this leads to an increase in leverage. Hypothesis 3 is therefore confirmed. A positive effect of the non-interest tax shield on the capital structure of Polish companies, consistent with agency theory, was diagnosed by Czerwonka and Jaworski (2019). However, the research of these authors concerned not only family firms, but all companies listed on the Warsaw Stock Exchange. It might suggest that this approach to financing is a result of the institutional environment in which public companies operate in Poland, regardless of whether they are family-owned or not. Future comparative studies may identify for which companies this relationship is stronger.

In view of the direction of the influence of the internal factors on the different quartiles of short-term debt, it can be concluded that family firms shape the amount of short-term debt according to the assumptions of the pecking order and trade-off theory. However, for the first quartile of short-term debt, decisions to shape its size are more often made according to the trade-off theory as evidenced by the direction of influence of variables such as asset structure, profitability expressed by ROA and ROE. These conclusions are partly in line with previous studies of capital structure factors of Polish family firms because, as already mentioned, previous analyses show that these entities make financial decisions in accordance with the pecking order theory (Martyniuk, 2015; Kawko, 2019). The positive relationship between the non-interest tax shield and short-term debt is consistent with the assumptions of agency theory and confirms, in part, hypothesis 3, as this regularity was not diagnosed for the first quartile of short-term debt.

Considering the direction and strength of the influence of the internal factors on the different quartiles of long-term debt of family firms, it can be concluded that these family firms make long-term debt decisions primarily in line with the assumptions of trade-off theory. However, this conclusion applies to firms whose long-term debt size falls into the first quartile.

## 7. Conclusions

Our study focuses on the capital structure of Polish listed family businesses. Due to the heterogeneous nature of family firms, we use the quantile estimation, which is new in this type of analysis. The method allowed us to identify the significance of individual capital structure factors by their quantile distribution.

In summary, the capital structure of family firms listed on the Warsaw Stock Exchange is shaped by several factors, both of an internal, sectoral nature and determining the family's share in the ownership, management, and supervision of the firm. However, these relationships show varying strength and direction depending on the maturity of the debt and the quartile into which the size of the indicator depicting the type of debt can be classified. Thus, firms with direct family ownership had lower levels of total debt and long-term debt than the others. For short-term debt, on the other hand, a relationship of the opposite direction was noted, also for the third quartile of debt. In the case of traditional activities, the levels of the first and third quartiles of total and short-term debt are higher than in companies with innovative activities. An inverse relationship was diagnosed for the first quartile of long-term debt.

Considering the direction and strength of the influence of internal factors on the different quartiles of total debt of family firms, it can be concluded that these entities shape their capital structure in line with the assumptions of the pecking order theory. For the short- and long-term debt of family firms, financing decisions are made according to the assumptions of both the pecking order and trade-off theories. However, for the first quartile of both types of debt, the trade-off theory mainly applies, as evidenced by the direction of influence of variables such as asset structure, and profitability expressed by ROA and ROE. The most important internal factors shaping the capital structure of Polish public family firms are size and non-interest tax shield. The first of these factors (SIZE) had a statistically significant effect on all quartiles of total and long-term debt and on the first quartile of short-term debt. The second variable (NDTS) had a positive, statistically significant impact on all quartiles of total debt and the second and third quartiles of short-term debt. Moreover, the strength of this impact is the largest of all the explanatory variables selected for the analysis. This implies that the family firms prevent the irrational use of free cash arising from increased depreciation by managers. To do so, they increase debt.

Factors determining family participation in ownership, management and supervision have a significant impact on the capital structure in our study. Given the strength of influence and the impact of the variable on all quartiles of total and long-term debt, the most important factor of the above is the presence of a family member on the management board. In the area of short-term debt, on the other hand, it is the share of family members on the supervisory board. The relationships between the variables characterizing a firm's family status and capital structure are both positive and negative, which in both cases can be justified on the grounds of agency theory. Family firms look after the interests of the family first and foremost, rather than those of the other shareholders. This means that family members determine the strategic direction of the company and seek to retain control of the company. In such a situation, debt is the preferred instrument for financing investments and the relationship between leverage and factors determining the family status of the company is positive. Negative relationships can be explained by concerns about the possible loss of socioemotional wealth. The influence of factors characterizing family involvement in ownership, management, and supervision proved statistically significant for most variables for the first, second and third quartiles of total debt. In contrast, for short- and long-term debt, the hypotheses were confirmed partially, primarily for the first quartile of both types of debt.

## **8. Future research proposals and limitations**

Our research is not without limitations but that may offer opportunities for further research. We used only the listed family firms' data so we cannot generalize these results on the non-public family firms, especially on SMEs. In addition, the study concerns only one year, a rather specific one, especially from the point of view of the business risk caused by the war in Ukraine. Hence, risk aversion on the part of family businesses as well as lenders could be higher than in an average year. It would therefore be worthwhile to examine the impact of individual factors over a longer period. A fruitful research direction could be also to extend the research scope to the Central European countries. Similarities and differences between countries in the region could be highlighted through international comparative research.

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## THE COMMERCIAL OFFER OF A PETROL STATION NETWORK AND THE NEEDS OF MICRO AND SMALL ROAD TRANSPORT ENTERPRISES IN THE PODKARPACKIE VOIVODSHIP

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**Purpose:** The aim of the research will be to indicate the gap in the cooperation between the offer of the petrol station network and the needs reported by micro and small road transport enterprises, whose headquarters are located in the Podkarpackie Voivodeship. The essence of the research problem will boil down to answering the question: To what extent the commercial offer of the petrol station network addressed to micro and small road transport enterprises in the Podkarpackie Voivodeship reflects the real needs of the market? Therefore, the subject of the study is the retail market of transport fuels, and the subject of the research are the network of petrol stations as well as micro and small road transport enterprises located in the Podkarpackie Voivodeship. The area of research are the gaps between the attributes of the commercial offer of the petrol station network and the determinants of its choice by the surveyed enterprises.

**Design/methodology/approach:** The research procedure will run through the following stages: 1) indicating the topic, purpose and scope of the research; 2) indication of the evaluation criterion; 3) measuring the attributes of the commercial offer; 4) measuring the supplier selection determinants; 5) characteristics of the entities participating in the research and the forms of their cooperation; 6) expert assessment of measurement results in the area of attributes of the commercial offer; 7) expert assessment of measurement results in the area of supplier selection determinants; 8) analysis and interpretation of the obtained results; 9) final conclusions; 10) dissemination of research results. The research method used is the expert method. For the purposes of the topic and purpose of the research, the following criteria were selected for evaluation, i.e. 1) the importance of the price; 2) importance of non-price factors; 3) transaction financial services; 4) e-book and mobile application; 5) services at petrol stations; 6) geographical scope of the commercial offer; 7) number of petrol stations and their location; 8) the position and importance of the operator. The above criteria will be subject to a three-stage evaluation by an expert, i.e. 1) essential (basic) factor; 2) secondary factor; 3) a factor of limited importance.

**Findings:** The implementation of the topic and purpose of the research allowed gap between the attributes of the commercial offer of the petrol station network and the determinants of its selection by micro and small road transport enterprises located in the Podkarpackie Voivodeship. It should be emphasized that the presented research is the third (last) stage of the research process, the main purpose of which was to indicate the scope and form of cooperation between a retail supplier of liquid fuels and a micro and small enterprise of road transport in the Podkarpackie Voivodeship. The stages of its implementation include: 1) defining the attributes

of the commercial offer of the petrol station network in the analyzed region; 2) indication of the determinants of the choice of liquid fuel supplier by the surveyed enterprises; 3) determining to what extent the commercial offer of the petrol station network addressed to micro and small road transport enterprises in the Podkarpackie Voivodship reflects the real needs of the market. In the final part of the article, the final conclusions from the entire research process and the encountered limitations and weaknesses will be presented.

**Originality/value:** In this article, the actions taken led to the expansion of scientific knowledge in the discipline of management and quality science in the field of commercial systems, their organization and management. The research focused on areas that have and will have an impact on improving the competitive position of a road transport enterprise.

**Keywords:** supplier, customer, liquid fuels, transport.

**Category of the paper:** Research paper.

## 1. Introduction

Road transport plays a very important role in human activity. Its proper functioning affects the efficiency and effectiveness of all sectors of the economy, the quality and lifestyle of the population, the condition of the natural environment and creates conditions for sustainable development. In Poland, since the beginning of the transformation period, the share of road transport in the transport of goods and passengers has remained at a high level. Currently, road transport is one of the most important sectors of the national economy. In the European Union (EU), Poland ranks first in terms of the volume of goods transported by road. On the other hand, in the structure of passenger transport by bus, it ranks fourth. In the past period, an increase in the number of cars was recorded in Poland. In their structure, the vast majority were vehicles powered by petroleum fuels. In 2021, for trucks, the share of motor gasoline (PB) in the structure of fuel consumption was 18.4%, and diesel oil (ON) 76.3%. In the case of car tractors, diesel fuel accounted for 98.1%, for buses diesel fuel 93.7% (Dymitrowicz-Życka, 2022).

In the analyzed period (2022-2023), a significant group of enterprises providing services in the field of road transport of goods and passengers was located in the Podkarpackie Voivodeship. A high share in their structure was occupied by micro and small enterprises. These were usually economic units with a limited number of vehicles. Due to the subject/entity of the transport and the available transport technology, the scope of transport services provided by them was very diverse. Sometimes they additionally provided other services in their offer – not related to transport. In the structure of the rolling stock owned by enterprises, the vast majority were vehicles powered by petroleum fuels

In recent years, Poland has seen an increase in the share of transport fuel costs in the global cost structure of enterprises. This was related to the persistently high level of transport fuel prices. It is worth recalling that fuel prices were not subject to regulation. They were determined on market terms. The structure contained elements such as excise duty, fuel surcharge, emission fee, VAT, margin and net price (Frączek et al., 2013). In addition, their final level in a given area was affected by the size of local needs and the scale of competition between suppliers. It should be emphasized that the domestic market of liquid fuels was strongly determined by the events recorded in the world. In addition, the EU climate and energy policy had a significant impact. In the analyzed period, crude oil resources and supply in Poland were significantly limited compared to the reported needs. The consumption coverage ratio with documented balance sheet inventories amounted to 0.9 years. On the other hand, the resource vitality index, which takes into account the volume of demand and supply, was 25.4 years (Gospodarka..., 2022; Surowce..., 2023). The logistics infrastructure was located in Poland, which allowed for the transport of fuels from various directions. As of February 1, 2023, over 90% of the raw material processed by the Orlen SA Group refinery comes from countries other than Russia (Orlen SA, 2023). In Poland, there were limitations in the supply of selected petroleum products, i.e. diesel oil and liquefied gas (LNG). On the other hand, the retail fuel market was characterized by high flexibility. Strong competition from the entities translated into the commercial offer.

In response to the above issues, it was assumed that the purpose of the research would be to identify the gap in cooperation between the offer of the petrol station network and the needs reported by micro and small road transport enterprises, whose headquarters are located in the Podkarpackie Voivodship. Its implementation will take place through: 1) establishing the current state of knowledge in the scope of the discussed issues; 2) description of the test method; 3) carrying out the measurement; 4) presentation of the results and final conclusions. The research method used is a critical review of the literature on the subject and an expert method.

It should be emphasized that the presented research is the third (last) stage of the research process, the main purpose of which was to indicate the scope and form of cooperation between a retail supplier of liquid fuels and a micro and small enterprise of road transport in the Podkarpackie Voivodship. The stages of its implementation include: 1) defining the attributes of the commercial offer of the petrol station network in the analyzed region; 2) indication of the determinants of the choice of liquid fuel supplier by the surveyed enterprises; 3) determining to what extent the commercial offer of the petrol station network addressed to micro and small road transport enterprises in the Podkarpackie Voivodship reflects the real needs of the market.

## 2. Theoretical basis

In the subjective approach, a transport enterprise is an organizational unit consisting of functional or task departments and human work. In material terms, an enterprise is defined on the basis of means of production (i.e. buildings and structures, means of transport, other technical equipment and materials used in their operation, including fuels and energy). In functional terms, it is a set of tasks related to the handling and implementation of the transport process (Mendyk, 2009; Koźlak, 2008; Grzywacz et al., 1989; Tarski, 1974). Taking into account the criterion of employment and annual revenues, the enterprise can be divided into micro, small, medium and large. A micro enterprise employs fewer than 10 employees, a small enterprise employs fewer than 50 employees (Journal of Laws of 2004, No. 173, item 1807). Their further division contained in the literature includes e.g. phases of flow of goods and services, specializations, scope of activity, capital structure, ownership sector, legal form or degree of resource involvement (Jedynak, 2022; Budzyński, 2013; Krawczyk, 2011; Journal of Laws of 2007, No. 251, item 1885).

In the literature on the subject, the basic and auxiliary subsystems are indicated as part of the organization of a transport company. One of the auxiliary subsystems is the fuel and energy subsystem. It covers the sphere of supply and consumption. The structure of the supply subsystem is formed by the department or positions responsible for the purchase and supply of energy carriers and their suppliers (Jedynak, 2022). In practical terms, a supplier is an enterprise that offers and delivers to recipients, on its own or by commissioning an external entity, appropriate goods and services being the subject of their manufacturing or commercial activity, in accordance with previously agreed purchase conditions (i.e. a commercial offer) (Jedynak, 2022; Dubisz, 2003). A commercial offer means a proposal from the supplier to sell products or provide services aimed at concluding a contract. The content contains the terms and methods of commercial transaction accepted by the supplier. The offer may be presented in various forms and scope. It can be submitted orally or in writing (paper or electronic). It can be directed at a single person or a larger group. It can be generally available or with limited access (Jedynak, 2023a).

The literature on the subject indicates various forms and principles of cooperation with the supplier. Their division generally takes into account the degree of concentration of supply services, supply rules, the number of regular suppliers or relationships that exist between a commercial entity and a supplier. In addition, the impact on the financial result of the enterprise in relation to supply risk is taken into account (Jedynak, 2022; Krawczyk, 2001; Bendkowski et al., 2011; Górski, 2000). On the other hand, two groups of methods are commonly indicated for the assessment and selection of the supplier by the recipient, i.e. audit and taxonomic methods (including the point method, point-graphic method, graphic method, indicator method or AHP) (Brzeziński, 2006). When choosing a supplier, the following criteria

are taken into account, i.e. delivery time, supplier reliability, its readiness and flexibility, and delivery efficiency. Additionally, the offered price or quality of products and services. Due to the different importance of the criteria, they are divided into primary and secondary criteria (Jedynak, 2022; Budzyński, 2016; Krawczyk, 2011; Bendkowski et al., 2011; Dworecki et al., 2005; Górski, 2000).

There are discrepancies (i.e. a gap) between the commercial offer of the supplier and the needs reported by the recipients. In the literature on the subject, distribution gaps are commonly distinguished (Christopher, 1996): time gap, space gap, quantitative gap, assortment gap and information gap. The time gap results from the fact that consumers make purchases at different intervals, while the enterprise, for economic or organizational reasons, tries to maintain continuous production. The space gap means that consumers are geographically dispersed in the market, while production is located in one place. The quantitative gap is the result of the fact that, on the one hand, the enterprise produces and supplies significant amounts of products or services, on the other hand, consumers report limited needs in the same period. The assortment gap results from the fact that the range of products manufactured by the enterprise is limited. On the other hand, consumers report diverse needs, which require a wide and deep assortment to be satisfied. The information gap results from the fact that consumers do not always have knowledge about the place or time of availability of the products they need. Producers, on the other hand, may not know where they are and who the potential buyers of their products are (Christopher, 1996; Jedynak, 2022).

### 3. Methodology

Subject of research: *The Commercial Offer of a Petrol Station Network and the Needs of Micro and Small Road Transport Enterprises in the Podkarpackie Voivodship*. Its main goal is to identify the gap in cooperation between the offer of the petrol station network and the needs reported by micro and small road transport enterprises, whose headquarters are located in the Podkarpackie Voivodship. The essence of the research problem will boil down to answering the question: To what extent the commercial offer of the petrol station network addressed to micro and small road transport enterprises in the Podkarpackie Voivodship reflects the real needs of the market? Therefore, the subject of the study is the retail market of transport fuels, and the subject of the research are the network of petrol stations as well as micro and small road transport enterprises located in the Podkarpackie Voivodship. The area of research are the gaps between the attributes of the commercial offer of the petrol station network and the determinants of its choice by the surveyed enterprises.

In terms of the state of knowledge, taking into account the researcher's scientific achievements and experience, the following research hypothesis was formulated, i.e. regardless of the size of the company, the number of fleets or geographical coverage, the gap between the commercial offer of the petrol station network and the needs reported by micro and small enterprises of road transport located in the Podkarpackie Voivodship, it will concern the importance of the price and the scope of interest in access to e-bok and mobile applications.

The stages of the research procedure include: 1) indicating the topic, purpose and scope of the research; 2) indication of the evaluation criterion; 3) measuring the attributes of the commercial offer; 4) measuring the supplier selection determinants; 5) characteristics of the entities participating in the research and the forms of their cooperation; 6) expert assessment of measurement results in the area of attributes of the commercial offer; 7) expert assessment of measurement results in the area of supplier selection determinants; 8) analysis and interpretation of the obtained results; 9) final conclusions; 10) dissemination of research results. The research method used is the expert method.

For the purposes of the topic and purpose of the research, the following criteria were selected for evaluation, i.e. 1) the importance of the price; 2) importance of non-price factors; 3) transaction financial services; 4) e-book and mobile application; 5) services at petrol stations; 6) geographical scope of the commercial offer; 7) number of petrol stations and their location; 8) the position and importance of the operator. The above criteria will be subject to a three-stage evaluation by an expert, i.e. 1) essential (basic) factor; 2) secondary factor; 3) a factor of limited importance.

The measurement in the area of commercial offer attributes was carried out on the basis of a review of available databases (electronic databases and cooperation regulations) and a direct interview conducted with a representative of a given petrol station chain. For the purposes of these studies, three areas to be assessed were identified, i.e. 1) economic and financial; 2) organizational and technical; 3) security. The adopted areas were defined by means of measures. The test form is presented in Table 1. The obtained measurement results, their analysis and final conclusions are presented in detail in the article: (Jedynak, 2023a, pp. 163-178).

**Table 1.**

*Interview form: Attributes of the commercial offer of a network of petrol stations addressed to micro and small road transport enterprises in the Podkarpackie Voivodeship*

Group name	Symbol	Tested parameter		Unit of measure
Economic and financial	A.1.1	Average unit price at selected petrol stations	- Motor gasoline	PLN/liter
	A.1.2		- Diesel	PLN/liter
	A.1.3		- LPG	PLN/liter
	A.2	Value/quantity discounts (fuel offer)		–
	A.3	Value/quantity discounts (non-fuel offer)		–
	A.4	Form of payment as part of the established cooperation		–
	A.5	Form of payment security		–
	A.6	Electronic invoices		–
A.7	Summary invoice for a given period		–	



Cont. table 1.

Organizational and technical	B.1	Remote form of concluding a cooperation agreement		–
	B.2	Duration of the agreement		–
	B.3	Availability of a fuel card in the offer (including the form of payment)		–
	B.4.1	Fuel card access	- Assigning the card to the vehicle	–
	B.4.2		- Assigning the card to the driver	–
	B.4.3		- Assigning cards to the company	–
	B.4.4		- Bearer card	–
	B.5	Other supported fleet cards		–
	B.6.1	Electronic platform and its functionality	- Access to fuel transactions and beyond fuel	–
	B.6.2		- Access to e-invoice	–
	B.6.3		- Possibility to personalize the card and purchase limits	–
	B.6.4		- Fast payment	–
	B.6.5		- Road and parking fees	–
	B.6.6		- Access to navigation and maps	–
	B.7	Mobile application		–
	B.8	Loyalty program		–
	B.9.1	Additional services	- Shop	–
	B.9.2		- Parking	–
	B.9.3		- Catering services	–
	B.9.4		- Hotel services	–
B.9.5	- Car repair		–	
B.9.6	- Car wash		–	
B.9.7	- Postal services		–	
B.9.8	- Infrastructure for servicing trucks and buses		–	
B.9.9	- Others		–	
B.10	Number of petrol stations located in the serviced area		pcs	
B.11	Geographic/demographic indicator		pcs/km <sup>2</sup> pcs100 thou. people	
B.12	Access to infrastructure		h/day	
B.13.1	Main location	- City	–	
B.13.2		- Highway and expressway	–	
B.13.3		- National roads	–	
B.13.4		- Other road categories	–	
B.14	Geographical scope of the commercial offer		–	
Security	C.1.1	Type of fuel	- Motor gasoline	–
	C.1.2		- Motor gasoline (Premium)	–
	C.1.3		- Diesel	–
	C.1.4		- Diesel (pPremium)	–
	C.1.5		- Diesel TIR	–
	C.1.6		- LPG	–
	C.1.7		- Electricity	–
	C.2	Fuel quality assessment (according to the President of the Office of Competition and Consumer Protection)		–
	C.3	Length of the supplier's existence on the market		–
	C.4	Enterprise size		–
C.5	Specialization in the service provided		–	
C.6	Supplier's position in the market		–	
C.7	Opinion about the supplier from buyers (concerns the Rzeszow poviat and the city of Rzeszow)		–	

Source: Jedynak, 2023a.

The measurement in the area of supplier selection determinants was carried out on the basis of a direct interview. For the purposes of the research, three areas to be assessed were identified, i.e. 1) the initial criterion; 2) form of cooperation; 3) determinants of choice. The adopted areas were defined by means of measures. The test form is presented in Table 2. The obtained measurement results, their analysis and final conclusions are presented in detail in the article: (Jedynak, 2023b, pp. 153-167).

**Table 2.**

*Interview form: Determinants of the choice of petrol stations by micro and small road transport enterprises in the Podkarpackie Voivodeship*

Group	Tested parameter		Description				
Entry Criterion	I.1	Does the enterprise use the services of petrol stations?	A	- yes			
			B	- no (please do not complete the rest of the questionnaire)			
	I.2	Enterprise type:	A	- micro (less than 10 people)			
			B	- small (from 10 to 49)			
			C	- other (please do not complete the rest of the questionnaire)			
	I.3	Type of business activity:	A	- road transport			
			B	- freight forwarding			
			C	- other			
	I.4	Object of transport and/or handling:	A	- transportation of passengers			
			B	- transportation of goods			
	I.5	Number of vehicles available:	-	-			pcs.
	I.6	Type of vehicles available:	A	- bus (up to 24 seats),			pcs.
			B	- coach (over 24 seats)			pcs.
			C	- van up to 3.5 t (GVW)			pcs.
			D	- truck up to 12 t (GVW)			pcs.
			E	- truck over 12 t (GVW)			pcs.
			F	- truck tractor/or specialist truck			pcs.
			G	- car			pcs.
			H	- other vehicles			-
	I.7	Geographic scope of activity:	A	- local (district, commune)			
B			- regional (Subcarpathian Voivodeship)				
C			- interregional (the area of the Podkarpackie Voivodeship and neighbouring provinces)				
D			- national				
E			- continental (Europe)				
F			- global				
I.8	Type of fuel used:	A	- diesel				
		B	- motor gasoline				
		C	- LPG				
		D	- CNG				
		E	- Electricity				
		F	- Other				

Cont. table 2.

Form of Cooperation	II.1	Do you use the services of only one petrol station?	A	- yes
			B	- no
	II.2	What type of petrol stations does the enterprise use?	A	- station networks (e.g. Orlen, Moya, BP, Shell, etc.)
			B	- independent stations (private owner)
II.3	Is there permanent cooperation with the station/stations (e.g. on the basis of a fuel card, individual contracts, etc.)?	A	- yes	
		B	- no	
II.4	Does the enterprise use a fuel card system (e.g. UTA, DKV, Eurowag, E100, etc.)?	A	- yes	
		B	- no	
Determinants	III.1	<b>The importance of price</b> when choosing a petrol station:	A	- is of primary importance (most important)
			B	- on par with non-price conditions
			C	- of secondary importance, below non-price conditions
	III.2	Basic <b>non-price factors</b> when choosing a petrol station: <i>* indicate max 3</i>	A	- transaction conditions (e.g. collective invoice, deferred payment date, etc.)
			B	- an electronic internet platform (e-bok) and a mobile application
			C	- petrol station services (e.g. truck parking, car wash, repairs, gastronomy, etc.)
			D	- geographical scope of the commercial offer
			E	- number of petrol stations and their location
			F	- position and importance of the operator on the market
			G	- other
	III.3	As part of <b>the financial service of the transaction</b> , the following are of fundamental importance when choosing a supplier: <i>* indicate max 2</i>	A	- payment method (non-cash/cash)
			B	- form of payment security (deposit, promissory note, etc.)
			C	- electronic invoices
			D	- summary invoice for a given period
	III.4	As part of access to <b>e-bok and the mobile application</b> , the following are of primary importance when choosing a supplier: <i>* indicate max 2</i>	A	- access to transaction history
			B	- access to e-invoice
			C	- the ability to personalize the card and purchase limits
			D	- quick payment
			E	- the possibility of paying road and parking fees
			F	- access to navigation and maps
III.5	As part of <b>the services provided at stations</b> , the following factors are of primary importance when choosing a supplier: <i>* indicate max 2</i>	A	- store	
		B	- car park/car park of truck	
		C	- catering services	
		D	- hotel services	
		E	- car repair	
		F	- car was	
		G	- other	

Source: Jedynak, 2023b.

## 4. Empirical Results and Discussion

Taking into account the number and structure of petrol stations located in the Podkarpackie Voivodship, the following were selected for the study: PKN Orlen SA (Orlen), BP Europa SE Spółka europejska Branch in Poland (BP), Shell Polska Sp. z o.o. (Shell), Circle K Polska Sp. z o.o. (Circle K), Anwim SA (Moya station network), Slovnaft Polska SA (Slovnaft Partner), Watek Sp. z o. o. (Thread). Petrol stations belonging to Grupa Lotos SA were not taken into account in the research. On August 1, 2022, this concern became part of PKN Orlen SA and the MOL Group. It should be noted that the analysis of the structure of petrol stations was carried out in the city of Rzeszów and the Rzeszów powiat (Jedynak, 2023a).

Based on the measurement, it was found that the share of Orlen petrol stations in Rzeszów in the total number of stations was 16.2%, in the Rzeszów powiat it was 16.1%. For BP, the share was 5.4% and 3.6%, Shell 10.8% and 1.8%, Circle K 5.4% and 1.8%, Moya 5.4% and 5.3%, Slovnaft 0.0% and 7.1% or Watek 13.5% and 3.6%. In the Podkarpackie Voivodship, in the case of dependent networks, access to the infrastructure was 24/7. For other operators, the availability resulted from the location of the petrol station and its purpose. The commercial offer of the subsidiaries included standard and premium fuels as well as TIR diesel oil. However, in the case of independent operators, the situation was different. In the analyzed period, according to the information of the President of the Office of Competition and Consumer Protection, no deviations from the applicable fuel quality standards were found at the examined petrol stations (Jedynak, 2023a).

On the other hand, the surveyed enterprises included entities located throughout the voivodeship. Assuming the employment size criterion, these were micro and small enterprises. Their main activity was road transport, mainly in the field of goods transport. In addition, these enterprises also provided other services. Taking into account the geographical scope of the conducted activity, the largest group among the surveyed enterprises were continental and domestic enterprises. In the structure of the fleet owned by the surveyed enterprises, vehicles for transporting goods prevailed. The largest group consisted of trucks over 12 t and car tractors. However, assuming the criterion of their size, more than 5 vehicles were owned by more than half of the surveyed enterprises. The main type of fuel used in enterprises was diesel oil (Jedynak, 2023b).

The commercial offer of the petrol station chain addressed to micro and small enterprises was based on constant cooperation. The remote form of concluding the contract was one of the accepted options. The contracts were offered mainly for an indefinite period. The offer included various variants of fuel cards, including those addressed to micro and small enterprises. Access to the fuel card was based on different variants. It was commonly issued to a vehicle, person or company. Fleet card systems, i.e. UTA, DKV, E100, etc., were accepted at petrol stations. Most suppliers offered a loyalty program (Jedynak, 2023a).

The vast majority of the surveyed enterprises used the services of many suppliers of transport fuels. More than half of the enterprises refueled their vehicles at petrol stations included in the network. An increase in the importance of independent petrol stations was noted in the case of enterprises with a limited number of owned vehicles or the range of operations conducted only in the Podkarpackie Voivodeship. More than half of the respondents cooperated with petrol stations on the basis of permanent contracts. Significant differences in this area occurred in the case of micro and small enterprises. In addition, its size was influenced by the number of vehicles at the enterprise's disposal and the geographic scope of the transport services provided. On the other hand, a limited group of enterprises used the fuel card system. This form of cooperation was mainly interested in small enterprises as well as continental and global companies (Jedynak, 2023b).

Expert evaluations of the measurement results in the area of commercial offer attributes are presented in Table 3.

**Table 3.**  
*Attributes of the commercial offer - expert assessment*

Criterion	Attributes	Expert assessment*
The importance of the price	Fuel prices at the surveyed stations remained at a similar level. During the research, no petrol station was identified where all fuel prices were below the competition. Discounts on fuel purchases and selected non-fuel products and services were granted at service stations.	■
The importance of non-price factors	Non-price factors played a fundamental role in the commercial offer. Access to the e-bok and mobile application, including the financial handling of transactions, was of great importance. In addition, the offer provided information on the services provided at petrol stations, their number and location, as well as the geographic scope of the offer.	■ ■ ■
Transaction financial services	For most operators, the permanent form of cooperation was based on a non-cash transaction through the use of a fuel card. Various forms of payment security were offered. Electronic and collective invoices were widely available in the offer. Different payment deadlines for the invoice have been noted at the operators.	■ ■ ■
E-book and mobile application	The electronic platform and mobile application was available in the commercial offer of most suppliers. Most often, their basic functionality meant reviewing transaction history, access to invoices, the ability to personalize cards and purchase limits, or road and parking fees.	■ ■ ■
Services at petrol stations	At petrol stations there was a shop, gastronomy, car wash and a public car park. Depending on the purpose of the station and its location, the stations were equipped with infrastructure for servicing trucks and buses. In addition, only selected domestic operators had postal services, a hotel, a car repair shop or a vehicle inspection station.	■ ■
Ggeographical scope of the commercial offer	The geographic scope of the retail offer of service stations varied from global, through continental and national, to regional.	■ ■ ■
Number of petrol stations and their location	The location of the stations of individual suppliers was most often dispersed throughout the Podkarpackie Voivodeship. Their location is mainly in the city. In the case of the network of stations belonging to concerns, additional distribution points were located on motorways, expressways and national roads.	■ ■

Cont. table 3.

The position and importance of the operator	Petrol station chains belonged to large and experienced enterprises. These were enterprises associated with domestic and foreign capital. Their activities were specialized. The position on the market of petrol stations, due to the potential they had and the location of individual points, was of fundamental nature.	■
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\* ■■■■ - essential (basic) factor, ■■ - secondary factor, ■ - a factor of limited importance.

Source: own study based on Jedynak, 2023a.

The expert assessment of the measurement results in the area of supplier selection determinants is presented in Table 4.

**Table 4.**

*Determinants of supplier selection - expert assessment*

Criterion	Attributes	Expert assessment*
The importance of the price	Regardless of the size of the enterprise, the fleet of vehicles owned or the geographical range of the services provided, the price was of primary importance in the selection of a supplier of transport fuels.	■■■
The importance of non-price factors	Non-price factors were of secondary importance (the most important factors for customers were the terms of the transaction, the service of petrol stations and the number of petrol stations and their location).	■
Transaction financial services	The form of payment, the summary invoice for a given period and the electronic invoice were of fundamental importance when choosing a supplier. A secondary factor was the form of payment security.	■■■
E-book and mobile application	Secondary non-price factor. Enterprises were primarily interested in access to the history of sales transactions and e-invoices. In addition, the possibility of paying road and parking fees and fast payment. The importance of the above factors varied depending on the size of the company, the fleet owned or the geographical scope of the business.	■
Services at petrol stations	In the structure of services provided at petrol stations, the following were important: car park/TIR car park and car wash. Other factors were secondary. The exception were enterprises providing their services only in the Podkarpackie Voivodship, where the shop and car wash were of primary importance.	■■■
Geographical scope of the commercial offer	The importance of the geographical range of the commercial offer varied depending on the geographical scope of the business.	■■
Number of petrol stations and their location	The non-price factor is essential, regardless of the size of the company, fleet of vehicles owned or geographical scope of the business.	■■■
The position and importance of the operator	The non-price factor is secondary, regardless of the size of the enterprise, the fleet of vehicles owned or the geographical scope of the business.	■

\* ■■■■ - essential (basic) factor, ■■ - secondary factor, ■ - a factor of limited importance.

Source: own study based on Jedynak, 2023b.

The expert assessment of the measurement results in the area of supplier selection determinants, taking into account the criterion of enterprise size, number of vehicles or geographical scope of business, is presented in Table 5.

**Table 5.**

*Determinants of supplier selection according to the size of enterprises, number of vehicles, geographical scope of activity - expert assessment*

Criterion	Expert assessment**								
	I.2		I.5 (number of vehicles)			I.6			
	A	B	1	2-5	<5	A-B	C	D	E-F
The importance of the price	■■■■	■■■■	■■■■	■■■■	■■■■	■■■■	■■	■■■■	■■■■
The importance of non-price factors	■	■	■	■	■	■	■	■	■
Transaction financial services	■■■■	■■■■	■■	■■■■	■■■■	■■■■	■■■■	■■■■	■■■■
E-book and mobile application	■	■	■	■	■	■	■	■	■
Services at petrol stations	■■■■	■■	■■■■	■■	■■■■	■■■■	■■	■■■■	■■■■
Geographical scope of the commercial offer	■	■■	■	■	■■	■	■	■■	■■
Number of petrol stations and their location	■■	■■■■	■■■■	■■■■	■■■■	■■■■	■■	■■	■■■■
The position and importance of the operator	■	■	■	■	■	■	■	■	■

\* ■■■■ - essential (basic) factor, ■■■ - secondary factor, ■ - a factor of limited importance.

Source: own study based on Jedynak, 2023b.

## 5. Conclusions

On the basis of the collected data and their analysis, a gap was indicated between the attributes of the commercial offer of the petrol station chain and the determinants of its selection by micro and small road transport company in the Podkarpackie Voivodeship. The price gap and the gap in access to e-books and mobile applications were indicated. Therefore, the research hypothesis was confirmed.

It should be emphasized that regardless of the size of the enterprise, the fleet of vehicles owned or the geographical scope of the business, the price was the basic factor in the selection of transport fuel suppliers by the surveyed enterprises. Non-price factors were secondary. On the other hand, in the case of the commercial offer of the service station network, non-price factors were of a basic nature. They were primarily related to e-bok and the mobile application, financial handling of transactions, services at petrol stations, location and number of petrol stations or the geographical scope of the commercial offer. However, the prices of individual fuels at the surveyed suppliers remained at a similar level. There was no indication of a petrol station where all fuel prices were below the competition.

In the case of access to e-book and mobile applications, the surveyed enterprises showed very limited interest. Most often, these entities omitted this choice factor in their answers. The research did not determine what caused this. On the other hand, in the commercial offer of the petrol station chain posted on websites, the available tools were treated as the basic factor. Their functionality in terms of supporting the implementation of the transport process and financial handling of the transaction was strongly emphasized. The available internet application gave the possibility to manage the fleet and the driver's work. The services made available allow for their control and gave the opportunity to personalize access to purchases and services and to set their limits. In the researcher's opinion, the message sent by the supplier to the enterprise was accessible and legible. It should also be emphasized that a commercial offer addressed to micro and small enterprises was posted on the websites.

It should be noted that the presented research was the third stage of the research process, the main purpose of which was to indicate the scope and form of cooperation between a retail supplier of liquid fuels and a micro and small enterprise of road transport in the Podkarpackie Voivodeship. The stages of its implementation included: 1) defining the attributes of the commercial offer of the petrol station network in the analyzed region; 2) an indication of the determinants of the choice of the supplier of liquid fuels by the surveyed enterprises; 3) determination of the extent to which the commercial offer of the service station network addressed to micro and small road transport enterprises in the Podkarpackie Voivodeship reflects the real needs of the market.

The results of the first stage of research were published in the article: (Jedynek, 2023a, pp. 163-178).

The results of the second stage: (Jedynek, 2023b, pp. 153-167).

The implementation of the main topic and purpose of the research allowed to indicate the following final conclusions:

- the basic attributes of the commercial offer of the service station network in the Podkarpackie Voivodeship include: personalization of the offer, limited access to the terms of cooperation, wide range of the offer, availability of the offer, integration of the transport process, personalization of tasks, speed of establishing cooperation, dispersion of points of sale, non-regional importance.
- The basic determinants of the choice of fuel supplier by the surveyed enterprises include: dispersed purchase, linking purchase, preferred permanent form of cooperation, price as the main selection factor, non-price factors as a secondary selection factor, traditional form of cooperation.
- In the case of petrol station chains, a permanent form of cooperation was preferred. Cooperation agreements were mainly concluded for an indefinite period. The range of possible cooperation offered by the petrol station chains was wide. It should be emphasized that the commercial offer is a package consisting of available goods and services as well as terms and conditions for handling purchase and sale transactions.



- The vast majority of the surveyed enterprises used the services of many suppliers of transport fuels. More than half of the respondents cooperated with petrol stations on the basis of permanent contracts. However, the importance of a permanent form of cooperation varies depending on the size of the enterprise, the number of vehicles owned and geographical coverage. The scope of interest in the commercial offer was limited only to selected factors.
- Gaps in cooperation between the surveyed entities were noted in the case of the importance of price and in access to e-bok and mobile application.

The main limitations and weaknesses in the implementation of the research process include obtaining data from the surveyed entities. Most operators had limited access to data on terms of cooperation. The difficulty was the lack of regulations or contract forms published by the supplier. Sometimes data could only be made available after sending a request for cooperation to the provider. Also in the case of telephone or e-mail contact, not all the surveyed petrol station chains expressed their willingness to answer the questions contained in the survey form. In the case of the surveyed enterprises, more than 35% of respondents offered a response. The main reason for refusal was lack of time. In addition, a major limitation in contact with the company was the outdated contact details contained in *Panorama Firm* electronic database (Panorama ..., 2023). However, what significantly enriched the research process was direct contact with the respondent. Thus, it is possible to obtain not only answers to the formulated questions, but also their justification.

In conclusion, the activities undertaken in the article aimed at achieving the progress of scientific knowledge have led to the expansion of knowledge in the discipline of management and quality science in the field of commercial systems, their organization and management. The research focused on areas that have and will have an impact on improving the competitive position of a road transport enterprise.

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## DEVELOPMENT OF SOFT COMPETENCES IN HIGHER EDUCATION EXPECTED IN TODAY'S JOB MARKET – STUDENTS' OPINIONS

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**Purpose:** The purpose of the conducted research was to identify the soft competences that students develop during their studies, relevant from the perspective of the requirements of the modern labor market.

**Design/methodology/approach:** The research, the results of which are presented in the article, was carried out in January 2023 at the Faculty of Management and Command of the War Studies University in Warsaw. The study involved 336 civilian students studying three majors. The research method used was a diagnostic survey carried out using a questionnaire technique.

**Findings:** As a result of the research, a list of soft competences required on the labor market was established and the scope of developing these competences at the university was examined, which allowed to show the competences formed at the university, as well as those on which more attention should be directed.

**Research limitations:** Research on soft competences shaped in the university, and required in today's labor market, was conducted at a single university, which limits the ability to make inferences on the entire population of students in Poland. The research sample was not representative. The study was of a pilot nature.

**Practical implications:** The obtained results of the research allow to infer which soft competences are not developed by students, and are required in the modern labor market. The discrepancies revealed provide a basis for modifying educational programs, with the aim of introducing classes aimed at developing those areas of competence that are considered competence gaps and limit students' ability to enter the labor market efficiently. In addition, the measures indicated in the research that students desire to improve the educational process would also affect the image of the university and the university graduates.

**Originality/value:** The article describes the results of the 2023 survey, thus a new empirical research on the development of soft skills required in the labor market.

**Keywords:** soft skills, university, labor market, students.

**Category of the paper:** research paper.

## 1. Introduction

Efficient performance of tasks on the job requires employees to have the relevant competences. Hence, it is extremely important to identify them in order to shape them both in the process of education in secondary schools and higher education, and in the process of training while already performing professional tasks. This is especially true of the so-called soft competences, which at different levels are necessary for all jobs, conditioning the use of hard (professional) competences. Hence, it is desirable to conduct research on the requirements of the labor market for these competences and to determine the discrepancies between these competences and the competences actually formed. Thus, universities, caring about the quality of education, should monitor the adequacy of soft competences acquired by students, thus affecting their ability to obtain a job and future professional success.

This issue became the subject of research interest for the authors of the article and guided the main objective of the research: to identify the soft competences that students develop during their studies. The main research problem was formulated as a question: *What competences expected in the modern labor market are developed by students at the University?*

The research was conducted in January 2023 at the Faculty of Management and Command at the War Studies University in Warsaw. Civilian students studying three majors: management and command, logistics and aviation were surveyed. The research was anonymous and was carried out through the use of an opinion poll method utilizing the survey technique. The study was of a pilot nature.

Achieving the purpose of the research made it possible to identify those soft competences that should be developed at the university, as they are desirable in the modern labor market.

## 2. Theoretical aspects of competence

The term competence (Latin *competentia* – responsibility, usefulness), can be understood in two contexts – as the scope of someone's knowledge, skills, and as the scope of authority, powers, scope of action of some institution. In the first sense, it is mainly found in the literature of management, pedagogy and psychology. While in the second meaning – in the area of law. In the rest of the article, competence will be understood in the first sense.

According to A. Gick and M. Tarczyńska, competence can be defined as *knowledge, skills, behaviors, qualities and attitudes that distinguish those who achieve the highest efficiency* (Gick, Tarczyńska, 1999, p. 45). A similar definition in content is presented by A. Szczęsna and T. Rostkowski, defining competences as *all qualities of employees (knowledge, skills, experience, abilities, ambitions, professed values, styles of action), the possession, development*

*and use of which by employees enables them to implement the strategy of the company in which they are employed* (Szczęsna, Rostkowski, 2004, p. 41). In narrower terms, competences are understood by G. Filipowicz: *Competencies are dispositions in terms of knowledge, skills and attitudes that make it possible to carry out professional tasks at an appropriate level* (Filipowicz, 2004, p. 17).

From the above definitions, as well as the analysis of other definitions, it is clear that the term competence is an interdisciplinary and multidimensional construct (Schneider, 2019), integrating various behaviors of an employee on the job. The common ground between the various interpretations is the search for and analysis of factors that contribute to the efficient performance of tasks by the employee, the team and the organization. There are still a number of scientific dilemmas regarding issues of definition (Wong, 2020) or measurement of competences, but nevertheless these issues do not restrict organizations from developing competency profiles and basing personnel processes on competences (Springer, 2018).

The aforementioned concepts define competences by distinguishing the components of competences and indicating their effects. An employee's ability to transform his potential into action effects is his ability to behave competently in a given position and under specific organizational conditions.

Hence, professional competence can be defined as the knowledge, skills, experiences, values, motivation and attitudes of employees that ensure the efficient performance of tasks on the job. It should be emphasized that competences are therefore not all the qualities possessed by employees, but only those that correlate with the efficient performance of tasks. Thus, the fundamental issue in the development of competences is their accurate identification for individual positions or groups of positions, and then their intentional formation both in universities and in the process of employee training.

The definitions given above include the individual components of competences. The most commonly mentioned components of competence include knowledge, skills, behaviors, values, attitudes, personality, abilities and motivations. It is debatable to include, for example, personality traits among these components. It is rightly noted by A. Springer that the concept of competence is overly multidimensional and fuzzy, hence the description of competence requires precise definition and indication of the accepted components of competence (Springer, 2018).

In organizational practice, the term competence is used alongside the term qualifications. Competences, however, are a broader concept and pertain to a specific job position, while qualifications express the level of education obtained (Topolewska, 2023), confirmed by a document, or skills acquired during education or training (Sidor-Rządkowska, 2006). It can be assumed that qualifications are the basis of competence, but they usually do not ensure efficiency on the job.

The required level of competence depends on the number and complexity of the tasks performed. This level can be both an indicator of the suitability of employees for a given position and an indicator of the quality of management's efforts in the professional development of subordinates.

The following characteristics of competence can be distinguished (Majewski, 2013):

- they distinguish a proficient employee from unsuccessful professional employees,
- are strictly task-oriented on the job (groups of jobs),
- the level of competence can be inferred from a set of observable behaviors,
- are measurable (Škrinjarić, 2022) and allow distinguishing several levels of behavior,
- are only such dispositions that are subject to development,
- correlating with the efficiency of action, are a prerequisite for performing a task at the required level.

Depending on the qualities possessed by the employee, the process of acquiring and using competences may proceed faster or slower, and the results achieved may indicate different degrees of efficiency (Gorbachenko, 2021).

In the reference books (Walkowiak, 2004; Springer, 2018), there are many typologies of professional competences, which are created for the purpose of theoretical considerations or the need to adapt to the individual needs of the organization. A distinction is made, among others, between hard and soft competences, general and specific, personal and job-related, individual and organizational, or, by content criterion: base, social, professional and conceptual.

Base competences are competences that are fundamental to any activity in a given area and condition the use of other competences. Therefore, they are usually desirable in all employees of a company and often relate to issues of values and norms of behavior, i.e. they belong to soft competences, e.g.: courage, loyalty to superiors, honor, fairness, being results-oriented. The stronger the values, the greater the influence they have on the behavior of members of a given organization – the structure adopted, the strategy and methods of operation, the style of leadership, the way decisions are made, etc.

Social competences relate to efficient, verbal and non-verbal communication with other members of the team or organization, leading others, motivating or resolving conflicts. Thus, they are also soft competences. They can also include conceptual competences relating to devising a plan to carry out the tasks received, determining solutions to problems arising on the job. Hard competences, on the other hand, will include professional competences, resulting from the specifics of the expertise, such as planning activities, operating equipment, knowledge of operating procedures and processes, inventory calculations.

The aforementioned types of competences condition and complement each other, as it is difficult to perform a task requiring professional competence without possessing certain soft competences. These competences are important in all executive and managerial positions, as they condition the use of professional competences.



The greater the number of tasks performed by an employee, the more diverse soft competences are required. However, it is possible to distinguish those that are most often repeated and are key to efficient performance. These competences should be especially developed both in universities, in organizations, as well as taken into account in personnel actions.

### 3. Soft competences required in today's labor market

When considering the issue of soft competences that employees should have in the modern labor market, it is worth considering what the mentioned competences are. Various definitions or views on the subject can be found in the literature, with soft competences being called in different ways by many institutions or organizations over the past years (Figure 1).

Life skills (WHO, 1993)
Transversal skills (ISFOL, 1998)
Generic competences (Tuning project, 2000)
Key competences for a successful life and a well-functioning society (OECD, 2003; 2012)
Key competences for lifelong learning (UE, 2006)
21 <sup>st</sup> century skills (Ananiadou & Claro, 2009)
Transferable skills (RPIC-ViP, 2011)
Future work skills (IFTF, 2010)
Soft Skills for Talent (Manpower Group, 2014)
Skills for Social Progress (OECD, 2015)

**Figure 1.** Different names proposed to define Soft Skills.

Source: Cimatti, 2016, pp. 97-130.

Soft skills are often referred to as *Generic Competences* (Poblete, 2015), *Key Competences*, or, following the Microsoft-Intel definition *21st Century Skills* (Hautamäki, 2015). Several European projects have also been developed to define and study the issue of competences, which include the Tuning project, in which generic competences are divided into three categories: *instrumental* (cognitive, methodological, technological and linguistic competences), *interpersonal* (individual and social competences) (Klinkosz et al., 2021), and *systemic* (organizational, entrepreneurial and leadership competences) (Poblete, 2015).

According to the general division, competences can be divided into professional competences, which are usually identified with hard competences (knowledge, specific skills related to the profession or work experience), and personal competences, which are usually referred to in the reference books as soft competences. These include self-awareness, motivation, innovation or social skills, i.e. leadership, teamwork, communication or conflict management (Szaban, 2012, pp. 87-88).

Soft competences are also defined as *attitudes and behaviors exhibited in interactions between people that affect the outcome of various interpersonal encounters* (Muir, 2004, p. 96). S.P. Robbins and D.A. DeCenzo likens soft competences to specific interpersonal skills, defining them as the *ability to cooperate with other people, understand them, act as a mentor to them, and motivate them both individually and in groups* (Robbins, DeCenzo, 2002, p. 41).

It should also be noted that soft competences can be divided into intrapsychic and interpersonal skills. The former testify to what a person should understand, what to develop independently, what to learn. The interpersonal approach, on the other hand, is about how a person can develop in the context of building relationships with other people (Cimatti, 2016). B. Cimatti also emphasizes that this type of distinction can be used in the context of defining personal skills as well as social skills.

Personal skills include, among others, knowledge and the ability to think, which corresponds to cognitive skills. Examples here include a desire for continuous learning and the ability to plan and achieve goals, but also openness, a sense of social support, high self-esteem and self-acceptance, optimism and a sense of humor. However, when it comes to professional life, the most important skills in this category are considered to be: flexibility of thinking, readiness to learn, creativity, analytical thinking, self-reliance, coping with stress and openness to change (Paszkievicz, Silska-Gembka, 2013). Personal competences contribute to efficient self-management and are seen as the *foundation of personality and treated as human potential* (Kędzierska, Znajmiecka-Sikora, 2011, p. 20).

On the other hand, social skills, i.e. those that relate to relationships with other people, involve such issues as listening skills, negotiating, networking, problem-solving, decision-making skills, and assertiveness (Cimatti, 2016; Engelberg, 2015). From the point of view of professional life, such skills as teamwork, sharing knowledge and experience, personal culture, communication skills, establishing relationships with customers, co-workers and superiors (Paszkievicz, Silska-Gembka, 2013).

The above testifies to the fact that a person's possession of the right soft skills allows hard skills to "develop", making soft skills go beyond the strict requirements of the profession (Grisi, 2014).

Soft skills can also be divided into entrepreneurial skills, which are related to the fact that a person has leadership skills, can take risks, is innovative, as well as can manage change, and technological skills, that is, skills that allow a person to perform specific tasks (Ciappei, 2015).

P. Smółka believes that soft competences – although unquantifiable and difficult to measure – allow for "hard" results (Smółka, 2008).

In general, soft competences are difficult to define in a clear, simple way. However, it is important to try to understand or reflect on which soft competences will be needed in the context of the future labor market.

Yet, there is no denying the fact that the modern labor market faces many difficulties, as it is subject to constant change. This in turn influences the fact that the business environment, both near and far, is increasingly difficult to predict. Therefore, this necessitates the search for new solutions in terms of development opportunities both from the perspective of the employer and the employee, or the implementation of forward-looking employee strategies, which will be the source of the search for new talent or the development of new work models. The Covid-19 pandemic has had a significant impact on the current labor market. However, as specialists from ManpowerGroup point out in the *Human Age 2.0 Future Forces At Work* report, the dynamics of change in today's market are also influenced by:

- individual choice – employees are increasingly opting for careers with multiple employers rather than “lifetime” jobs. The main goal of young people has become to develop and acquire new skills, knowledge and experience, in the future it may lead to a career promotion or a change to a more rewarding job (Figure 2). And this is where the problem arises among employers, among others: *why should I train you if you will leave and work for my competitor?*



**Figure 2.** The Rise of Individual Choice – What Have You Done For Me Lately?

Source: <https://www.manpowergroup.co.uk/wp-content/uploads/2016/01/humanaage2-futureforcesatwork.pdf>, March 29, 2023, p. 6.

- demographics/talent management – an aging population and declining birth rate, resulting in a declining workforce and difficulty in attracting talent. Many countries are introducing a number of programs e.g. knowledge transfer to train the next generation, aimed at finding and attracting new talent;

- customer sophistication – companies are starting to think more strategically about where they source talent from. It is worth noting at this point that large organizations are beginning to use large data sets, as well as advanced recruiting. What's more, more and more ways of "retaining" trained employees are being introduced – if only by introducing modern motivational methods. The aim of such measures is primarily to increase employee productivity, but also to change the way companies think about talent. Through the use of behavioral tests, digital scorecards and better information systems on available human resources, companies are becoming better at identifying their employees, and this consequently provides information on where the best talent is in the company or where there may be gaps;
- technological revolutions – there is no denying that technological development has a huge impact on shaping changes in the modern labor market, primarily in the context of competency requirements. Thanks to the development of various mobile devices, as well as applications, employees are able to communicate with each other more quickly, both within their organizational unit and throughout the organization, but also in terms of better communication with customers. A telling example of the above, using a higher education institution as an example, is the use of MS Teams applications – both in communication between employees, but also with students. The use of this type of technology by managers/leaders gives them opportunities to manage their teams more effectively. The development of technology is also related to the increasing use of artificial intelligence in various industries – for example, in the medical industry, where human-AI collaboration allows for the reduction of errors made when diagnosing various diseases. However, it is important to keep in mind that the development of technology using artificial intelligence can be associated with risks for employees. As indicated by research presented in the Global Risk Report 2017, technological advances may lead to up to half of existing jobs undergoing massive transformations in the coming years, and some of them, especially those requiring work with human hands, will disappear altogether (The Global..., 2017). A telling example of such a revolution in terms of replacing or displacing jobs is, for example, the automotive industry from the point of view of the use of robots, which make it easier and faster to do the job (Human Age 2.0..., 2016, pp. 3-9).

As a result of the development of technology, and therefore the digitalization of the work environment, soft competences have become extremely important, by which they are defined as *PowerSkills* or as *company-wide competences* (Workplace Learning Trends Report, 2022). In the context of the discussion at hand, it is useful to briefly define soft competences referred to as *PowerSkills*. According to the Workplace Learning Trends<sup>1</sup> report, these competences

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<sup>1</sup> Workplace Learning Trends 2022 report, is based on data obtained from UdeMy Business participants from around the world, provides a unique look at the desired professional skills that employees and their companies need to be competitive in today's workforce – and the workforce of the future.

include the areas of communication and teamwork, leadership and management, productivity and collaboration, as well as personal development and well-being. In this regard, the relevance of such competences in today's labor market is indicated:

- assertiveness – it's a teamwork competency that allows you to communicate effectively, to express one's own opinion without showing aggression or attacking the other party, in other words, it's a skill by which an employee approaches himself, as well as others, with respect. From 2020 to 2021, the demand for this competency increased by 250% (from 2017 to 2021 by 602%);
- diversity management (D&I) – this is a competency for which demand increased from 2020 to 2021 by 205% (from 2017 to 2021 by 324%), It deals with issues such as fitting in with the organizational culture, amenities for employees such as flexible working hours, a room for breastfeeding mothers, a meditation room and others, hiring 50+ people, or the principle of gender equality and anti-discrimination;
- strategic thinking - this is also a competency in the area of leadership and management, which has grown in popularity by as much as 331% from 2017 to 2021. It is primarily concerned with employees being able to use their knowledge, to see their strengths as well as their weaknesses, to be able to achieve their goals which allows them to act more effectively as a result. It is worth mentioning here that the ability to think strategically is strongly correlated with the possibility of promotion;
- free use of digital tools – in today's era, where employees are increasingly taking advantage of hybrid work opportunities, especially after the experience of the Covid-19 pandemic, the ability to use a computer or other mobile devices has become one of the most important productivity soft skills. Between 2017 and 2021, the demand for computer-related competences increased by 404%, between 2020 and 2021 by 169%;
- speaking English – is a competency in the area of personal development, the demand for which increased by 150% between 2020 and 2021. A Pennsylvania State University study also indicates that speakers of more than one foreign language are better at performing multitasking (Workplace Learning Trends Report, 2022, pp. 7-12).

In contrast, from research published by NTUC LearningHub in its *Emerging Jobs and Skills Report*<sup>2</sup>, the most important PowerSkills from an employer perspective include:

- adaptability – which means the ability of an employee to adapt quickly to changes that occur both in the organization itself and in its environment. A telling example of this was the transition from "overnight" from working in stationary mode to remote mode during the Covid-19 pandemic;

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<sup>2</sup> The survey was conducted among more than 650 working Singaporeans in early December 2021 by NTUC LearningHub. Respondents included 450 full-time employees (with a subordinate manager) and 200 employers (senior, middle managers who make hiring decisions about hiring).

- developing people – understood as expanding/improving competences among employees in order to build or develop their career paths;
- collaboration and communication skills – the ability to communicate efficiently within a team and to convey information is extremely important. Also noteworthy is the fact that, increasingly, meetings, briefings or task completion are conducted remotely or hybridly, hence employees are required to acquire skills in this area (Emerging Jobs and Skills Report, 2022, pp. 37-48).

Summarizing the previous considerations, it should be said that from the point of view of the changes that are taking place in the modern labor market, the importance of employees having the right soft skills will continue to increase. This is because it will affect the professional success of the employee, the management of his career, but will also contribute to the success of the organization, by maintaining a sustainable competitive advantage.

## **4. Soft competences – results of empirical studies**

### **4.1. Research methodology**

The development and quality of functioning of the education system, especially in the context of the need for lifelong learning, resulting from technological progress and changing situational conditions, is an issue that is the subject of discussion and analysis carried out at the national level, as well as at the European Union level within the framework of the programs and initiatives undertaken (Kwiatkowski, 2018). The ways of forming competences, including the choice of the competences themselves to be developed is a special challenge, the implementation of which is not possible without awareness of the situation taking place in the labor market, including the existence of deficit and surplus occupations. Universities, whose main idea of functioning is to educate students in order to prepare them for professional work (Act..., Article 13, point 1, section 1), should constantly monitor the labor market and make the necessary changes in educational programs in order to develop the competences required by the market, keeping in mind that the rate of acquisition of individual competences varies, and that the competences themselves form so-called families of competences. The development of one competence determines the possibility of acquiring another, which shows how important it is to carefully plan the educational process, and this is not possible without thorough knowledge of competences. The importance of competences is emphasized by, among others, S.B. Parry indicating that: competences are a set of interrelated knowledge, skills and attitudes that represents a key component of a person's job role and responsibility, that associates with performance in a job, that can be measured against well-established standards, and that can be reinforced through training and development (Parry, 1996).

Understanding the importance of competence development, the authors of the article conducted a study aimed at finding out the opinions of students on the development of soft skills in a higher education institution. The research was conducted in January 2023 at the Faculty of Management and Command of the War Studies University in Warsaw. Civilian students studying three majors: management and command, logistics and aviation were surveyed. Both full-time and part-time, first- and second-degree students were invited to participate in the research. The research was voluntary and anonymous and was conducted through the use of a diagnostic survey method carried out using a questionnaire technique. Questionnaires in paper form were distributed by the authors of the article among students from each group. A total of 336 students participated in the study.

The main objective of the conducted research was to identify the soft competences that students develop during their studies. The choice of the indicated research area was related with the need to identify at the university the competences that should be developed, without which students might find it difficult to find their way in the labor market (Pang et al., 2019). The university, taking care of the quality of education, should constantly monitor the effects of its activities, which in the case of students have a significant impact on their professional future and quality of professional life. In addition, the importance of soft skills is presented in various reports and analyses. Deloitte Access Economics recognizes that by 2030, 66% of all jobs will be occupations requiring soft competences (Competences..., 2022). The indicated forecast reveals how important it is to form these competences at all stages of education, and especially for those who will cooperate in teams or lead them in their future work.

The main research problem was formulated as a question: *What competences expected in the modern labor market are developed by students at the University?* The research also sought to answer the following specific problems:

- *Will studying in the field of study chosen by students allow them to acquire the competences necessary for efficient functioning in the labor market?*
- *Which competences expected in the modern labor market are not developed at the university, but according to students should be developed?*
- *What actions according to students should be taken at the university in order for students to meet the requirements of the modern labor market?*

The competences analyzed as part of the research were extracted on the basis of reports and industry articles on expected competences in today's labor market. An example of a report is *Gamma Competences of the Future*, in which the authors note the importance of such soft competences as learning, conflict resolution, creativity, teamwork, assertiveness, negotiation skills, stress resilience, ability to use technology, critical thinking, communication, relationship-building and leadership skills (Gamma..., 2020). The importance of soft skills is also presented in The Future of Jobs Report 2020. According to the report, in 2025 the most important soft competences will include: analytical thinking and innovation, active learning and learning strategies, complex problem solving, critical thinking and analysis, creativity, originality and

ingenuity, leadership and social influence, use of technology, monitoring and control, technology design and programming, resilience, ability to cope with stress, flexibility, and reasoning, problem solving and idea generation (The Future..., 2020).

The authors of the article are aware that not all soft competences were studied, but only selected competences that most often appeared in domestic as well as foreign reports.

#### 4.2. Sample structure

Diagnosing opportunities for the development of soft competences, in order to adjust educational programs to the needs of the labor market, should be carried out in each university, regardless of its nature or the courses offered. The research analyzed the competences of students of the Faculty of Management and Command at the War Studies University, which was due to the place of work of the authors of the article, as well as was related to the first stage of the research carried out, during which the research tool – a survey questionnaire – was analyzed in detail, which, after validation, will be used in subsequent stages of the research. The study was of a pilot nature. The authors of the article would like to carry out the research of students' competences periodically, which will allow to reveal the impact of changes in educational programs on students' competences.

The structure of the research sample is shown in Table 1. The research sample was characterized by six basic criteria, such as gender, age, level and type of study, field and year of study, and place of residence.

**Table 1.**  
*Sample structure*

Criterion	Responses	N	%
Gender of the respondents	Female	139	41.37
	Male:	197	58.63
Age of respondents	Up to 22 years old	206	61.31
	23-25 years	89	26.49
	More than 25 years	41	12.20
Level and type of study	Full-time undergraduate studies	177	52.68
	Full-time graduate studies	40	11.90
	Part-time bachelor's degree program	73	21.73
	Part-time graduate studies	46	13.69
Field of study*	Command and Management	123	36.72
	Logistics	153	45.67
	Aviation	59	17.61
Year of study*	I	159	47.46
	II	120	35.82
	III	56	16.72
Place of residence	village	73	21.73
	city with up to 19 999 inhabitants	29	8.63
	city with 20,000 to 99 999 inhabitants	79	23.51
	city with 100,000 to 499 999 inhabitants	17	5.06
	city with 100,000 to 499 999 inhabitants	138	41.07

\*For field of study and year of study, 335, and not 336 students, responded to the survey.

Source: Own research results.



A total of 336 students were surveyed, so 59.79% of the total number of students studying at the Faculty of Management and Command participated in the survey. This included 41.37% of women and 58.63% of men. The survey included undergraduate students, with a total of 250, and graduate students, with a total of 86. The survey questionnaire was completed by 159 first-year students, 120 second-year students and 56 third-year students. The largest group was made up of students from the field of logistics (45.67%). The remaining students studied management and command – 36.72% and aviation – 17.61%. Most of the students surveyed were residents of cities with a population of 20 000 to 99 999 (23.51%) and cities with a population of more than 500 000 (41.07%).

### 4.3. Results and discussion

Conducting a study devoted to the issue of the development of soft competences important in the modern labor market, and developed (or not) in higher education, the views of students regarding the conviction that studying in the chosen field of study will allow the acquisition of competences necessary for efficient functioning in the labor market were first analyzed (Table 2).

**Table 2.**

*Studying allows to acquire competences needed in the labor market – opinions of respondents in %.*

Responses	Field of study		
	management and command	logistics	aviation
Strongly yes	10.57	13.91	8.475
Rather yes	46.34	54.97	64.41
It's hard to say	32.52	24.50	16.95
Rather not	8.13	5.30	8.475
Definitely not	2.44	1.32	1.69

Source: Own research results.

In analyzing the results of the survey, it should be noted that the most convinced that studies allow the acquisition of competences needed in the modern labor market are students studying aviation – 72.89%. 68.88% of students majoring in logistics also shared this opinion, while the least number of students majoring in management and command (56.91%) marked an affirmative answer. Thus, one could conclude that the higher the level of specialization of studies, the greater the students' conviction about the possibility of developing, as part of their studies, competences necessary for the labor market.

The conviction that studying in a particular field of study will allow a certain pool of competences to be acquired may not only be due to the field of study a young person has taken (technical majors are more oriented towards the development of hard, rather than soft, competences). An important factor influencing students' views is also their work experience (Table 3), since a student's full conviction about whether or not he or she possesses certain competences can be verified by realizing himself or herself professionally. The very

participation in interviews, and therefore also the feedback received by students from recruiters, increases the self-awareness of young people, which translates into more critical thinking, and therefore also the possibility of more fully verifying the usefulness of the chosen field of study.

**Table 3.**

*Students' work experience*

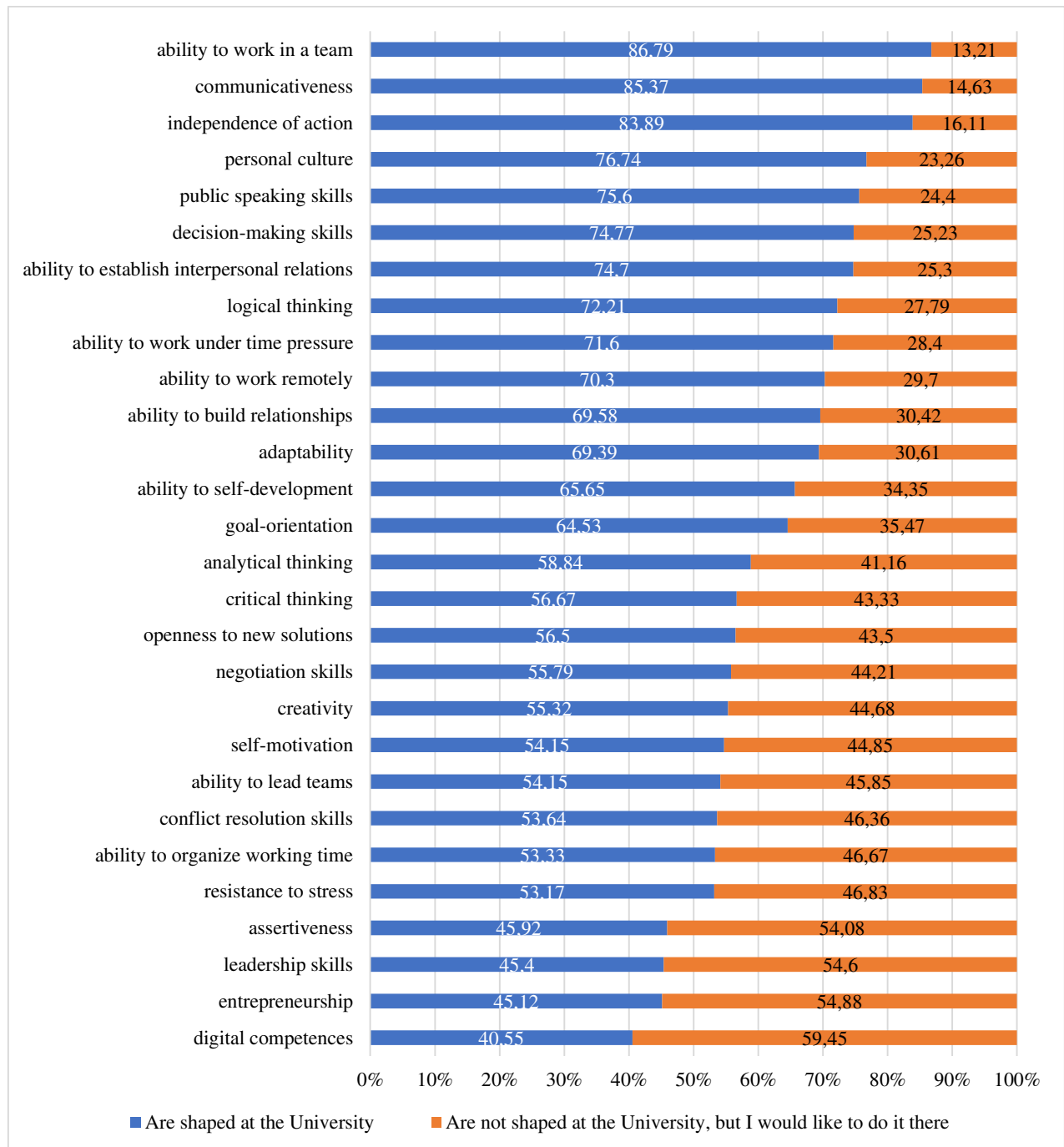
Responses	N	%
Yes, I have worked, but I am not currently working	69	20.54
Yes, I am working professionally	174	51.79
Yes, I was/am running but no longer running my own business	3	0.89
Yes, I am currently running my own business	7	2.08
Yes, only in the form of internships and apprenticeships	27	8.03
I have no professional experience	54	16.67

Source: Own research results.

The surveyed students of the Faculty of Management and Command were mostly those who were working professionally at the time of the survey – 51.79%, those who were not working but had work experience – 20.54%, those who were self-employed – 2.08% or had previous experience in running such a business – 0.89%. The respondents also included people whose work experience is related to with the implementation of internships and apprenticeships – 8.03%. A total of 83.33% of students declared that they had work experience. The fact of having work experience was an important factor that, according to the investigators, influenced the way in which soft competences shaped at the University were assessed, as well as the very need to develop those competences that are not shaped at the University.

Soft competences, as already indicated in the deliberations, are developed not only in educational institutions, but also in courses, training, during interactions with family members, peers, or colleagues at work. Some of the soft competences, such as, for example, communicativeness, resistance to stress or leadership skills are determined by personality (Robescu et al., 2020), which means that people developing the indicated competences in the same environment can achieve different results. In addition, the desire, and therefore the need to develop soft competences is very individual, resulting from the course of the socialization process, the chosen direction of education and the profession that a person would like to pursue in the future. Not all people feel the need to develop particular soft competences, which is due to self-awareness, as well as and knowledge of what competences constitute a competitive advantage for employees in the labor market and determine professional success.

As part of the ongoing research, students were asked to indicate which of the highlighted soft competences they have the opportunity to form at the university, and which competences they do not, but should be developed as part of their studies (Figure 3).



**Figure 3.** Soft competences shaped and not shaped at the University – students' opinions.

Source: Own research results.

Analyzing the results of the survey, it can be indicated that according to the students, all the competences highlighted are shaped at the University, while some of the competences should be given more attention, which shows the need for modification of educational programs. The university primarily enables the formation of such competences as teamwork (86.79%), communication skills (85.37%), self-efficacy (83.89%), personal culture (76.74%), public speaking skills (75.6%), decision-making skills (74.77%), interpersonal relationship skills (74.7%), logical thinking (72.21%), ability to work under time pressure (71.6%) and ability to work remotely (70.3%). More attention, on the other hand, is needed to develop digital

competences in particular - 59.45% of surveyed students indicated that they do not develop these competences. 54.88% indicated the need to develop entrepreneurship, which may also be related to the experience of some students in running their own businesses, or the desire to open such a business after graduation. Interestingly, 54.6% of students see the need to develop leadership skills, which is probably related to their desire to hold leadership positions in the future. Students also indicated the need to develop such competences as assertiveness (54.08%), resistance to stress (46.83%), ability to organize work time (46.67%), ability to resolve conflicts (46.36%), leading teams (45.85%), etc.

The analysis of the survey shows that students recognize the need to develop soft skills, as indicated by their desire to improve the highlighted competences. Development in the indicated areas would allow students to be better prepared to function in the modern labor market, enable them to apply for more prestigious jobs, as well as increase students' sense of professional attractiveness, thereby increasing their self-esteem.

In order to complete the explored issue, the research also analyzed the actions that the students believe the University should take in order to even better prepare young people to meet the demands of the labor market (Table 4).

**Table 4.**

*Actions that universities should take in order to prepare students to meet the demands of the labor market*

Responses	%
provide students with professional career counseling	64.07
increase the scope of cooperation with entrepreneurs in the form of traineeships/internships offered by the university	56.29
develop the offer of the career office – to support students in the process of job search	45.51
pay more attention to language competences	41.14
pay more attention to the formation of soft competences of students	30.84
pay more attention to the formation of hard competences of students	30.84
increase the employment of practitioners as lecturers	27.84
pay more attention to digital competences	26.65
increase the number of hours of practical classes	21.56
increase the competence of the university's teaching staff	18.86
increase the number of hours of mandatory traineeships/internships	7.78
other	2.40

Source: Own research results.

In order to meet the demands of the modern labor market by students, higher education institutions should undertake various activities, the implementation of which in both the modification of educational programs, the development of the competence of teaching staff, increasing the scope of cooperation with employers, or expanding the offer of career offices and career counseling, will allow to enrich the competence and increase the level of self-awareness of students. As part of the survey, 64.07% of students indicated that they perceived the need to receive support in the form of professional career counseling at the University. Offering career counseling would allow students to take part in a professional assessment of their potential, identify directions for development in line with their profile and

competence/personality predispositions, or prepare for professional challenges. The second measure indicated, according to the students surveyed, is to increase the scope of cooperation with companies in the form of traineeships/internships offered by the university – 56.29%. Developing the university's cooperation with companies, and therefore enriching the offer of traineeships and internships supervised by the career office, would make it possible to support students in taking their first steps in the labor market. Currently, the Faculty of Management and Command engages in cooperation with various companies, which results in consulting on the implementation of changes in educational programs, or offering especially the best students internships and graduate traineeships, but this offer cannot be used by all willing students. Cooperation in the modification of educational programs is very important, as the so-called external stakeholders indicate precisely during consultations what areas of competence they think should be developed at the University, which also results from their staffing needs. 45.51% of students also indicated that they perceive the need for support from the career office in the job search process. This support could take the form of courses and training in, for example, self-presentation, how to deal with job interviews, drafting a visually attractive and substantive resume, or using recruitment portals (setting up accounts, updating information about work experience, etc.). It should be noted that as part of the survey, an additional 7.78% of students revealed the need to increase the number of mandatory internship hours. Currently in the Faculty, students are obliged in the second year of study to carry out a student internship of 120 hours. This internship is mostly carried out during the summer vacation period. Increasing the number of hours of mandatory internship, for example, already after the first year of study, would enable students to face the challenges of the labor market more quickly, and thus acquire important professional experience that could form the basis for further professional orientation – the choice of major or additional subjects (faculties).

Meeting the demands of the modern labor market is currently not fully possible without having language competences. The need to develop these competences was indicated by 41.14% of the students surveyed. Students at the Faculty develop foreign language skills as part of curricular activities, they have the opportunity to choose a foreign language faculty, as well as a free choice subject taught in English. However, these classes do not end with the passing of any certificate, which the university should consider as an action worth introducing. Such a change would allow students to acquire an additional qualification and perhaps mobilize them to put more effort into learning languages.

Interestingly, the same percentage of students surveyed – 30.84% – declared the need for the Faculty to pay more attention to the development of both soft and hard competences. Perception of the need to develop both groups of competences shows that students are aware of their competency gaps in this area, which is probably due to both accumulated professional experience and feedback received from teachers in the educational process. The need to develop digital competences was indicated by 26.65% of the respondents, and 21.56% indicated the need to increase the number of hours of practical classes.

The surveyed students also indicated that the development of their competences is determined by increasing the employment of practitioners as lecturers (27.84%) and increasing the competence of the university's teaching staff (18.86%). It should be noted that, especially during the period of remote learning, the need to raise the competence of teaching staff was perceived, while the employment of practitioners is seen by students as an opportunity to develop their competence, which is probably also due to the participation of students in the so-called *Practical Management Workshops*. As part of these meetings, eager students participate once a month in classes conducted by representatives of various companies, who present real problems they face in their organizations and ways to overcome them.

## 5. Summary

Shaping soft skills, required in the modern labor market, and therefore constituting students' professional opportunities, is an important task facing universities. Activities aimed at identifying development needs, including those resulting from changes in the labor market and the requirements of organizations (Midhat Ali et al., 2021), allow for intentional shaping of educational programs, which translates into the level of competence of university graduates.

As part of their research, the authors aimed to reveal the competences expected in the modern labor market and developed by students at the University. The research shows that students develop all the highlighted soft competences important from the perspective of the modern labor market at the University. The respondents' answers regarding competences developed and not developed at the University varied. This leads to the conclusion that there is a need to modify the educational programs in order to pay more attention to the development of those competences that were indicated by the majority of respondents as needing development. Digital competences, leadership skills, assertiveness, resistance to stress (Kim, Jung, 2022), ability to organize work time, ability to resolve conflicts, or ability to lead teams are key competency areas in need of improvement. The need to improve competences can also be confirmed by referring to the students' responses in terms of their conviction that studies allow them to acquire competences necessary in the modern labor market. Such an opinion was expressed by 72.89% of the surveyed students studying aviation, 68.88% of students from the logistics faculty and 56.91% of students from the management and command faculty. The need to develop the highlighted competences stems both from the students' professional experiences (83.33% of students declared such experiences) and their understanding of the labor market situation.

Above all, students need support from the University in the form of career counseling, offering internships and apprenticeships in cooperation with various organizations, increasing the offer of the career office, or paying more attention to the development of language

competences. The indicated activities would help better equip students with the competences required in today's labor market, thereby making it easier for students to enter the labor market.

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## BARRIERS TO INNOVATION IN WAREHOUSE MANAGEMENT – CASE STUDY

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**Purpose:** The purpose of this paper is to identify and analyse the barriers to the implementation of innovation in a logistics service provider in the area of warehouse management.

**Design/methodology/approach:** The process of identifying and analysing barriers consisted of several stages. The first stage was a literature search to carry out a classification of innovations in logistics services and to develop a set of potential barriers to their implementation. The second and third stages were carried out through a case study. In the second stage, barriers to implementing lean projects were identified and analysed, while in the third stage, barriers to implementing other innovative projects were identified and analysed.

**Findings:** The result of the work is a set of barriers to the implementation of innovation in logistics services together with their relation to the type of innovation.

**Research limitations/implications:** The empirical research was based on a single case study. This organically represents the results obtained and does not allow them to be related to all logistics operators.

**Practical implications:** The research carried out provides recommendations on approaches to creating and implementing innovations for other logistics operators by inferring from the barriers that hindered the implementation of innovations.

**Originality/value:** This paper supports existing research on innovation in logistics services by building a set of barriers to their implementation. The focus of the research on innovation in warehousing services is justified by the contemporary demand for these services and also by the need for continuous improvement of warehousing services in supply chains.

**Keywords:** innovative logistics services, barriers to innovation implementation, logistics operator, logistics 4.0, warehouse management, smart warehouses.

**Category of the paper:** Research paper.

## 1. Introduction

Warehousing is the most visible process in the entire supply chain. In recent years, the demand for warehouse space in Poland has been growing and the warehouse market is facing the challenge of meeting the increasingly demanding needs of the customer and the end user. At the end of Q1 2023, the total stock of modern warehouse and industrial space in Poland approached the 30 million sq m mark, exceeding 29.9 million sq m, an increase of 19.3 per cent compared to the same period in 2022. New supply in the first three months of this year totalled more than 1.9 million sq m, the highest quarterly figure in the history of the Polish warehouse market, surpassing the previous record set in Q1 2022, when developers delivered 1.25 million sq m. At the end of March 2023, the volume of warehouse and industrial space under construction stood at 2.1 million sq m, 38% less than in Q4 2022 and more than 55% less than in Q1 2022 (Polski rynek...). At the same time, the development of new processes within the warehouse service such as co-packing, co-manufacturing and also the handling of e-commerce orders, which are supported by warehouse management systems, is observed.

Trends emerging in the TSL sector are prompting logistics companies, including logistics operators providing warehouse services, to implement modern solutions, the most eye-catching of which are the development of information and IT technologies and the desire to build cooperation with the customer and other companies on the market. The warehousing industry is dominated by the e-commerce sector. More and more companies are investing in the development of multi-channel services, a trend that poses new challenges for logistics companies operating such distribution systems.

Companies that want to be considered innovative will improve their processes by following these trends. Implementing innovation into a company involves overcoming many barriers based in the external environment (market, systemic/regulatory, technological, competence, financial), but also within the company (human, financial, technological/technical, structural).

Considering the challenges posed to logistics companies providing warehousing services and the problems of implementing innovation in logistics services, the focus of this paper is on identifying the barriers to the implementation of innovation by a logistics operator in the area of warehouse management. To this end, a literature study was conducted on innovation in warehouse management and the barriers to its implementation. This was followed by a case study of one logistics operator and analysed the innovations implemented in the period 2018-2022, identifying the reasons why innovative ideas were not implemented.

## **2. Process innovations in the warehouse management of logistics companies**

### **2.1. Warehouse management of logistics companies - challenges**

Logistics service providers in recent years have not limited their activities to simple transport, forwarding and warehousing services, but have developed their activities to include more complex services that create additional value for the customer through the synergy of many activities (Tunak, 2017). The role of the warehouse is therefore also changing and expanding to include additional activities and processes. There are seven main trends leading to the development of warehouse management (Fajczak-Kowalska, 2017):

- Changing the role of the worker from direct execution of operations to giving instructions and controlling the operation of equipment.
- Automation of processes to improve workflow and reduce costs.
- Introduction of information technology and mobile devices to improve the work and quality of operations.
- Development of Internet E-commerce sales and the associated adaptation of the warehouse to ship shipments to the individual customer.
- Ongoing access to stock-related information, e.g. stock levels.
- Improvement of planning systems.

These trends are superimposed on the growing needs reported by customers of logistics service providers (Winkelhaus, Grosse, 2020; Facchini et al., 2020, Richards, 2022):

- Customization and ancillary services including, for example, co-packing.
- High reliability of flows.
- Resistance to interference.
- Flexibility to respond to non-standard orders.
- Safety.
- Handling supply chains 4.0.
- Managing an increasing number of small shipments and fulfilling more frequent orders.
- Handling returns.

In addition, logistics organisations are being challenged with sustainable flows, green logistics of social responsibility.

There is a lot of competition in the 3PL logistics operators market, so the struggle is not only based on creating low prices, but also on undertaking diverse activities aimed at increasing one's position on the market (Bartczak, 2014). Companies offering end-to-end logistics services strive to create systems characterised by high complexity and uniqueness aimed at meeting customer requirements (Gąsowska, 2016).

In order to create a competitive advantage, service providers set themselves various economic, social and environmental goals to balance the development of the enterprise. In the case of companies with many customers, this process can be very complicated due to the diversity of customer requirements and, in the case of multinational companies with operations in different countries, e.g. legal regulations (Bąkowska-Morowska, 2015). To meet all these challenges, logistics companies need to improve both their transport and warehousing processes.

Both the warehouse infrastructure and the ways of managing all the processes in the warehouse, in response to the trends and challenges indicated, are constantly changing. Innovative technologies, the drive to automate every process occurring in the warehouse from reception, through storage, picking to the moment of withdrawal from the warehouse, guarantee new opportunities for companies, and innovative equipment allows warehouse solutions to be adapted in such a way as to ensure the highest possible benefit for the end customer.

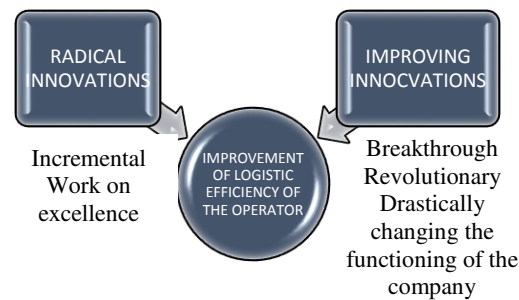
Among the technological trends in warehouse management, the most frequently mentioned are (Simis, 2023):

- Wearable technologies - mobile devices that can be worn by the user and used to provide real-time insight into stock and availability data, support the execution of warehouse processes and optimise delivery and distribution processes.
- Augmented reality, which is used to optimise warehouse processes. The use of such a solution makes it possible to increase productivity by freeing the worker's hands and providing information about obstacles in the warehouse.
- Ability to access data on an ongoing basis - real-time access to inventory is a prerequisite for effective warehouse management.
- Three-dimensional (3D) space in the form of spatial visualisation of data, which allows for the optimisation of internal and external processes.
- Picking technologies, including voice and light picking technologies, which are being used by an increasing number of companies providing warehousing services. The solutions improve order preparation productivity and prevent picking errors.
- Identification of goods in logistics systems, including in particular the use of RFID technology and improvements in barcode technology (improved scanners and interfaces).

## 2.2. Types of innovation in the warehouse management of logistics companies

The definition of innovation according to J. Schumpeter (1934), where innovation is interpreted as the introduction of a new product or products with new properties to the market, the introduction of a new production method and a new technological process, the opening of a new market, the acquisition of new sources of raw materials, the carrying out of a new organisation of some industry, is characterised by a wide scope, referring to practically every field of activity of the enterprise. According to Pomykalski (2001), innovation is understood as a process covering all activities related to the creation of an idea, the creation of an invention, and then the implementation of a new or improved product, process or service. There are various interpretations of innovation (Pomykalski, 2001). Thus, in a narrow view, innovation can be equated with an invention that finds a specific application (Janasz, Kozioł, 2007). On the other hand, in a broader view, innovation is interpreted as a complex management process involving a variety of activities aimed at creating, developing and introducing new value in products, new combinations of means and resources (Białoń, 2012). In a broad sense, innovation also includes the transfer of these values to existing or new market partners, and may also be the result of collaboration between a group of companies (Oke, 2007). An important aspect of enterprise innovation is the implementation of such improvements that create new value from the customer's point of view, which in the case of logistics enterprises translates into changes in both the infrastructure and the processes themselves (Gąsowska, 2016). The innovation space in which a company operates has four dimensions (4Ps): product innovation, process innovation, positioning (position) innovation, paradigm innovation (Tidd, Bessant, 2011). The first two types can be defined as innovation in the traditional, narrower sense, while the last two types should be interpreted as innovation in the modern, broader sense. A product innovation is called a new or significantly changed product in terms of technical specifications, materials used, embedded software, etc. (Gąsowska, 2016). Process innovation refers to changes in product manufacturing methods and delivery methods, and includes technology, machinery, equipment and software. Although the definition of innovation varies, researchers point out that its intrinsic characteristic is novelty, which makes it an important determinant of development (Romanowska, 2016).

From a logistics point of view, innovation is expressed in the introduction of new logistics processes or services aimed at meeting customer needs (Cichosz, 2016). A logistics enterprise that manages innovation correctly therefore focuses on customer value, working with the customer in this respect and being future-oriented, which involves a process of continuous improvement and learning (Flint et al., 2005; Cichosz, 2016). Each type of innovation can be seen as radical or improving (Grawe et al., 2009; Cichosz, 2016) (Figure 1).



**Figure 1.** Breakdown of innovations by speed of change.

Source: own work based on Cichosz, 2016, p. 3.

Smart warehouses are the answer to the challenges posed to logistics operators. They must have an extensively developed information communication system and also have the capacity to efficiently manage warehouse resources by sensing the states both inside and outside the warehouse. This is possible thanks to the use of solutions that continuously control the operation of every system in the warehouse, from automated operations to communication systems between workers in the company and warehouse control systems such as ventilation, power supply to the warehouse, lighting or anti-theft systems (Zhen, Li, 2022).

Based on trends in warehouse logistics and the level of development of the technology currently used in warehouses, it is possible to create a picture of the warehouses of the future, which will use solutions geared towards (Richards, 2017):

- Eco-innovation, including modern energy supply technologies based on renewable energy sources, solutions supporting the development of flora and fauna ecosystems.
- Personalisation of the logistics service.
- Elimination of barriers to last mile transport.
- Omni-channel service with the same service standards across all channels.
- The use of machine learning, among other things, in handling returns and complaints.

Alongside automation, the most visible trend in warehouse development at the moment is digitalisation, i.e. scanning data, reducing it to information through machine processing, data transfer and the dissemination of knowledge online (Simic et al., 2023). Innovation can be applied at various levels, from the design of the warehouse itself to tools and warehouse management systems.

Industry 4.0 standards in warehousing refer to the use of modern technologies and solutions to automate warehouse processes and increase efficiency. Some of the more important Industry 4.0 standards in warehousing are:



- Interoperability: allows different systems and equipment in the warehouse to be easily interconnected, thus automating warehouse processes and increasing efficiency.
- Cyber security (Cheung et al., 2021): provides protection for data and storage systems against cyberattacks.
- Process transparency: makes it possible to track and analyse warehouse processes, thereby improving efficiency and service quality.
- Data analytics (Andiyappillai, 2019): allows data on warehouse processes to be collected and analysed for better warehouse management.
- Process automation: using industrial robots, automation systems and IoT to automate warehouse processes.

Robots, becoming faster and cheaper, are taking over repetitive warehouse processes such as picking and packing (Zhang, 2022). Typically, robots of this type are equipped with a gripping arm, a 3D scanner and a camera system for navigation through the warehouse, as well as additional software that is integrated with the internal WMS (Wang, 2022). An example of the use of automation solutions in the warehouse process is a mobile robot moving between racks. Robots are also the most effective tool to ensure the smooth circulation of goods between the receiving area, the storage area and the release area. Autonomous Mobile Robots (AMRs) are already being used in the warehouses of many companies. These machines are able to perform various tasks and move autonomously without interference. They provide greater precision and reliability and rapidly increase productivity (Hercik et al, 2022). Advanced automation and robotisation solutions can also be installed in picking vehicles. Equipped with software, sensors and laser scanners, the truck automatically recognises and tracks the operator, analysing the warehouse area, the operator's position, other people and obstacles in real time. The automation and robotisation of warehouse processes contributes to improved comfort and safety at work, makes it possible to work in a 3-shift system, increases efficiency, as well as reducing labour costs and increasing the competitiveness of the company (Azadeh et al., 2019). The concept of Industry 4.0 is reflected in high-bay warehouses, which are an advanced form of warehouse automation, where the role of forklift operators is taken over by warehouse stacker cranes handling pallets on racks up to 40 metres high (Trzop, 2020). Another automated solution found in warehouses are Pick-by-Voice, Pick-by-Point, Pick-by-Light, etc. systems. Pick-by-HoloLens is a picking support system that uses interactive glasses. Using augmented reality, this system presents information to the worker about the products and where they are stored by means of a hologram (Cieśliński et al., 2022). Beacon technology is a micro-device, equipped with a Bluetooth Low Energy transmitter and appropriate software, which can be used in the order picking process and determine the fastest route for the trolley. Beacons can also support inventory work in the warehouse. These devices are relatively energy efficient, small in size and can communicate with almost any smartphone, tablet or laptop, allowing the construction of a network that supports a wide range of warehouse operations and fits in with the trends of the Internet of Things (Min, 2023). Also important in logistics 4.0 is

the concept of big data, which plays a key role in warehouse management for inventory management (Manyika et al., 2011). Big data analytics in warehouse logistics offers tangible benefits to companies that use the vacancy method or have implemented a cross-docking strategy for intra-warehouse cargo handling. In both cases, it leads to a more accurate planning of the assumed throughput and the resources needed for efficient warehouse processes. Big Data also improves the design of efficient routes in warehouses, minimising the fuel or energy consumption of forklifts, drones and other vehicles used in intra-warehouse transport. Most devices enabled by the Internet of Things do not have much in the way of data collection and processing capabilities, so the solution has become cloud computing, which is accessed simultaneously by personal (including mobile) devices with significant processing power (computers, tablets, smartphones) equipped with specialised applications (Sharma, Panda, 2023). The cloud is often the backbone of IT systems in many enterprises, and is the unifying factor between the technologies of the SMAC architecture: social networking (Social), mobile devices (Mobile), advanced analytics (Analytics) and cloud computing (Cloud). These elements enable the company to exploit synergies by communicating with each other. Cloud computing has gained an extension in the form of fog computing. Fog computing has bridged the gap between remote data resources accessible via the Cloud and Internet of Things devices, in industrial environments that generate large amounts of diverse data that must then be processed quickly. It provides internet-connected devices with a certain buffer of autonomy and the processes carried out with security (Szymczak, 2015). In this way, it is possible to design a comprehensive warehouse management system, integrating the functionality of an inventory management system and a warehouse management system (Ding, 2013). It provides the possibility of managing resources in real time, with detailed information about their quantity, type, date of production or expiry date; it also makes it possible to control storage conditions and analyse the efficiency of storage processes, such as reception, storage, packaging or issuing, carried out using automated internal transport devices, handling equipment, stacker cranes or robots. The solution can also be used to optimise storage space utilisation (Nowicka, Szymczak, 2020), stock rotation, duration of operations, damage and error rates.

### **2.3. Barriers to innovation**

Rapid progress carries the risk of increasing barriers to the creation and implementation of innovations, resulting, for example, from a lack of necessary financial reserves or from a mismatch between the designed innovation and customer requirements. Another, most frequently repeated factor inhibiting the implementation of innovations is the human factor, i.e. the resistance/unwillingness of employees to change and the associated need to adapt to new working conditions (Fajczak-Kowalska, 2017).

Surveys conducted by the Central Statistical Office in 2012-2014 showed that about  $\frac{3}{4}$  of enterprises from the industrial and service sector that did not implement innovative solutions into the enterprise cited as the main cause the lack of a sufficient reason to introduce innovation. The remaining  $\frac{1}{4}$  of enterprises declared that they had thought about implementing innovative solutions but the barriers proved too difficult or impossible to overcome (Działalność innowacyjna..., 2015).

Barriers to innovation fall into two categories:

- External barriers that arise outside the company.
- Internal barriers that arise within the company implementing the innovation solution.

The barriers that may occur both before the start of an innovative project and during its implementation are presented in Table 1.

**Table 1.**

*Potential Barriers occurring during the implementation of innovative solutions*

External	Market	Low or uncertain market demand for innovative solutions
		Limited market for high-tech innovation in Poland
		Small number of customers trusting innovative solutions from Poland
	System/regulatory	Too many laws and regulations that are often subject to change and ambiguous in their interpretation
		Outdated legislation unsuited to a modern economy, not adapted to the development of innovation
		Lack of a long-term economic development concept for innovation activities,
		Lack of a system to foster the development of innovation knowledge in enterprises
		Lack of state and regional policy support for regional innovation systems.
		Support mechanisms too bureaucratic
		Underdeveloped regional innovation systems in Poland
		A system that provides limited support for innovation activity
	Technology	Insufficient development of innovative infrastructure
		Insufficient technology transfer
	Competence	Limited public administration support due to unfamiliarity and ambiguity of regulations and lack of business experience of people working in innovation centres.
		Misunderstanding of the strategic importance of innovation
	Financial	Difficulty or inability to raise funds for innovative activities due to the reluctance of banks to lend for such investments
		Lack of a funding system for innovative activities
		Overly complex credit procedures
		Bureaucracy involved in obtaining funding
Investors focused on short-term investments		
Other	Lack of partnership approach on the part of the customer	
	Customer disapproval	
	Low level of trust between individuals	

Cont. table 1.

Internal	Human	Employees' approach to implemented innovations	Employee and organisational opposition to change
			Fear of redundancy or redeployment
			Fear of changing job requirements
			Uncertainty about the future
			Risk of changes affecting the personal interests of some employees
			Misunderstanding of the changes being implemented
			The sense of loss associated with changes in the work process that affect the modification of social ties between employees.
		Perception of change as a lack of respect for the achievements of predecessors	
		Employees' perception of the changes introduced as an unnecessary adjustment to a well-functioning process	
		Creating innovative ideas	Failure to recognise development potentials/opportunities in the surroundings
			Lack of willingness to learn
			Not showing creativity for fear of criticism
			Low employee self-esteem
			Feeling uncertain about the usefulness of one's own ideas
	Perceiving one's actions as not useful		
	Reluctance to take any action that might cause a disruption to the sense of stability (risk aversion)		
	Sceptical approach to customer information		
	Knowledge/competences	Lack of management knowledge of company processes	
		Lack of management awareness of opportunities to build competitive advantage through corporate innovation	
		Lack of or inadequate pro-innovation management	
		Lack of management competence in relation to innovative solutions	
		Shortage or lack of staff qualified to implement innovative projects	
		Lack of marketing knowledge and skills	
		Lack of economic knowledge and skills	
		Lack of knowledge or insufficient knowledge of the market	
	Lack of knowledge or insufficient knowledge of new technologies		
		Communication	The use of complex terminology, or terminology known only within a particular unit, that is not understood by all employees
Failure to respect the stratification / levels present in the company in communication			
Financial		Significant costs of implementing innovations	
		Too little profit for the company derived from the implementation of the innovation	
		No dedicated innovation funding, innovation funding from profit only, innovation funding from profit only,	
		Economic risks	
		Lack of funds for employee training in connection with the implementation of innovations	
Technological/technical		Lack of adaptation of research and development units with adequate infrastructure	
		Lack of infrastructure to implement innovative projects	
Structural		Lack of a unit responsible for research and development and the implementation of innovations	
		An enterprise based on archaic organisational structures and outdated stereotypes of thinking	
Other		Too long a payback period	
		Too much time needed for an innovation project	
	Imposed time constraints on project implementation		

Source: own work based on: Drozdowski, Zakrzewska, Puchalska, Morchat, Mroczkowska, 2010, pp. 113-114, 117-118; Penc, 2003, pp. 338; Cyran, 2016, pp. 204-205; Larsen, Lewis, 2007; Kraśnicka, 2013, pp. 165-179.

A company that is able to manage innovative projects in the right way can limit the emergence of barriers and, when they occur, reduce their impact on project implementation to a minimum. All innovations implemented in a company should be treated as a natural factor in building the company's advantage on the market (Penc, 2003).

### **3. Methodology**

The barriers to innovation implementation identified in the literature research were analysed in a company providing logistics services. This company is an international logistics operator, which for more than 50 years has been offering a wide range of activities in the field of warehousing services extended by copacking, comanufacturing and e-commerce processes, transportation and distribution both domestically and internationally, as well as supply chain management for both manufacturing and distribution customers.

The offer of the warehousing service is based on the company's own network of storage and cross-docking points. The company offers the performance of basic warehousing processes (receiving, storage, picking, delivery) tailored to the requirements of the individual client, which can be extended to include additional services such as customised packaging, copacking and packaging of raw materials or semi-finished products into finished products (comanufacturing). The logistics facilities are equipped with advanced WMS warehouse management systems, which guarantee constant control over inventory, prevent errors and streamline all the processes taking place in the warehouse.

In order to best adapt its activities to the requirements of the market, the company is constantly expanding its storage areas through the construction of new facilities equipped with innovative solutions, cooperating in this respect with a company operating in the field of structural engineering.

The operator has more than a dozen storage points and transshipment hubs in Poland. Depending on the location, each of the logistics points serves a different market sector and therefore different brands are stored in each warehouse.

The empirical research, consisting of two stages, analysed the reported innovation ideas over a period of four years. The innovation ideas were classified according to the assumptions indicated in the literature research (research stage 1). Barriers to implementation were assigned to each innovation. The analysis was separated into projects that were a consequence of Lean implementation (research stage 2) and other innovation projects in warehouse management (research stage 3).

The logistics operator has introduced the Lean philosophy into the company. Most of the ideas implemented in the company are carried out on the basis of suggestions made by employees in the various warehouse departments and recorded on Lean boards distributed throughout the company. The ideas are divided into two types:

- Immediate action - the idea is implemented immediately by one or more people delegated to carry out the idea without appointing a working group.
- CI project (Continuous Improvement) - an idea requiring more extensive activities (investments, tests) by a working group assigned to this task. The realisation of the idea often requires contacts with other departments of the company, higher levels of the organisation's management as well as other divisions of the company, these projects often initiate the innovation activity of the company.

## 4. Research results

### 4.1. Analysis of barriers to implementing Lean ideas

Between 2018 and 2022, 608 ideas have been submitted for improvements to warehouse processes in nine departments located on the warehouse site. Each of the projects can be given one of four statuses during or after the project launch process:

- Rejected - idea rejected.
- Pending - an idea in the pipeline.
- Suspended - project implementation temporarily or completely suspended.
- Implemented - project completed.

The progress of each project is monitored on an ongoing basis and its status during the course may change.

Table 2 shows the breakdown of projects by assigned status taking into account the period from 2018 to June 2022. The largest number of ideas, 41.9% of the ideas from the entire analysed period were submitted in 2018. In each subsequent year, the number of ideas submitted under the Lean boards decreased. The largest decrease in the number of projects compared to the previous year occurred in 2019, with 116 fewer improvement ideas submitted in this period than in 2018. In the last year analysed, the number of ideas submitted accounted for only 3.6% of the total sum of the total number of projects, but this is due to the fact that only the period from January to June 2022 was taken into account.

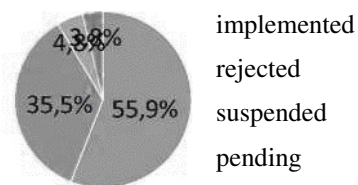
**Table 2.**

*Number of projects by status from 2018 to 2022*

Year of application	Status				Total
	Implemented	Rejected	Suspended	Pending	
2018	135	110	10		255
2019	88	46	5		139
2020	53	49	8	4	114
2021	50	10	6	12	78
2022	14	1		7	22
Total	340	216	29	23	608

Source: Own work based on company materials.

The pie chart (Fig. 2 ) shows the percentage of the sum of the different statuses of the ideas during the period under analysis. More than half of the ideas proposed (55.9%) were implemented and more than one third of the ideas were rejected. The lowest percentage is represented by ideas in progress (3.8%) of which the majority (12) are ideas that started to be implemented in 2017, but it is worth noting that four of the problems proposed in 2016 with a pending status have not been solved so far. Considering the total number of ideas that did not live to see implementation (i.e. rejected and suspended), they represent 40.3 % of the total number of ideas submitted for implementation. The reasons for the rejection and suspension of ideas will be presented later in the analysis.



**Figure 2.** % share of each status in the total number of projects.

Source: Own work based on company materials.

Figure 2 provides a visualisation of the number of Lean ideas by assigned status considering the period from 2018 to June 2022.

Analysing the statuses by year, it can be seen that the highest number of ideas (39.7%) in the analysed period was implemented in the first year. From year to year, the number of ideas implemented at the logistics operator decreased. This situation is due to the fact that the number of areas in the company that require improvement is decreasing, which illustrates the fact that the company is achieving more and more specialised work and process excellence. In each year, the number of projects implemented exceeded the number of projects rejected. In 2020, 43.0% of the projects submitted were rejected, almost equalling this result with the number of projects implemented (46.5%). From 2021 onwards, there is a trend towards a decrease in the percentage of rejected projects in relation to the projects submitted in each year. In 2021, only 12.8% of ideas submitted were rejected and in 2018 - 4.5%.

In order to best identify the factors influencing the non-implementation of an idea, all projects in the rejected and suspended categories (245 ideas) were analysed and implementation barriers were identified on this basis. Table 3 shows a breakdown of the identified barriers by source of barrier formation and type of barrier, taking into account the number of individual barriers in each year. Taking into account the source of origin of the barriers, the sources were distinguished:

- External - barriers that do not result from the logistics operator's actions but come from outside the company.
- Internal - barriers that are the result of actions and decisions taken within the company.
- Other - these are not strictly barriers but rather other reasons for not implementing an idea.

Each of the 18 barriers originating outside the enterprise was assigned to one of seven types of barriers divided into legal barriers, health and safety barriers, barriers related to the availability of the product on the market and the customer of the logistics operator. Each of the 51 barriers originating from inside the enterprise was assigned to one of twelve barrier categories. For twenty-two projects (8%), insufficient data were obtained to identify barriers to implementing solutions into the enterprise (these ideas were categorised as other).

**Table 3.**

*Barriers to implementing Lean projects in the warehouse management of a logistics operator*

Source of barriers	Type of barrier	Barrier to implementation	year of application					Final total
			2018	2019	2020	2021	2022	
External	OHS	The solution will not increase safety or convenience of work		1				1
		A solution that does not comply with health and safety rules	1		1			2
	Decision-making - customer	Lack of acceptance of the project by the customer			2			2
		Failure to take action by the customer	1					1
		The customer does not need such a solution	1					1
		The customer does not agree with the solution	2	2				4
		Customer does not agree with solution - solution does not work	1					1
	Operation at the customer's premises	There is no possibility of solving the problem on the customer client side	1		1			2
		Problem solving on the customer side	1					1
	Customer communication	Limited communication with the customer	2					2
		Failed negotiations	1					1
	Legal	No possibility of amending the contract during its term			1			1
		HACCP regulations		1	1			2
		Solution rejected due to legal constraints	2					2
		Change in nationwide procedures	1					1
	Product	Lack of availability on the market of products with the required parameters			2			2
	Customer requirements	Solution applicable only to special benefits			1			1
		Solution not adapted to customer requirements	3	1				4
Internal	No proposal to solve the problem		1		1		2	
	No project leader	No person willing to lead the project		1			1	
	Temporary	Waiting too long to implement a solution	1	1		1		3
		No cost-effective solution - manual application equals automatic application	1					1
	Financial	Unviability of the solution due to lack of customer volume		1				1
		Too little savings from introducing a solution	2					2
		The cost of implementing the solution is too high	10	4	4	2		20
		Too high cost of introducing the solution, too low savings from introducing the solution			2			2
		Moving away from the old system - investing in changes to the old system generates unnecessary costs			1			1
	IT	Lack of features in the new version of the system	1	1				2
		Lack of adaptability of the system	4		1	1		6
		Solution rejected during testing, solution will not work					1	1



Cont. table 3.

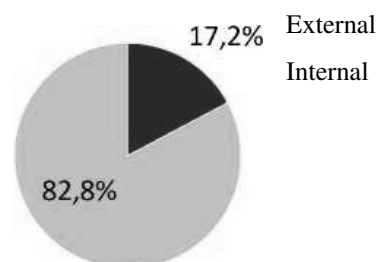
	The introduction of the solution will negatively affect the implementation of processes	1				1
	Problem not solved	1				1
	No IT solution possible	4	5	4		13
	The introduction of the solution will adversely affect the operation of the system			1		1
Internal communication	Lack of decision-making on project implementation	1	1			2
	No response to project enquiry	3		1		4
	No response to project enquiries from individual departments	1				1
	Insufficient information to implement the project		1			1
	Unfamiliarity with the subject due to absence of the reporting employee		1	1		2
	Limited communication on project implementation	2	2	1	4	9
	A problem with the transfer of information between departments	1				1
Theft	Inability to implement the project due to risk of theft by outsiders			1		1
Solution rejected by vote	Solution rejected by the working group	1	3	4		8
	Solution rejected by superiors			1		1
	Solution rejected in staff vote	1	1	4		6
	Solution rejected at the meeting of the Company Social Benefits Fund	1				1
	Solution rejected by the HR department	1	1	1		3
Organisational	No solution possible	3	1	1		5
	Need to reorganise the warehouse				1	1
	Not viable due to elimination of the existing permanent solution	6	1	2		9
	Project not cost-effective with current configuration of process execution at warehouse	1		1		2
	The proposed solution adversely affects current processes	1	2			3
	The solution cannot be introduced during high activity	1				1
	The solution cannot be implemented in just one location - it must be implemented across the entire enterprise			1		1
	Resolving the problem by returning to the previous solution		1			1
	The introduction of a solution may result in a decrease in the process quality indicator			1		1
	The introduction of the solution may result in a disruption of the process	1				1
	The introduction of the solution may result in changes to the process standard	1				1
	Problem with traceability of several receptions on one document	1				1
	Implementation of the idea will negatively affect the flexibility of the warehouse		1			1
	The need to redefine process specifications within the organisation		1			1
	Solution deemed insufficient	1				1
Echnical	Inability to match technical infrastructure	3				3
	Lack of adaptability of the solution to specific work tools		1			1
	No installation of the solution			1		1

Cont. table 3.

		No solution possible	2	2	3	2		9	
		No solution for all types of products		1				1	
		Project causes damage to storage infrastructure			1			1	
		The proposed technical infrastructure has a shorter life cycle than that used to date		1				1	
		Solution tested - does not work	2	1				3	
	Ergonomics at work	Implementation of the project will worsen working conditions in terms of human physiological capacity			1			1	
Other	Anomaly		3	1		1		5	
	No data available		17	2	3		2	2	
	Action taken in another project		15	8	6	1	0	3	
	Incorrect execution of the process	Incorrect execution of actions in the system		1	1				2
		Failure to comply with standards		3					3
		Unfamiliarity with the process on the part of the employee					1		1
	Problem verified - unsubstantiated report (everything is working fine)		3	2	2			7	
	Solution out of date	Introduction of a solution not justified due to customer abandonment		1					1
		Introduction of a solution not justified because the problem is time-barred					1		1
	Rare disruption		6	3				9	
	Use of an alternative solution		8	1	4	1		4	
Final total			134	60	63	17	1	275	

Source: Own work based on company materials.

An analysis of the number of barriers in terms of the source of constraints on the implementation of ideas showed that 82.8% (5/6) of the barriers arise from within the company and only 1/6 of the ideas are not implemented by the influence of factors pushing from outside the company (Figure 3), indicating that in most cases it is the company's activities that influence the limited development of the logistics operator.

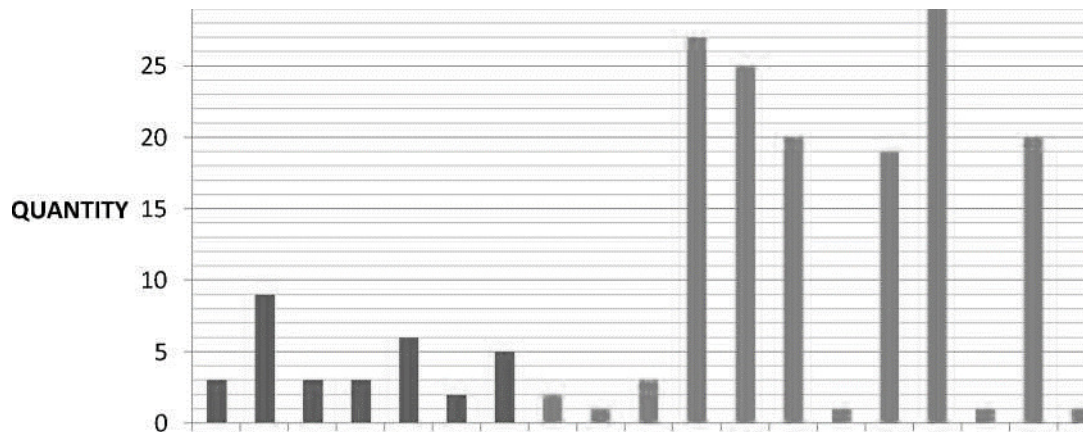


**Figure 3.** % share of individual sources of barriers in the total number of barriers identified.

Source: Own work based on company materials.

Analysing the number of different types of barriers in Figure 4 (the maroon colour indicates external barriers and the orange colour indicates internal barriers) illustrates which types of barriers most frequently influenced the rejection or suspension of an idea. The most common types of barriers are organisational (16.1%) followed by financial (15%), technical (11.1%) and those related to communication within the company (11.1%) and rejection of the idea (10.6%). All the above-mentioned types of barriers belong to the constraints arising within the company and they account for 7/9 of the reasons for project rejection. Reducing the impact of these

barriers on the implementation of ideas would significantly improve the implementation results achieved at the logistics operator.



In order: OHS, Decision making – customer, Operations on customer side, Communication – customer, Legal, Product, Customer’s requirements, No proposal to solve the problem, No project leader, Time, Financial, IT, Internal communication, Theft, Rejected by voting, Organizational, Insufficient solution, Technical, Ergonomics work.

**Figure 4.** Barriers identified in the projects.

Source: Own work based on company materials.

A detailed study of the six most common types of barriers will be presented in the following section.

The number of organisational barriers decreased year on year. The highest number of organisational barriers occurred in Lean projects in 2018. The most common organisational barrier is rejection due to the unviability of the solution caused by the extinction of the legacy solution. It accounts for 40% of the organisational barriers that occurred in 2018 and 33.3% in 2020, and represents 31% over the entire period analysed. The most common reason for rejecting projects for organisational reasons in 2019 was the negative impact of the solution on the implementation of warehouse processes (28.6%). No organisational barriers were reported in 2022.

The highest number of financial barriers occurred in 2018 of which 76.9% was the too high cost of introducing the solution and it also represented the highest percentage of financial barriers recorded in the analysed period (74.1%). This barrier was recorded in every year between 2018 and 2021. The increase in the number of barriers compared to the previous year only occurred in 2020, where the number of barriers increased from 5 (in 2019) to 7 (in 2020). No financial barriers were recorded in 2022.

The number of IT barriers decreased year on year. The highest number of IT barriers occurred in 2018, with the highest percentage of barriers occurring in 2018 being the inability to implement a solution (36.4%) and the inability to fit an IT system (36.4%). Over the entire period analysed, the largest percentage was the barrier of not being able to implement a solution (52.0%).

The occurrence of fewer and fewer technical barriers was recorded each year. The highest number occurred in 2018 (7) and the lowest in 2021 (2). In 2022, no technical barriers were recorded as occurring. The largest percentage of such barriers was the inability to implement a solution for technical reasons. This barrier occurred in every year between 2018 and 2021 and in 2020 it accounted for as much as 60% of the technical barriers recorded in this period (tab. 4).

Of the most common types of barriers in Lean projects, only the category rejected by vote appeared more and more frequently between 2018 and 2020 as a factor determining the rejection of ideas. In the following years it did not occur at all. The number of barriers increased from 4 in 2018 to 10 in 2020, with the highest number of solutions rejected by the working group in the period analysed (42.1%).

**Table 4.**

*Ratio of the number of projects submitted in a given year to the number of barriers*

	Year of application				
	2018	2019	2020	2021	2022
Number of projects	255	139	114	78	22
Number of barriers	134	60	63	17	1
	52,5%	43,2%	55,3%	21,8%	4,5%

Source: Own work based on company materials.

#### 4.2. Analysis of barriers to the implementation of other innovations in the logistics operator's warehouse management

Table 5 lists eight innovation projects that were proposed for implementation at the logistics operator but were not implemented. For each project, the potential benefits of implementing the solution are added, as well as the factors that determined the logistics operator's decision not to take action in this regard. Proposals for the first innovation projects were submitted in 2019 (three projects).

**Table 5.**

*Description of innovation projects not implemented in the company*

Solution	Description of the solution	Potential benefits of implementing the solution	Reasons for non-implementation of the project	Year
Drones	Drones used to implement the inventory process at the warehouse	<ul style="list-style-type: none"> <li>Reducing human labour</li> <li>Accelerating process efficiency</li> </ul>	<ul style="list-style-type: none"> <li>No verification of the number of boxes/pallets</li> <li>Large discrepancies between the actual quantity stored and the system data</li> <li>Warehouse space too limited</li> </ul>	2019

Cont. table 5.

Loading platform Autodock	Equipped with a handling control system, the external platform automatically transports pallets in and out of the external means of transport dedicated to a specific company customer	<ul style="list-style-type: none"> <li>• Exclusion of manual loading and unloading</li> <li>• Reducing the use of internal transport</li> <li>• Reduction in loading and unloading times by a factor of 6 (increase in productivity)</li> </ul>	<ul style="list-style-type: none"> <li>• Not applicable to all customers (adaptation of transport infrastructure)</li> <li>• Payback period too long (too few runs per shift)</li> <li>• The need to fit docks into the solution</li> <li>• Lack of decision-making on the part of the customer</li> </ul>	2019
Inverter	Forklift truck-mounted pallet changer frontal e16	<ul style="list-style-type: none"> <li>• Exclusion of manual repacking of damaged pallets or pallets with damaged goods</li> <li>• Reduction in process execution from 15-20 min to 2 min.</li> </ul>	<ul style="list-style-type: none"> <li>• No possibility of using in a dedicated storage area (does not work with liquid agents)</li> </ul>	2019
Embedded scanner	Dual scanner built into the forks of the means of transport that automatically scans the label on the pallet	<ul style="list-style-type: none"> <li>• Exclusion of label scanning</li> <li>• Reduced process times (increased productivity)</li> </ul>	<ul style="list-style-type: none"> <li>• High cost of purchasing the solution</li> <li>• Lack of adaptability of the system (system aimed at optimising the trucker's path, change of mission forces double scanning of the label)</li> <li>• An uneconomic solution due to lower human labour costs</li> </ul>	2020
Suction pads	Surface vacuum gripping systems for handling components used in the picking of bulk packaging.	<ul style="list-style-type: none"> <li>• Relieving human labour</li> <li>• Increasing productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Inability to use the solution with a large variety of pack sizes</li> </ul>	2020
Automation of copacking stations	Automation of processes previously performed manually by employees	<ul style="list-style-type: none"> <li>• Increasing production efficiency</li> <li>• Relieving human labour</li> </ul>	<ul style="list-style-type: none"> <li>• Too much variability in the type of production in a short period of time</li> <li>• Lack of possibility to adapt the solution to each production order due to very low repeatability of orders</li> </ul>	2020
Exoskeleton	A suit attached to the outside of a worker's body to support the work and strengthen the strength of the user's muscles during the picking of heavy packages.	<ul style="list-style-type: none"> <li>• Relieving human labour</li> <li>• Increasing productivity</li> </ul>	<ul style="list-style-type: none"> <li>• High purchase cost of the solution</li> <li>• Too long a period of human adaptation to work in the suit</li> <li>• Impossibility to use the solution at the two planned warehouse locations due to differences in the type of work to be done and differences in the physical characteristics of the goods</li> <li>• Not suitable for work carried out in one position (too much stress on the knees)</li> </ul>	2021

Cont. table 5.

Implementation of innovations e-commerce department	Application of innovative solutions for e-commerce combined with changes to the department's infrastructure	<ul style="list-style-type: none"> <li>• Reducing lead times</li> <li>• Increasing productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Too long a payback period (Too few orders executed)</li> <li>• Unprofitable investment - low income of the department</li> </ul>	2021
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Source: Own work based on company materials.

Each barrier occurring in innovation projects was classified according to the division introduced by the author in Lean projects. The number of barriers occurring in innovation projects is presented in Table 6. Seven types of barriers were identified, including six which have an internal source and one whose causes should be found in the company's environment. In eight projects, 20 barriers were identified leading to non-implementation of projects, of which the most frequent were lack of profitability of the solution (25% of the total number of barriers) and inability to apply the solution to all types of products (20% of the total number of barriers).

**Table 6.**

*Barriers to the implementation of innovation projects in the warehouse management of a logistics operator*

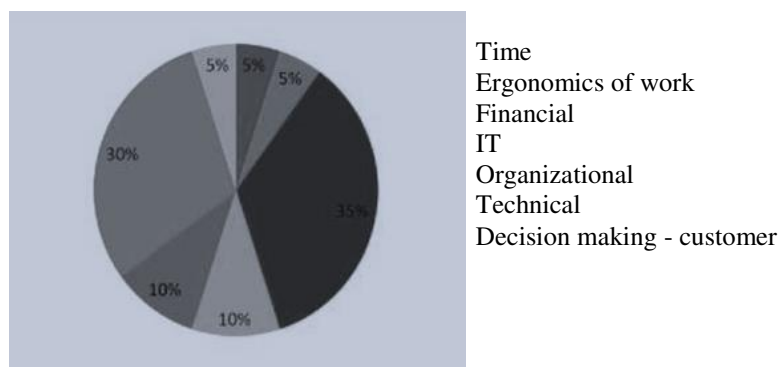
Source	Type of barrier	Barrier	year								Final total		
			2019			2020			2021				
			Drones	Inverter	Loading platform Autodock	Automation of copacking stations	Suction pads	Embedded scanner	Exoskeleton	Innovation in the e-commerce			
Internal	Temporary	Waiting too long to implement a solution								1		1	
	Ergonomics at work	Implementation of the project will worsen working conditions in terms of human physiological capacity								1		1	
	Financial	Lack of cost-effectiveness of the solution	1		1	1		1			1	5	
	Financial IT	The cost of implementing the solution is too high						1		1		2	
		Lack of adaptability of the system						1				1	
	IT	System errors	1									1	
	Organisational	Need to reorganise the warehouse			1							1	
	Organisational Technical	The new solution adversely affects existing processes	1										1
		Lack of capacity to access technical infrastructure	1										1
Technical customer	No solution for all types of products		1		1	1			1			4	
	Need to adapt transport infrastructure				1							1	
External	Customer	Lack of acceptance by the customer			1							1	
Final total			4	1	4	2	1	3	4	1		20	

Source: Own work based on company materials.

Analysing the sources of barriers to the implementation of innovation projects in the company based on data for eight innovation projects, it can be seen that more than 90% of the barriers arise inside the company

Technical barriers in 2019 were present in every innovation project planned at that time, in 2020 they were identified in two projects and in 2021 in one project. As for financial barriers, their number increased from one in 2019 to 3 in 2020 and 2021 and they were mainly due to the lack of profitability of implementing the innovative solution.

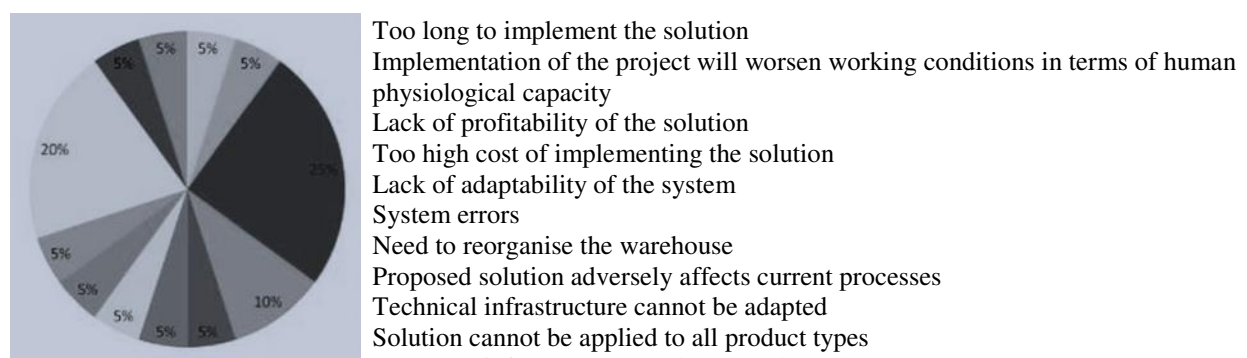
Figure 5 shows the percentage share of each type of barrier in the innovation projects analysed. The highest percentage are financial barriers (35%) followed by technical barriers (30%). IT and organisational barriers account for 10% of barriers each and the least common barriers are those related to work ergonomics, customer decision-making and time.



**Figure 5.** Percentage share of each type of barrier in innovation projects in the total number of barriers identified.

Source: Own work based on company materials.

Analysing the two most frequent types of barriers in innovation projects (financial and technical), it can be observed that the most frequent barrier for the implementation of innovation projects is the lack of profitability of the solution (20%), followed by the lack of possibility to apply the solution to all types of products (20%). The third most frequent barrier is too high cost of introducing the solution. The rest of the barriers occurred in equal amounts (Figure 6).



**Figure 6.** % share of individual financial and technical barriers.

Source: Own work based on company materials.

Innovation activities in the company are more limited by the unprofitability of the solution than by the too high cost of the solution, which indicates that the operator wants to invest in modern solutions. A major constraint is that the solution is not versatile enough, making the application of innovation uneconomic due to the limited field of application of automation. This is a serious problem, as many of the ideas analysed were driven by the specific needs of the customer served. According to the literature research, it is the customer and its needs that are the main source of innovative ideas.

Personalisation of the logistics service, on the other hand, determines that a solution created for a specific customer will not be applicable to serving another customer. Investment in this type of innovation is therefore associated with high risk. This risk is not mentioned in the research to date on the barriers to the implementation of innovation in companies providing logistics services.

## 5. Conclusion

The contemporary interest in the issue of service innovation stems from the need for modern companies to build a competitive advantage, the sources of which are currently increasingly seen in service activities. Research on service innovation depends on the level of analysis adopted. They may concern the economic importance of innovation (macroeconomic approach) or the importance of service innovation within the boundaries of the enterprise (microeconomic approach).

On the basis of the research carried out, it can be concluded that the impetus for innovation in logistics companies is the changing needs of customers, especially in the area of additional services. Logistics service providers in recent years have been developing their activities with more complex services that create additional value for the customer through the synergy of many activities. Taking into account the entire TSL industry, a large number of modern, innovative solutions can be observed, which are applied during service provision and sometimes interdependent.

Introducing innovative solutions into an enterprise involves encountering a wide variety of obstacles and overcoming implementation barriers ranging from financial constraints to the human factor, i.e. employee resistance/unwillingness to change and the associated need to adapt to new working conditions, which are identified and classified in the paper.

The logistics operator included in the case study achieves a high market position by taking action based on continuous improvement of the entire company based on the Lean Management philosophy and managing the creation and adaptation of innovations.



Based on the analysis of 608 Lean Management ideas covering the years 2018-2022, it was noted that more than half of the ideas submitted (55.9 per cent) in the years analysed were implemented in the company, confirming that the operator is undertaking increased continuous improvement activities in the company. Considering the total number of ideas that did not live to be implemented (i.e. rejected and suspended), they represent 40.3% of the total number of ideas submitted for implementation. The lowest percentage is accounted for by pending ideas (3.8%), the majority of which (12) are ideas that started to be implemented in 2017, but it is worth noting that four of the problems reported in 2016 with a pending status have not been resolved to date, illustrating the limitations of the company as regards the implementation of some employee ideas.

However, when analysing the 245 projects with rejected and suspended status, 18 barriers originating outside the company (17.2% of all identified barriers) and 51 barriers originating inside the company (82.8% of all identified barriers) were identified, which indicates that in most cases it is the company's activity that influences the limited development of the logistics operator. The most common types of internal barriers are organisational and financial. The most common barrier in Lean projects is the too high cost of implementing the solution.

Analysing the 8 innovative projects that have not been implemented in the logistics company between 2019 and 2021, it was noted that more than 90% of the constraints preventing project implementation are to be found in the internal activities of the company. The most common types of barriers occurring limiting the implementation of innovation projects are financial and technical barriers (these account for more than half of all types of innovation project barriers), in particular the lack of profitability of the solution (25% of the number of all barriers) this occurs in four out of eight projects and the inability to apply the solution to all types of products (20% of the number of all barriers) this occurs in four out of eight projects.

Given that in the analysed logistics company, innovation management is strictly linked to the company's activities in terms of Lean Management philosophy, the focus should be on eliminating the most common barriers in both areas of the company's activities, in particular financial, organisational and technical barriers. Reducing the impact of these barriers on the implementation of ideas would significantly improve the implementation performance of the logistics operator and further increase the innovation level of the enterprise.

One case study was included in the paper, which was dictated by the granularity of the analyses conducted, however, this is a limitation of the research as the results obtained cannot be generalised to other logistics operators. It is therefore worth extending the research to other logistics enterprises in further stages of the study, which will allow an analysis of the relationship between the type of innovation and the barriers to its implementation to be carried out.

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## DETERMINANTS OF MOBILE PUBLIC TRANSPORT USE BY YOUNG CONSUMERS: A SHARING ECONOMY PERSPECTIVE

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**Purpose:** The purpose of this paper was to explore the determinants for which young users decide to accept or decline shared mobile transport in public spaces.

**Design/methodology/approach:** Research study was conducted by means of a face-to-face interview with young consumers using shared mobile transport in urban spaces.

**Findings:** The modern consumer aspires to be able to access goods and services rather than to have them. The research found that the positive determinants of mobile transport use included convenience, accessibility, economic aspects, ecology, entertainment, the possibility of substituting the current mode of transport, recommendation, random situations and simply wanting to get around. On the other hand, among the negative determinants, respondents indicated a low or lack of knowledge of sharing economy solutions, limited availability outside major cities, lack of conviction and negative attitudes towards shared vehicles, the desire to own and alternative strangers.

**Research limitations/implications:** The modern consumer aspires to be able to access goods and services rather than to have them. The research found that the positive determinants of mobile transport use included convenience, accessibility, economic aspects, ecology, entertainment, the possibility of substituting the current mode of transport, recommendation, random situations and simply wanting to get around. On the other hand, among the negative determinants, respondents indicated a low or lack of knowledge of sharing economy solutions, limited availability outside major cities, lack of conviction and negative attitudes towards shared vehicles, the desire to own and alternative strangers.

**Practical implications:** The results of the research indicate that the knowledge and awareness of the young generation regarding the use of SE in various business and social activities should be improved. The article contributes to the educational trend of the young generation in view of conserving natural resources through frugal/healthy living, conscious and efficient use of things. The article attempts to identify more sustainable behaviour patterns among the younger generation.

**Originality/value:** The article broadens the understanding of consumer motivations regarding urban transport, with a focus on environmental protection and carbon footprint reduction in public spaces. It attempts to identify more sustainable patterns of behaviour among the younger generation.

**Keywords:** sharing economy, shared mobile transport, determinants, motives, mobile transport, young consumers.

**Category of the paper:** Research paper.

## 1. Introduction

Sharing economy (SE) essentially refers to the evolving forms of economic exchange today, promoting the consumption of goods and services based on the principles of resource sharing, the temporary value of which is made available through technologically developed digital platforms (Belk, 2014; Ert et al., 2016; Hofmann et al., 2019). The SE concept is gaining momentum in its development and application in various economic and social activities, including business models (Belk, 2014; Ganapati, Reddick, 2018; Matharu et al., 2020). The rise in popularity of digital platforms (e.g. peer to peer or business to peer), the growing need for economic and environmental sustainability, CSR and CSV activities, and the impact of the Covid-19 pandemic and high inflation, have prompted greater interest in this topic in the public space, especially in the context of urban transport (Carillo et al., 2017; Avital et al., 2015; Codagnone et al., 2016; Cohen, Sundararajan, 2015; Ganapati, Reddick, 2018; Heinrichs, 2013; Lukasiewicz et al., 2022; Owyang et al., 2013; Rong et al., 2021; Standing et al., 2019).

Contemporary cities are overcrowded, and projections indicate that this trend will continue due to population growth and the drive for better living conditions and work opportunities (Realini, Bercovich, 2018). By 2030, according to the United Nations (UN), urban dwellers will account for almost 60% of the global population (Harrington, 2019). Rapid global urbanisation around the world poses serious threats to the economic and environmental sustainability of cities, primarily related to intensive energy consumption and greenhouse gas emissions (Cohen, Muñoz, 2016). To counter this, it is crucial that cities focus on developing new technologies that improve the management of metropolitan areas and the quality of life of their inhabitants (Realini, Bercovich, 2018). Nowadays, cities are promoting collaboration at both the public and private level, which is fostering the emergence of new business models based on sharing resources and harnessing the power of collective intelligence to find solutions to urbanisation challenges (Realini, Bercovich, 2018). The sharing economy is a tool that has contributed to solving the problems of modern cities around the world and promotes social, economic and environmental sustainability on a global scale (Fan et al., 2019; C. Wang et al., 2019; Wang et al., 2019). SE, in particular, is changing the way people move around a city, optimising transport costs and improving urban mobility (Realini, Bercovich, 2018). It is also important for city dwellers to be aware of the risks involved. They need to be aware of the need to give up ownership in favour of accessing and sharing resources with other people (Bartenberger, Leitner, 2013; Sundararajan, 2014). However, the attitude of individuals is not

always consistent with their behaviour. The inconsistency is due to various factors that can stimulate the desire to change, but also act as a barrier before adopting new habits. This aspect also affects the use of SE services.

This study focuses on sharing mobile forms of urban transport, which often replace or complement traditional public transport modes (Le Vine et al., 2014). Research to date on SE mobile transport tends to focus on evaluatively older forms, such as bikesharing or carsharing (Cohen, Kietzmann, 2014; Standing et al., 2019). These studies indicate that the majority of SE service users are young people, (usually representatives of generations Y and Z), with developed digital competences (Hamari et al., 2016; Suchanek, Szmelter-Jarosz, 2019; Tilley, Houston, 2016). Therefore, the main focus of this study is on this group of users of shared urban mobile transport solutions.

The purpose of this study is to identify the determinants that determine young users' decision to accept or reject shared mobile transport solutions. An attempt is made to find out the personal situations that may induce young market participants to use mobile shared transport services in urban areas. In the final part of the paper, recommendations are made for the further development of shared mobile public transport offerings, together with the limitations of the research conducted.

## **2. Sharing economy: literature review**

### **2.1. Sharing economy: definition**

There is a wide range of definitions of the 'sharing economy' in the literature (Cohen, Kietzmann, 2014; Cohen, Sundararajan, 2015; Hofmann et al., 2019; Möhlmann, 2015; Schor, 2014). This diversity is due to the combination of different terms that refer to specific aspects or dimensions of SE (Ganapati, Reddick, 2018; Graham et al., 2017). These terms include collaborative consumption (Hamari et al., 2016; Lampinen et al., 2015; Möhlmann, 2015) collaborative economy (Cohen, Muñoz, 2016; Owyang et al., 2013), crowd-based capitalism, gig economy (Graham et al., 2017), on-demand economy (Cockayne, 2016) platform economy and circular economy (Ganapati, Reddick, 2018). A list of the authors' definitions can be found in Table 1.

**Table 1.***Selected definitions of the sharing economy from the literature review*

Issue	Definition	Source
Collaborative consumption	“peer-to-peer-based activities of obtaining, giving, or sharing access to goods and services, coordinated through community-based online services”	(Schor, 2014; Suchanek, Szmelter-Jarosz, 2019)
Collaborative economy	“an economic model where ownership and access are shared between corporations, startups, and people. This results in market efficiencies that bear new products, services, and business growth”	(Owyang et al., 2013)
Crowd-based capitalism	„an economic system with the following five characteristics: Largely market-based; (...) High-impact capital; (...) Crowd-based ‘networks’ rather than centralized institutions or ‘hierarchies’; (...) blurring lines between the personal and the professional: the supply of labor and services often commercializes and scales peer-to-peer activities like giving someone a ride or lending someone money, activities which used to be considered ‘personal’; blurring lines between fully employed and casual labor, between independent and dependent employment, between work and leisure”	(Sundararajan, 2016)
Platform economy	“a growing number of digitally enabled activities in business, politics, and social interaction”	(Stephany, 2015)
On-demand economy	“digital platforms that connect consumers to a service or commodity through the use of a mobile application or website (...) usually refers to digital media firms that connect users through two-sided platform-based marketplaces”	(Sundararajan, 2016)
Circular economy	“a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended”	(Ganapati, Reddick, 2018; Rinne, 2015)
Gig economy	“an economic development strategy to bring jobs to places that need them, it becomes important to understand better how this might influence the livelihoods of workers” (Graham et al., 2017, p. 135)	(Cockayne, 2016)

Source: Own elaboration.

SE is growing due to the prevalence of digital platforms such as social media and digital ecosystems (Carillo et al., 2017; Owyang et al., 2013). For the most part, SE focuses on mobile device users, hence the popular term 'mobile first'. With mobile apps, users can access sharing economy services from anywhere and anytime (Ganapati, Reddick, 2018). Digital platforms contribute to lower transaction costs and enable the exchange of information between users who do not know each other (Hamari et al., 2016). The sharing economy also supports sustainable consumption practices (Heinrichs, 2013). SE is influencing cultural and attitudinal change as people are increasingly willing to give up ownership in favour of accessing and sharing goods (Botsman, Rogers, 2010). It is an alternative form of consumption that focuses on ethical aspects such as over-consumption, ecological use of resources and environmental protection. It is mainly based on short-term rentals, which can range from non-commercial sharing within a community to the exchange of market values through short-term commercial rentals (Belk, 2014; Ganapati, Reddick, 2018).



SE is also characterised by its environmental friendliness, choosing to combat climate change and resource wastage, and contributes to the public sector (easier movement in the public area) and the social sector (isolation, over-consumption, economic scarcity) (Bartenberger, Leitner, 2013; Hamari et al., 2016; Matharu et al., 2020; Rinne, 2015; Stephany, 2015). SE enables the use of goods and services at a relatively low cost, without the need for ownership, and does not transfer ownership of the good or service (Belk et al., 2019; Martin, 2016; Zvolska, Mont, 2015). The authors of the study, for the purposes of research, define SE as short-term transactions in the consumer market (peer to peer and business to customer) (Goudin, 2016), that enable goods and services to be made available through online platforms and mobile applications (Stephany, 2015).

## 2.2. Forms of shared mobile transport in public spaces

Systematising the definitions and classifications of the different mobile forms of sharing in transport is problematic, due to the rate of evolution and overlap of concepts (Clewlow, Mishra, 2017; SAE International, 2022; Standing et al., 2019). According to SAE International, shared mobility is "the sharing of a vehicle, motorbike, scooter, bicycle or other mode of travel when needed" (SAE International, 2022). Types of sharing are classified on the basis of on-demand self-rental or membership requirements (Standing et al., 2019). Acceptance of technology, such as apps and SE platforms, is also important when using this form of transport (Cockayne, 2016). From a business context, this form of transport is referred to as 'ridesourcing' services, which consist of on-demand paid transport services where drivers and passengers connect via digital apps (Cohen, Kietzmann, 2014). The SAE International Committee on Shared and Digital Mobility has undertaken to standardise terms and definitions related to shared mobility, such as Bikesharing, Carsharing, Microtransit, Ridesharing and Scooter sharing (SAE International, 2022).

**Table 2.**

*Terms and definitions for mobile forms of shared transport according to SAE International*

Issue	Definition	Examples
Bikesharing	'provides users with on-demand access to bicycles at various pick-up and return locations for one-way or return trips. Bike-sharing fleets are typically implemented in a network in a metropolitan region, city, district, employment centre and/or university campus'	Nextbike, Veturilo, Roovee, Freebike, Citi Bike
Carsharing	'offers members access to vehicles by joining an organisation that provides and maintains a fleet of cars and/or light trucks. These vehicles can be located in neighbourhoods, public transport stations, employment offices, universities, etc. The carsharing organisation usually provides insurance, petrol, parking and maintenance. Members who join a carsharing organisation usually pay a fee each time they use the vehicle'	Autolib, Stadtmobil, Zipcar, CityBee, 4Mobility, EasyShare, MiiMove, Panek, CarSharing, Traficar oraz TrafiCargo, Wwozisz, Car2go, Innogy, MiiMove, CityBee, eCarTauron

Cont. table 2.

Ridesharing (carpooling, vanpooling) and ride-hailing - Transportation Network Companies (TNCs) services	'formal or informal ridesharing between drivers and passengers with similar pairs of departure and destination points. Ridesharing includes vanpooling, which consists of 7 to 15 passengers who share the cost of the van and operating costs, and may share driving responsibilities. Ride-hailing - the rider hires a personal driver to take them exactly where they want to go. The vehicle is not shared with other users, nor are there several stops along the route'	BlaBlaCar, inOneCar, JedziemyRazem, Uber, GoCar Share, Via, UberPool, Lyft Shared
Microtransit - improves public transport	'a private or public technology-enabled transit service that typically uses shuttles or vans with multiple passengers/pools to provide on-demand or fixed-schedule service with a dynamic or fixed route'	Lifetango, L.A. Metro Micro, Crossroads Connect, COTA Plus, Via, Chariot
Scooter sharing (types of scooters with electric drive (e-scooters) and internal combustion (mopeds))	'scooter sharing allows individuals to access scooters by joining an organisation that maintains a fleet of scooters at various locations. Scooter sharing models can include a variety of powered and non-powered scooters. The scooter service provider usually provides petrol or a fee (in the case of motorised scooters), maintenance and may include parking as part of the service. Users usually pay a fee each time they use the scooter'	Blinkee.city, EcoShare, Hop.City, Lime, Naminuty.pl, Logosharing, slidescooters, Bird, Dott, Quick, Freenow, Voltscooters, Bolt, Hulaj, Tier

Source: Own elaboration based on: (Ganapati, Reddick, 2018; Le Vine et al., 2014; SAE International, 2022).

The above-mentioned forms of mobile transport are often alternatives or complements to public transport such as commuter trains, buses and light rail (Clewlow, Mishra, 2017; Ganapati, Reddick, 2018; Le Vine et al., 2014). Carsharing and bikesharing are the most popular forms of urban transport, with the other forms being the result of an evolution of this type of activity (Clewlow, Mishra, 2017; Cohen, Muñoz, 2016; Le Vine et al., 2014; Standing et al., 2019). These forms not only enable efficient mobility, but also integrate societies, cities, actors (Ganapati, Reddick, 2018).

### 2.3. Determinants motivating and limiting the use of mobile transport

Literature and market reports increasingly state that SE services are changing customers' consumption behaviour. Instead of buying new products and services, customers are starting to share or reuse them (Jeon et al., 2020; Rong et al., 2021). The modern consumer is more interested in accessing goods and services than in owning them (Falcone, Imbert, 2017). Research by Hamari et al. (2016) confirms young people's engagement with the sharing economy and their intentions to use it (Hamari et al., 2016). Kim et al. (2018) demonstrated that SE awareness positively influences consumer attitudes and behaviour (Guo, Zhang, 2021; Kim et al., 2018). On the other hand, Eccarius and Lu (2020) indicate that a lack of alignment with mobility needs, lifestyles and personal values may influence low intention to use sharing services. Awareness of the sharing system and environmental values indirectly influences intention to use (Eccarius, Lu, 2020). The gap between attitudes and consumer behaviour can be explained by the lack of motivators for SE use, such as appreciation or enjoyment (Goldstein

et al., 2008; Hamari et al., 2016). Positive attitudes towards collaborative consumption may influence intention to participate, but this phenomenon plays a lesser role when dealing with actual rather than declared participation (Hamari et al., 2016). There is a need for further research, as attitude does not always translate into user behaviour, although it is a major determinant of change (Ajzen, 1991).

### **Motives for and barriers to using shared mobile transport services**

Motivation is a key factor in the success of initiatives (SE) and can be extrinsic and intrinsic (Acquier et al., 2017; Möhlmann, 2015). Research shows that intrinsic motivation influences attitude, but it is extrinsic motivation that is an important predictor of intention to use SE services over the long term (Hamari et al., 2016). Participants' motivations for shared mobile transport vary and depend on a variety of factors such as form of transport, city, country, people's preferences and socio-demographic and psychological characteristics (Davidson et al., 2018; Hossain, 2020). Although Barnes and Mattsson (2016) indicate that economic, environmental, political, social and technological factors are the main motivators of SE (Barnes, Mattsson, 2016)

#### *Motives*

Research on the motives for using shared mobile services indicates that utilitarian (useful) motives play a major role (Bardhi, Eckhardt, 2012; Lamberton, Rose, 2012; Moeller, Wittkowski, 2010). In empirical studies, economic value and convenience are the most important determinants of participation in shared mobile services (de Luca, Di Pace, 2015; Lindloff et al., 2014). Other studies point to lifestyle and environmental awareness as additional motives for using services such as B2C carsharing (Bardhi, Eckhardt, 2012; Burkhardt, Millard-Ball, 2006; Schaefer, 2013). Research on US carsharing users identifies four primary motives: value-seeking, convenience, lifestyle and environmental motive (Wilhelms et al., 2017).

A study by Wilhelms et al. (2017a) showed that the environmental motive is not the dominant motive for carsharing use. Instead, the value-seeking motive and the convenience motive have a stronger influence on user behaviour (Wilhelms et al., 2017).

Some researchers suggest that social motivations play a limited role in SE (Hüttel et al., 2018), while others consider social value as an important factor is an important motive for individuals to engage in SE types (Benoit et al., 2017; Joo, 2017). In the context of shared mobile transport, social value is the reduction of noise and road congestion (Hossain, 2020). Studies show that services such as ride-hailing and carsharing complement public transport, solve parking problems and reduce greenhouse gas emissions (Ganapati, Reddick, 2018).

Motivations for using different forms of micromobility also vary. In the case of bikesharing, the key factors are convenience, easy access to bikes, health benefits, economic benefits and the experience of fun (Franckle et al., 2020; Shaheen, Cohen, 2019; Zhang et al., 2019). E-bikes are mainly used for the first and last mile and for commuting directly to different destinations, especially to work (Bartkowiak et al., 2021; He et al., 2019; McKenzie, 2019).

E-scooters, as the newest form of urban transport (as of 2017), are comfortable, provide a pleasant driving experience and have flexibility. Studies suggest that e-scooters could replace traditional cars (Guo, Zhang, 2021).

For e-scooters, the main motivations for use among regular users in the US are speed compared to walking (especially in hot weather), convenience, enjoyment, the ability to get to a destination without a car, low cost, environmental benefits and a sense of safety (Sanders et al., 2020).

A study by Eccarius et al. (2020) indicates that the motivations for using e-scooters in Taiwan are environmental issues, convenience, accessibility without owning a vehicle, saving money, flexibility and price (Eccarius, Lu, 2020). In Spain, on the other hand, the main reasons for using e-scooters are easy parking, flexibility to avoid traffic jams, efficient operation of the system, competitive prices and environmental awareness (Aguilera-García et al., 2020, 2021).

Despite the growing popularity of micromobility, the literature still has a limited amount of research on the determinants of use of these services among Polish users (Bartkowiak et al., 2021). A study of Polish e-scooter users indicated that the main motivations for use are convenience and lack of cost of parking in the city (Bartkowiak et al., 2021). Other studies have confirmed that e-scooters are often used for recreational purposes (Bieliński, Ważna, 2020).

### *Barriers*

Similarly, as there are motives for using SE solutions, there are reasons why people avoid shared mobile transport. The most common barriers to using shared mobile transport stem from personal beliefs, as well as oversights on the part of the providers of this type of service. Barriers to participation in shared mobile transport in urban areas, like motives, are diverse and depend on a number of factors, such as location and environment. A significant reason for all forms of mobile sharing is the lack of consistent legal solutions, especially in the case of micromobility, i.e. scooters, scooters, which often exclude certain groups of users from sharing (e.g. due to lack of appropriate age, driving licence, bicycle card, etc.). Safety of use has been identified as the biggest barrier, especially related to accidents (Bartkowiak et al., 2021). In the case of bikesharing, barriers to use include lack of helmet, rental/return problems, traffic safety concerns, adverse weather conditions and inconvenient stations (Franckle et al., 2020). Barriers to e-scooter/scooter use relate to safety concerns (e.g. risk of hitting or being hit, lack of safe places to ride, feeling unstable/risk of falling off), practicality (e.g. lack of space for luggage or carrying passengers, unsuitability for longer routes) and equipment (e.g. damage to e-scooter, difficulty finding it when needed, incomplete battery, concerns about equipment failure/malfunction) (Sanders et al., 2020). Users of e-scooters/scooters also pay attention to the cleanliness of the vehicle, accessibility/distance to the next e-scooter, price and speed (Eccarius, Lu, 2020).

### 3. Methods

The study was conducted on a purposive sample of 29 respondents, with age as the selection criterion. The authors focused mainly on young people, due to their more active use of SE solutions, including shared mobile, compared to older groups (Guo, Zhang, 2021; Shaheen, Cohen, 2019; Suchanek, Szmelter-Jarosz, 2019). These are the people (representatives of the Millennials and Z generation) who are attributed with greater digital skills and driving force in the development of mobile forms of shared urban transport (Suchanek, Szmelter-Jarosz, 2019; Vaughan, Daverio, 2016; Warwas et al., 2022). The research was conducted in the central Poland region, where forms of shared mobile such as e-scooters, scooters, bicycles and cars are available.

The study was qualitative and conducted through IDI interviews, using an interview scenario with open-ended questions on the determinants and motives for using shared mobile transport in urban spaces.

The choice of interview method was determined by the fact that a declared attitude of shared consumption can positively influence participation in shared mobile transport, but this can change when people consider actual rather than declared participation (Hamari et al., 2016).

Based on the literature review, the following research questions were formulated:

- RQ1 - Are respondents familiar with the concept of shared mobile and do they use shared vehicles?
- RQ2 - What are the determinants of the use and non-use of shared mobile solutions?
- RQ3 - In which situations do respondents use shared mobile solutions?

Following the process of collecting the results, the authors reviewed the responses of the respondents and then attempted to synthesise the results of the survey resulting in overarching categories for each response to organise the data collected (Gibbs, 2015).

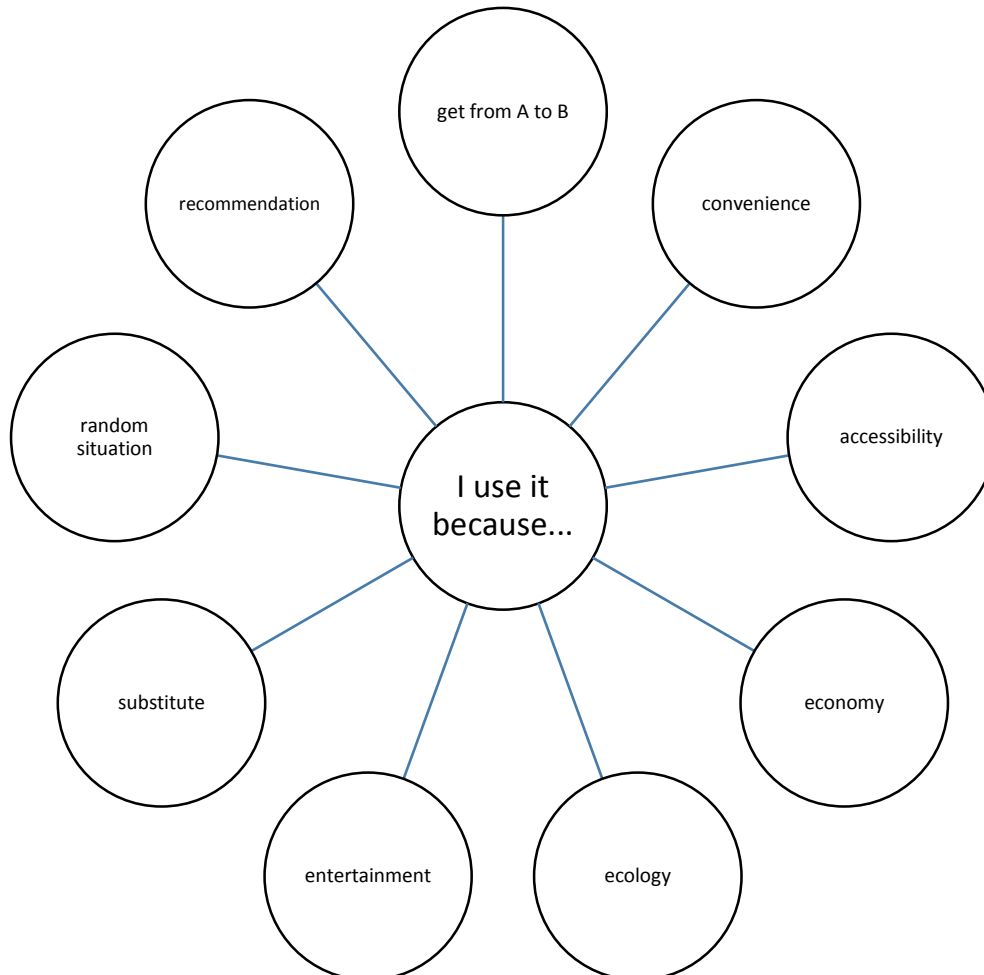
The study group consisted of 29 subjects, of whom 18 were women and 11 men. The median age was 23 years. Seventeen people had a tertiary education, while 12 had a secondary education.

### 4. Results

In the first part of the survey, the authors asked respondents whether they had ever encountered the term shared mobile and whether they had used shared mobile. It turned out that 20 had encountered the term before and 19 had used shared mobile solutions, while 10 had no such experience. Among the respondents, 4 forms of shared vehicles were mentioned that they had used. These were: city bike, electric scooter, scooter and car.

The respondents were then asked about the determinants of the use of shared mobile services. The survey included factors that positively motivate the use of shared mobile solutions, as well as factors that negatively influence decisions not to use these transport services.

The positive determinants are shown in the figure below.



**Figure 1.** Categories of positive determinants driving the use of shared mobile solutions.

Source: Own elaboration based on empirical research.

The key positive factor determining the use of shared mobile services, indicated by respondents, was the desire to 'get from point A to point B', whether this was to work, home or related to the need for transport in a new city.

Respondents also cited aspects related to the 'convenience' category, which relates to the use of shared mobile vehicles. They valued both the ease of driving these vehicles and the convenience resulting from the preparation for driving, for example through a dedicated app.

In the next category of determinants, i.e. 'accessibility', respondents indicated that vehicles based on the shared mobility model are readily available, especially in large cities where several different vehicle forms and brands are available. Respondents mentioned vehicles where several different vehicle forms and brands are available. The most frequently mentioned forms of vehicles were an electric scooter, an electric scooter, a bicycle and a car.

In the category 'economics', the authors included respondents' answers focusing on issues related to the charges for using shared vehicles, considering them a cheaper alternative than having their own means of transport. In addition, they highlighted time savings that allowed them to reach their destination faster compared to traditional means of transport, such as avoiding traffic jams with electric scooters.

The "ecology" determinant stemmed from the pro-environmental attitudes of respondents, who considered that the use of shared vehicles contributes to a reduction in consumerism and helps take care of the environment by reducing CO2 emissions, and reducing the demand for own vehicles.

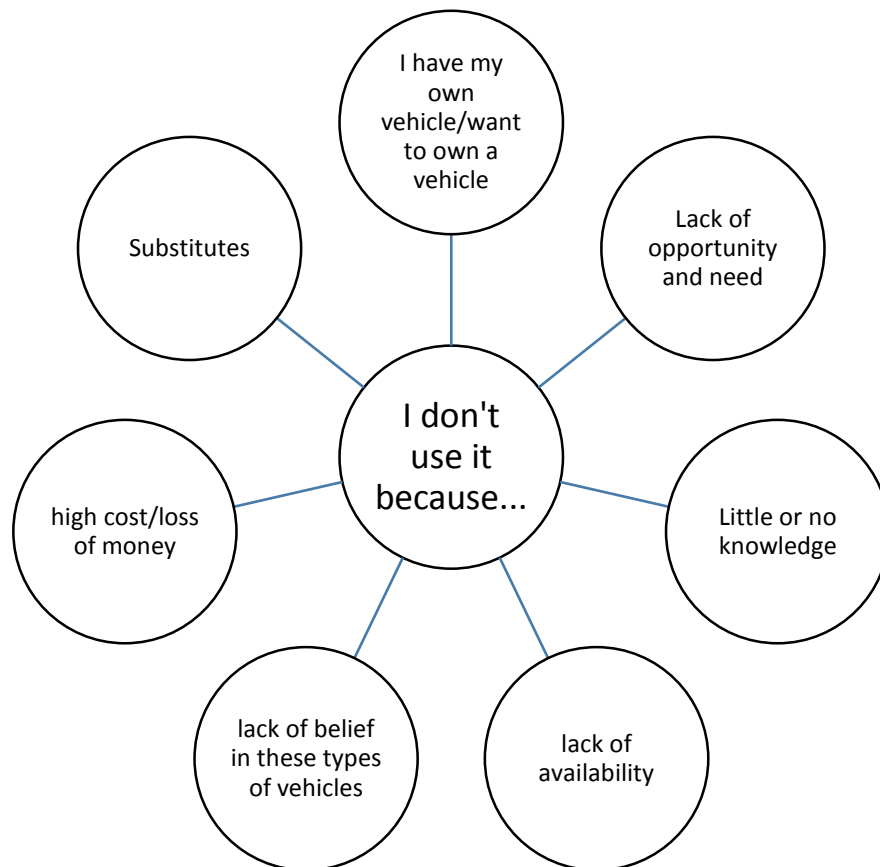
In the 'entertainment' category, it emerged that one of the determinants of the use of such solutions is the sheer experience of entertainment, the desire to try something new and satisfy curiosity.

Respondents also indicated a 'substitution' factor, which referred to the use of shared vehicles as an alternative to both owned vehicles and public transport or taxis.

In random situations, i.e., when something happened to the current means of transport or when the respondents were running late, the use of shared vehicles was also indicated as a solution to the problem, it was classified in the "random situations" category.

The last positive determinant of shared vehicle use is the 'recommendation' category. Respondents often mentioned that they used these services based on referrals to friends or family members.

The negative determinants are shown in the figure below.



**Figure 2.** Categories of negative determinants causing non-use of shared mobile solutions.

Source: Own elaboration based on empirical research.

In the first category of determinants 'I have my own vehicle/would like to own a vehicle on my own', respondents gave various reasons for not using shared mobile solutions due to having their own car, scooter, scooter or bicycle. Often this was due to living outside the city, where respondents had to commute. Some simply preferred to have their own vehicle and were even reluctant to use second-hand or shared items.

Another category was 'no opportunity or need', where respondents indicated that they had no opportunity or need to use shared vehicles due to having their own means of transport.

In the 'little or no knowledge' category, we found that respondents cited a lack of knowledge about shared mobile solutions, both in terms of usage and the sharing economy phenomenon itself.

'Lack of accessibility' was also identified by respondents as a key determinant. Particularly when respondents lived outside the city, vehicles such as scooters, electric scooters or bicycles were more difficult to access, mainly being in city centres and neighbourhoods next to the city centre.

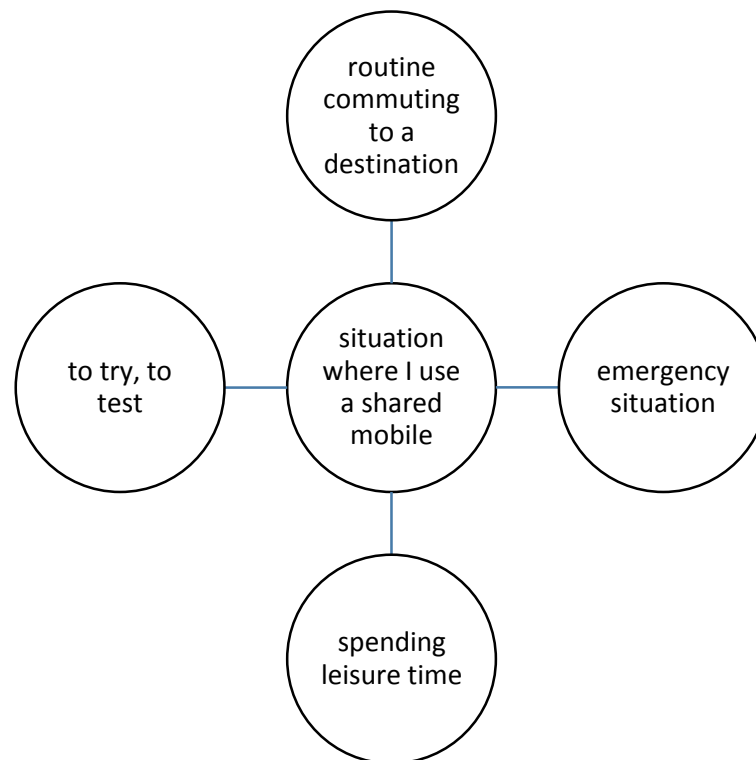
Respondents also indicated a 'lack of conviction towards these types of vehicles' and negative attitudes towards them.



Respondents highlighted economic elements, in the category of 'high costs - a waste of money'. They expressed that they considered it unprofitable to spend money on using this type of solution or pointed out the amount of fees associated with use.

The final category of negative determinants is 'substitutes', where respondents did not use shared mobility vehicles because they preferred to walk or use other forms of transport.

In the last part of the survey, respondents were asked about situations in which they use shared mobile solutions. Based on the respondents' answers, 4 categories of such situations were created (Figure 3).



**Figure 3.** Categories of situations in which respondents used shared mobile solutions.

Source: Own elaboration based on empirical research.

The first category created was 'routine commuting to a destination'. The authors categorised respondents' answers to this category, which concerned the use of shared mobile solutions for daily commuting to school, work or back home.

The next category presented was 'ad hoc situation'. This category included respondents' answers that referred to the need to use a particular vehicle when no other means of transport was available or when heavy items needed to be transported. It also included respondents who mentioned the use of shared vehicles in emergency situations or for business trips. Additionally, responses related to using them for occasional outings, such as birthdays, parties, meeting friends or simply getting to the train station, were included in this category.

The 'leisure' category was created from the responses of respondents who used shared vehicles to travel, explore or discover a new city, and as a means of transport during holidays.

The last category, 'testing', was created from the responses of respondents who used these types of vehicles simply to test how the solutions work and how they are used. This was important for them to know how to operate such a process if necessary.

## 5. Discussion and Conclusion

Answering the research question formulated, the results for RQ1 show that the majority of respondents were already familiar with the concept of shared mobile and had used shared vehicle services, especially in the form of a bicycle, electric scooter, scooter and car. Literature studies confirm that there is a positive relationship between awareness of the sharing economy, including shared mobile, and the use of shared services (Guo, Zhang, 2021; Kim et al., 2018). This attitude usually leads to active participation in the use of these services. However, other studies show the opposite result, indicating that positive attitudes towards sharing play a lesser role when people consider real actions rather than mere declarations of participation (Hamari et al., 2016). This may be due to a lack of sufficient incentives/motivators to encourage the use of ride-sharing services (Goldstein et al., 2008; Hamari et al., 2016). Attitudes do not always automatically transfer to behaviour, but they are important determinants of change (Ajzen, 1991).

A study carried out, together with other authors in the literature, in response to RQ2 showed that there are several factors of a positive nature that can determine the degree of use from shared transport solutions. Among the main motives are convenience and economic value (Bardhi, Eckhardt, 2012; de Luca, Di Pace, 2015; Eccarius, Lu, 2020; Franckle et al., 2020; Ganapati, Reddick, 2018; Lindloff et al., 2014; Shaheen, Cohen, 2019; Wilhelms et al., 2017; Zhang et al., 2019) In addition, the study identified other factors influencing the use of shared vehicles, such as easy accessibility (Franckle et al., 2020), environmental values (Burkhardt, Millard-Ball, 2006; Schaefers, 2013; Wilhelms et al., 2017), entertainment aspect (Franckle et al., 2020; Shaheen, Cohen, 2019), the possibility of substitution and free movement for any purpose (Bartkowiak et al., 2021; McKenzie, 2019) and random situations. All these factors have a positive impact on decisions to use shared transport services and introduce potential users to this form of mobility.

In terms of negative determinants, the respondents also indicated an economic barrier, which agrees with previous research (Eccarius, Lu, 2020). However, in contrast to the other barriers mentioned, respondents highlighted the aspect of sheer awareness of the phenomenon and knowledge of shared vehicle solutions. This is an important point to consider, especially among a group that is open to such solutions. In addition, respondents describe a lack of conviction or a negative attitude towards shared vehicles as a negative determinant (Bartkowiak et al., 2021). The aspect of ownership is also worth mentioning, as some respondents stated that

they do not use such vehicles due to the fact that they need to have a sense of ownership of the mode of transport. The lack of availability of such solutions for non-urban areas is another negative determinant. It has also been written about by (Eccarius, Lu, 2020). In conclusion, there are several negative factors that may inhibit the use of shared vehicles. It is worth taking action to overcome these barriers, through education, awareness and accessibility of services in non-urban areas, to encourage potential users to use this form of transport.

In response to RQ3, respondents identified the main situations in which they use shared vehicles, such as: an emergency situation, leisure activities, a situation to try or test a new solution or a routine commute to a destination such as work or school. Consumers use shared vehicles when they have an urgent need to get from point A to point B, but do not have access to their own means of transport. This may be as a result of unexpected circumstances, such as the breakdown of their own car or a lack of parking spaces. Some users treat shared vehicles as a means of transport during recreation. This may be when they go on trips, meet up with friends or have other forms of entertainment and find shared vehicles a convenient mobility option. The willingness to test a new solution indicates consumers' curiosity about new technologies and services. It is possible that they are using shared vehicles to see how it works, to compare it with other means of transport or to assess whether such a solution would be suitable for them on a permanent basis. The regular use of shared vehicles as a means of transport to work or school suggests that for many people, traditional forms of transport such as their own car or public transport may become less attractive. This may lead to a change in urban traffic patterns and require new infrastructure solutions. The interest in shared vehicles may be the result of a growing environmental awareness. Using shared modes of transport, instead of owning one's own vehicle, can contribute to reducing greenhouse gas emissions and air pollution in cities.

The limitations of the present study are the purposeful nature of the selection of individuals for the study, which only made it possible to present a certain perspective of the phenomenon in question, and not its full scale. Furthermore, the focus was only on young people, which shows the point of view of one homogeneous group and not that of the general public. Future research should pay attention to these aspects especially in the context of the acceptability of car-sharing, taking into account the different variables moderating this relationship. In addition, it is important to delve deeper into the reasons for negative attitudes towards the sharing economy and to look for effective ways to change them. In this way, we will better understand the factors influencing decisions to use shared transport services and effectively promote this form of mobility.

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## QUALITATIVE COMPARATIVE ANALYSIS: A METHOD OF GROWING INTEREST IN MANAGEMENT RESEARCH

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**Purpose:** Qualitative comparative analysis (QCA) allows a systematic and transparent comparison of cases while investigating explanatory conditions as sufficient or necessary for an outcome to occur. This paper aims to illustrate the usefulness of QCA in management research.

**Approach:** There are five steps in a standard QCA process: 1) constructing a configurational model and selecting the conditions and outcome of interest, 2) identifying empirical cases and calibrating the data into sets, 3) converting the dataset into a truth table, 4) analysing set relations between the conditions and the outcome and 5) evaluating, interpreting and visualising the findings. We discuss these five steps and illustrate their application with a fictional analysis of configurations of conditions leading to high investment in research and development (R&D). In addition, we review the recent literature on QCA, including its application in management studies.

**Findings:** We provide information on QCA-related resources and events, including workshops and summer schools. Current challenges in the diffusion and development of QCA involve analysing large data samples and including QCA in mixed-methods and multi-method research designs. Future challenges are related to configurational theorising, including time in the analysis and the foundations and procedures on which causal claims are made in QCA.

**Practical implications:** QCA is gaining popularity in management research. Its assumptions about social reality and research procedures align well with management research questions and practices. There are many areas for further development. Nevertheless, QCA is a valuable tool for management researchers.

**Value:** This paper focuses on the use of QCA in management research. It sheds light on the standard procedures involved in QCA and describes the application of QCA in management research based on the current literature.

**Keywords:** Qualitative comparative analysis, R&D investment, Comparative research.

**Category of paper:** General Review.

## 1. Introduction

Qualitative comparative analysis (QCA) is a relatively new research method that is attracting increasing attention in management research. QCA is a formalised comparative method inspired by comparative case study research (Yin, 2004) that uses set analytics and Boolean algebra to explicitly and systematically compare cases. These features of QCA allow it to identify conditions that are sufficient or necessary for an outcome to occur and to handle relations of considerable causal complexity.

There are many reasons for the growing popularity of QCA. These include the ability of QCA to allow researchers to explore complex causal relations structures when, for example, an outcome is explained not only by one condition but by the co-occurrence of many conditions. As such, QCA is suited to studies that aim to build typologies and investigate causal relations. In addition, QCA is systematic and transparent. Thus, all researchers can replicate the analysis and relatively easily engage in a discussion about decisions that were made during the analysis and the obtained results. QCA can be applied to a large number of cases. An additional advantage of QCA is that it can be integrated with other qualitative and quantitative methods.

While there is already an abundance of QCA studies in management research (Kumar et al., 2022; Kraus, Ribeiro-Soriano, Schüssler, 2018; Riog-Tierno, Gonzalez-Cruz, Llopis-Martinez, 2017), including papers published in this journal (e.g. Kwiotkowska, 2022), there is a need to share recent developments and good practices (Rubinson et al., 2019; Thomann, Ege, Paustyan, 2022). In this paper, we address this need by illustrating the use of the five-step QCA process in management research using a hypothetical scenario. The target audience of this paper is management researchers who have some knowledge of QCA and are interested in applying it in their research.

We place QCA within the context of management research and briefly illustrate the use of QCA in five steps. Towards the end of the paper, we discuss current developments and challenges in QCA and offer practical tips for those interested in learning more about QCA. The novel aspects of this paper are the review of the current literature on QCA and the demonstration of the application of QCA using a hypothetical Polish example.

## 2. QCA in Business and Management Research

### 2.1. Historical background

QCA emerged in 1987 with the publication of ‘The comparative method. Moving beyond qualitative and quantitative strategies’ by Charles Ragin (1987). QCA originated in comparative sociology and political sciences and was primarily used in these fields until the early 2000s.

Until this point, the application of QCA was limited to crisp sets (i.e. binary indicators), allowing researchers to distinguish only two states. With the publication of ‘Fuzzy-set social sciences’ (Ragin, 2000), researchers were now able to measure and express nuances—a change that led to the swift expansion of QCA across the social sciences, including the first applications of QCA in management research (Kitchener, Beynon, Harrington, 2002; Takahashi, Nakamura, 2005) and the development of the first software for QCA analyses, such as fs/QCA and Tosmana (Cronqvist, 2017; Drass, Ragin, 1992).

QCA became more widely known in management research by publishing several conceptual, methodological and empirical studies (Bell, Filatotchev, Aguilera, 2014; Crilly, 2011; Fiss, 2007, 2011; Greckhamer et al., 2008). Together, these studies comprehensively introduced the conceptual logic and analytical approach underlying QCA to the management community and triggered the emergence of a community of management researchers with a shared interest in configurational comparative methods. From the mid-2010s, the use of QCA in management research began to rapidly spread from the core field of organisational theory and organisational sociology into related fields, such as strategy and technology management, governance and entrepreneurship and human resource management or managerial cognition research, with many researchers publishing studies on QCA in leading academic journals (Aversa, Furnari, Haefliger, 2015; Crilly, Zollo, Hansen, 2012; Garcia-Castro, Francoeur, 2016; Meuer, Rupiotta, Backes-Gellner, 2015; Pajunen, 2008). During this period, the expertise of editorial boards in dealing with QCA papers and of reviewers in constructively developing these papers substantially increased, as did the QCA community. Together, these developments led to tailored QCA-related training, regular events (e.g. the Annual Professional Development Workshop [PDW] at the Academy of Management [AOM] and International QCA Workshops) and the purposeful integration of QCA with other research methods (e.g. Fischer, Maggetti, 2017; Gabriel et al., 2018; Meuer, Rupiotta, 2017a). Today, QCA has established itself as arguably the most important and frequently used analytical method for configurational comparative research in the management literature.

## **2.2. Typical applications**

There are several reasons why QCA is increasingly applied in management research. At a foundational level, the conceptual perspective of QCA closely aligns with many dominant theories in management research (Fiss, 2007). Organisations—as the unifying theme of management research—are often conceptualised as configurations of interconnected elements. Thus, management researchers face many phenomena that are configurational by nature, making configurational research both conceptual and methodological.

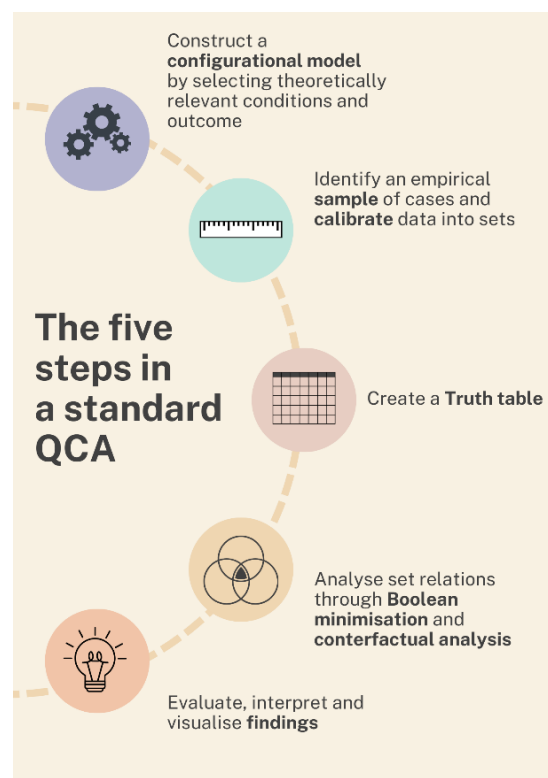
Another reason why QCA is increasingly applied in management research is that its approach to configurational theorising is closely aligned with many fields in management research. Rather than examining the role and magnitude of individual explanatory factors as a cause of an outcome of interest, QCA’s approach to theorising allows researchers to explicitly

distinguish necessary from sufficient conditions. In so doing, QCA also closely aligns with typology theorising, an approach to theorising that is often used in management research, as indicated by prominent typologies (e.g. Hall, Soskice, 2001; Miles, Snow, 1978; Van Knippenberg et al., 2004).

Furthermore, QCA's approach to empirical research is attractive to management researchers. On the one hand, QCA is a case-based method, requiring familiarity with entire cases (rather than individual variables). On the other hand, QCA is similar to more quantitative empirical methods in that its analytic approach is transparent, systematic and formalised. In fact, many researchers have drawn on QCA because it offers a means to systematically analyse data sets with only a few observations. For these reasons, QCA is often described as being able to bridge the qualitative and quantitative divide in the social sciences. The applicability of QCA to smaller samples while remaining transparent, systematic and formalised makes it particularly suited to being integrated with other methods.

### 2.3. Standard QCA process

The choice of research method always needs to be aligned with the research question that an empirical study addresses. Moreover, most methods have certain prerequisites in terms of the nature of the investigated phenomena, volume and type of data. In general, QCA appears to be a valuable method for investigating complex associations between necessary and sufficient conditions or for identifying complex patterns or typologies through a systematic and case-comparative approach. The five steps of a standard QCA process are illustrated in Figure 1.



**Figure 1.** The five steps in a standard QCA.

In the first step, the researcher develops a configurational model. This step includes both selecting the outcome and the explanatory conditions, as well as engaging in ‘configurational theorising’. The selection of the explanatory conditions may be inductive (e.g. based on the researcher’s observations or substantive arguments) or deductive (e.g. based on theoretical considerations). Through configurational theorising, the researcher reveals causally complex associations between the outcome and (among) explanatory conditions, addressing such questions as why would conditions appear in combinations or why would a certain condition be more important in one bundle than in other bundles.

In the second step, the researcher constructs the dataset. This step includes identifying the relevant cases (usually through case selection), defining measures and calibrating data into either crisp or fuzzy-set membership scores. QCA is relatively flexible in terms of data requirements, utilising both quantitative and qualitative data (e.g. archival material, interviews, recordings, surveys and official statistics). Historically, QCA studies have used small sample sizes of between 12 and 50 cases (small-N QCA). However, a few early studies and a growing number of recent studies have used much larger samples (large-N QCA). Two important considerations when constructing the dataset are to ensure sufficient diversity among cases, both in the outcome and in the explanatory conditions, and to have a high enough ratio of cases to conditions<sup>1</sup>.

The researcher then calibrates the outcome and conditions by assigning membership scores based on substantive and theoretical knowledge. Calibration is relatively unknown in the social sciences but common in other fields and refers to the process of transforming raw data into meaningful set-membership scores. The researcher calibrates the data by defining three critical, meaningful qualitative anchors (Ragin, 2000, 2008) that determine whether a case is a member of a set (full membership) or not a member of a set (full non-membership) or whether it is unclear whether a case is in or out of a set. Calibration is a critical step in QCA, substantively, because it ensures that the researcher analyses meaningfully measured conditions and mathematically, because it transforms data into set-membership scores, a prerequisite for the Boolean minimisation that QCA uses to analyse datasets. Due to its importance, researchers often spend a significant amount of time on calibration and on discussing and proposing best practices around calibration, such as avoiding symmetric calibration, the full range of Likert scales or central measures of tendencies (Rubinson et al., 2019).

In the third step, the researcher converts the dataset into a so-called truth table. The truth table is a mathematical instrument in logics and Boolean algebra. Each row in the truth table corresponds to one logically possible combination of present and absent conditions. The truth table captures the entire universe of all logically possible combinations. The size of the truth table (i.e. the number of rows) is determined by the number of conditions included in the model. The number of rows is  $2^k$ , with  $k$  referring to the number of conditions, so that the truth table size exponentially increases with the number of conditions in the model. The truth table provides two important pieces of information about each configuration (i.e. truth table row):

the frequency number and the consistency score of a configuration. The first piece of information, the frequency number, indicates how many cases correspond to a configuration. Each case in a dataset corresponds to only one configuration. Thus, some configurations may appear frequently, whereas others may only have one case, and some may not appear at all in a dataset. Configurations for which no empirical evidence (i.e. no cases) is found are called 'logical remainders'; the observation that one often only finds small (i.e. limited) number of configurations in reality is called 'limited diversity'.

The second piece of information, the consistency score of a configuration, is a number that shows the proportion of cases with a given cause or combination of causes that also display the outcome. The consistency score ranges from 0 to 1, where a score of 1 indicates that all cases with that configuration show the outcome. A lower consistency score indicates that while some cases with this configuration exhibit the outcome, others do not. These two indicators are used to select configurations that appear often (frequency) and are strongly associated (consistency) with the outcome of interest for further analysis.

In the fourth step, the researcher minimises the configurations to synthesise and reduce their complexity<sup>ii</sup>. Here, QCA follows Mill's methods of agreement and disagreement: two foundations in logic concerned with the systematic matching and comparison of cases or configurations (Ragin, 1987). For example, if two configurations associated with the outcome are similar in all conditions but one, QCA would consider this one differing condition irrelevant for explaining the outcome. Similarly, if all configurations associated with the outcome have only one condition in common, QCA would consider this condition important (or necessary) for explaining the outcome. Through this systematic comparison of configurations, QCA eliminates irrelevant conditions. In doing so, it identifies a more condensed, or parsimonious, number of configurations<sup>iii</sup>.

In the fifth step, the researcher analyses the QCA results, usually by illustrating the results graphically, for example, through a configuration chart (Ragin, Fiss, 2008), considering the overall solution coverage and consistency and describing and explaining each configuration that appears in the results. When interpreting the results, it is important to interpret the roles of combinations of conditions, not just the role of an individual condition across multiple configurations. When interpreting the results, 'return to the cases' is common in a standard QCA process to identify and explain the mechanisms underlying each configuration. A researcher analysing a small dataset may refer to specific cases, similar to an in-depth case analysis. When analyzing a large sample, additional descriptive statistics of the sub-sample of cases of one configuration may help to provide additional insights into the mechanism of a configuration.



### 3. Illustrating the Use of QCA

To illustrate the application of QCA, we apply the five-step process outlined in Figure 1 to a hypothetical research scenario<sup>iv</sup>. In this hypothetical scenario, a researcher who has already conducted a comparative case study on six companies located in a Kraków Technology Park decides to include all 31 companies registered in the park. The researcher is primarily interested in understanding and explaining why these companies invest heavily in R&D (INV).

#### 3.1. A configurational model explaining high R&D investments

Step 1 involves constructing a configurational model and selecting theoretically relevant conditions and the outcome. Based on the comparative case study already conducted and a literature review, the researcher considers three conditions explaining R&D investments: being a large company (BIG), operating in high-tech industry (HIGH), and receiving public funding for R&D (PUB). This step, known as scoping (Furnari et al., 2021), refers to the identification of conditions that may plausibly explain the outcome of interest (i.e. R&D). In addition, central to all QCA analyses, the researcher theorises and explains why these conditions might be expected to be connected to one another. This explanation is important for developing working hypotheses about the configurational nature of the conditions and their conjunctive relation to the outcome of interest. For example, one hypothesis may be that large firms or firms operating in high-tech industries receive more public funding. Another hypothesis may be that such firms have high R&D expenditures, irrespective of or in the absence of public R&D funding. The process of configurational theorising is important because it clarifies why configurations of conditions and not independent, individual variables can be expected to explain the outcome and because it motivates the choices of configurational methods, such as QCA.

#### 3.2. Identifying cases and calibrating data

Step 2 involves identifying the empirical sample and calibrating the data into set membership scores. Having identified and selected the cases, the next step is to define, measure and calibrate the outcome and conditions. In our example, the researcher draws on a variety of qualitative and quantitative data, including short interviews with each company, information from their annual reports and publicly available databases.

To measure the outcome, high R&D investment, the researcher uses a measure of R&D intensity (i.e. R&D expenditure to sales ratio) each year. The data are collected through a short round of phone interviews. The measure of R&D intensity ranges from 3 to 45%. In the absence of theoretical and substantive arguments to define thresholds, the researcher uses the 10th, 50th and 90th percentiles to calibrate the set of companies with 'above average R&D investments'. Quantitative anchoring points compromise the quality of QCA. To take account

of this issue and ensure that the analysis meets best practices, the researcher performs additional robustness tests (Oana, Schneider, 2021), shifting the anchoring points and then precisely labels the outcome.

For calibrating the set of large firms, the firms are categorised according to employee number: small (< 50 employees), medium (51-250 employees) and large (> 250 employees). Moreover, the researcher uses corporate reports, webpages and newspaper articles to calibrate a crisp (i.e. binary) set of high-tech industry firms. Last, to calibrate the set of firms that receive public R&D support, the researcher analyses a publicly available database set to determine whether the firm received public funding in the three years before the outcome was measured.

**Table 1.**  
*Calibration of the outcome and conditions*

Condition	Data source	Measure	Calibration	Set label
Above-average R&D investments (INV)	Phone interview data	R&D intensity	Scores from 0 to 1, with 10th, 50th and 90th percentiles having respective scores of 0.05, 0.5 and 0.95	The set of companies with above-average R&D investments
Large firm (BIG)	Annual reports	Number of employees	0: Less than 50 employees 0.4: Between 51 and 250 employees 1: More than 250 employees	The set of large firms
High-tech industry (HIGH)	Corporate documents, webpages	Documented evidence on high-tech industry	0: No high-tech industry 1: High-tech industry	The set of firms in a high-tech industry
Public support (PUB)	Public database	Receiving public support in the 3 years before the outcome was measured	0: no public support 1: public support	The set of firms that received other public support

Note. INV: high investment; BIG: large firm; HIGH: high-tech industry; PUB: public support.

Table 1 provides an overview of the outcome and the conditions in the example. At this point, the researcher has constructed the dataset<sup>v</sup> for the analysis. This dataset is similar to other conventional datasets (cases across rows and conditions across columns) but with one major difference: The outcome and conditions are measured in set-membership scores that indicate whether a case is rather ‘in’ or rather ‘out’ of a set, such as the set of large firms.

### 3.3. Truth table of configurations of conditions explaining R&D investments

Step 3 in QCA involves constructing and analysing the truth table. The truth table is arguably the most important analytical instrument in QCA. Instead of a conventional data table, the truth table contains one row for each logical possible combination of conditions. One row may, for example, describe a configuration of firms with high membership scores for each attribute (e.g. large high-tech firms with public funding). Another row may capture a configuration of firms with one high and two low membership scores (e.g. large firms with no public funding not operating in a high-tech industry).

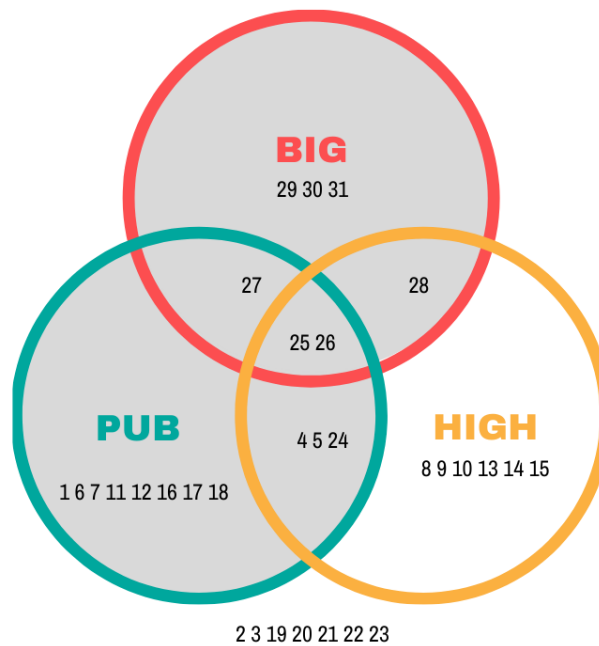
**Table 2.**  
*Truth table*

Row	BIG	HIGH	PUB	INV	Cases
1	0	0	0	0	2, 3, 19, 20, 21, 22, 23
2	0	0	1	1	1, 6, 7, 11, 12, 16, 17, 18
3	0	1	0	0	8, 9, 10, 13, 14, 15
4	0	1	1	1	4, 5, 24
5	1	0	0	1	29, 30, 31
6	1	0	1	1	27
7	1	1	0	1	28
8	1	1	1	1	25, 26

Note. INV: high investment; BIG: large firm; HIGH: high-tech industry; PUB: public support.

In our example using three conditions, the truth table contains eight rows, as indicated in Table 2<sup>vi</sup>. For each configuration (i.e. row), the truth table provides additional information on the outcome and the cases that exhibit one of the configurations. For example, row 1 describes a configuration with low set-membership scores (absent) in all three conditions. The configuration may also be written out in Boolean terminology: big\*high\*pub. The condition label written in small letters signifies the absence of the condition, “\*” indicates conjunction, and “+” disjunction. The seven firms that exhibit this configuration also exhibit low R&D investments. In contrast, row 5 captures a configuration of conditions of large firms not operating in a high-tech industry and not receiving public R&D support (BIG\*high\*pub). Yet, the three cases matching this configuration all show high membership scores in the set of firms investing in R&D.

An alternative to a truth table is a Venn diagram in which each condition is represented by one circle and the combination of all conditions as overlapping (or intersections) circles. The membership of cases in diverse configurations of conditions is represented by the locations of their numbers (Figure 2). Take again the case of row 1: a configuration of cases where all conditions are absent. This configuration is represented by the field outside the circles, where all such cases are located. The grey shaded area symbolises the occurrence of the outcome. In our example, this is the case in the fields inside the circles BIG and PUB. The non-shaded area symbolises the absence of the outcome. In short, both the truth table and the Venn diagram provide an overview of all logically possible combinations of conditions, information about how each configuration is linked to the outcome of interest and information about the corresponding number of cases.



**Figure 2.** Venn diagram.

### 3.4. Analysing the truth table and simplifying the configurations

At this point, the truth table primarily describes the configurations leading to high R&D investments. Rows 2, 4, 5, 6, 7 and 8 all show such configurations. However, the configurations may be simplified by systematically comparing each configuration with each other and eliminating those conditions that appear irrelevant for explaining high R&D investment. In our example, a comparison of the configurations in row 2 (big\*high\*PUB) and row 4 (big\*HIGH\*PUB) reveals that both configurations share the absence of large firms (big) and the availability of public R&D funding (PUB). Yet, whether firms operate in a high-tech industry seems irrelevant to explain investments in R&D. Thus, smaller firms that receive public R&D funding seem to invest more in R&D (big\*PUB). Comparing the other rows reveals analogous observation. Comparing rows 5 (BIG\*high\*pub) and 6 (BIG\*high\*PUB) allows the configurations to be minimised into a more simplified solution (BIG\* high). Moreover, comparing rows 7 (BIG\*HIGH\*pub) and 8 (BIG\*HIGH\*PUB) minimises the configurations into a simplified solution (BIG\*HIGH). As these two simplified configurations (BIG\*high; BIG\*HIGH) are comparable and can be minimised into BIG. In this way, we can observe the outcome for the enterprises that are either smaller and received public support (green circle in Fig. 1 without the area overlapping the red circle) or big (red circle). In Boolean terms, the minimised solution is  $\text{big*PUB} + \text{BIG} \rightarrow \text{EXP}$ , which means that for an enterprise to have high R&D expenditures, it is sufficient to be either a smaller firm and receive public support or to be a large firm. Thus, to have high R&D expenditures it is sufficient to be either a large firm or to receive public support.

### 3.5. Evaluating, visualising and interpreting the results

The results of the QCA reveal two configurations, or explanations, for when firms invest heavily in R&D. Smaller firms that receive public funding support (big\*PUB) invest heavily in R&D, as do large firms (BIG). These two configurations are sufficient for explaining high investments in R&D. The results highlight some of the unique features and opportunities of QCA related to the notion of complex causality. The results illustrate the ability of QCA to identify results marked by conjunctural causation (i.e. several conditions in conjunction explain an outcome). The results also demonstrate the ability of QCA to reveal equifinality, which refers to the notion that there may be multiple ways to explain the same outcome. In our case, we identify two ways: either being small and receiving public funding or being large. The third notion of complex causality in QCA is the notion of 'causal asymmetry'; that is, the configurations of conditions explaining the presence of the outcome (e.g. high R&D investments) are different than the configurations of conditions explaining the absence of the outcome (i.e., not high R&D investments).

The results of QCA go beyond traditional qualitative or quantitative research by clearly identifying groups of cases and describing them through the lenses of configurations of conditions. Stakeholders may use such results in their design of support for the companies. For example, different types of support may be offered to the identified groups.

The results can be visualised and then used to better evaluate and communicate the findings to stakeholders (Ragin, Fiss, 2008; Rubinson, 2019). Alternatively, the results can be visualised using a Venn diagram (for a model with three conditions) or an adjusted form of Venn diagrams for models with more than four conditions. Having identified the configurations for high R&D investment, the next step is to explain the results. To do so, the researcher may speculate that small firms on their own do not have slack resources to invest in R&D and hence require external funding, which in our case is provided by public support. Once these two conditions appear simultaneously (i.e. in conjunction), they explain high investments in R&D. For large firms, the additional public funding appears irrelevant, possibly because large firms have sufficient slack resources to independently invest in R&D.

The results of QCA do not in themselves provide a causal explanation. Instead, they are primarily descriptive. For unravelling the mechanisms inherent in each configuration, researchers must conduct a formalised post-QCA, for example, in the form of additional in-depth case studies or focused analysis of cases that belong to only one of the configurations.

## 4. Current Issues in the Diffusion and Development of QCA

QCA is now commonly accepted and utilised among diverse disciplines, and papers describing QCA studies have been published in many high-profile journals. Discussions are ongoing about methodological aspects of QCA and possible applications in other areas, such as in mixed-methods and multi-method research (e.g. De Block, Vis, 2019; Meuer, Rupiotta, 2017a; Rihoux, Álamos-Concha, Lobe, 2021). At the same time, QCA is not without limitations and faces several challenges in the future, such as the need for more clarity around best practices (e.g. Greckhamer et al., 2018; Rubinson, et al., 2019) and the need for more configurational theorising (e.g. Furnari et al., 2021).

### 4.1. Best practices for small-N and large-N QCA studies

Since the late 2010s, scholars have highlighted substantive differences between the application of QCA with a few cases (small-N or case-centred QCA) versus that with a large number of cases (large-N or condition-centred QCA). Small-N QCA is the traditional form of QCA (for typical examples, see: Halme et al., 2018; Vergne, Depeyre, 2016). Researchers applying small-N QCA have in-depth knowledge of the investigated phenomenon and thus high familiarity with the cases. In small N-QCA, models are created via inductive coding and theorising, and their primary purpose is theory development. Calibration in small-N QCA is based on substantive knowledge of the cases, and expectations related to the model's parameter of fit are stricter than for large samples. In contrast, large-N QCA applications are better suited to exploring data, identifying patterns and typologies across cases and theory testing (see for example, Fiss, 2011; Misangyi, Acharya, 2014). Large-N QCA usually involves less familiarity with cases and focuses more on the analytical technique. While conditions in large-N studies resemble variables, mixing QCA with statistical methods is quite popular. With the diffusion of QCA into new fields of research in management and beyond, the distinction between small- and large-N QCA is likely to grow, a development that may require best practices specific for each approach and researchers to develop distinct best practices and distinct skill sets.

### 4.2. QCA and other research methods

QCA is often described as a comparative method that lies halfway between qualitative and quantitative approaches. As such, it is well suited to be integrated with both approaches. Meuer and Rupiotta (2017a) and Rihoux et al. (2021) reviewed strategies for integrating other research methods before, during or after QCA. Using methods before QCA most often helps in identifying conditions worth including in the analysis. Moreover, other methods may simply serve as a way of collecting data. They may also be used during QCA to provide support for important methodological decisions. QCA followed by other types of analysis may provide additional support (or not) for the conclusions of the research. Across all mixed-methods

approaches involving QCA, it appears that the more QCA is integrated with other research methods, the stronger the explanatory power of the research design. Future QCA research is likely to rely on mixed-methods QCA.

The distinction between small-N and large-N QCA studies provides opportunities for the integration of QCA with other analytical techniques. Small-N QCA studies draw more comprehensively on the richness and diversity of case study research. They also provide opportunities to learn from process and longitudinal research (e.g. Aversa et al., 2015). In small-N QCA studies, the integration of QCA with process tracing is gaining popularity (e.g. Álamos-Concha et al., 2020). Thus far, large-N QCA has been integrated primarily with statistical methods and with advanced econometric and data science techniques. More recently, researchers have begun experimenting with integrating QCA with advanced modelling approaches, for example, using artificial intelligence during calibration (e.g. Pappas, Woodside, 2021; Schimpf, Barbrook-Johnson, Castellani, 2021; Shrestha et al., 2021).

### **4.3. Future challenges**

Although QCA is constantly developing, some challenges remain to be resolved. Some of the most important of these concerns the relationship between theory and configurational thinking, incorporating the time component into the analysis and the rigour of making causal claims.

#### **4.3.1. Configurational theorising**

QCA involves adopting a particular conceptual perspective and a specific analytical technique. QCA always includes a theory or conceptual model and empirical data. Since the early days of QCA, the conceptual perspective underlying the analysis has been grounded in the notion of complex causality, a notion that in essence covers three tenets of causal complexity: conjunctural causation, causal asymmetry and equifinality. Over the past three decades, the conceptual perspective, one that draws on configurational thinking and deterministic causality, has not progressed to the same extent as an analytical technique. Therefore, researchers may find the conceptual part of their study challenging.

There is a consensus within the QCA community that it is time to move beyond the notion of complex causality as the only rationale for applying QCA. Instead, more attention should be paid to configurational theorising. Furnari et al. (2021) proposed a structured approach to ‘configurational theorising’. They argued that configurational theories are well suited to addressing causal complexity, especially considering the challenges of conjunction, equifinality and asymmetry inherent in causal complexity. They proposed a model of the configurational theorising process that includes three stages and corresponding sets of heuristics. The contribution of Furnari et al. (2021) are possibly only the beginning of a new period of research that focuses more explicitly on configurational theorising. There are ample opportunities to contribute to the debate.

### 4.3.2. Time and QCA

QCA was developed to systematically compare cases at one point in time. One of its most frequently mentioned limitations relates to its inability to incorporate aspects of time and processes in the analysis (e.g. Caren, Panofsky, 2005; Fischer, Maggetti, 2017; Furnari, Meuer, 2016). The question of time component in configurations may be related to both cross-case level (i.e., temporal order of conditions) and within-case level (i.e. a change in the cases themselves). In the past, researchers have attempted to address questions relating to time and processes using models developed based on the logic and analytics of QCA (Caren, Panofsky, 2005; García Castro, Casasola, 2011; Schneider, 2019; Schneider, Rohlfing, 2013). However, only a few of these models have been used in empirical studies. QCA researchers acknowledge these challenges and continue to develop new methods of addressing time in QCA (Pagliarin, Gerrits, 2020; Rupietta, Meuer, 2021). These new methods require validation and applications to the simulated and real-world data to better understand their opportunities and limitations. Hence, much remains to be done to develop QCA methodology and illustrate its usefulness across many academic fields.

### 4.3.3. Methodological rigor and causal claims

As with many analytical methods, the question of how to unambiguously identify causal mechanisms and allow researchers to claim causality is much debated (Baumgartner, Thiem, 2017; Haesebrouck, Thomann, 2021). In its traditional form, as a small-N in-depth comparative case method, QCA relies heavily on a researcher's substantive and theoretical knowledge to identify only those conditions that influence the outcome (Greckhamer et al., 2018; Ragin, 1987). With the increasing application of QCA to large samples, several new methodological challenges have emerged, of which two appear particularly important.

First, QCA describes a particular interdependency among causal conditions and their association with a certain outcome. In statistical analysis, this objective is closely related to theorisation around moderating and mediating variables (Baron, Kenny, 1986). In QCA, researchers use terms such as 'combine', 'interdepend' and 'interact' in relation to causal conditions, but how these conditions produce a particular outcome remains vague. Thus, the interrelationship between factors needs to be more accurately conceptualised, and methodologies for empirically studying different forms of interdependencies with QCA need to be developed. The concepts of mediating and moderating mechanisms may be valuable starting points (Du et al., 2022).

Second, the risk of omitted variables (or in QCA terms 'omitted conditions') is a general methodological concern (Radaelli, Wagemann, 2019). One possible indicator of omitted variable bias is a QCA model in which all cases are clustered in one or two configurations. Such a cluster may mean that the model includes too few distinguishing conditions. The risk of omitted conditions is more likely in large-N studies where researchers lack familiarity with the research setting and context and the individual research case. Thus, the primary instrument safeguarding against an omitted condition in small-N QCA is the researcher's familiarity with



the research case. One option where an important explanatory factor is known but there are no data to include the factor as a condition is to use a proxy condition.

## 5. Summary and Practical Recommendations

QCA is an exciting research approach that continues to grow in management research. There are many opportunities not only to apply QCA but also to contribute to its development. In this paper, we provided only a brief introduction to QCA in management research, including the background, basic steps and challenges faced by researchers. For researchers curious to learn more about QCA, there are many sources of QCA-related information, including books, events, training and software. In terms of the literature, Charles Ragin's original monographs continue to be an excellent source of information (e.g. Ragin, 1987, 2000, 2006). There are also a number of important QCA textbooks (Schneider & Wagemann, 2013), with more recent ones authored by Mello (2022) and Oana, Schneider and Thomann (2021). In addition, there are regular workshops, trainings and conferences where QCA researchers meet. Table 3 provides information on useful courses, training and regular conferences. For more information about software, training and conferences, interested readers may want to visit the webpage of the Comparative Methods for Systematic Cross-case Analysis (COMPASS) network, which is an academic community of QCA researchers across all disciplines. Or simply get in touch with us directly by writing an e-mail!

**Table 3.**

*QCA-related sources of information, courses and conferences*

<b>Sources of Information</b>	<b>Massive Open Online Courses</b>
Comparative Methods for Systematic Cross-case Analysis (COMPASS) network <a href="https://compasss.org">https://compasss.org</a> Facebook group: Qualitative Comparative Analysis and Fuzzy Sets	Erasmus University Rotterdam/Coursera <a href="https://www.coursera.org/learn/qualitative-comparative-analysis">https://www.coursera.org/learn/qualitative-comparative-analysis</a>
<b>Summer/winter schools</b>	<b>Conferences and workshops</b>
The European Consortium for Political Research (ECPR) <a href="https://ecpr.eu/">https://ecpr.eu/</a> Erasmus Research Institute of Management <a href="https://www.erim.eur.nl/doctoral-programme/courses/summer-school/">https://www.erim.eur.nl/doctoral-programme/courses/summer-school/</a> Global School in Empirical Research Methods, University of St. Gallen <a href="https://www.gserm.ch/stgallen/">https://www.gserm.ch/stgallen/</a> Nijmegen School of Management, Radboud University, the Netherlands 2022 Summer School in Social Research Methods - Nijmegen School of Management (ru.nl)	Paper Development Workshop <a href="https://compasss.org/intlqca/">https://compasss.org/intlqca/</a> QCA Conference of the Americas (AQCA) <a href="https://compasss.org/aqca/">https://compasss.org/aqca/</a> Academy of Management <a href="https://aom.org/events">https://aom.org/events</a> European Group for Organisational Studies <a href="https://egos.org/">https://egos.org/</a> European Academy of Management <a href="https://euram.academy/">https://euram.academy/</a>

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## Appendix

Table 4 presents the membership scores of all the cases included in the analysis. The data were used as inputs in the analytical part of the QCA.

**Table 4.**  
*Input data*

ID	BIG	HIGH	PUB	EXP
1	0	0	1	1
2	0	0	0	0
3	0	0,3	0	0
4	0	1	1	1
5	0	1	1	1
6	0,1	0	1	1
7	0,1	0	1	1
8	0,1	1	0	0
9	0,1	1	0	0
10	0,1	1	0	0
11	0,1	0	1	1
12	0,1	0	1	1
13	0,1	1	0	0
14	0,1	1	0	0
15	0,1	1	0	0
16	0,1	0,3	1	1
17	0,4	0,3	1	1
18	0,4	0,3	1	1
19	0,4	0,3	0	0
20	0,4	0,3	0	0
21	0,4	0	0	0
22	0,4	0	0	0
23	0,4	0	0	0
24	0,4	0,7	1	1
25	1	0,7	1	1
26	1	1	1	1
27	1	0,3	1	1
28	1	0,7	0	1
29	1	0,3	0	1
30	1	0	0	1
31	1	0	0	1

## Footnotes

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- <sup>i</sup> There are suggestions in the literature describing the minimal number of cases (N) in relation to the number of conditions (C) as  $N = C * 3$  or  $N = 2^C$ , which for four conditions translates to a minimal number of cases of 12 or 16, respectively (Schneider, Wagemann, 2013).
- <sup>ii</sup> For the sake of brevity, in this paper, we do not describe the analysis of necessity (Schneider, Wagemann, 2013), which should be the first step of investigating set relations.
- <sup>iii</sup> In a standard QCA process, the researcher conducts a separate analysis of the occurrence of the outcome and non-occurrence of the outcome.
- <sup>iv</sup> The scenario is inspired by the actual research (Krupnik et al., 2023).
- <sup>v</sup> The dataset that we use in our illustration is available as in the appendix.
- <sup>vi</sup> The dataset not only includes crisp (i.e. 0 and 1) but also fuzzy-set membership scores (i.e., between 0 and 1). The truth table in QCA simplifies the input data only on the surface but continues to operate mathematically with fuzzy-set member scores.



## PREVALENCE AND PREVENTION OF POST-TRAUMATIC STRESS SYMPTOMS RELATED TO THE COVID-19 PANDEMIC IN WORKING ENVIRONMENT

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**Purpose:** The aim of this paper was to analyse the occurrence of the symptoms of post-traumatic stress related to the COVID-19, while also their pre-conditions in a group of working people. The paper also analyses ways of counteracting the symptoms of post-traumatic stress in a working environment.

**Design/methodology/approach:** The study included 46 employees (26 men and 20 women) from the IT sector. The analysis was of a cross-sectional nature. In the analysis, a self-designed survey, as well as the Impact of Event Scale (Revised version- IES-R) were availed of for this purpose.

**Findings:** The findings acquired indicate the occurrence of a clinical intensification of the symptoms in the field of the general post-traumatic stress indicated amongst 15.2% of those under analysis, while in turn by taking account of a more rigorous diagnostic approach in terms of 8.6% of those analysed. The analysis made it clear that the intensification of the symptoms was higher in terms of women and amongst people with a higher level of education (only in the field of the general results, as well as the measurement of arousal).

**Research limitations/implications:** One of the limitations of this study is the use of self-reported measurement tools. In addition, the survey was conducted amongst a group of employees in one sector which creates some limitations in terms of the generalization of the results. At the same time, this provides a reason to design similar studies in the future with the participation of employees from different sectors of the economy.

**Practical implications:** The analysis presented emphasizes how important actions aimed at increasing the level of awareness in the field of the occurrence of the symptoms of post-traumatic stress associated with COVID-19 are, particularly in the working environment. What is the most important is that this awareness should particularly encompass the managerial staff, who on the basis of this should develop the practice of preventing the development of PTSD (*post-traumatic stress disorder*) amongst the working staff, while also ways of helping the employees who experience this problem.

**Originality/value** This research emphasizes the long-term consequences of the pandemic, while also the ways of counteracting them in the workplace on the basis of the analysis of the problem of the post-traumatic stress associated with the COVID-19 pandemic amongst a group of people working in the IT sector.

**Keywords:** symptoms of post-traumatic stress, PTSD, COVID-19 pandemic, employee.

**Category of the paper:** Research paper.

## 1. Introduction

The emergence of the threat associated with the COVID-19 pandemic forced significant changes in the functioning of various spheres of life. Sanitary restrictions were implemented unexpectedly and suddenly, while also the obligatory social distancing and possible quarantine. These changes also appeared in professional life. Remote working became the recommended and common form of making a living. Its application grew with relation to the period prior to the pandemic, e.g. in the research entitled ‘Living, working and COVID-19’ conducted by Eurofound in April 2020, over one-third (39%) of the employees of EU member states indicated that they were working from home because of the pandemic (Eurofound, 2020). As a consequence of the existing changes, while also the feeling of danger experienced, health problems began to emerge of a long-term mental nature or physical symptoms (Nilamadhab, Kar, Karc, 2021; Talevi et al., 2020; Vieta et al., 2020). On the basis of a systematic review conducted by Santomauro et al. (2021) in 2020 due to the COVID-19 pandemic there was approximately a 27% increase in global terms with regard to the occurrence of major depressive disorder (with the total prevalence totalling 3,152 cases per 100,000 of a population), while also approximately 25% of a global increase in the occurrence of anxiety disorders (with the total prevalence totalling 4,802 cases per 100,000 of a population). The emergence of other health problems relating to mental disorders also grew, namely, the feeling of danger in terms of interpersonal relations, obsessive disorders, or the symptoms of post-traumatic stress (Heitzman, 2020). The fact is that during the formation of this publication, the number of new cases of SARS-CoV-2 reduced significantly with relation to the state of affairs during the peak of the pandemic<sup>1</sup>, albeit the long-term effects of the pandemic may be felt in terms of mental health. It is possible that the extreme feeling of threat to life, as well as to personal health and the health of loved ones, or even the loss of income experienced during the course of the pandemic, was such an experience of crisis as to lead to long-term difficulties in terms of functioning that have remained despite the passing of time. The identification of these consequences is of significance particularly in terms of the perspective of the necessity to return to the everyday mode of functioning on the basis of the principles prior to the pandemic and simultaneously the need for the appropriate adaptation to social and professional requirements.

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<sup>1</sup> According to data from the Ministry of Health as of: 2023.09.10 the number of new cases of infections in Poland totalled 10 (<https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2>).

In this paper, an attempt was made to evaluate the occurrence of the symptoms of post-traumatic stress associated with the COVID-19 pandemic, while also their preconditions in a group of working people. This paper also undertakes an analysis of preventive actions that may be taken with regard to the problems described in the working environment.

## 2. Literature review and research background

Research confirms the increased occurrence of the symptoms of the spectrum of post-traumatic stress as a result of the COVID-19 pandemic (Qiu et al., 2021; Salehi et al., 2021; Yunitri et al., 2022). The pooled prevalence of PTSD (*post-traumatic stress disorder*) in the COVID-19 pandemic is estimated to be between 12 and 27.13 % of the general population, while also between 15.45 and 36.3 % amongst COVID-19 survivors and between 17.23 and 29.22% among health care workers. These arguments suggest that despite a certain ambiguity in the field of the diagnostics criteria of the COVID-19 pandemic and the stressors associated with it, it is possible to consider this in terms of categories of traumatic stressors, as a result of which PTSD may develop (Bridgland, Moeck, Green; 2021). In accordance with the diagnostic criteria proposed by DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*) (American Psychiatric Association, 2013), the traumatic stressor usually encompasses a direct reaction to an event (indirect if the stressor relates to close ones), albeit, as proven, the symptoms of traumatic stress may appear as the effect of the indirect impact of pandemic stressors, such as information about the transmission of the virus presented by the media (Chao et al., 2020; Mertens et al., 2020). In China, nurses who were not involved in terms of providing care for patients with COVID-19 and the general public had higher PTSD-like symptoms, such as depression, anxiety, stress symptoms, as well as physiological reactions than front-line nurses (Li et al., 2020). The authors at hand suggest that it is possible that the front-line nurses referred to the information from the media regarding COVID-19 to a lesser degree. Furthermore, the symptoms of post-traumatic stress may also appear as a result of an anticipated event, which has not yet happened and may emerge in the future, e.g. the risk of infection and death of close ones. One of the criteria of the traumatic stressor both in terms of the classification of DSM-5, as well as ICD-10 (*International Statistical Classification of Diseases and Related Health Problems*) also indicates its catastrophic nature (American Psychiatric Association, 2013; WHO, 1998), which would eliminate multiple stressors associated with the COVID-19 pandemic from this category (Norrholm et al., 2021). Nevertheless, it is confirmed that a range of stressful events connected with the pandemic causes the release of symptoms from the spectrum of traumatic stress (Bridgland, Moeck, Green; 2021). This trauma may be the result of confrontation with several less intensified experiences, such as, among others: the fear of infection, exposure to quarantine and isolation, fear of losing employment, closure

and the loss of social life (Łaskawiec et al., 2022). Moreover, due to the fact that new cases of the virus infection are still occurring (despite the drop in infections), peri-traumatic reactions are possible (responses at the time of a stressful event or immediately after), which intensify the symptoms experienced (Bridgland, Moeck, Green, 2021).

The diagnosis of PTSD, apart from the criteria associated with the exposure to the stressor of a traumatic nature (criteria A), also requires the presence of other characteristic symptoms. In the table below (Table 1), a set of the remaining diagnostic criteria has been presented on the basis of two commonly applied classifications as follows: DSM-5 and ICD-10.

**Table 1.**

*Set of remaining diagnostic criteria for PTSD according to ICD-10 and DSM-5 (apart from criteria A)*

DIAGNOSTIC CRITERIA ACCORDING TO ICD-10	DIAGNOSTIC CRITERIA ACCORDING TO DSM-5
<p>B. There is persistent recall or “reliving” of the stressor in the form of disturbing “flashbacks”, vivid memories, or recurring dreams, or feeling worse when faced with circumstances resembling or related to the stressor.</p>	<p>B: Presence of at least one symptom of intrusion related to the traumatic event that occurred after the traumatic event:            B1. Recurring unwanted, intrusive and stressful memories of a traumatic event.            B2. Recurrent, distressing dreams whose content and/or emotional content is related to the traumatic event(s).            B3. Dissociative reactions (e.g. flashbacks) in which the person feels or behaves as if the traumatic events have happened again. (These reactions can be considered on a continuum with the most extreme intensity consisting in the loss of awareness in the surrounding reality).            B4. Severe or prolonged psychological distress when exposed to internal or external cues that symbolize or resemble some aspect of the traumatic event.            B5. Strong physiological responses to internal or external stimuli that symbolize or resemble some aspect of the traumatic event.</p>
<p>C. Patient currently avoids or prefers to avoid circumstances that resemble or are related to the stressor that were not present prior to exposure to the stressor.</p>	<p>C. Persistent avoidance of trauma-related stimuli after the traumatic event, as manifested by one or both of the following:            C1. Avoiding or trying to avoid distressing memories, thoughts or feelings about or closely related to the traumatic events.            C2. Avoiding or attempting to avoid external stimuli reminiscent of the event (people, places, conversations, activities, objects, situations) that evoke distressing memories, thoughts or feelings about or closely related to the traumatic events.</p>
<p>D. Any of the following is present:            1) Partial or complete inability to reconstruct certain important circumstances of the encounter with the stressor.</p>	<p>D. Negative cognitive and emotional changes that occurred or worsened after the traumatic events, as manifested by at least two of the following symptoms:            D1. Inability to recall important aspects of the traumatic events (usually related to dissociative amnesia rather than head injury, alcohol or drug use).            D2. Perpetuated and exaggerated negative beliefs about oneself, other people, or the world itself (e.g., "I am a bad person," "No one can be trusted," "The world is absolutely dangerous," or "My nervous system is completely ruined").            D3. A fixed and distorted way of thinking about the causes or consequences of the traumatic events that leads to blaming yourself or others.            D4. Persistent negative emotional state (e.g. fear, horror, anger, guilt or shame).            D5. Markedly limited interest or participation in important activities.            D6. Feeling distant from other people or being alienated.            D7. Persistent inability to experience positive feelings (e.g. inability to feel happy, content, or loved).</p>

Cont. table 1.

<p>2) Persistent symptoms of heightened psychological sensitivity and arousal state (not present prior to exposure to the stressor) as any two of the following:</p> <p>a) difficulty with falling asleep or staying asleep,  b) irritability or outbursts of anger,  c) difficulty with concentrating,  d) excessive vigilance,  e) enhanced startled reaction.</p>	<p>E. Marked changes in feeling of arousal and reactivity related to the traumatic events that started or worsened after the events, such as at least two of the following:</p> <p>E1. Irritability or outbursts of anger.  E2. Risk-taking or self-destructive behaviour.  E3. Increased vigilance.  E4. Excessively strong reaction to unexpected stimuli.  E5. Difficulty with concentrating.  E6. Difficulty with falling or staying asleep.</p>
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Source: American Psychiatric Association, 2013; Światowa Organizacja Zdrowia (WHO), 1998.

By assuming that the experiences of the COVID-19 pandemic may result in the development of the symptoms of post-traumatic stress of varying intensity that may remain despite the passing of time and intensify particularly in the face of confrontation with the consequences of the constant activity of the SARS-CoV-2 virus, in this paper an attempt has been made to evaluate the occurrence of the symptoms of post-traumatic stress, while also their preconditions (sex type, age, education, job seniority) in the analysed group of employees.

### 3. Methodology of the research

#### 3.1. Participants

The research was conducted amongst a group of employees working in the IT sector in the period of March-April 2023. The research was conducted online and the criteria of the selection of employees for analysis was a minimum of 3 years of job seniority, while also a position held that required a stationary form of work. Of the employees who give consent to the research, 46 people (26 men and 20 women) returned the forms, who were aged between 28 and 49 ( $M = 33.98$ ;  $SD = 5.45$ ). Detailed characteristics of the analysed group are presented in Table 2.

**Table 2.**

*Characteristics of the study group*

		<b>n</b>	<b>%</b>
<b>EMPLOYEES</b>	females	20	43.5
	males	26	56.5
<b>EDUCATION</b>	higher	27	58.7
	medium	19	41.3
		<b>M</b>	<b>SD</b>
<b>AGE (YEARS)</b>		33.98	5.45
<b>JOB SENIORITY (YEARS)</b>		5.03	1.37

### 3.2. Measurements of scale

In the research, the *Impact of Event Scale - revised version* (IES-R) was availed of. This scale was adapted to the Polish conditions by Juczyński and Ogińska-Bulik and consists of 22 items and is primarily designated to the gauging of post-traumatic stress, thus rendering it possible to indicate the general intensity of the symptoms of post-traumatic stress, while also the intensity of the symptoms of the particular measurements of this variable (intrusion, avoidance and arousal) (Juczyński, Ogińska-Bulik, 2009). A person under analysis is evaluated on a five-degree scale (0 – not at all, 1 – to an insignificant degree, 2 – moderately, 3 – to a significant degree, 4 – decisively so) in terms of the frequency of the occurrence of symptoms relating to a specific traumatic event. The general result is calculated by means of the sum of all the points, although the results for each of the sub-scales by means of the sum of points from the questions attributed to the particular sub-scales. It is also possible to calculate the medium values for the general result and sub-scales. The threshold for the clinical intensity of symptoms is the medium value of 1.5, which relates to both the particular measurements, as well as the general indicator of the intensity of the symptoms of post-traumatic stress. Results exceeding the value of 1.5 in each of the three measurements of the scale authenticate the diagnosis. The reliability of the scale was assessed by means of estimating its internal consistency and absolute stability. The internal consistency, assessed on the basis of the  $\alpha$  Cronbach coefficient, amounts to 0.92 for the entire scale, while in the case of intrusion, arousal and avoidance this comes to 0.89, 0.85 and 0.78 respectively. In turn, the values of the coefficients of internal stability for the entire scale, as well as the subscales of intrusion, arousal and avoidance amounted to 0.75, 0.79, 0.76, 0.68 respectively. For the purposes of this paper, the instructions were modified in order for the people under analysis to assess the occurrence of the symptoms of post-traumatic stress with reference to the COVID-19 pandemic.

Furthermore, in the research, a self-designed survey was applied that took account of the following data: sex type and age of those analysed, education, position held in the firm at hand, while also job seniority in the analysed firm.

### 3.3. Data analysis

The study was cross-sectional by nature. The aim of establishing the dependency between the symptoms of post-traumatic stress, while also the variables describing the analysed group of employees required the application of a non-parametric test (unfulfilled assumption of the normality of distribution) in the case of independent groups (Mann-Whitney test), while also the Spearman's rank correlation. The statistical program STATISTICA 13.3 from Statsoft was used for the calculations and a statistical significance level of  $p < 0.05$  was adopted.

## 4. Results

In Table 3, the research findings for the intensity of the symptoms of post-traumatic stress of the measured scale of IES-R have been presented (the general result and the results in 3 dimensions of post-traumatic stress) on the basis of the acquired raw output.

**Table 3.**

*Level of symptoms of post-traumatic stress disorder in the analysed group of employees*

Results of post-traumatic stress on the IES-R scale	M	SD
Intrusion	7.9	5.2
Avoidance	6.1	5.3
Arousal	9.3	5.3
General results	23.5	14.3

M – medium, SD – standard deviation.

In order to check the percentage of the clinical values (above the cut-off point) for the symptoms of PTSD in the analysed group of employees, a medium value was calculated in the particular dimensions of post-traumatic stress, as well as the medium general result, while subsequently the results were set out which achieve values above the accepted cut-off point (> 1.5). The acquired data is presented in Table 4.

**Table 4.**

*Clinical values of symptoms of post-traumatic stress (above the cut-off point) acquired in the analysed group of employees*

Intrusion		Avoidance		Arousal		General results	
n	%	n	%	n	%	N	%
6	13	4	8.6	10	21.7	7	15.2

15.2% of the employees analysed acquired clinical values for the general indicator of post-traumatic stress. In turn, more restrictive guidelines for diagnosis require the acquisition of values above the cut-off point in all three dimensions analysed simultaneously (Juczyński, Ogińska-Bulik, 2009). In this research, such a result was attained by 8.6% of those analysed (n = 4). The most results of a clinical intensity were amongst those analysed in terms of the dimension of the symptoms of arousal (21.7%), whereas the least in terms of the dimension of avoidance (8.6%).

In the following tables: 5, 6, 7, 8, an analysis of the symptoms of post-traumatic stress has been presented (the general result and three dimensions) depending on variables characterizing the analysed group (sex type, age, education, job seniority).

**Table 5.***Comparison of medium values of post-traumatic stress depending on the sex types analysed*

Results of post-traumatic stress on the IES-R scale	Men		Women		U	p
	M	SD	M	SD		
Intrusion	5.77	3.3	10.7	6.3	124.5	<b>0.002</b>
Avoidance	3.8	3.03	9.1	6.43	124.0	<b>0.002</b>
Arousal	6.77	3.85	12.6	5.38	97.0	<b>0.000</b>
General results	16.5	8.31	32.55	16.04	97.5	<b>0.000</b>

M – medium, SD – standard deviation, U – value of Mann-Whitney test, p – level of significance.

**Table 6.***Comparison of medium values of post-traumatic stress depending on the level of education of those analysed*

Results of post-traumatic stress on the IES-R scale	Higher education		Medium-level education		U	p
	M	SD	M	SD		
Intrusion	9.3	5.75	5.95	4.2	169.5	0.057
Avoidance	7.22	5.58	4.53	4.95	170.0	0.058
Arousal	10.67	5.92	7.37	3.89	166.5	<b>0.044</b>
General results	27.4	15.95	17.89	10.3	166.5	<b>0.045</b>

M – medium, SD – standard deviation, U – value of Mann-Whitney test, p – level of significance.

**Table 7.***Dependency between the symptoms of post-traumatic stress and the age of those analysed*

Results of post-traumatic stress on the IES-R scale	Spearman's rho	p
Intrusion	-0.08	0.583
Avoidance	-0.05	0.728
Arousal	0.10	0.504
General results	<0.01	0.995

p – level of significance.

**Table 8.***Dependency between symptoms of post-traumatic stress and job seniority of those analysed*

Results of post-traumatic stress on the IES-R scale	Spearman's rho	p
Intrusion	-0.16	0.284
Avoidance	<0.01	0.997
Arousal	-0.02	0.910
General results	-0.07	0.644

p – level of significance.

The results of the analysed dependencies revealed differences in the field of the intensity of the symptoms of post-traumatic stress between women and men both in the field of the general post-traumatic stress indicator, as well as in the field of all three dimensions. Women attained a statistically significant higher level of these symptoms with relation to men. Comparisons of the intensity of the symptoms of post-traumatic stress depending on the level of education of those analysed, revealed significant differences in the field of the general result, while also the measurement of arousal, whereby those analysed with a higher level of education acquired a higher intensity of symptoms with regard to those analysed with a medium-level of education. In the sphere of varying ages and job seniority, no significant statistical dependency was revealed.



## 5. Discussion

The results acquired from the employees of the IT sector indicated the occurrence of clinical intensity of the symptoms in the field of the indicator of the post-traumatic stress amongst 15.2% of those analysed, while in turn by taking account of a more rigorous diagnostic approach amongst 8.6% of those analysed (where all three dimensions must achieve values above the cut-off point simultaneously) these results are lower in comparison with the data indicated in the meta-analysis of research on PTSD associated with COVID-19 in the general population (12 – 27.13 %) (Qiu et al., 2021; Salehi et al., 2021; Yunitri et al., 2022). Similarly, in comparison with the research findings while taking into consideration the employees of various sectors, e.g. in the research with the participation of 181 social workers, 26.21% met the diagnostic criteria for PTSD (Holmes et al., 2021). In turn, in the research conducted by Rosemberg et al. (2021) this involved the participation of employees working in the food services, food retail, hospitality and industries, while the probability of the occurrence of PTSD was estimated to be 37% of those analysed. Perhaps the span of the indicator of the post-traumatic stress as a consequence of the COVID-19 pandemic is related to the time in which the measurement was taken, as the further away from the moment of the outbreak of the pandemic, the lower this indicator may be (Shevlin et al., 2021). This research was conducted three years after the moment of the outbreak of the pandemic, which may explain the relatively lower indicators of the analysed variable. Nevertheless, it is worth emphasizing that the research in the area described was conducted on various groups of employees, while also with the use of various tools for diagnosing the symptoms of post-traumatic stress, which may render reliable comparisons difficult, while simultaneously constitute an inducement in terms of further research. However, this does not change the fact that even a slight intensity of the analysed symptoms amongst the employees may affect their functioning at the workplace. Post-traumatic stress disorder, as in the case of other mental health problems, may increase the level of absenteeism at work. On the basis of data from 24 countries, the average number of days out of role (when employees were totally unable to do their work or usual activities) due to PTSD amounted to 42.7 annually (Alonso et al., 2013). Analogically speaking, the unfavourable impact of the aforesaid symptoms also relates to the productivity of an employee, which in turn relates to the organizational performance. The research carried out during the course of the pandemic on a group of 169 employees revealed a weak, yet significant dependency between the general indicator of PTSD and the measurements of PTSD and the efficiency of an employee (Yilmaz, Karakuş, 2022). The symptoms of post-traumatic stress may disrupt verbal memory (Johnsen, Asbjørnsen, 2008; Johnsen, Kanagaratnam, Asbjørnsen, 2008), which may have an impact on the process of learning and weaken the quality of the tasks carried out in particular where people work on worded material. The consequences may also appear in the area of interpersonal ties at the workplace. In situations of conflict, employees

with symptoms of PTSD are more prone to experience anxiety and irritability (McFarlane, Bookless, 2001). This may result in keeping a distance and alienation in terms of relations in the workplace. Symptoms from the spectrum of post-traumatic stress are also associated with employee burnout, while also its characteristic symptoms: emotional numbness, depersonalization, and a diminished sense of personal accomplishment (Whealin et al., 2007; Mather, Blom, Svedberg, 2014).

The fact of the relatively high level of indicators attained in research in the field of arousal in terms of post-traumatic stress (21.7%) is worth mentioning. This signifies that amongst the employees analysed, there are symptoms such as difficulty with sleeping, decreasing levels of concentration, irritability, excessive vigilance, or excessive reactions to unexpected stimulants that occur more frequently by comparison with symptoms of avoidance and intrusion. The symptoms of arousal may hinder the execution of tasks at work, while also reduce their quality and lead to mistakes and accidents at work. Generally speaking, problems with concentrating on work, while also the associated absorption of anxiety may have an impact on professional activity in every aspect that leads to a clear decrease in its quality. However, it is worth emphasizing that the symptoms of the measurement of arousal are the pivotal symptom not only in terms of post-traumatic stress, but also for other anxiety disorders, which may in turn hinder the unequivocal conclusion as to their origin (Brown, McNiff, 2009). Thus, there is a need for further research that would verify the cause-effect dependency in this area.

In the analysed group of employees from the IT sector, the intensity of the symptoms of post-traumatic stress differed in terms of sex types and levels of education. The intensity of the symptoms was higher amongst the women analysed (in all categories of the symptoms of post-traumatic stress), while also amongst people with a higher level of education (only in the sphere of the general result and measurement of arousal). Sex type turns out to be pre-conditioned by an intensity of symptoms in the analysed group of employees, which is cohesive with the data in the sphere of the spreading of PTSD, according to which women are more susceptible to the occurrence of this type of symptoms as a consequence of traumatic events (Bossini et al., 2016). It is indicated that women experience post-traumatic stress twice more frequently than men (Rabe-Jabłońska, 2011), which may have a connection with, among other things, the differences in the sphere of the reactivity to the HPA axis of stress (hypothalamic-pituitary-adrenal axis), as the changing of the hormonal environment of women may have an impact on the greater reactivity of this axis and the lower stability of the homeostatic system in women (Christiansen, Berke, 2020). In research, it is also indicated that both men and women are exposed to varying types of traumatic events and this is the source of the differences in terms of experiencing the symptoms of PTSD (Tolin, Foa, 2006). However, in this research the symptoms of post-traumatic stress that have a connection with the same stressor were analysed, namely the COVID-19 pandemic. One of the few research projects that analyses the differences between sex types in the field of PTSD associated with COVID-19 was conducted on 285 residents of

Wuhan and the surrounding cities also indicated greater intensity of the symptoms amongst women than men (Liu et al., 2020). Similarly, in research carried out amongst the population of South Africa, higher indicators were noted in the case of the symptoms of post-traumatic stress associated with the pandemic amongst women by comparison with men (Nzimande et al., 2022). The pandemic as a traumatic stressor may induce varying consequences for women and for men. It is possible that the acquired findings may be influenced by factors that arise from different consequences of the pandemic felt by women and men, e.g. women declared higher levels of loneliness during the pandemic when compared to their male counterparts (Padmanabhanunni, Pretorius, 2021). A significant factor may also be that of the anxiety of women in terms of the life and health of the family, especially with regard to their offspring. These relations may be confirmed by empirical research which emphasizes higher stress reactions to the pandemic amongst women working in the health care services by comparison with men working there (Canal-Rivero et al., 2022; Lopez-Atanes et al., 2021; Luo et al., 2020). Nevertheless, more detailed research is required in order to establish the significance of the impact of the variables that mediate in the field of the dependencies described.

The results in the field of the differences in terms of the intensity of the symptoms of post-traumatic stress amongst the employees with higher levels of education and medium levels of education would seem to be surprising with regard to some empirical data that indicates that a low education level constitutes a predictor in terms of the development of PTSD (Brewin, Andrews, Valentine, 2000; Engelhard et al., 2006; Trickey et al., 2012). Simultaneously, the afore-mentioned research related to post-traumatic stress as the consequence of other crisis events than the pandemic. What is more, in this research the analysed group did not reveal any people with basic levels of education, which may also have an impact on the variability of the findings. It is possible that in the case of the stressor in the form of the COVID-19 pandemic, education determines the medical knowledge held and the awareness of the threat to health and life. Research conducted by Duplaga (2020) indicated that people with higher levels of education were more reluctant to process information about the COVID-19 pandemic of the nature of conspiracy theories. With regard to these premises, it is possible to conclude that the higher we perceive the pandemic threat, the higher the level of stress felt. Furthermore, it is worth underlining that the statistically significant dependency referred to only the symptoms in the sphere of the general result, while also the measurement of the arousal of the post-traumatic stress, which as already mentioned, encompasses the non-specific symptoms that are also typical for other psychological problems. By comparison with the “sex type”, education may therefore have a lower value in determining the described differences in terms of the intensity of the symptoms of post-traumatic stress.

The analysis conducted indicates that there is no relation between the symptoms of post-traumatic stress and the age and job seniority of those analysed. In the context of the “age” variable, the findings are ambiguous – some confirm the greater risk of PTSD amongst younger people (Lei et al., 2021; Pasha et al., 2023), while others indicate a lack of such a relation (Roel,

Lara, Bilsen, 2021). In the analysed group, there were no younger employees than 28 year olds (and the average age of those analysed was 33.98 years of age). Hence, in the analysis, there cannot be a reference to very young adults (18-25 years of age), which may constitute caution in terms of the interpretation of the findings. The lack of a connection between the symptoms and job seniority may signify that job seniority is a relatively independent factor, which does not protect against post-traumatic stress, yet it does not have an impact on its intensity either. It is worth underlining that the specifics of the IT sector lead to greater certainty in terms of finding employment, even in the form of remote working, while reducing at the same time the attachment to one specific place of work (Iskierka, Krzemiński, Weźgowiec, 2017). By way of consequence, this factor may not have an impact on the intensity of the feeling of danger associated with the pandemic. A similar result in research was acquired by Roel et al. (2021) by indicating the lack of connection between job seniority and PTSD associated with COVID-19 amongst a group of directors of funeral homes.

Preventing the symptoms of post-traumatic stress that may develop as a result of the COVID-19 pandemic constituted and continues to constitute a challenge all over the world. It is certain that huge significance in terms of preventing this problem is attached to the following: increasing the widespread access to services in the sphere of mental health, including telepsychiatry, preliminary assessment, health screening, psychosocial support for specified groups of risk, while also adequate treatment (the therapeutic methods of PTSD within the framework of cognitive-behavioural psychotherapy include the following: among others, prolonged exposure and emotional processing (Foa, Riggs, 1993), CPT therapy (*Cognitive Processing Therapy*) (Resick, 2019), EMDR therapy (*Eye Movement Desensitization and Reprocessing*)).

In subject-related literature, in accordance with the knowledge of authors, there is a lack of propositions of standardized programs aimed at preventing the development of PTSD as a consequence of the pandemic, which would be dedicated for execution in the working environment. Simultaneously, this research constitutes an important basis for the preparation of recommendations in the field of the aforesaid prevention. Preventing the symptoms of post-traumatic stress in a working environment should encompass activities both with regard to the employees, as well as to the employers. It is very significant to work on the awareness of the problem, as well as a change in the manner of comprehending the situation of danger. With this aim in mind, it is worth organizing a reliable psychoeducation program to be run by experts for the entire working community. In the sphere of prevention, with regard to the managerial staff, the most efficient may turn out to be the impact of primary prophylactics that ensures the basic instructions with reference to supporting the natural mechanisms of coping with stress in terms of both the manager and the subordinates. In turn, all employees should be covered by selective first degree prophylactics. Activities of this type may be based on therapy and encompass the familiarization with the specifics of the pandemic as a traumatic stressor, while also the possible symptoms of the spectrum of the post-traumatic stress, as well as other problems of mental health.

An extraordinarily significant resource in the context of protection against the consequences of the effects of a traumatic stressor is that of self-efficacy, particularly coping self-efficacy (Gallagher, Long, Phillips, 2020). Coping self-efficacy in the context of trauma is a set of convictions relating to the effectiveness of coping with the circumstances after the effects of a traumatic stressor, which is by nature threatening, unpredictable and uncontrollable. Hence, prevention should have an impact on this resource in such a way that the person could understand the mechanisms of emotional control better and control the uncontrollable cognitive phenomena which are, among other things, intrusive and bring back memories (Benight, Bandura, 2004).

Forms of impact within the framework of the prophylactics of the development of PTSD may be realized in the form of training. The preparation of training should take account of the transfer of knowledge, as well as training of social skills, particularly the ways of coping with stress. It is worth supplementing the training program with problematic situations associated with the pandemic indicated by employees and verified on the basis of, e.g. structured interviews. A sample training plan directed at strengthening the skills of coping, particularly the feeling of self-efficacy both amongst employees, as well as employers should include the following elements:

- education in the sphere of knowledge relating to stress, traumatic stressors and the basic consequences of stress, including chronic state of autonomic arousal,
- exercises to regulate tension associated with stress with the aid of the techniques of relaxation and biofeedback,
- education and training to recognise the cognitive distortions of the methods of cognitive restructuring,
- exercises to regulate tension associated with stress with the aid of the impact on the maintenance of the aim of changes to the non-constructive patterns of reacting in a crisis situation,
- training on the strategy of resolving problems (e.g. according to Nezu, Nezu, Zurilla, 2013),
- education and training in terms of resolving problems indicated as the most significant for the participants of the training.

## 6. Conclusions

In this paper an evaluation was conducted on the occurrence of the symptoms of post-traumatic stress, while also their pre-conditions in terms of a group of employees of the IT sector. The research findings confirm the occurrence of the clinical intensity of the post-traumatic symptoms amongst the employees analysed within the period of three years following

the pandemic. The illustrated intensity of the symptoms is lower with relation to the previously acquired data from the meta-analysis of research in the sphere of the occurrence of PTSD associated with COVID-19 amongst the general population. What is significant is the fact that the highest levels of intensity were visible in the sphere of the measurement of the arousal, which signifies that amongst the employees analysed, the symptoms were characterized by, among other things, increased vigilance, anxiety, impatience, difficulty with concentration occurring frequently by comparison with the symptoms of avoidance and intrusion. However, with regard to the non-specificity of the symptoms of the dimension of arousal, the cause-effect conclusions should be treated with caution. On the basis of analysis on the pre-conditions of the symptoms of post-traumatic stress amongst the group of employees, it is possible to conclude that women, as well as people with higher levels of education are more susceptible to the development of PTSD.

It is necessary to emphasize the fact that even a slight intensity of the symptoms of post-traumatic stress amongst employees may have an impact on their professional efficiency, while simultaneously affect the organizational performance. This constitutes an important inducement to increasing the awareness of this problem, while also planning preventive action and ways of intervention. Prophylactic action should encompass psychoeducation, while also training on managerial skills, particularly directed at strengthening the coping self-efficacy. Fundamental responsibility in the sphere of conducting these actions in the workplace lies with the managerial staff.

This empirical work contributes considerable value to the hitherto knowledge in the sphere of long-term consequences of the COVID-19 pandemic by filling in the significant hole relating to the analysis of these consequences amongst a group employees from the IT sector. Indeed, it is worth underlining that the majority of research undertaking the theme of the burden on mental health as a result of the COVID-19 pandemic focuses on the employees of the health care workers.

## **7. Limitations**

One of the limitations of this study is the use of self-reported measurement tools, which are associated with the risk of measurement error resulting from consciously or subconsciously presenting themselves in a different light than in reality. In addition, the survey was conducted amongst a group of employees in one industry and on a relatively small sample size, which creates some limitations in terms of the generalization of the results. At the same time, this provides a reason to design similar studies in the future with the participation of employees from different sectors of the economy.

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## ENTRY MODES USED IN THE INTERNATIONALIZATION PROCESS OF AUTOMOTIVE ENTERPRISES

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**Purpose:** The main aim of the article is to identify and describe strategies for entering foreign markets and forms of serving these markets by automotive sector enterprises as part of the internationalization process. The secondary goal is to find links between these strategies, their forms and their importance for the overall course of internationalization of activities of the surveyed enterprises.

**Design, methodology and approach:** The article uses mixed research methods. The starting point was literature studies to determine the current state of knowledge in the research area and to formulate the problem. The research proper was conducted using a qualitative approach. The core consisted of case studies supported by data from secondary sources.

**Findings:** It is not possible to design a universal internationalization model for all enterprises in the automotive sector. Strategies adopted depend on many factors: general conditions of the country's economy and its size, level of technological advancement in production, capital resources, product range and vision of development. Therefore, the greatest similarities occur in the geographical layout. Asian, European and North American companies followed different paths of internationalization.

**Research limitations and implications:** The research expands knowledge about internationalization of automotive companies. It shows the context of the process, which makes it easier to understand the current balance of power and competitive structure in the automotive sector. The main limitation is that the research is not exhaustive. Relevant information and data are dispersed and their form often does not allow for objective comparisons. Therefore, it can be assumed with high probability that not all dependencies have been discovered.

**Practical and social implications:** Apart from the scientific community, this article can be recommended to management practitioners, especially executives responsible for strategic management. The development paths and solutions described here may help them make decisions on strategies and forms of entering foreign markets.

**Originality and value:** The originality of the research lies in the attempt to comprehensively describe the internationalization process: entry strategies, forms of serving markets and sequences of individual stages of proceeding on the global market. The conclusions and recommendations contained in the article allow for a better understanding of the mechanisms of building competitive advantage on the global market.

**Keywords:** internationalization, strategy, management, entry forms, entry modes.

**Category of the paper:** research paper.

## 1. Introduction

There are two basic ways of developing an international enterprise (Lee, Lieberman, 2009). The first is internal development, which takes place without involvement of other entities, and the second is external development during which the company engages in various forms of cooperation. In addition to various forms of cooperation with partners that are not direct competitors, an external development strategy may be implemented through cooperation with actual or potential competitors, i.e. a strategic alliance (Albers et al., 2016). It is also necessary to solve a critical dilemma: whether the company will choose the path of specialization or diversification of business (Kaulich, 2012). Another issue is the scale of operations. This means the need to choose whether the company is to operate on a regional, national or global scale (Verbeke, Asmussen, 2016). Choosing how to compete requires adopting an appropriate approach to customers and markets, which often comes down to choosing to compete based on costs or differentiation (Baker et al., 2016).

Yip's research (1996) proved that both the sector and the market in which a company operates may have global and local nature at the same time. Therefore, the strategy must be designed in a way that ensures optimal use of the potential of foreign markets and the potential of the enterprise itself.

The strategy should answer the question of how the company should proceed in order to gain and maintain the desired competitive position on the market (Mintzberg, Quinn, 1996). Strategic management is a response to the growing level of uncertainty in the business environment of enterprises (Baker, Bloom, 2016). It allows them to look for new methods of building competitive advantage because classic management concepts and methods turn out to be insufficient (Binnis et al., 2014; Kaplan, Orlikowski, 2015). A detailed analysis allowed McKiernan (1997) to distinguish four basic approaches to enterprise management: planning, evolution (learning), positioning and resource balancing.

The planning approach focuses on long-term planning in order to match the overall strategy of the company to its environment (Ansoff, 1965; Andrews, 1987; Grant, 1991; Stonehouse, Pemberton, 2002). The disadvantage of the approach is that uncertain and inaccurate input data may lead to wrong decisions (Stonehouse et al., 2001). The evolutionary (learning) approach assumes that the strategy will begin to emerge and develop spontaneously over time and the company will somehow cope on its own (Mintzberg et al., 1995). In fact, companies constantly adapt their strategies to their changing environments. The strategy therefore evolves rationally in response to the changes (Quinn, 1978). The positioning approach is associated primarily with the concepts of Porter (1980), in particular the general strategy, the five forces model and the value chain model. This approach is also called "external-internal" due to the objects of analyses (McKiernan, 1997). Critics of this approach (Rumelt, 1991) point out that it is static in nature, profitability of the sector does not have to determine profitability of the company,

it focuses on competition (not taking into account cooperation), and it puts emphasis more on the environment than on the company's competences. The resource balancing approach focuses on explaining relationships between the company's resources and its competitive advantage (Prahalad, Hamel, 1990; Barney, 1991; Barney et al., 2001; Krupski, 2006). The enterprise is treated as a set of resources and skills that build its strength and distinguish it from others (Obłój, 2007). This approach assumes the need to conduct an external-internal analysis of the company, and in this respect it is not an alternative but rather a complement to the positioning approach.

Nowadays, for an enterprise to be managed effectively, it must increase its strategic flexibility understood as the ability to adapt to changes in the environment (Shimizu, Hit, 2004). This element must be taken into account when choosing a development strategy. Choosing an appropriate strategy is one of the key choices for the enterprise, which determines its future operation. This is because the strategy defines a long-term perspective of activities in the areas of competition and resource management.

## **2. Research methodology**

The study used a mixed two-stage research approach. The first part of the work included studies of the literature on the subject in order to determine the current state of knowledge in this area. The second stage included qualitative research. A research approach consisting of qualitative case assessment was used. The study included the following stages.

- Review of the literature: A thorough review of cohesive data sets items and scientific articles was conducted. Reputable databases were used to collect relevant literature, including Scopus, Web of Science. The literature covered the subject of international development of economies and enterprises, with particular emphasis on issues related to internationalization of business activities.
- Formulation of the research problem: The literature analysis revealed a research gap. It was found that there is a lack of research that describes the internationalization process in a comprehensive way against the background of the entire sector. This allowed for the formulation of the main and secondary goals. The main goal was to describe strategies of entering foreign markets and forms of serving these markets used by automotive sector enterprises in the internationalization process. The secondary goal was to show links between these strategies and forms and their importance for the overall course of internationalization of enterprises.
- Data and information collection: Data was obtained from various sources: international institutions, industry organizations, market reports, enterprise reports, press articles, websites.

- **Data analysis:** The collected data was carefully triaged and rigorously analyzed, taking into account the criterion of the purpose of the research. Where possible, the data was transposed in order to obtain systems enabling direct comparisons. Then, the classic assumptions of the qualitative research approach were applied.
- **Results and recommendations:** The article ends with conclusions and recommendations for business and researchers.

**Limitations:** The data used in the study is scattered. Its form and the method of data presentation often do not allow for objective comparisons. The data is also discontinuous in nature. This makes it difficult or completely impossible to track the development of many phenomena over time. This leads to the obvious conclusion that not all dependencies within the studied problem have been discovered.

### **3. The essence of internationalization strategies**

A strategy can be understood as an integrated and coordinated set of activities undertaken to leverage core competencies and gain competitive advantage (Hitt et al., 1995; Johnson et al., 2010). This approach allows us to distinguish two basic types of strategies (Stabryła, 2000): baseline strategies and functional strategies.

Baseline strategies define in general how companies compete. These may be, for example, strategies based on cost, quality leadership/differentiation, head-on competition or market niches. The cost leadership strategy assumes that it is necessary to achieve higher cost efficiency than the competition (Gehani, 2013). It allows to offer a product at a lower price without compromising profitability. Economies of scale contribute to achieving cost advantage. The quality leadership strategy assumes that a standard product cannot satisfy the needs of many customers (Choon et al., 2000). There is a group of consumers who are ready to pay a higher price to get a product of higher quality, better suited to their needs or having unique features that make it stand out. The head-on competition strategy means competing openly in the company's sector. It involves confronting rivals by bringing a typical product to the market at a typical price. Competing based on this strategy is much more difficult when the company has relatively small resources. In this case, the market niche strategy often turns out to be a better choice. The market niche strategy (Noy, 2010; Schot, Geels, 2008) involves concentrating activities on a selected group of products (production concentration), geographic markets (geographic concentration) or a specific group of buyers (market concentration). It is often used by companies that do not want to directly confront much stronger rivals or compete on a highly competitive market.

Hill and Jones (2007) explain that functional strategies involve concentration of actions and programs within the enterprise (Sharma, Fisher, 1997), and their effect is the creation of value at lower costs or higher product prices. Adopting these strategies involves the need to modify operations of the enterprise. Functional strategies lead to the achievement of four goals: higher efficiency, better quality, more innovation and better fit to the market needs.

The strategy may be aimed at gaining sustainable competitive advantage for the company on foreign markets. To this end, it may be necessary to decide between differentiation and standardization. Adopting this criterion, Ansoff (1985) distinguished four such strategies: penetration, product development, market development, diversification. The following strategies can be distinguished in the context of international development (Yip, 1996):

- multinational,
- international,
- global,
- transnational.

The multinational strategy involves decentralization of decisions and delocalization of resources (Brock, Birkinshaw, 2004). Activities of foreign branches of the company are based on high autonomy and independent use of key competences and resources transferred from the parent organization. This strategy is based on strong differentiation of foreign sales markets served by individual branches. Their task is to adapt production for host country markets.

The international strategy means diversification in the product and in the country/market array (Hitt et al., 2016). Product diversification involves delivery of different, localized, product ranges by individual foreign branches. Country or market differentiation assumes the use of different locations for individual operational activities (different for supply, production and sales). The autonomy of international branches is much smaller than that of multinational branches. The global strategy is characterized by activities that are integrated and coordinated on a global scale. The products offered are standardized and sold relatively cheaply. This strategy is used in a competitive environment characterized by low requirements for adaptation to local sales markets and by strong pressure to reduce costs. Plants are located in regions with optimal conditions for production (e.g. cheap raw materials and labor, business-friendly host countries). The product is sold on as many foreign markets as possible. Global strategies are difficult to implement and require large financial resources, know-how and highly qualified staff, especially managers. Excessive centralization and standardization may result in slower adaptation to the changing competitive environment. The global strategy leads to poor adaptation of the product to the local context and causes strong pressure on costs (Stonehouse et al., 2001).

The transnational (supranational) strategy integrates the international and global strategies (Donaldson, 2009). It involves an attempt to coordinate and standardize activities both in the product matrix and in the country/market array. Transnational strategies show better adaptation to local requirements than global strategies. The main instruments for implementing

a transnational strategy are decomposition (dismemberment) of the company's value chain and geographical dispersion of functions and organizational units. It is also characterized by multidirectional flows of semifinished products, resources and information, as well as extensive cooperation with other companies (Stonehouse et al., 2001).

Global and transnational strategies are generally referred to in management practice as "global strategies" taking into account various levels of centralization or decentralization of decisions, functions, resources, etc. These strategies basically differ only in the flexibility of adaptation to local markets.

#### **4. Modes of internationalization**

Internationalization requires a decision on the adoption of an appropriate form of serving foreign markets. A frequently adopted criterion is the question how the company is supposed to invest its resources abroad. This approach is presented by Meissner (1981), for example. According to many researchers, including Caves (1982), Davidson (1982) and Root (1987), an important criterion for distinguishing forms of international expansion, in addition to the intensity of foreign involvement, is the level of control.

There is no unanimity in the literature on the number of forms of internationalization. For example, Buckley (1996) distinguishes export, non-capital (contract) cooperation and capital cooperation. Otta (1994), in turn, distinguishes export-import, cooperative links (capital, non-capital, strategic alliances) and running business independently. Certo and Peter (1998) point to four methods of foreign expansion: exports, licenses, joint ventures and direct investments, while Hill and Johns (2007) distinguish five: exports, licensing, franchising, joint ventures and direct investments.

The division of forms of internationalization into those requiring and those not requiring institutional location abroad was made by Dülfer (1992). He included in the first group direct and indirect exports, direct imports, barter trade, transfer of licenses, franchising and leasing, in the second group management contracts, delivery and construction of a turnkey plant, sales branches, assembly plants and manufacturing plants. Despite this great diversity of forms, literature often divides them into three basic ones:

- export entry modes,
- contractual entry modes,
- investment entry modes.

Each of these forms may be the best option under certain conditions. The choice of an appropriate variant on a specific foreign market depends, among other things, on the environment of the host country and assumptions of the overall expansion strategy.



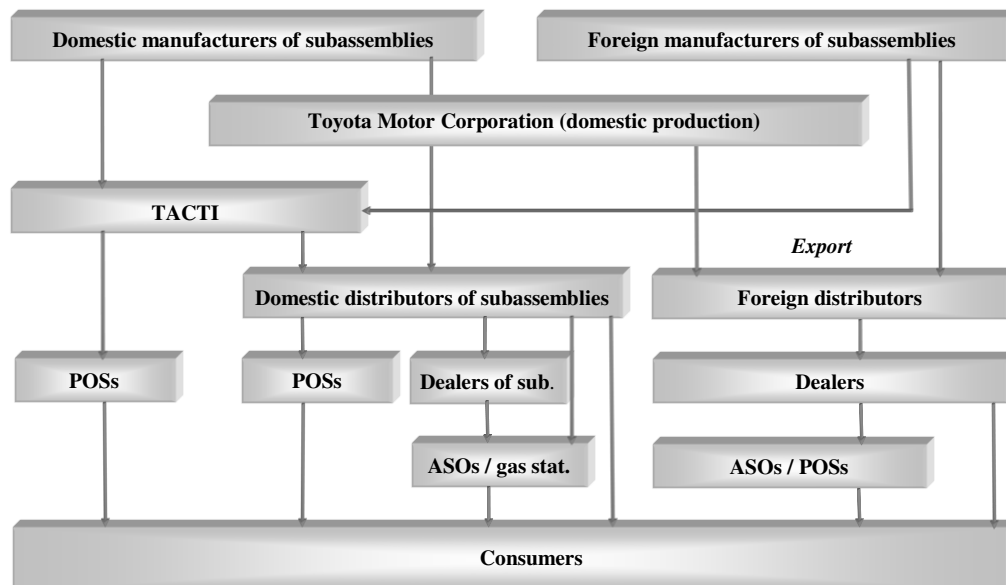
#### 4.1. Export

According to the evolutionary model of the internationalization process (Johanson, Wiedersheim-Paul, 1975; Johanson, Vahlne, 1990), the first and simplest form of entering a foreign market is export. It is most often undertaken when the internal market gets saturated and sales decrease. Export activity usually begins with the sale of a product made in the home country on foreign markets (Buckley, 2002). Using an existing distribution network may help reduce expansion costs. Another option is direct sales on foreign markets through a local agency. Taking into account organizational criteria, exports may be divided into indirect and direct ones.

Indirect export involves the company selling its own products to an intermediary or transferring them to a commission agent. A domestic exporter or a domestic branch of a foreign importer may be the intermediary. Foreign distribution channels of another domestic manufacturer may also be used for this purpose. The simplest form of export is that with a distributor (dealer). The distributor acts on its own account and on its own behalf. The risk is greater when exporting on own account but there is more control. Direct export may be effected through a branch or subsidiary. Direct export provides greater opportunities to manage and control the course of transactions and foreign marketing plans (distribution, prices, promotion, service), better brand protection and feedback. However, it involves higher costs and risks. The choice of an appropriate form of export depends on its value, volume, share in global sales, product nature, competitive environment, and host countries' trade policies (Rymarczyk, 2000).

For car companies, export is usually the first form of foreign expansion. It allows to recognize needs and sizes of foreign markets without having to incur high costs and risks. If a bad decision regarding market selection is made, the company may quickly withdraw from it. Exporting, however, means relatively low profit and little control. Indirect export is usually the first choice. It is a good solution for companies that are just entering a specific foreign market and do not have sufficient knowledge about it. It minimizes political and economic risk and allows to start foreign sales without additional expenses. Indirect export channels were used by Fiat, among others. Fiat sold Alfa Romeo cars in the USA through the distribution network of the local manufacturer, Chrysler. Thus, the Italian manufacturer gained access to the US market without having to organize export on its own, which would be unprofitable given small sales. Japanese companies also used distribution channels of local manufacturers on the North American market. Toyota and Suzuki cars were sold by GM, Mazdas by Ford, and Mitsubishi's by Chrysler. This form is usually used in the initial phase of internationalization and when the sales volume is small. As knowledge about foreign markets increases, enterprises strive to more actively penetrate them. Indirect export isolates the manufacturer from the target market and prevents it from pursuing its own export strategy. That is why car companies most often choose direct export channels.

In fact, sales systems of automotive companies are very complex. An example of Toyota's distribution channel system is shown in Figure 1.

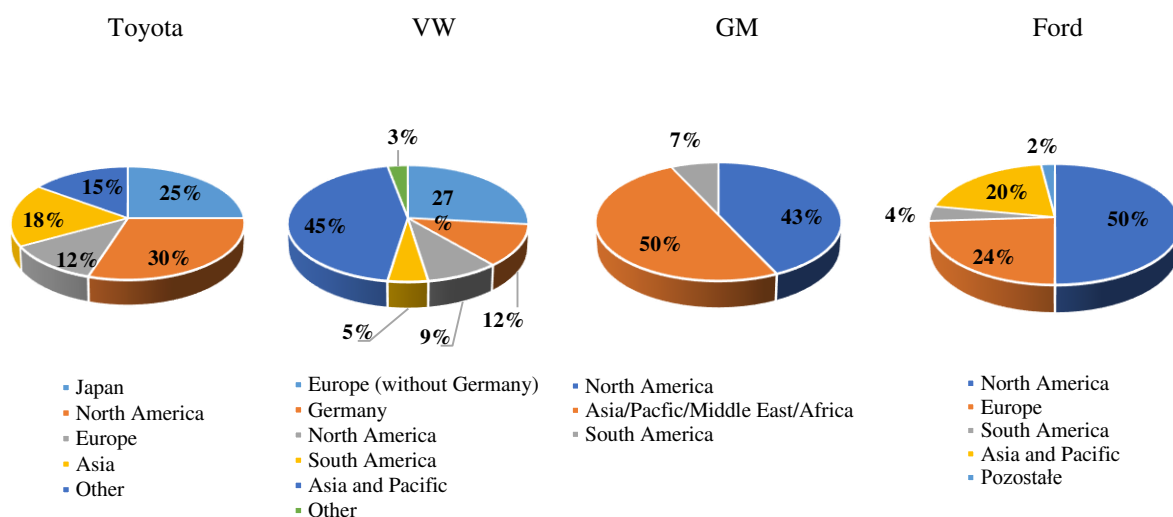


**Figure 1.** Foreign and domestic distribution channels of Toyota Motor Corporation.

Source: Toyota Motor Corporation, 2002, p. 67.

Toyota uses direct export channels to sell products abroad. They are sold to foreign distributors or transferred to foreign branches or subsidiaries. Then, the products are sold to local dealers who sell cars directly to retail customers or place them in their distributed sales outlets.

Toyota Motor Corporation is currently the largest car manufacturer in the world. In 2020, it sold 9 million vehicles of which only 25% on the home market. Toyota is therefore characterized by a very high level of sales internationalization. Figure 2 illustrates this.



**Figure 2.** Sales of Toyota Motor Corporation, Volkswagen Group, General Motors Company and Ford Motor Company by region in 2020.

Source: Toyota Motor Corporation, 2020a, p. 4; Volkswagen AG, 2021, p. 106; Ford Motor Company, 2022, p. 4.

North America, mainly the US (approx. 90%), is the region with the largest share of sales of Toyota vehicles. Asia, including China with a 62% share in 2021, is the next largest market. Other important Asian markets are Indonesia, Thailand, the Philippines and Taiwan. In Europe, where approximately 18% of Toyota's global sales were made, the largest markets were the UK, Russia, France, Italy, Germany and Spain. The sales in these countries ranged from 67,000 to 114,000 vehicles. In Latin America, the Brazilian market is the most important for Toyota, with sales exceeding 134,000 cars, and the Argentinean market, with sales exceeding 51,000 (Toyota Motor Corporation 2020b).

The direct competitor of Toyota, the Volkswagen Group, the world's second and largest European car manufacturer, has a completely different sales structure. The European market is very important for Volkswagen: every fourth car is exported there and, including Germany, Europe accounts for almost 40% of VW's global sales. VW has a significantly lower share than Toyota in the North American markets, but a very strong presence in the Asia-Pacific markets (44% of the total sales). The data provided in Table 1 allows for a more thorough analysis of the directions of VW's commercial expansion.

**Table 1.**

*Sales of VW passenger cars by region in 2020*

Region/country	Number of cars sold
<b>Western Europe, including:</b>	<b>2,848,861</b>
Germany	1,065,811
France	222,522
UK	409,064
Italy	239,167
Spain	213,700
<b>Central and Eastern Europe, including:</b>	<b>652,813</b>
Czechia	112,589
Russia	221,811
Poland	126,883
<b>North America including:</b>	<b>784,299</b>
USA	574,822
Canada	83,531
Mexico	125,946
<b>South America including:</b>	<b>440,326</b>
Brazil	336,773
Argentina	57,555
<b>Asia Pacific including:</b>	<b>4,110,782</b>
China	3,844,679
India	28,423
Japan	66,935
<b>Other markets including:</b>	<b>278,104</b>
Türkiye	121,129
South Africa	64,693
<b>Total worldwide sales:</b>	<b>9,115,185</b>

Source: Volkswagen AG, 2021, p. 106.

The most important European markets for VW, apart from Germany, are France, UK, Italy and Spain. This manufacturer's share in the North American market is significantly lower than Toyota's and amounts to 9%. VW has a relatively small share in the South American market

(5%). However, the Asia-Pacific market is of great importance, with the share of VW's global sales amounting to 44%. This is a result of VW's very strong position on the Chinese market, where it sells almost 94% of its production for this region.

Foreign sales are also an important element of the company's international development strategy for the largest American car manufacturer, General Motors (GM). After the sale of Opel, a part of GM's portfolio since 1929, the American car manufacturer has been practically absent from Europe since 2017. It sold only 1,000 vehicles on this market in 2020. GM sold 37% of its vehicles on its home market, and even more in China – 42%. GM sells as much as half of its cars to Asia-Pacific, Middle East and Africa. Meanwhile, the share of South America in the total sales volume is 7%.

Another American manufacturer, Ford Motor Company, made half of its sales on the North American continent in 2020, of which 44% in the home country. Unlike for GM, the European market is very important to Ford, where it sells approximately every fourth car it manufactures. The Asia-Pacific market is also of great importance to Ford. This region accounts for approximately 20% of its global sales, with the Chinese market being by far the most important, accounting for 15% of Ford's global sales volume.

These data from the largest car manufacturers in the world, located on three different continents, show that sales on foreign markets are in each case higher than on the home market. This shows the importance of internationalization in the strategies of these companies and their high level of internationalization of commercial activities.

The sales structure is largely determined by the size of the home market. American companies, whose home market is very large and absorbent, started to export on a large scale relatively late. The small size of domestic European markets forced earlier and more dynamic expansion. Japanese manufacturers turned to exporting because of the relatively small size of their domestic market, but also thanks to their huge potential.

Their export strategies contributed to Japan achieving the status of the third car manufacturer in the world at the end of the 1960s, and in 1971 it was already the second place with over 3.7 million cars. Exporting remained the dominant form of expansion for Japanese companies in the 1970s and 1980s. In 1976, Japan already exported more than half of the vehicles produced in this country, and in 1980 it became the largest manufacturer and exporter of cars. Export was the dominant form of international relations of Japanese companies until the end of the 1980s. In the early 1990s the Japanese were hit by a simultaneous decline in demand on the domestic market and a sharp decline in export sales. This was primarily due to the strengthening yen exchange rate.

## 4.2. Contractual cooperation

Contractual cooperation is sanctioned by appropriate cooperation agreements between enterprises, during which there is no pooling of capital. This criterion is met by license agreements, franchise agreements, management contracts, turnkey investment contracts, sub-delivery contracts and contractual joint ventures.

One of the most important forms of cooperation is licensing (Stonehouse et al., 2001). Licensing agreements cover a variety of contractual arrangements under which the licensor makes its intangible property available to the licensee for a fee. These may be patents, know-how, technologies, trademarks, names, utility models or decorative designs. The transfer of rights is usually accompanied by services provided by the licensor to facilitate their proper use (Root, 1987). Licenses for the use of technologies are of the greatest importance in international trade.

License agreements are concluded when the target market is protected by high entry barriers. This is also an appropriate approach to markets with high economic or political risk. Since selling licenses is generally less profitable than selling one's own products, licenses are granted when the following obstacles are faced (Rymarczyk, 1996):

- trade barriers (tariff and non-tariff),
- high transport costs,
- host country's risky political environment,
- host country's reluctance,
- no economies of scale due to market size,
- high costs of product adaptation,
- product maturity on the home market,
- lack of capital for other forms of expansion.

The advantages of licensing include low employment and capital requirements, which reduce expansion costs. This form offers a faster return on R&D expenditure and generates additional income when, for any reason, the company cannot manufacture locally. Important benefits include the ability to access risky or highly protected markets.

The sale of licenses also involves certain limitations. There is, among other things, the danger that the licensee could supply products of inferior quality. This is particularly important when they are manufactured under the licensor's brand. Another unfavorable result is that the licensee, after acquiring knowledge and experience, may become a major rival of the licensor in the future. For this reason, licensing agreements often contain clauses that define markets in which licensees may operate and areas in which product improvements may be made.

Cooperation agreements in the automotive sector are most widely represented by license agreements. They have been concluded since the very beginning of the automotive industry. For example, Daimler granted as many as 1,900 licenses to European and American

manufacturers for the engine it designed at the end of the 19th century. These rights were used, among others, by Armand Peugeot and Panhard-Levassor to introduce their own gasoline engines. Large-scale licenses for the manufacture of complete cars were granted to Japanese companies by American manufacturers. Examples include licenses for Nissan (Austin A40), Isuzu (Hillman Minx), Hino (Renault 4CV) and Mitsubishi (Jeep under the license from Kaiser).

Licensing is important in the initial phase of internationalization. It enables acquisition of essential competences. For example, Isuzu did not have sufficient technological experience in manufacturing cars, so it had to rely on licenses. Licensing agreements allowed this Japanese company to use the licensors' technologies, patents, know-how and other intangible assets for a certain period of time. Using the learning effect, Isuzu achieved a level of skills and know-how sufficient to design and make passenger cars. The company also used this acquired knowledge to improve the process of manufacture of trucks and diesel engines. Interestingly, Isuzu does not have a policy of selling licenses.

Fiat initiated its presence on the Polish market with licensing in 1931. It was also the first time in the history of the Italian manufacturer that a license to manufacture cars abroad was granted. Also under license agreements, passenger cars were manufactured in Poland in the 1970s and 1980s under the "Polish Fiat" brand. At the same time, Fiat granted licenses to companies in Spain (Seat), Turkey (Tofas, Otobus Karoseri), Yugoslavia (ZCZ, TAM) and Egypt (El Nasr Automotive Manufacturing Company), and previously for Yugoslav Zastava and Russian Lada. Romanian Dacia manufactured cars under license from Renault.

The international expansion of Fiat's Iveco truck brand largely involved establishing joint ventures with, and licensing of, local entities. In this way Fiat marked its presence in China, Turkey and India. Iveco cars in Turkey were manufactured under license by Tofas, a company affiliated with Fiat. In India, Ashok Leyland, a company related to Iveco, manufactured and sold over 30,700 cars in 2000. Additionally, licenses for trucks were granted to countries in Eastern Europe, Asia, Middle East, Africa, Latin America and Australia. Acquiring rights (licenses) to use Fiat's trademarks required paying license fees. The fee for the Fiat brand was 0.5%, and for Iveco 0.2%, of the sales value.

In 1995, South Korean Samsung Heavy Industries Co. Ltd. established Samsung Motors Inc., thus entering the automotive sector. Because the company did not have any experience in building cars, it purchased a license from Nissan. This ended in failure and in 2000 Renault Samsung Motors, a company established especially for this purpose, bought 70.1% of the shares of the Korean company. This is how Renault acquired a modern factory, R&D center, national distribution network and rights to use the Samsung brand, which has a very good reputation in Korea, for 10 years.

When the license expires, cooperation may take another form. The alliance between British Leyland (later Rover) and Honda was a consequence of the license agreement concluded between the companies in 1979 for manufacture of Japanese Honda Ballade in the UK, called Triumph Acclaim there.

### **4.3. Foreign direct investments**

Foreign direct investments (FDIs) are considered the most advanced form of internationalization. They involve investing capital in business entities outside homeland in order to obtain full and lasting influence on management as well as earnings and distribution of profits. This form is characterized by the highest degree of control among those discussed. FDIs are a channel for moving company resources across borders in order to use them effectively. The transfer of financial, technical and physical resources and „knowledge assets” of an enterprise to a foreign host country in the form of a self-controlling venture enables a fuller use of competitive advantage on this market.

When entering a foreign market, the investor may choose between a greenfield investment, joint venture, merger or acquisition. This means expanding the company externally through acquisition of, or merger with, other entities in the host country.

One of the most important motivations for undertaking FDIs in the automotive sector is access to cheaper means of production and new markets. This thesis is confirmed by observation of investments made by Japanese, European and American manufacturers. In the automotive sector, due to the high share of fixed costs and expenditure on R&D, there is a need for strong concentration of production. A typical plant is profitable only when making approximately 100,000 vehicles per year. The choice of foreign investment as a form of entry is often determined by the host country's regulations. The import of cars and components is strongly limited in many developing countries, so the only form of presence there is direct investment. In some cases, the organizational form and/or ownership structure is also a consequence of state interventionism. For example, in Mexico and China foreign car manufacturers were not allowed to set up solo ventures and majority shares in joint ventures had to be held by local owners.

FDIs of automotive companies take two basic organizational forms: an independent fully controlled branch (solo venture) and cooperation with partners (joint venture). A solo venture gives the owner full control but carries greater risk. The strategic success of a joint venture depends on the selection of the right partner for cooperation, clear specification of goals and proportional distribution of risk among the partners. The most important benefits of a joint venture include lower transaction costs, economies of scale and bypassing barriers to entry to blocked markets.

The automotive sector often uses joint ventures to internationalize. This is usually the case where one partner has a specific product and is trying to introduce it to a foreign market, while the other has privileged access to it. For this purpose, Renault entered into a joint venture

with Mexican semi-truck manufacturer Diesel Nacional SA (DINA). The Renault Mexicana company was established, the purpose of which was to assemble and sell jointly produced Renault R5 and R12 cars on the Mexican market. The joint venture was for the French company an alternative to exporting and running the business independently. The choice of the joint venture instead of a solo venture was due to the lack of knowledge of the realities of the local market and cultural barriers, among other things. For the Mexican partner, the manufacture of passenger cars without cooperation would not be possible because of insufficient technical competences and resources. Toyota also often uses joint ventures as a form of foreign direct investment in its expansion (Table 2).

**Table 2.**  
*Organizational forms of Toyota Motor Corporation's direct investment on foreign markets*

Region	Country	Company	Form
North America	Canada	Canadian Autoparts Toyota, Inc.	●
		Toyota Motor Manufacturing Kanada, Inc.	●
	USA	Bodine Aluminium, Inc.	●
		Nwe United Motor Manufacturing, Inc.	▲
		TABC, Inc.	●
		Toyota Motor Manufacturing, Alabama, Inc.	●
		Toyota Motor Manufacturing, Kentucky, Inc.	●
		Toyota Motor Manufacturing, Indiana, Inc.	●
Toyota Motor Manufacturing, West Virginia, Inc.	●		
Latin America	Argentina	Toyota Argentina S.A.	▲
	Brazil	Toyota do Brasil Ltda.	▲
	Columbia	Sociedad de Fabricacion de Automotores S.A.	▲
	Wenezuela	Toyota de Venezuela Compania Anonima	▲
Europe	Czechia	Toyota Peugeot Citroën Automobile Czech	▲
	France	Toyota Motor Manufacturing France S.A.S.	●
	Poland	Toyota Motor Manufacturing Poland Sp. z o.o.	●
	Portugal	Salvador Caetano	▲
	UK	Toyota Motor Manufacturing Ltd.	●
Africa	Kenya	Associated Vehicle Assemblers Ltd.	○
	South Africa	Toyota South Africa Motors Ltd.	▲
Asia	China	Sichuan Toyota Motor Co., Ltd.	▲
		Tianjin Toyota Motor Engine Co., Ltd.	▲
		Tianjin Fenjin Auto Parts Co., Ltd.	▲
		Tianjin Toyota Forging Co., Ltd.	●
		Tianjin Toyota Motor Co., Ltd.	▲
		Tianjin Jinfeng Auto Parts Co., Ltd.	▲
	Indonesia	P.T. Toyota-Astra Motor	▲
	Malaysia	Assembly Services Sdn. Bhd.	●
		T & K Autoparts Sdn. Bhd.	▲
	Philippines	Toyota Autoparts Philippines, Inc.	▲
		Toyota Motor Philippines Corporation	▲
	Taiwan	Kuoziyu Motors Ltd.	▲
	Thailand	Siam Toyota Manufacturing Co., Ltd.	▲
		Hino Motors Thailand Co., Ltd.	▲
		Toyota Auto Body Thailand Co., Ltd.	▲
		Toyota Motor Thailand Co., Ltd.	▲
Vietnam	Toyota Motor Vietnam Co., Ltd.	▲	



Cont. table 2.

<i>Oceania</i>	Australia	Toyota Motor Corporation Australia Ltd.	●
<i>S-E Asia &amp; M. East</i>	Bangladesh	Aftab Automobiles Ltd.	○
	India	Toyota Kirloskar Motor Ltd.	▲
	Pakistan	Indus Motor Company Ltd.	▲
	Türkiye	Toyota Motor Manufacturing Turkey Inc.	▲

● – 100% Toyota capital ▲ – *joint venture*.

○ – 100% local capital.

Source: Toyota Motor Corporation, 2002, p. 25.

Joint venture is sometimes treated as a means of sharing non-obvious or difficult to codify skills. These premises underlay the idea of cooperation between GM and Toyota: the New United Motor Manufacturing (NUMMI) company. The agreement was concluded in order to jointly manufacture cars developed by Toyota under two brands. This joint organizational unit was supposed to absorb competences (knowledge, skills, experience) of the Japanese partner. Solo ventures do not have such merits. Instead, they offers a higher degree of control. They are not used on markets where there are constraints from host country policy, or where there is a concern that market knowledge is too scarce. The choice of the form of a direct investment is therefore determined by various factors.

When locating an investment on a selected market is not possible, strategically similar markets become an alternative. The Chinese government's ban on new joint ventures prompted GM to invest in India together with a local partner, Hindustan Motors. Fearing that GM would become too strong on the Indian market, German companies also made direct investments: Daimler-Benz established a joint venture with Tata Engineering and Locomotive, VW allied with Eicher Motors, French PSA with Premier Auto Mobiles, and Renault SA with Mahindra & Mahindra Limited (The Economist, 1994).

Most decisions on the location of investments in the automotive sector had two basic motives. Investments are made in developed countries to tap into their absorbent markets, as well as in countries with low production costs, to take advantage of their comparative advantages. Fiat's investments were primarily driven by the latter motive. It placed its production facilities in the form of solo ventures in Brazil, Argentina, India, Turkey and established many joint ventures in these and other countries. Its investments in Poland were of a similar nature.

Isuzu's investments in South-East Asian countries were also associated with obtaining cheap means of production. The company's investments in Thailand, China, Indonesia, Philippines and Taiwan were intensified in the late 1980s and the choice of locations, in addition to cheap labor, was also determined by short distance from the home country and negligible cultural differences (Sitek et al., 2000).

Faced with increasing competition and high saturation of mature markets, manufacturers are looking for new ones. They recognize the need to be present on markets that will become crucial for their global competitive position in the future. In this case, decisions about the placement of plants in specific countries may be made even if they are not yet economically rational. For example, none of the eight foreign car companies investing in China made a profit in 1997, and only half of the 1 million cars manufactured locally were sold there. This figure represented only one fifth of the German market at that time (The Economist, 1997).

Toyota decided to use foreign investments to intensify their expansion onto global markets. At the end of the 1990s, the most ambitious investment project in the history of the global automotive industry was implemented, with the total expenditure planned at \$ 16 billion. In the USA, the popular light truck segment was attacked because the market share of 8% was considered too low. Toyota also decided to intensify investments in Europe where it had just a 2.5% market share. The company began to develop B segment cars in this region together with French PSA. Czechia was chosen as the investment location.

The best measure of FDI is the size of investment flows. In the absence of such data, it seems that the next measure is the value of assets located outside the home country. The scale of a company's FDI may also be evidenced by the number of manufacturing and R&D units located outside its homeland. For car companies, they always involve a huge capital commitment and are associated with high risk. Decisions to make such investments have a long-term impact on the capital, production and employment structure and are always based on in-depth analyses. Toyota's FDI scale is shown in Table 3.

**Table 3.**

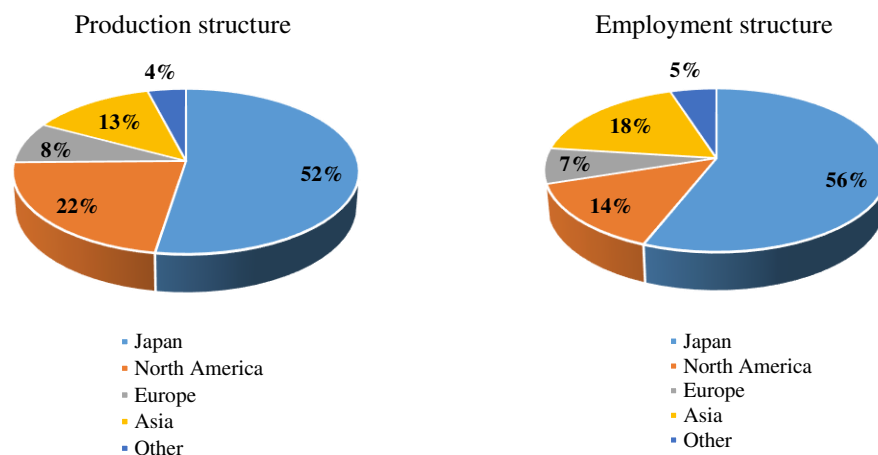
*Locations of manufacturing plants and R&D units of Toyota Motor Corporation*

Units in Japan		Units outside Japan		
<i>Manufacturing</i>	<i>R&amp;D</i>	<i>Region</i>	<i>Manufacturing</i>	<i>R&amp;D</i>
16	8	Asia	26	4
		Europe	7	3
		North America	13	5
		Other	7	-

Source: Toyota Motor Corporation, 2020a, p. 4.

The table shows that Toyota has more than three times as many manufacturing plants outside its home country as in Japan (53 and 16, respectively). Toyota also has more other units outside Japan (12 and 8, respectively). The usefulness of this type of information for analyzing the level of internationalization of a given company is, however, limited, because it does not say anything about the scale of capital involvement, production potential or employment level.

Therefore, such an analysis should be supplemented with these values. For example, for Toyota, whose total production volume in 2020 was over 7.5 million vehicles, the production structure is shown in Figure 3.



**Figure 3.** Production and employment structures of Toyota Motor Corporation in 2020.

Source Toyota Motor Corporation 2020a, p. 4.

The analysis of the data contained in Table 2, supported by the analysis of the production structure presented in Figure 3, justifies the conclusion that, on average, the manufacturing plants located outside Japan have a much lower production potential than the domestic ones. All Toyota's foreign units make fewer cars than the three times smaller number of domestic units. The FDI analysis can be enriched with an analysis of the employment structure. FDIs require a lot of employees, especially in manufacturing sectors. Toyota had over 366,000 employees in 2020, most of them in Japan (56%). The proposed method of analyzing the employment structure, in connection with the analysis of the production structure, from a methodological point of view, enables formulating hypotheses about higher or lower efficiency of foreign manufacturing plants (also on a regional basis) and efficiency of the use of human resources.

#### 4.4. Mergers and acquisitions

A company's growth strategies can generally be of two types: internal growth or external growth (Lee, Lieberman, 2009). Internal growth consists primarily in expanding the company's potential. An alternative to internal growth is external growth, for example through mergers and acquisitions.

A merger occurs when two (or more) companies combine by contract to create a new company. A feature of merger is the voluntary cooperation of partners, usually similar in size, with the aim of achieving synergy. In business practice it is more frequent that one entity takes over ownership of, and management control, over the other.

Mergers and acquisitions have been used in the automotive sector as a development strategy almost from the very beginning of its existence. Car manufacture was initially artisanal in nature. Many car manufacturing companies were established in Europe. World War I gave a strong stimulus for the development of the sector. After the war, due to drastic lack of capital, an intensified process of concentration began in the sector, as a result of which weaker

enterprises were taken over by larger ones. The concentration of capital was necessary to defend the European sector against Ford whose mass production system allowed them to offer cheaper cars. One of the first acquisitions in the UK was made by GM who took over Vauxhall in 1925. Apart from the British market, concentration was very strong in France. Using Ford's experience, French companies were the first in Europe to start the process of product standardization, which allowed for a significant reduction in production costs and thus car prices. Citroën was the pioneer of this approach. For example, Citroën's production in 1919 was 100 cars a day, and in just 7 years it increased fivefold. Three French companies – Citroën, Peugeot and Renault – accounted for over 50% of the total car manufacture in this country already in the 1920s.

Italian industry suffered from a deep technological gap at that time. Under these conditions, completely integrated production was necessary, carried out on a mass scale and based on huge capital. As much as 80% of the domestic market was controlled by only one company, Fiat, already in the early 1920s.

In the mid-1920s there were as many as 86 companies on the German market manufacturing almost 150 different models, a total of approximately 30,000 vehicles per year. Car production in Germany was very dispersed then. Strong competition resulted in bankruptcy of many weaker companies, as well as numerous mergers and acquisitions. The merger of Daimler and Benz in 1926 is an example. A significant increase in German production occurred only after the stage of market concentration, which allowed achieving economies of scale and offering clients cheaper, and therefore more accessible, products. Opel already had an established position at that time, while BMW and DKW were starting their operations.

Despite dynamic development of the European sector in the late 1920s, its global production accounted for only 12% of the output of American companies. This example shows the different levels of maturity of the American and European industries at that time. The examples presented clearly show that strong concentration of capital and production was a prerequisite for development of the sector. This sector is highly capital-intensive, which necessitates mergers or taking control of weaker rivals in order to acquire new markets and take advantage of the economies of scale.

The young European car industry was further changed by the Great Depression of the 1930s. That period marked the end of their existence for a vast majority of French companies. However, starting from 1936, enterprises that survived the recession began to gradually increase their output. The crisis severely undercut the domestic production also in Germany. The market's defensive reaction was mergers, an example of which was the establishment of Auto Union AG which acquired Audi, Horch, Wanderer and DKW in 1932. The crisis caused significant changes in the competition structure also in Italy. Smaller and weaker companies were taken over by Fiat or, like OM, by Alfa Romeo, while Isotta Fraschini came under state control. The Italian market, protected by high customs barriers, offered favorable conditions for Fiat to strengthen its position.

The next stage of concentration in the sector took place at the end of the 1950s. The four largest manufacturers then had a 90% share in the domestic production. Mergers and acquisitions that had previously taken place in other European markets also reached the UK with some delay. The dispersion of production in this country (in the mid-1940s there were over 30 different brands) was the direct cause of low competitiveness of British companies, especially in comparison to French and German ones.

The primary goal of mergers and acquisitions is to improve competitiveness as a result of achieving synergy. It seems that the economic dimension is the most important one in this context. However, such situations, apart from economic problems, often also trigger emotions in society. The reason for the failure of the merger between Citroën and Fiat, prepared in the 1960s, was the protest of Citroën's French shareholders. However, the candidacy of domestic Peugeot was accepted six years later.

The concentration of the automotive sector accelerated significantly in the 1970s. For example, almost all Italian car companies came under Fiat's control in Italy: Autobianchi in 1967, Lancia in 1968, Ferrari in 1968, Alfa Romeo in 1986, Maserati and Innocenti in 1996. Ford, on the other hand, took over British Aston Martin Lagonda (1987) and Jaguar (1989). Seat was taken over by VW in 1986 and Czech Škoda followed the pattern five years later. Ford took over the passenger car division of Swedish Volvo in 1999 (currently the brand is owned by a Chinese concern).

There is high operational risk associated with mergers. For example, the merger of Daimler-Benz and Chrysler heralded the beginning of the world's great automotive power, the fifth largest global player in terms of production. The partners had complementary contributions and a complementary market offer. The merger ended in failure in 1998. The reason was strategic mismatch and inability to achieve the intended goal. Chrysler was purchased from DaimlerChrysler by Cerberus Capital Management, one of the largest American investment companies, in 2007.

For the American industry, as for the European one, the crisis of 1929 had very serious consequences. It triggered the process of capital concentration. As a result, a vast majority of the seventy companies operating at that time went bankrupt or were taken over by stronger rivals. After the crisis and a period of relatively steady growth in the sector, demand dropped again during World War II. Only after its end the sector started to grow – on a scale unprecedented in the global economy. Production increased from approximately 2.15 million vehicles in 1946 to 6.6 million in 1950. The motorization index in the USA reached 226, which is more than five times higher than in the UK (46), the most motorized European country at that time. Demand in the US stabilized at 5-6 million per year in the 1950s and 1960s. The market was dominated by GM, Ford and Chrysler.

The Japanese car industry started to develop much later than the American and European ones – in the late 1940s, from a very low level. The first strong increase in production occurred in the late 1950s, mainly owing to Subaru, Suzuki and Mazda. Then, good economic situation

of the Japanese market allowed for significant investments in new technologies. That was reflected in a dynamic growth of the productivity index which reached a level higher than that of the West in a short time.

The automotive sector is subject to constant and very dynamic changes, especially in terms of control. A huge number of agreements (contractual and strategic), bankruptcies, takeovers and mergers are intra-sector factors responsible for these changes. However, changes in control are also, to a large extent, a result of changes in the balance of economic forces on individual local and regional markets and, ultimately, on the global market.

As a consequence of these changes, some brands disappeared from the market, including Mercury, Oldsmobile and Pontiac, some changed hands, for example Jaguar, Volvo, and others were created, for example Cupra and DS. The until recently Swedish Volvo is now owned by a Chinese company. Jaguar, the British prestigious manufacturer of luxury and sports cars, was acquired by American Ford in 1989, and in 2008 it was sold to Indian Tata Motors. Cupra, in turn, is a sub-brand of VW, which covers cars from Seat. It is positioned as a sports brand. DS is a French concern, manufacturer of premium cars in the PSA group. It was founded by Citroën in 2009 and then served as a sub-brand tasked to introduce more luxurious models of this manufacturer's cars. It has been an independent brand since 2015.

Many brands changed ownership many times as a result of mergers and acquisitions. In order to illustrate the current situation, Table 4 summarizes the most important car corporations and the brands they own.

**Table 4.**  
*Selected car corporations and their key brands*

Corporation	Brand
BMW Group	Alpina, BMW, Mini, Rolls-Royce
Ford Motor Company	Ford, Lincoln
General Motors Company	Buick, Cadillac, Chevrolet, GMC
Honda Motor Corporation	Honda, Acura
Hyundai Motor Group	Genesis, Hyundai, Ioniq, Kia
Mazda Motor Corporation	Mazda
Mercedes-Benz Group	Mercedes-Benz, Mercedes-EQ, Mercedes-Maybach, Smart (with ZGH)
Nissan Motor Corporation	Infiniti, Nissan
Stellantis N.V.	Abarth, Alfa Romeo, Chrysler, Citroën, Dodge, DS Automobiles, Fiat, Fiat Professional, Jeep, Lancia, Maserati, Mopar, Opel, Peugeot, Ram, Vauxhall
Subaru Corporation	Subaru
Tata Motors	Jaguar, Land Rover, Tata
Tesla, Inc.	Tesla
Toyota Motor Corporation	Daihatsu, Toyota, Lexus
Volkswagen Group	Audi, Bentley, Bugatti, Cupra, Lamborghini, MAN, Neoplan, Porsche, Volkswagen, Scania, Seat, Skoda
Zhejiang Geely Holding Group (ZGH)	Lotus, Polestar, Smart (with Mercedes-Benz Group), Volvo

Source: Own study.

One of the largest mergers in the history of the sector took place recently. In early 2021, PSA Group<sup>1</sup> and FCA<sup>2</sup> decided to join on a fifty-fifty basis in a project that resulted in the emergence of a new entity: Stellantis N.V. based in Amsterdam (The Wall Street Journal, 2020). In terms of global sales, Stellantis was the fifth manufacturer in the world in 2021, behind Toyota, VW, Hyundai and GM. At the time of the merger Stellantis had over 300,000 employees, more than 130 national markets and manufacturing plants in 30 countries.

Initially, this merger was to include other partners. FCA sought to merge with the French Renault Group. However, the position of the French government (holding over 15% of the shares in Renault) and the stance of Nissan controlled by Renault (holding 15% of the shares based on an exchange of shares with Renault) made FCA abandon this concept, treating it as a harbinger of future problems (The Economist, 2019). Given these facts, FCA proposed a merger with another French concern – the PSA Group. The aim of the merger was to create the fourth largest player on the global market in terms of production volume and to achieve a reduction in overall costs by EUR 3.7 billion as a result of the economies of scale. This amount was later increased to EUR 5 billion (Wayland 2020). It was also declared that there was no intention to liquidate any of the 14 brands of the proposed organization. The name “Stellantis” would only be used to identify the corporate entity, while the existing brand names and logos would remain unchanged. The European Commission approved the merger in December 2020, imposing minimum restrictive measures to preserve competition in the sector (European Commission, 2020). At the same time, in accordance with applicable law and International Financial Reporting Standards (IFRS), which require identification of the acquirer and the acquiree, it was recorded for accounting purposes that these were PSA and FCA, respectively.

#### 4.5. Strategic alliances

The internationalization strategy may also take the form of a strategic alliance. The concept of “strategic alliance” is not clearly defined in the literature on the subject. Some authors call it a type of cooperation between enterprises that cannot be implemented in the form of contractual agreements combining contractors and subcontractors into an “extended enterprise” or “constellation of enterprises”, but this term is also used to describe “friendly” buyouts and mergers. The definition of “alliance” as a joint venture in which one of the partners aims to obtain a better competitive position in the partner’s country was used in their research by Harrigan (1988); Lyles (1988); Doz, Hamel, Prahalad (1989); Bleeke, Ernst (1993); Romanowska (1997). Strategic alliance is often called an agreement between two or more enterprises established in order to implement a common project or conduct a specific activity

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<sup>1</sup> PSA (Peugeot Société Anonyme) was established in 1976 as a result of Peugeot taking over Citroën after its bankruptcy.

<sup>2</sup> FCA (Fiat Chrysler Automobiles) was established in 2014 as a result of the takeover of the American Chrysler by the Italian Fiat. FCA’s brands include Alfa Romeo, Chrysler, Dodge, Fiat, Jeep, Lancia, Maserati and Ram.

(Garrette, Dussauge, 1996). Currently, there is no such strong emphasis on the need for competition between alliance partners. Cygler (2002) showed in her research that agreements between entities that are not direct rivals may also have the nature of strategic alliances.

The work adopts the definition by Garrette and Dussauge (1996), according to which strategic alliances are agreements between enterprises that are actual or potential competitors, which aim to jointly implement a project or conduct a specific activity while coordinating competences, means and necessary resources in order to provide a better competitive position to each partner participating in the agreement, merger, assignment or acquisition of an area of activity.

Terpstra and Simonin (1993) showed in their research that the automotive sector is characterized by the largest number of alliances, after the computer hardware sector. They are established to achieve a certain common strategic goal, so competition in this area is suspended. However, the cooperation agreement strictly defines the scope of information and technology transfer, because the alliance partners still remain competitors outside the cooperation area and act independently when implementing their own projects. Alliances in the automotive sector are most often established to achieve synergy (Krzyżanowski, 1994). The best result is achieved when weaknesses of one ally are made up for by strengths of the other.

In the automotive sector there are two basic types of strategic alliances. One of them involves connecting the same or different links in the value chain. Connecting the same links in the chain, for example R&D or manufacturing, is done to enhance the economies of scale. Alliances were established to jointly manufacture cars between Toyota and General Motors (New United Motor Manufacturing, Inc. – NUMMI) and between Fiat and Peugeot (manufacture of the Ducato semi-truck), for example. The main advantage of such an alliance is shortening the time needed to develop new technologies and products. Another feature is the faster joint achievement of the potential necessary to take action to increase combined market share at the expense of competitors. Connecting distribution channels and services serves a similar purpose. In addition to the benefits of increasing the market share, this strengthens the position of one customer over another.

The second type of alliance involves combining different links in the chain and various competitive advantages of allies, allowing the use of the partner's key competencies. An example of such alliance logic is the cooperation of a company with skills and experience in the manufacture of a specific product range with a company with key competences in the area of sales and service. These were the characteristics of the Fiat-Chrysler alliance. The cooperation involved importing Fiat's sports brand, Alfa Romeo, to the USA and selling it through Chrysler's distribution network. Fiat avoided costs associated with building its own network, and Chrysler expanded its commercial offer.



Research on alliances in the automotive sector has shown that they are formed primarily for the following purposes (Badaracco, 1991):

- cost reduction,
- risk reduction,
- increasing market share,
- increasing flexibility,
- observing competitors' behaviors,
- quick transfer of skills,
- weakening competitors.

Cost reduction is the basic goal of concluding alliances in the field of R&D and manufacturing. The benefits of GM's alliance with Korean companies included the American company's acquisition of low-cost manufacturing capacity. A similar task was fulfilled by the GM-Toyota alliance, under which NUMMI was established.

In order to reduce risk in its operations, GM established many alliances with Asian manufacturers. They were intended to constitute a security buffer that would increase their own bargaining power and weaken the negotiating position of the partners. These were the consequences of the alliance established in 1981 between GM and Suzuki. It was a counterweight to the previously concluded alliance between GM and Isuzu.

Alliances allow car companies to have a stronger impact on one of the instruments of internationalization – increasing participation in the global market. Car companies pursue this in two ways: increasing readiness to cover growing demand through joint production with partners and expanding the distribution network, taking advantage of opportunities offered by strategic cooperation.

In some cases, the purpose of establishing alliances is to increase operational flexibility. Enterprises participating in joint ventures may develop their technologies faster and access markets more effectively.

Alliances allow for close observation of competitors' behaviors. GM's alliance with Toyota enabled the American company to acquire know-how and experience. GM's adoption of the Toyota Production System (TPS) allowed it to achieve a level of productivity previously available only to Japanese companies in the 1990s.

Alliances create environments facilitating rapid transfer of skills between partners. A company entering the sector does not have to gain experience over many decades to acquire the ability to manufacture cars. Alliances allow to significantly accelerate the learning process and bridge technological and organizational gaps. Korean manufacturers soon mastered global car manufacturing technology thanks to alliances with Japanese and American companies.

An important feature of alliances is the ability to use them to weaken a competitor's market position by weakening its negotiating power due to the dispersion of skills.

What is characteristic of the automotive sector is that cooperation agreements are usually not limited to one partner or one type of activity. The need to incur huge expenditure on R&D, technological advancement of the product and, in particular, its high degree of complexity are reflected in agreements concluded with many partners and in a wide range of operations.

Toyota has entered throughout its history into strategic alliances with all of its most formidable rivals in both the European and North American markets. This example clearly shows that even very direct competition does not rule out the possibility of cooperation in certain areas. In this way, car companies participate in costs by implementing projects that are desirable on the market or forced by regulations, for example in the area of environmental protection. Then, these solutions are implemented in the products of all alliance partners. As a result, achieving the alliance's goal does not increase the advantage of any of the partners. As long as all the partners have the same degree of control over it, it is neutral to their competitive positions. Toyota also entered production alliances with GM and French PSA, owner of the Peugeot and Citroën brands. The alliance has the form of a joint venture in Czechia where the manufacture of small cars (segment A) began in 2005. Almost identical cars, differing only in their brands, finish and equipment details, leave the factory: Citroën C1, Peugeot 107 and Toyota Aygo. Thus, by reducing product development costs, companies have expanded their product portfolios.

It seems that the problem of alliances was often oversimplified in research. There were two basic groups, some of which were supposed to be agreements between partners completely suspending competition. In this case, the most important goal of the alliance was to strengthen the position of all its participants in relation to the world at large. The remaining alliances were characterized by strong competition between partners who were still competitors. The motive for concluding this type of alliances was to weaken the partner's position or strengthen one's own. In fact, the problem turned out to be much more complex, as demonstrated by French researchers Garrette and Dussauge.

Strategic alliances concluded in the automotive sector can be classified using the approach of Garrette and Dussauge (1996). The division is based on two criteria: contributions made to the alliance by each of the allies and the alliance's "output". Allies' contributions to the alliance may be identical or different. If they are different, partners with complementary assets are desirable. This criterion was used to distinguish the so-called "complementary alliances". The second criterion is the problem of critical production volume. If an alliance covers only one form of activity, it is further called a "joint integration alliance". If it extends to the entire activity and results in the introduction of a common product to the market, it is a "pseudo-concentration alliance". Examples of these alliances are presented in Table 5.

**Table 5.***Typology of alliances between competitors*

Joint integration alliances	Pseudo-concentration alliances	Complementary alliances
<ul style="list-style-type: none"> <li>▪ Renault-VW (V6 engine, gearboxes)</li> <li>▪ Toyota-VW (recycling, navigation systems)</li> <li>▪ Toyota-VW, Toyota-DaimlerChrysler (exhaust gas treatment system)</li> <li>▪ Toyota-Renault, Toyota-Ford, Toyota-GM (wireless communication between car components)</li> </ul>	<ul style="list-style-type: none"> <li>▪ VW-Ford (vans: VW Sharan, Seat Alhambra, Ford Galaxy)</li> <li>▪ Toyota-PSA (small passenger cars: Citroën C1, Peugeot 107, Toyota Aygo)</li> <li>▪ Fiat-Peugeot (Ducato van)</li> </ul>	<ul style="list-style-type: none"> <li>▪ GM-Toyota (NUMMI)</li> <li>▪ Isuzu-Subaru (model exchange)</li> <li>▪ Fiat-Chrysler (Alfa Romeo sales in the US)</li> </ul>

Source: Own study.

Joint integration alliances are the most common in the automotive sector. In addition to strengthening the economies of scale, the motive for concluding an alliance is also the desire to isolate a certain stage of the production process. For example, VW and Renault jointly developed and manufactured automatic transmissions which were then used in products that were directly competitive with each other (VW Golf and Renault 19). These alliances do not suppress competition on the market level but they carry the risk of excessive product unification and loss of brand identity. There is also concern about transferring (deliberate or unintentional) technology, experience and skills to a partner. Therefore, R&D work is usually done out by alliance participants within their native organizational units.

The motive for concluding pseudo-concentration alliances is to obtain the same benefits as in the case of a merger, but without making it. The advantage of this type of agreements is the distribution of fixed costs of a joint project and the expansion of the sales market. The agreement concluded between VW and Ford in 1991 is an example of such an alliance. The subject matter of the agreement was joint manufacture of large-capacity limousines (multi-purpose vehicles, MPV), commonly called vans. The Autoeuropa-Automóveis Lda company was established in Portugal for this purpose in the form of a joint venture. Under the agreement, the German side was responsible for product development and the Americans dealt with factory equipment and the technical side of the production process. As a result, the manufacture of cars under three brands began in 1996: VW Sharan, Seat Alhambra and Ford Galaxy. In fact, it was the same design – the vehicles differed only in some external elements and interior furnishings. Even though VW took over 100% of the company's shares in 1999, the manufacture of cars with the Ford logo continued until 2006. In that year Ford began manufacturing an independently developed vehicle, which meant the final dissolution of the alliance. Another example of a pseudo-concentration alliance is the previously described agreement between Toyota and PSA regarding the manufacture of small cars in Czechia.

Complementary alliances occur when one of the allies sells a product through the partner's distribution network. For example, in the US, GM distributed Toyota and Suzuki vehicles, Ford distributed Mazdas, and Chrysler distributed Mitsubishi cars. These alliances are less often

related to production activities. However, the initial balance resulting from the complementarity of contributions may be disturbed over time when one of the allies acquires competences previously typical of the partner. After achieving the goal for which they were established, complementary alliances are sometimes renewed, but more often they end with one of the partners making a decision to terminate the previously joint activity. The initial complementarity between partners gradually vanishes. When one partner takes over competences of the other, the existence of such an alliance ceases to be rational. This is how the alliances of Japanese car manufacturers with American partners functioned. The Japanese formed alliances to commercialize their models in the USA and then used them to create their own distribution networks there. The strategic consequence of the alliance between Toyota and GM was a significant improvement in the strategic position of the Japanese company (own retail network), but it did not change GM's position.

The latest trends in cooperation between enterprises in the global environment involve the evolution of alliances from classic forms of cooperation between two enterprises towards the so-called "alliance networks". An interesting example is the network of alliances comprising GM, Toyota, Isuzu, Suzuki and Saab, or the competitive network of Ford, Nissan, Mazda and Kia. The basic premise for creating such networks is, as in the case of classic alliances, to obtain a competitive advantage unavailable to individual enterprises or traditional alliances.

To sum up, alliances offer benefits similar to concentration but without its limitations. For example, an alliance partner may benefit from economies of scale and accumulated competences without losing autonomy. Because car companies strongly protect their brands, they prefer this method of growth. The alliance also has the advantage of being "reversible".

Research shows that alliances concluded in the automotive sector have little impact on the competitive positions of the partners. However, they can significantly reduce costs. This applies in particular to alliances concluded for the purpose of implementing environmental protection projects. Production alliances involve greater risk. As a result, the weaker or less efficient alliance partner may lose a part of the market or, in an extreme case, be taken over by the stronger partner.

## **5. Conclusions and recommendations**

The entry of an enterprise into a foreign market involves the need to choose the optimal organizational form. Entry modes can be defined as institutional arrangements that enable companies to introduce goods or resources and capabilities into another country. Due to the wide variety of forms of internationalization, different criteria may be the basis for their classification. For example, it may be the scope of organizational control, management involvement, resource involvement, risk, profit potential. The transition from less to more

advanced forms of internationalization requires a change in the mechanism for coordinating transactions and operations: from market (exports, sub-supplies) through inter-organizational (agreements, joint ventures) to intra-organizational (subsidiaries, mergers). The choice of the entry method should be preceded by an analysis of available methods and factors determining the current and future position of the enterprise and the entire sector.

Entry strategy is a comprehensive program covering tasks, necessary resources and business policy of the enterprise, the aim of which is to gain and maintain a share in a foreign market. Choosing an entry strategy requires making a number of decisions (Root, 1987). These include: choosing a product/market matrix, determining tasks and activities on this market, choosing a method of entering the market, developing a marketing plan for market penetration, developing a control system to monitor market performance.

The most frequently cited concepts in the literature on the subject are the choice of entry form developed by Root (1987) and Yadong (1999) – factorial and the eclectic ones by Kim and Hwang (1992). The choice of the entry method is only one of the components of the entry strategy but it seems to be the most important. In addition to selecting the product/market array, setting tasks and choosing the entry method, the entry strategy also consists of a draft marketing plan. Only such a comprehensive approach allows to make the final decision about entering a specific foreign market.

According to the evolutionary model, an enterprise begins its international development with exports, followed by various forms of cooperation, and only then foreign direct investments (FDI). This concept has been criticized in the literature and has not been confirmed in these studies. For example, FDIs, considered the most advanced form of entry, were used by Japanese manufacturers in early stages of development and were subordinated to export strategies. These investments were located in South-East Asian countries. Short distance from the home country and cheap means of production allowed Japanese companies to gain cost advantages, thanks to which effective expansion into other markets, especially the USA, became possible.

Research has shown that the international development paths of Japanese, European and American companies were completely different. But within this division they already show great similarity. This allows us to formulate the thesis that the course of internationalization strategy and the sequence of adopted forms of serving markets depend to the greatest extent on the conditions, i.e. factors that shape the overall course of internationalization. These are politics-, market-, cost- and competition-driven factors. In each of the economic areas – Asian, European and North American – these factors develop differently. The conclusions presented in this article allow for a better understanding of the current balance of competitive forces and the structure of competition in the sector.

The limitations of the study include its fragmentation. This is a result of unsatisfactory quality of the data obtained. It is dispersed, discontinuous and presented in different layouts. This makes it significantly difficult to accurately track a specific phenomenon and conduct objective comparative analyses. The research is therefore fragmentary. However, despite these limitations, the study expands knowledge in the discussed area.

Further research may be aimed not only at discovering and describing insufficiently studied areas in the selection of strategies and forms of serving foreign markets. For some time now, the economy has been observing the phenomenon of returning production to home countries due to the depletion of the comparative advantages of host countries. The working name for this phenomenon could be “deinternationalization”.

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## MOBILITY AS AN IMPORTANT CHARACTERISTIC OF CONTEMPORARY HUMAN CAPITAL IN THE CONTEXT OF ORGANIZATIONAL RESILIENCE

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**Purpose:** Drawing attention to factors which determine the growing role of human capital in the effective functioning of enterprises in the face of market threats, i.e. in the building of their resilience, as well as indicating mobility as a characteristic of human capital that may affect the company's situation and its resilience.

**Design/methodology/approach:** The study was based on a critical analysis of the subject literature. In order to empirically verify the issues discussed, materials regarding companies included in the WIG-20 index were analysed.

**Findings:** The considerations presented in this study have demonstrated that human capital is one of the important factors that can shape the resilience of an organization, and mobility is one of its characteristic features determining this resilience. Mobility should therefore be monitored with the use of appropriate measurement mechanisms.

**Practical implications:** Theoretical considerations were supplemented with an analysis of materials regarding companies included in the WIG-20 index in order to verify whether the leading entities on the Polish market notice, analyse and report the significance of the phenomenon of human capital turnover. This allowed identifying the current trends in this area of management as well formulating the conclusions and recommendations.

**Social implications:** Highlighting the important role of human capital in the functioning and building of modern entities' resilience as well as raising awareness of the phenomenon of excessive turnover may have multi-faceted beneficial socio-economic consequences and can support the effective management of this capital to the benefit of both the employer and the employee.

**Originality/value:** The study presents the approach to human capital through the prism of its characteristics, i.e. knowledge and the resulting mobility, which may become an important factor determining the resilience of an organization. It also points to the imperfection of the turnover ratio used in the analysis.

**Keywords:** human capital, resilience, knowledge, mobility, turnover, fluctuation.

**Category of the paper:** Viewpoint, General review.

## 1. Introduction

Due to the specific crisis situation caused by the pandemic on global markets, organizational resilience, understood as the organization's ability to face complex, unfavourable scenarios and to adapt to changes required by these situations, has become the subject of interest for management practitioners and theoreticians (Odporność..., 2020). At the same time, for many years there has been the widespread view on the market that in the era of innovative, technologically advanced economy, an increasingly important role in an enterprise is played not by material resources, but by the human factor, together with the knowledge, creativity, flexibility and experience of employees included in the human capital. Alfred Sloan's slogan (Szopik-Depczyńska, 2011), 'if you take away all our assets and leave the people, we will get everything back in five years' perfectly captures the essence of the matter and emphasizes the irreplaceable role of human capital, which can be perceived as an important determinant of organizational resilience. This capital comes only with a specific person or group of people. Each of us has their own unique intellectual, physical and genetic capital. Therefore, it cannot be the permanent property of any of the enterprises, as mobility<sup>1</sup> is one of its characteristics. However, it includes values with which the company identifies, which correspond to its organizational culture and without which the company's functioning is difficult. Thanks to the capital of its employees, the company gains innovation and dynamics, which in turn has a positive impact on its development, making it competitive and resilient to threats from the environment.

In the light of such considerations, this study will present human capital through the prism of modern knowledge workers as an important element helping to build organisational resilience, with particular focus on its mobility, which in practice means employee turnover. Therefore, this phenomenon has been explained and discussed in more detail.

The aim of the study is to draw attention to the significant role of employees in modern enterprises and employee mobility as a characteristic feature of modern human capital, which poses a challenge for human capital management in the context of resilience.

This study has been based on a critical analysis of the literature and supplemented with an analysis of empirical materials regarding companies included in the WIG-20 index.

## 2. Modern human capital - its basic features and role

To effectively function on the market, i.e. to develop instead of merely surviving, today's companies must be resilient, which means that they need to be able to appropriately respond to threats, accept the new situation, improve organizational processes and create new

competencies that may result from this situation (Duchek, 2020)<sup>2</sup>. The process of identifying the determinants of resilience is still ongoing, and the conducted analyses allow concluding that resilience grows with an increase in resources and strengths shaping the company's specific capabilities. The role of human capital and knowledge is particularly emphasized in this regard (Ingram, 2023). Knowledge is crucial for building the company's resilience to external shocks and for making the company more agile in the achievement of better results and sales (Audretsch, Belitski, 2021).

This concept is consistent with general trends on the market, where since the 1980s the world economy has been referred to as the New Economy (Begg, Fischer, Dornbusch, 2003), i.e. a knowledge-based economy. Its core is human capital, i.e. knowledge, skills, competences and capabilities of individuals, which constitute a value for enterprises and influence their innovativeness.

It is noteworthy that the knowledge that provides a basis for modern economy is contributed by people – they should therefore be perceived as a pillar of a modern enterprise, determining its situation and resilience to market conditions.

Human capital has a huge potential. People constitute a strategic resource, shape processes in the enterprise and its strategic framework, establish relationships and, through recognized values, shape the identity and organizational culture of the entity in which they work (Kwiecień, 2015). Human capital is therefore a basic factor supporting the achievement of the company's goals, including the creation of organizational resilience.

Knowledge, as the most important resource in the 21st century, enables creativity (Amabile, Khaire, 2011), develops imagination, gives rise to creative anxiety, has a dynamic character and should be absolutely useful. Combination of creativity and knowledge provides a specific category of employees - knowledge workers. Knowledge workers (Davenport, 2007) have a high degree of specialized knowledge, education or experience, and their work requires the creation, distribution and use of knowledge. They earn their living by thinking, their working tool is the mind, and every effort related to their profession is intellectual in nature. This group usually includes: specialists, senior managers, technical staff, researchers and engineers (Stewart, 2003), who are characterized by independence, specialist competences, responsibility, awareness of tasks and their own value. As explained, the employees in question are owners of a special resource - knowledge, which is characterized by the fact that its value does not decrease when it is transferred. For this reason, knowledge workers can also perform tasks for competitors. Their characteristic feature is therefore a high level of mobility, which in business practice is reflected in the phenomenon of employee turnover.

Mobility is a derivative of knowledge, professionalism based on individual competences, perfection in action and intellectual activity. The time and place of work no longer matter, because knowledge workers, having the means of transport and communication at their disposal as well as the sought-after competences, can work anywhere. It is the organization that is more interested in such employees' knowledge resources and experiences than the employees

themselves, as they do not need a specific institution to develop their professional career because they can share knowledge with various entities.

Such circumstances give rise to an important category that requires analysis in the context of resilience, namely employee mobility.

The characteristics of modern knowledge workers make us realize that today's market is competitive in virtually all aspects of its functioning. Enterprises compete with each other not only for the position on the market, but also for employees. Some modern solutions, e.g. remote work, which has become widespread due to the pandemic, increase the risk of high mobility and independence of modern employees.

On the one hand, employee mobility is a positive feature, a proof of human capital flexibility, but from the point of view of the organization, it can be both a positive (desirable turnover) and a negative phenomenon (undesirable turnover) - when the company loses its key employees. The challenge may therefore lie in effective management, which will allow the company to keep its employees, especially knowledge workers (because employees of this group and their competences are usually of key importance to the company). The term 'knowledge worker' describes an employee who, owing to their ability to utilize knowledge, can, under given conditions, exert a large impact on a specific organization, i.e. contribute a great value to it. Therefore, the departure of such employees may be particularly unfavourable for the organization (Kowalski, 2011).

Excessive employee turnover and, consequently, shortages of competent staff at all levels and positions can lead to huge problems for the company and constitute one of the most important business risk factors that reduce the organization's resilience. Deficiencies in this area mean problems with meeting market expectations, with providing good quality products and services to customers and partners, and generally with accepting changes. It is therefore necessary to talk about employee mobility in order to understand the phenomenon of turnover, its causes and effects.

Good employees are difficult to recruit and even more difficult to train, but the hardest task is to keep the best employees (Jaworska, 2021). Effective human capital management, aimed at motivating employees and, thus, preventing excessive, undesirable turnover, is a huge challenge for organizations, because employees are perfectly aware of how valuable and unique their capital is.

### **3. Employee turnover and human capital**

Although the previous part of the study was focused on knowledge workers, it should be clearly emphasized that mobility, and therefore the phenomenon of employee turnover, applies to all professional groups. However, the scale and consequences of this turnover may vary.

It is worth emphasizing that the limited effectiveness of retention activities and the related unpredictability of employee behaviour significantly limit the development and adaptation potential of the enterprise and, consequently, are recognized as a factor that threatens the stabilization of the organization's functioning. It reduces its resilience to unfavourable and unforeseen circumstances. It also limits the effective use of opportunities arising for the company. Therefore, building and maintaining an appropriate level of organizational resilience is to a large extent determined by an effective human resources management policy that allows for retaining valuable talents in the organization.

Mobility, which is most often defined in the context of employee mobility, includes spatial mobility (migration) and professional mobility. This article is focused on the issue of professional mobility, understood as the tendency of employees to change their profession or employer. It involves the employee making significant efforts that enable retraining, but also gaining professional experience in new areas (Sienkiewicz, 2014; Bednarska-Grandson, 2016). This phenomenon is subjected to studies in various fields of science. Sociological research in the context of mobility emphasizes the concept of migration and social mobility (Sorokin, 2009; Bednarska-Wnuk, 2016). In the case of human resources management, professional mobility is most often referred to as turnover (Bednarska-Wnuk, 2016). This study considers in particular problems related to the retention of human capital. Therefore, the term turnover will mainly be used here to analyse the phenomenon of professional mobility.

When addressing the issue of employee turnover, which is interchangeably referred to in the literature as churn rate, mobility or fluidity, or even employee mobility (Skowron-Mielnik, Bor, 2015; Bednarska-Wnuk, 2016), one should first consider the meaning of the word turnover. This term has many meanings, but most often means variability, fluidity, instability, deviation from average values or from the norm.

In the area of human resources management in an organization, employee turnover (churn rate) is frequently defined as the rate at which employees change their job positions 'due to promotion, voluntary resignation, retirement, or as a result of forced resignation' (Dalrymple, Cron, DeCarlo, 2001). It is a natural phenomenon as long as it is maintained at a reasonable level. Unjustified (excessive) turnover is an unfavourable phenomenon. It is caused by poor human capital management policy, which manifests itself, for example, in the lack of objectivity in assessment, bad relations at work, poor working conditions or a bad remuneration system (Urbaniak, 2010).

Turnover, sometimes referred to as departure of mature employees from work (Woźniak, 2016; Spychała et al., 2019), is often considered in a narrow perspective in journalistic writing, limited mainly to employees leaving the organization voluntarily (Cybulski, 2008). It should be emphasized, however, that for management purposes, all circumstances accompanying changes in the size and structure of employment should be taken into consideration, including those related to the cases of departure forced by the employer - the so-called forced turnover (Woźniak, 2016).

The role of employee turnover in the process of shaping the company's economic position is not clear. This phenomenon may have both a positive and negative impact on the functioning of the organization. In the case of turnover forced by the employer, the purpose of which is to reduce the negative connotations associated with an employee performing their duties in an inappropriate manner and having a destructive impact on the organization, it should bring positive effects. In such a case we deal with a positive turnover - functional, i.e. desirable. However, this type of employee turnover may prove the low efficiency and effectiveness of the recruitment processes (Cybulski, 2008). It may therefore indicate the need to reorganize and improve the process of finding suitable employees for job positions. Its opposite is dysfunctional turnover (Urbaniak, 2010; Spychała et al., 2019), with the potential to negatively impact the functioning of the organization, also known as undesirable turnover. This phenomenon is associated with the departure of qualified employees, which has a negative impact on both the continuity of processes carried out in the company (Darmon, 2006) and the loss of knowledge and, consequently, a reduction in the intellectual capital of the organization. It should be emphasized that the ability to transfer the knowledge of individual employees to the entire organization is the foundation of effective learning (Wszendybył-Skulska, 2011) and increased value of its intangible capital. Negative turnover is most often regarded as conscious or unconscious actions of employees, usually undertaken on their own initiative, resulting in employee departure (Wojtaszek, 2016).

The above considerations present a clearly ambivalent approach to the phenomenon of turnover - on the one hand, it is considered an undesirable phenomenon indicating management errors, and on the other, an inevitable and even expected phenomenon (Skowron-Mielnik, Bor, 2015).

Turnover identified with employee departures and employments is analysed with the use of turnover rate (Cynk, 2016). Generally, this indicator presents the scale and level of employee flows in the selected period.

Turnover rate is calculated as a total number of employee departures/total number of employees\* 100% (Cynk, 2016).

The numerator in the basic algorithm presented above takes into account the number of all employee departures in the analysed period, and the denominator - the number of employees. The algorithm can be modified depending on information needs. Poczowski emphasizes that indicators for measuring the phenomenon are unlimited and depend on the purpose and scope of a specific analysis (Poczowski, 2008). However, this indicator, as the most universal, does not take into account the causes of changes in the area of employment. It is therefore impossible to use it as an arbitrary criterion for assessing the human resources management policy. Such an assessment requires an in-depth analysis of the phenomenon, including its causes and consequences. The indicator enables a general assessment and identification of disturbing trends, though.

In addition to operational problems that may limit the organization's ability to generate revenue, the phenomenon of turnover involves additional costs incurred by the organization.



The costs of turnover include primarily (Cybulski 2008):

- costs of employee departure (related to the payment of due benefits, administrative costs and costs related to the loss of intellectual capital),
- replacement costs (related, among others, to the recruitment process),
- costs of a new employee adaptation, including training costs,
- other costs related to, among others, loss of profits.

These costs are particularly severe for learning companies in the event they lose knowledge workers - those who had a special share in the process of creating its intangible intellectual capital (Sopińska et al., 2015). Hence, appropriate talent management, including creation of a system of incentives to ensure proper employee retention, is extremely important.

The research conducted by CEBOS 'Poles at work. Employment conditions, readiness for changes'. (CEBOS 2014) indicates that despite the fact that remuneration was mentioned as the first factor encouraging employees to change employment (65% of respondents), the lack of tensions and stress was also mentioned as very important (53% of respondents), followed by employment stability (56% of respondents), work consistent with skills (23% of respondents) and high independence (21% of respondents) (Cynk, 2016). The research on readiness to change the job conducted by CBOS in 2021 - 'Professional situation of Poles and readiness to change the job' - demonstrated that despite remuneration indicated as the main factor encouraging employees to change the job (62% of respondents), the second most common factor was boredom and the desire for change (31% of respondents), followed by dissatisfaction with working conditions (29% of respondents) and, finally, conflicts with the employer or co-workers (9% of respondents) (CEBOS 2021). The presented results of the above-mentioned studies provide an important tip for the employer. However, their reliable interpretation requires additional research.

To sum up, it can be concluded that organizations should analyse the level of risk related to the materialization of negative consequences due to employee turnover, as well as the dynamics of changes in the level of this risk (Janowiec et al., 2022). Excessive turnover may result in disruption of the entity's operational efficiency and, consequently, in its reduced resilience. However, this analysis must be multidimensional. Although the observation of turnover rates and their changes makes it possible to become acquainted with the trends, it is not a sufficient criterion for assessing the effectiveness of human capital management (Marzec, Strużyna, 2023). Nevertheless, conducting an analysis in this area is an important element of the system for monitoring the efficiency and effectiveness of management processes. Due to the importance of the human capital management process for achieving goals, companies subject to numerous reporting requirements are obliged to report information on turnover. In ESG reports prepared on the basis of the Sustainable Development Reporting Directive, the employment turnover rate in the 'S' - Social area has been included among the basic indicators, the reporting of which will be treated as mandatory and will be reported by companies from 2024 (Directive 2022/2464).

#### 4. Empirical verification

In order to empirically verify the presented theoretical considerations, data on employee turnover in enterprises included in the WIG 20 index has been analysed.

The turnover rates presented in Table 1 are an important element of the organizational improvement system. The possibility of predicting the values of these indicators in the future may provide grounds for conducting research among the employees.

The reports emphasize the need to create an ‘engaging work environment’ (e.g. GK Alior Bank, 2022, p. 48; Grupa mBank S.A., 2022, p. 161). To achieve this goal, the above-mentioned studies on the opinions and engagement of employees are carried out. Their aim is to facilitate the process of taking decisions on the basis of facts, or, as it has been formulated in one of the reports (GK Alior Bank, 2022, p. 48), to enable ‘understanding the factors that significantly influence the efficient and effective functioning of the Bank’. The importance of such research results from the fact that it shows the employees’ motivation and attitude to work. Therefore, it can be assumed that the said studies ‘are an indicator of potential turnover or absenteeism’ (GK Alior Bank, 2022, p. 48). This encourages organizations to report the number of hired employees and those who left the organization in a given year, and to show the turnover rates calculated on this basis<sup>3</sup>.

**Table 1.**

*Turnover rates and employment levels for selected Capital Groups (based on WIG-20 Companies)*

Data Organization	Number of employees reported in a given year					Turnover rate (if provided by the organization)	
	2018	2019	2020	2021	2022	2018	2022
GK Alior Bank	8228	8143	7878 (jobs)	7678	7293	-	-
Allegro (Poland)	-	2479	3289	4848	7840	10.5% (2019) <sup>4</sup>	16.33%
Asseco Group	24 302	26 843	28 009	30 374	32 750	-	-
CD Projekt Group	912	1 080	1 177	1 196	1 292	ca. 20% (2021) <sup>5</sup> (CD Projekt SA)	14.3% (CD Projekt SA)
Polsat Plus Group (4 biggest companies)	4150 (3 companies, jobs, FTE)	4304 (3 companies, jobs, FTE)	4393 (3 companies, jobs, FTE)	5882 (jobs, FTE)	5995 (jobs, FTE)	9.00% (weighted average for three companies)	11.02% (weighted average for four companies) <sup>6</sup>
Dino Group	16 530	19 241	25 840	32 426	37 386	-	-
GK JSW	28 268	30 629	30 593	31 916	30 739	-	3877 number of departures
GK KGHM Polska Miedź S.A.	34 249	34 345	33 526	33 965	33 760	2254 departures (6.58%)	3161 departures (9.4%)

Cont. table 1.

Kęty Group	5146	5196	5322	5572	5488	619 departures	12.3% <sup>7</sup>
PEPCO Group (end of reporting year 30.09.)	-	35 310	38 770	42 045	43 212	-	-
GK Bank PEKAO S.A. Capital Group	16 714	15 678	14 994	14 842	14 462	2077 departures (Bank PEAKO S.A. in 2019, jobs)	16% <sup>8</sup>
Orange Polska Group	13 222	12 058	10 967	10 144	9466	2.8%	3.4% <sup>9</sup>
KRUK S.A. Group	3364	3447	3108	3274	3375	5% (in age group up to 30 years), 7% (age group between 30 and 50 years), 0 (age group over 50 years)	13.4%
LPP Group (financial year from 1.02 to 31.01)	25 174 (31.12. 2018)	24 447	21 977	24 466	29 930	14.1% (LPP SA, 31.12. 2018)	104.5% (age group under 30 years); 33.2% (age group 30-50); 33.3% (age group over 50) <sup>10</sup>
mBank Group	9423	8224	8306	8350	8364	22%	15% <sup>11</sup>
Orlen Group	21 282	22 337	32 960	35 424	64 494	9.9%	11.7% <sup>12</sup>
PKO BP Group (jobs)	27 856 (jobs)	27 708 (jobs)	25 859 (jobs)	25 657 (jobs)	25 071 (jobs)	15.7%	14.1% <sup>13</sup>
PGE Group	41 763	42 283	40 444	38 001	38 013	6%	9% <sup>14</sup>
GK PZU (jobs)	41 742 (jobs)	41 042 (jobs)	39 900 (jobs)	38 700 (jobs)	37 900 (jobs)	9.05% (PZU and PZU Zycie)	17% <sup>15</sup>
GK Santander Bank Polska (jobs)	15 357 (jobs)	14 032	13 158	11 581	11 976	24% Santander Bank Polska S.A (2019)	17% Santander Bank Polska S.A <sup>16</sup>

Source: own study based on companies' reports.

Importantly, the significance of these rates can be looked at more broadly, also from the point of view of the situation on the market. It is indicated that 62% of the 4,718 respondents (National Report, Randstad Employer Brand Research, 2023, pp. 31-32) did not plan to change employment in the first half of 2023, and 15% of the respondents changed their employer in the second half of 2022. For example, in the case of the organizations the data of which is presented in Table 1 it was observed that in three organizations with the highest employment increases in 2018-2019, i.e. the CD Projekt Group, Dino Group and Asseco Group, the values of employment dynamics indicators ranged between 1.1 and 1.2, while for the period 2021-2022 the highest dynamics indicators were recorded in organizations such as the Orlen Group, Allegro.eu and LPP Group, reaching the level of approximately 1.2-1.8. For these three organizations, the employment levels in 2018-2019 were different, i.e., for example, there was

an increase in the Orlen Group, but a decrease in the LPP Group. The downward trend continued in the periods 2018-2019 and 2021-2022 in the Orange Group, PEAKO Bank Group, and PKO BP Group. An increase in employment in the years 2018-2019 and, next, a decline in 2021-2022 was recorded, for example, in the JSW Group. There were also changes in the opposite direction, i.e. a decrease in employment in the years 2018-2019 was accompanied by an increase in employment in 2021-2022, e.g. in the mBank Group, Santander Bank Polska Capital Group. or the previously mentioned LPP S.A. Group. It can be noted that among the turnover rates reported by these organizations, the values in 2022 did not exceed 20%, although most of them were higher than 10%. However, in most cases, they were lower than in 2018, when the rates reached 20% or more. If the organizations included in the table were divided into two groups, i.e. the first one in which an increase in employment was recorded both in the period 2018/2019 and 2021/2022, and the second one in which both indicated periods were marked by a decrease in employment, the first group would include the CD Projekt Group, Dino Group and Asseco Group, Orlen Group, Polsat Plus Group, KRUK S.A. Group, PGE Group, while the other would include the PKO BP Group, Alior Bank Group, PZU Group, Bank PEKAO S.A. Capital Group and the Orange Polska Group.

Importantly, the values quoted in the reports urge the organizations to identify problems in the specified areas and make them try to present explanations. When explaining the decline in the turnover rate in 2022 in CD PROJEKT, attention was drawn to the actions taken in recent years, namely, the improvement of working conditions and the fact that the offer addressed to the employees was enriched<sup>17</sup>.

On the other hand, the case of this company also demonstrates that caution should be exercised as changes in the turnover rate may be caused by factors related not so much to the organization as to the branch, such as departure of team members after finishing the project (CD PROJEKT, 2022, p. 42) The possible consequences of the departure of team members (especially in the case of key members) in the CD PROJEKT Group include a decline in innovation, work pace, quality of products and processes, loss of potential unique ideas and, consequently, loss of competitive advantage (CD PROJEKT, 2021, p. 28). Relatively high turnover rates recorded at CD PROJEKT S.A. together with the entire set of potential negative consequences of this state of affairs are therefore juxtaposed with the statement of reasons, partly in a non-organizational field (branch), and, at the same time, supplemented with a list of remedial actions taken. Moreover, the CD PROJEKT Group belongs to the groups of organizations noting an employment growth, which may to a certain extent suggest that negative consequences of employee departures are rather unlikely to occur. The KRUK S.A Group, another organization from the first group, points out that the low turnover and the wide range of know-how gained over many years of work translate into the stability of the managerial staff, which constitutes the Group's competitive advantage (Kruk, 2022, p. 32) .

The Santander Capital Group is an organization that noted a quite significant decline in employment over the years 2018-2022 (although it was not included in the second group of organizations with a decline in two periods – compared to previous departures - due to a rather moderate increase in employment in the years 2021-2022). Here, the causes of staff turnover are explained mainly through the prism of potential positive consequences of this phenomenon. Attempts made to achieve positive consequences allow for explaining the recorded values of turnover rates. It can therefore be indicated that a higher turnover rate may also be related to actions focused on customer relations and business development, as was the case with Santander Bank, where the reasons for decreased employment (in 2021) were sought in the digital transformation of the business model, including the implementation of solutions aimed at increasing the operational efficiency of the organization (Santander Bank Polska, 2021, p. 85). It is worth noting, however, that actions taken to increase efficiency do not necessarily coincide with declines in employment. The case of the PEPCO Group shows that the implementation of IT solutions to increase the operational efficiency of processes may be accompanied by an increase in employment. It should also be emphasized that this group, in the case of which the employment growth remained at the level of 6.96% in the years 2019-2022 (average pace of change), stands out due to operational and technological resilience, which is associated with the implementation of the Oracle ERP system (as well as with the resulting greater simplicity, efficiency and degree of automation of daily operations) and the implementation of policies ensuring cybersecurity. There are also other elements, such as responsible financial management, conducting the business in an ethical and more professional way, as well as zero tolerance for tax avoidance, which in turn is associated with financial and tax resilience. Given the fact that regular communication channels are also important, it can be assumed that it is lower, not higher, rates of turnover that favour its development (PEPCO, 2022, p. 45).

Potential difficulties in explaining the turnover rate are visible in the next case, which concerns an organization belonging to the second analysed group, i.e. one in which a decline in employment was recorded both in the period 2018-2019 and 2021-2022. The efforts to achieve a higher efficiency of processes and the resulting centralization of functions and processes (PKO BP - raportroczny2022.pkobp.pl) are emphasised by the observation that the organization is taking actions aimed at retaining its employees (PKO Bank Polski S.A. - Management Board Report..., 2022). Given the reported declines in employment, the effectiveness of these measures may be rather limited. However, in the report itself this seems to be strongly justified by references to trends on the labour market (in the discussed case in the year 2022), i.e. a new form of work (remote work) and the existing employee market. All these factors together were supposed to influence decisions to change the job.

A case that may prove the effectiveness of measures taken to reduce the employee turnover is that of mBank (mBank Group does not belong to either of the two groups mentioned above due to an increase in employment in the period 2021-2022 after a previous decline in the period

2018-2019), where, in addition to creating an engaging work environment, it is also a high culture within the organization that is highlighted as an important factor helping to maintain the employee turnover at a low level. This involves developing succession plans, especially for key employees in managerial positions. The possibility of internal transfers is also promoted (Grupa mBank S.A., 2022, p. 161).

It is also worth paying attention to organizations that noted an employment decrease and increase, respectively, in the discussed periods of 2018-2019 and 2021-2022 (or vice versa, attention is drawn to cases for which there was no data indicating a decrease or increase in employment in one of the periods). In the case of the Allegro Group, which noted a significant increase in employment in 2022 compared to 2021, there was an increase in the turnover rate from 10.5% to 16.3% in the year 2022 in comparison with 2019 (in 2020 the rate reached 8.9%)<sup>18</sup>. Firstly, this case may indicate the relationship between the previously mentioned issues, which are related to the need to build an engaging workplace, and employee retention. It is worth noting that the trends are negative. In the ESG report in the year 2022, attention was drawn to the fact that there were further declines in engagement compared to the results from 2020-2021 (Allegro, 2022, p. 50). On the other hand, the results showed that (at one of the reported levels, i.e. BaZa) the response rates in the engagement survey exceeded 90%, i.e. the vast majority of the employees wanted improvements, and therefore, they remained engaged (additionally, according to the cited Pulse survey results, 82% of the employees declared that they would recommend Allegro as a great place to work - Allegro, 2022, esg, 50). Therefore, a relatively high number of job departures may also be accompanied by a high rate of new hires. Although the occurrence of such a phenomenon may imply difficulties involved in the building of organizational resilience, it is not possible to draw such a definite conclusion without further research.

The next case allows for considering another potentially interesting dependence, i.e. the correlation between the weight assigned to turnover rates and the number and effectiveness of the implemented solutions aimed at reducing these rates. In the Kęty Group, the strengthening of the status of an attractive employer is measured by a 5% decrease in the employee turnover rate on a year-to-year basis (Grupa Kęty, 2022, p. 12). This indicator is intended to measure the effectiveness of activities related to the approach to employee processes, which is accompanied by the assumption that the Group has a real impact on the development of employees (Grupa Kęty, 2022, p. 14). One of the interesting solutions intended to help the organization improve the work environment are so-called exit interviews, i.e. interviews with employees leaving the organization. They are used to get to know the employees' opinions on the working conditions and the company's offer (Grupa Kęty, 2022, pp. 12-24).

Finally, it should be emphasized that drawing conclusions about high turnover rates or their changes in the context of implemented organizational solutions is difficult as it may to a large extent depend on situational conditions or, as already indicated in the case of the CD Projekt

Group, on the specificity of the branch. It may also happen that the information about the rate itself will be too general to draw conclusions about further dependencies. Therefore, high values of the turnover rate may be related to group layoffs (GK Santander, ESG Report 2019, p. 96). In such a case, it is impossible to associate such a level of the rate with e.g. the indicated possibility of losing a competitive advantage, or loss of organizational resilience if the role of the competences of the laid-off employees has not been defined.

The turnover rate in the case of the business model characteristic of LPP may give extremely high results (above 50%, as in the case of LPP Retail, where such high results are due to people, including students, for whom working in a showroom is a casual and short-term job (LPP Group, 2022/2023, p. 101). It can be assumed that a high ratio per se will not be related to competitive advantage or organizational resilience.

The report entitled *Employer brand research 2023 report – national report Poland* emphasizes the role of a friendly atmosphere, which, if treated as one of the HR priorities, enables limiting the staff turnover and ensuring the effectiveness of employees (National Report, Randstad Employer Brand Research, 2023). Thanks to the monitoring of turnover, it is also possible to identify in advance the competencies that will require replacement in near future (GK JSW, 2022, p. 144), which should enable the organization to respond appropriately also in the event of crisis situations. However, the description of the above cases indicates that shaping the appropriate turnover rate requires careful consideration of the implemented solutions and their expected consequences.

## 5. Summary

The validity of the assumption about the significant role of human capital in the shaping of organizations' resilience is summarized in the statement contained in the study on human capital in Poland: 'The key importance of human capital in the economic and social development of countries cannot be overestimated in any way. It is assumed that human capital affects the individual earnings of employees, the efficiency and effectiveness of entrepreneurs, as well as the amount of added value generated by the national economy' (Human capital in Poland..., 2021).

The managers of the analysed entities seem to confirm this thesis; they appreciate the significant role of human capital in the functioning of their organizations and present data on human capital in their reports, explaining the ongoing changes in human capital. However, one can notice some chaos resulting from both the different situations of individual entities and the obtained values of the rates, as well as from differences in the provision of information on employment and turnover, its description and explanation.

Summing up the above considerations and data regarding the phenomenon of staff turnover in the analysed entities, it can be concluded that the value of turnover rate in the year 2018 ranged from 2.8% to 24%, and in 2022 - from 3.4% to 16.3%, i.e. the maximum value of the rate has decreased. In the case of several companies, no such information or only partial information on the number of departures was provided. Generally, companies do not provide detailed information on employee turnover in particular job groups or employment levels, focusing only on employee age ranges. Also, the rates do not indicate the nature of the turnover phenomenon (positive or negative) in individual organizations.

It is also impossible to indicate a uniform trend characteristic of the entire market, because in the analysed period the value of turnover rate increased in several companies, while in others it dropped, as described above. The causes and effects of staff turnover in individual companies are different, which the authors attempted to demonstrate by quoting the information provided in the companies' reports.

However, it is certain that issues related to employee turnover are treated as important in individual companies, because most of them report this data and explain the values of the achieved rates in their reports.

It can be viewed as appreciation of the role of this factor in the effective functioning of the organization. Although none of the companies refers turnover directly to the phenomenon of organizational resilience in their reports, the PEPCO Group report draws attention to operational, technological, financial and tax resilience. In many cases, companies explain the reasons for the increase or decrease in employment by pointing to various internal factors (e.g. improvement of working conditions, digital transformation of the business model) and external factors (macroeconomic conditions). This issue is also associated with employee engagement. All these factors undoubtedly shape the efficiency of companies' operations and influence organizational resilience.

Based on the above analysis, it can be concluded that issues related to human capital turnover are an important element of management in individual companies. Managers are aware of the role played by human capital in the effectiveness of entities' functioning, so they analyse the phenomenon of turnover, the causes and effects of which may considerably vary from entity to entity and can undoubtedly influence organizational resilience.

The analysis of empirical data of companies included in the WIG-20 index has revealed the imperfection of the turnover rate parameter. The very level of this indicator does not allow for its proper interpretation as the causes of the phenomenon are not known. The turnover rate does not take into account the division into voluntary departures of employees, which may be a loss for the entity, and departures forced by the employer so as to eliminate ineffective employees or reduce employment due to other company problems (cost cutting) or company development (process automation). The presentation of data regarding employee turnover requires clarification. It is necessary to provide additional information explaining the causes and



expected effects of this phenomenon. Data on voluntary departures and those forced by the employer is also worth detailing.

We agree that the issue of employee turnover is very important to enterprises, therefore it is necessary to clarify the requirements for its reporting, which will allow for a better assessment of issues in the field of human capital management.

The consequences of the phenomenon of employee turnover for enterprises allow us to conclude that the market goal should not be to achieve a record employee mobility or labour market flexibility (characterized by high turnover), but moderate stability and a sense of security of employees, who in such a situation show greater commitment and, thus, influence the stability of functioning of resilient entities (Kołodziej, 2019).

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24. Sprawozdanie zrównowazonego rozwoju za rk 2022/2023 Grupy LPP.

## Footnotes

- <sup>1</sup> Job mobility means the employee's tendency to change their profession or employer, which involves making a significant effort not only to retrain, but also to gain new professional experience in a completely new area (Bednarska Wnuk, 2016). To discuss the phenomenon of mobility, terms such as migration, mobility, turnover or fluctuation are used interchangeably. Management sciences usually talk about turnover, which focuses on the processes of quantitative and qualitative changes in the sphere of employment.
- <sup>2</sup> The subject literature, both world and Polish, quotes many studies on resilience (including Olekalns, Caza, Vogus, 2020; Ingram, Bratnicka-Myśliwiec, 2019).
- <sup>3</sup> However, it should be emphasized that methodological proposals for calculating such indicators differ between organizations.
- <sup>4</sup> Employee turnover rate (%) = employees leaving the company/average number of employees in the analysed period (Grupa Allegro, 2021, p. 97).
- <sup>5</sup> Calculated as the ratio of the number of people leaving the job to the total number of employees (Grupa CD Projekt, 2022, p. 42).
- <sup>6</sup> The rate calculated as a weighted average of turnover in 2022 in the four main companies of the Group (GK Polsat, 2022, p. 106).
- <sup>7</sup> Calculated as the number of employees who left the company/average employment status (Grupa Kęty, 2022, p. 18).
- <sup>8</sup> Includes the rate of voluntary and forced employee turnover (Grupa PEKAO, 2022, p. 171).
- <sup>9</sup> The turnover rate taking into account all departures excluding voluntary departures (for reasons not attributable to the employee) and departures upon the employer's initiative and excluding departures within the Group (GK Orange Polska, 2022, p. 91).
- <sup>10</sup> The general employee turnover rate is calculated according to the following formula: the total number of employees in a given category who left the organization in the reported financial year (12 months) divided by the total number of employees in a given category in the reported financial year (employment status as of January 31, 2023), multiplied by 100 (Grupa LPP, 2022/2023, p. 101).
- <sup>11</sup> The turnover rate is calculated as the ratio of the number of employees who left their jobs to the number of people employed (Gupa mBank S.A, 2022, p. 171).
- <sup>12</sup> The employee turnover calculated as the number of employees in a given group leaving the company in a given year to the total number of employees in a given group, excluding the former LOTOS Group and former PGNiG Group (GK Orlen, 2022, p. 146).
- <sup>13</sup> The turnover rate calculated as the number of employees whose employment relationship was terminated in 2022 to the number of employees employed at the end of 2021 (GK PKO BP S.A. - raportroczny2022.pkobp.pl).
- <sup>14</sup> The rate calculated as the percentage of employees who left their jobs in the reporting period (GK PGE 2022, p. 233).
- <sup>15</sup> The rate calculated as the rate of voluntary departures and layoffs of all employees of the PZU Capital Group employed on the basis of an employment contract (takes into account also the internal turnover between PZU/PZU Życie and other PZU Group companies (GK PZU i PZU SA, 2022, p. 136).
- <sup>16</sup> The calculated rate is the ratio of employee departures in the reporting period to the number of all employees employed in the Bank under employment contracts on December 31, 2022 (GK Santander, ESG Report 2022, p. 92). The turnover in 2019 was calculated as the ratio of the number of contracts terminated in 2019 to the average employment in 2019 (GK Santander, ESG Report 2019, p. 96).
- <sup>17</sup> Given the fact that human capital is a key factor in the process of building the organization's resilience, it is not surprising that investments are made in employee development. In addition, the conducted analyses point to the rules adopted in this field, which potentially opens up another field of research related to the impact of the adopted detailed solutions on the resilience of the organization. For example, the Polsat Plus Group (2022) applies the 70-20-10 rule, which means that 70% is development through experience (tasks, participation in projects), 20% is development through relationships with others (sharing knowledge, feedback, coaching, mentoring) and 10% is development through participation in training (online, stationary, internal and external) (GK Polsat, 2022, p. 115). The question arises whether such a model of competence development would be the best from the point of view of developing the organization's resilience.
- <sup>18</sup> Many potential reasons for such values of these rates are sought in the rapid development of the organization as well as greater formalization and disruptions, including not only circumstances related to the external environment (war in Ukraine, macroeconomic conditions) but also internal factors (post-merger reorganization and succession of top management) (Allegro, 2022, p. 50).



## INSURANCE MARKETS INTEGRATION AND ECONOMIC GROWTH IN THE VISEGRAD GROUP COUNTRIES IN 1999-2019

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**Purpose:** the aim of the article is to examine the impact of the degree of insurance markets integration on economic growth in the Visegrad Group countries in the years 1999-2019.

**Design/methodology/approach:** the research was divided into two stages. In the first stage the degree of the insurance markets integration of the Visegrad Group countries was assessed. Insurance market integration measures have been established with regard to gross written premium (Ilg) and investments (Qg). In the second stage of the research, the impact of the degree of insurance markets integration on economic growth in the Visegrad Group countries was assessed. In order to investigate the impact of the degree of insurance markets integration on economic growth, an econometric model was constructed. The model was built using the backward stepwise regression method and then estimated using the Engle-Granger cointegration test.

**Findings:** the conducted empirical analysis based on statistical and econometric methods allows for the formulation of several important conclusions regarding the insurance markets integration of the Visegrad Group countries. Firstly, the degree of insurance markets integration, measured by integration indicators, is quite high and there is a tendency to its further growth. At second, the impact of the insurance market integration's degree (measured by Qg) on economic growth is rather weak. Variable Ilg is statistically insignificant. Thus, the conducted research shows that the degree of insurance markets integration, measured by integration indicators, is poorly related to the economic growth in the Visegrad Group countries in the analyzed period.

**Practical implications:** the research results can be used by insurance companies and insurance market institutions to develop their insurance business.

**Originality/value:** the article presents original research findings and fills a research gap on the impact of insurance market integration on economic growth in the Visegrad countries and contributes to the discipline of economics and finance.

**Keywords:** international financial markets, insurance, economic growth, Visegrad Group.

**Category of the paper:** research article, case study.

## 1. Introduction

The insurance markets integration on the international scale affects the economic growth by stimulating the development of the insurance market as a part of the financial development (e.g. Kozarević et al., 2013; Njegomir, Marović, 2012; Andelić et al., 2010). The process of insurance market integration, like of other segments of the financial market, increases inflows of foreign capital to the insurance sector in a country, which improves the effectiveness of insurance companies (e.g. Bukowski, Lament, 2020). The access of enterprises and households to the large international insurance market, the financial stability and security of insurance companies improve as the effect of risk sharing is applied to the formation of investment portfolios (e.g. Cummins, Rubio-Misas, 2006; Swiss Re, 1996). The effectiveness of capital allocation improves. What is more, the international insurance markets integration (through the harmonisation of legal regulations) leads to the improvements of accounting standards, corporate governance, insurance supervision and the associated prudential rules, and financial law (e.g. Gąsiorkiewicz, Monkiewicz, 2022; Monkiewicz, Monkiewicz, 2022; Nissim, 2010; Monkiewicz, 2005; Monkiewicz, Wanat-Poleć, 2005; Fedor, 2005). In effect, the integration of financial markets helps improve the effectiveness of insurance companies and fosters economic growth.

The aim of the article is to examine the impact of the degree of insurance markets integration on economic growth in the Visegrad Group countries in the years 1999-2019. In the first stage of the research, the degree of the insurance markets integration of the Visegrad Group countries was assessed. Insurance market integration measures have been established with regard to gross written premium (Ilg) and investments (Qg). In the second stage of the research, the impact of the degree of insurance markets integration on economic growth in the Visegrad Group countries was assessed.

In order to investigate the impact of the degree of insurance markets integration on economic growth, an econometric model was constructed. The model was built using the backward stepwise regression method and then estimated using the Engle-Granger cointegration test.

The research used annual financial data on insurance markets from the OECD Statistics and EIOPA Statistics databases, while macroeconomic and monetary data from the AMECO Database and ECB Statistical Data were used.

The research covered the period 1999-2019. The article uses the STATISTICA 13 and GRETL software.

The paper is structured as follows: the theory of insurance market integration is briefly analysed in the first part, while the second presents the characteristics of the insurance markets of the Visegrad Group countries. The third part shows measures of the insurance markets integration' degree and their picture in the Visegrad Group. The fourth part presents impact of the insurance markets' integration on economic growth in the Visegrad Group countries and discusses the main results of the model estimation. The last part summarises the results.



## 2. Insurance market integration – literature review

The international integration of financial markets plays an important role in the development of financial markets and their impact on economic growth. The insurance market is characterised by certain specificities which make it difficult to assess integration processes. Therefore, the issues related to the integration of the insurance market constitute a poorly recognized research area.

One of the stages of insurance market integration were the third Generation Directives (Council Directive 92/49/EEC of 18 June 1992 and Council Directive 92/96/EEC of 10 November 1992), which introduced a single EU license whereby an insurer licensed in one EU country can do business in all EU countries without obtaining additional licenses or being subject to regulations by host countries. The Directives also abolished substantive insurance supervision, freeing insurers from the regulation of prices and conditions as well as removing other regulatory impediments to competition. However, legal systems and institutional and cultural characteristics still differ significantly across EU countries (e.g., Cummins, Venard, 2008; Bikker, Gorter, 2011; Berry-Stölzle et al., 2013; Cummins et al., 2017; Bukowski, Lament, 2020).

According to the basic concept of financial market integration, the law of one price is in force. This means that in integrated financial markets, assets generating identical cash flows have the same price (rate of return). Referring it directly to the insurance market, it would mean that policyholders should be able to purchase insurance cover in each country (region) on the same conditions, regardless of the location of an insurance company. It can be assumed that if there are uniform legal regulations for conducting insurance activity, it is possible. It is the subject of numerous legal analyses, which means that the phenomenon of the insurance market integration in its legal aspect is both the subject of regulation the adaptation of national regulations to supranational regulations, and scientific and research analyses (e.g. Gąsioriewicz, Monkiewicz, 2022; Monkiewicz, Monkiewicz, 2005, 2022; Nissim, 2010; Monkiewicz, 2005; Monkiewicz, Wanat-Poleć, 2005; Fedor, 2005).

From the financial point of view, it is important to analyse it in the real sphere and demonstrate that such processes take place, and to examine the degree of this integration. It is not an easy question to study. While, for example, in the banking sector it is possible to analyse the interest rate on individual types of loans or the interest rate on deposits, in the insurance sector one cannot directly compare the price of insurance protection (insurance premium) for individual types of insurance, or the value of claims and benefits from individual types of insurance. This is due to the differentiation of risk even within individual types of insurance and different insurance conditions. This means that the insurance premium (the price of the insurance cover) varies depending on the scope of the cover. Therefore, there is a problem with a thorough analysis and unambiguous comparison of insurance offers. The diversified

scope of insurance coverage generates different prices that are difficult to compare unequivocally even within one national market for a given type of insurance. Hence, it is difficult to say whether there is a single price in the insurance market, and therefore the possibility of assessing the degree of integration of the insurance market.

Most analyses on integration, especially on convergence in efficiency across EU financial services markets have focused on the banking industry (e.g. Weill, 2009; Casu, Girardone, 2010; Matousek et al., 2015; Tziogkidis et al., 2020).

Research into the integration of the insurance market has been carried out by, among others:

- Cummins, Rubio-Misas (2022) – analysing integration and convergence both in efficiency and in technology gap of 10 EU life insurance markets over the period 2008-2014. In research applied the meta-frontier Data Envelopment Analysis. Results show convergence in cost/revenue efficiency among major EU life insurance markets during the sample period. The global crisis has led to a slowdown in the progress of integration and convergence in efficiency and technology gap of EU life insurance markets in terms of cost efficiency but not in terms of revenue efficiency.
- Bukowski, Lament (2022) - the authors define the insurance markets integration. And they present the main measures concern the degree of the insurance market integration. The research concerns insurance markets integration in the EU (1999-2019) and analysis of the dependency between the insurance markets integration and economic growth in the EU and especially in the euro area (1999-2019). The authors also investigated the influence of the monetary policy (QE) on the insurance market and degree of insurance markets integration. Both the ratios of insurance markets' integration both in the whole EU and in the euro area are very similar, though somewhat higher in the euro area than estimated for the entire EU. There is a rather strong, positive, and statistically significant impact of the variations of  $Ig$  and  $Qg$  on economic growth in the European Union countries. The situation in the euro area is similar, although the effect of variable (ratio)  $Ig$  is statistically insignificant, whereas the impact of  $Qg$  changes on the rate of economic growth is statistically significant and quite strong.
- Giantsios, Noulas (2020) – the authors estimated revenue efficiency and efficiency convergence with dynamic panel data models for 22 EU insurance markets during the financial crisis and after – in 2006-2014. In estimating the level of convergence, the concepts of  $\beta$ -convergence and  $\sigma$ -convergence are used. The results show that the average revenue efficiency is found to be relatively stable over the period 2006-2014 with a noticeable reduction for the period 2006-2008 due to the global financial crisis.
- Cummins, Rubio-Misas (2018) – examine the impact of integration on the efficiency of EU life insurance markets in 1998-2011. The authors use Data Envelopment Analysis (DEA) and panel data models. In order to determine if the EU deregulation policies have succeeded in improving the efficiency and performance of life insurance sectors, the authors evaluate the dynamics of efficiencies obtained by DEA, a non-parametric

frontier approach. In the analysis, efficiency is measured by comparing firms to “best practice” efficient frontiers formed by the most efficient firms in the industry. Financial market development, legal and governmental systems, as well as competitive intensity are found to affect insurance market performance and integration.

- Schoenmaker, Sass (2016) – analyse the internationalisation of insurance groups and identify some scope for supervision connected with problems due to internationalisation. The empirical findings suggest a high degree of cross-border penetration in European insurance. This high and increasing degree of internationalisation of European insurance groups poses a challenge for supervision – it may tilt the supervisory balance.
- Kozarević et al. (2013) – research the process of integration of Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Montenegro, Former Yugoslav Republic of Macedonia, Kosovo and Serbia) into the EU in 2002-2011. The Spearman’s coefficient of rank correlation is used as the measurement of correlation between the development of the integration into the EU. The authors use the following indicators of insurance market development: total premium per capita, ratio of total premium to GDP (Gross Domestic Product), share of life insurance products, legal and institutional environment and solvency standard. The authors conclude there is a strong positive correlation between the insurance development in the Western Balkan states and the process of their European integration.
- Njegomir, Marović (2012) – have identified five key trends in the insurance market. These affect the insurance industry and the activity of insurance companies. They are: integration processes, which encompass globalisation, consolidation and convergence, intensified catastrophic events, and new risks, mainly caused by the emerging technologies. Integration is one of the factors which influences insurance markets development.
- Andelić et al. (2010) – analyse the influence of globalisation on the insurance and reinsurance markets of Eastern Europe from 2000 to 2008. The results confirm the significance of the relationship between globalisation trends and changes in the insurance and reinsurance markets of Eastern Europe. Integration is one of the factors which influences insurance markets development.
- Jurkiewicz, Wycinka (2006) – evaluate the level of European markets integration in 1999 by using multivariate statistical methods (Pearson correlation index, k-mean clustering, factor analysis, Self Organizing Map). The authors use two groups of variables. The first group show the importance of insurance markets to the economy (premium/GDP, investment/GDP, investments in shares/market capitalisation, insurance employment/service, premium per inhabitant, insurance employment per inhabitant). The other group of variables describe the structure of insurance markets (provisions/premium ratio, number of companies per thousand inhabitants, share of the

five largest life insurance companies, share of the five largest non-life insurance companies, share of life premium in total premium, share of life investment in total insurance investments, life investments/life premium, non-life investments/non-life premium, share of motor premium in total premium). According to the authors, the European insurance market is integrated on a very low level.

The analysis of the literature on the subject shows that the research so far has not in principle assessed the degree of insurance markets integration, except research Bukowski, Lament (2022). The integration of insurance markets was studied mainly as one of the factors of market development and improvement of their efficiency. Two studies – Jurkiewicz, Wycinka (2006) and Kozarević et al. (2013) – concern the assessment of the degree of insurance markets integration, however, the proposed research methodology does not constitute a comprehensive approach, but only covers selected elements. Research by Kozarević et al. (2013), Njegomir, Marović (2012) and Andelić et al. (2010) indicate that the insurance market integration influences the development of the insurance market.

The conducted research on the subject literature allowed for the formulation of the following research hypothesis: the degree of the insurance market integration affects economic growth.

The article fills the research gap in assessing the degree of insurance markets integration and their impact on economic growth. Such research was conducted by Bukowski, Lament (2022) in relation to the insurance markets of the European Union and the euro area.

### **3. Research methodology**

#### **3.1. Characteristics of the insurance markets of the Visegrad group countries**

Domestic insurance markets are diversified in terms of their size and degree of development. This is due to the size of the country, its population and the degree of economic development. Due to the similar level of economic development of the Visegrad Group countries, it seems that their insurance markets should be characterized by similar parameters. The insurance markets of the surveyed countries were analyzed against the European Union (EU) insurance market using such measures as: gross premium written, number of insurance companies, share of life insurance in the insurance market, insurance penetration ratio (premium written/GDP) and insurance density ratio (premium written/population). The research period covers the years 1999-2019, but to ensure better transparency of the presentation of research results, they were presented every 5 years. The characteristics of the insurance markets of the Visegrad Group countries compared to the EU insurance market are presented in Table 1.

**Table 1.**

*Characteristics of the insurance markets of the Visegrad Group countries in comparison to the EU insurance market in 1999-2019*

Specification	Years				
	1999	2004	2009	2014	2019
Gross written premium (US Dollar, Million) (1)					
Czech Republic	1 815 (0.15)	4 380 (0.28)	7 561 (0.51)	6 238 (0.45)	7 215 (0.61)
Poland	4 663 (0.38)	7 558 (0.49)	16 286 (1.09)	14 144 (1.02)	15 869 (1.35)
Slovakia	574 (0.04)	1 487 (0.09)	2 794 (0.18)	2 198 (0.15)	2 490 (0.21)
Hungary	1213 (0.1)	2 963 (0.19)	3 898 (0.26)	2 964 (0.21)	3 909 (0.33)
European Union	1 205 375 (100.0)	1 520 437 (100.0)	1 484 642 (100.0)	1 375 113 (100.0)	1 171 643 (100.0)
Number of insurance companies (2)					
Czech Republic	42 (0.92)	40 (0.92)	53 (1.31)	53 (1.44)	46 (1.43)
Poland	63 (1.38)	72 (1.66)	66 (1.63)	57 (1.55)	59 (1.84)
Slovakia	28 (0.61)	26 (0.6)	34 (0.84)	38 (1.03)	38 (1.18)
Hungary	24 (0.52)	24 (0.55)	27 (0.66)	25 (0.68)	16 (0.49)
European Union	4 549 (100.0)	4 325 (100.0)	4 045 (100.0)	3 667 (100.0)	3 202 (100.0)
Share of life insurance in the insurance market (in %)					
Czech Republic	31.5	39.2	41.7	45.0	32.0
Poland	31.8	37.8	58.9	52.1	32.3
Slovakia	33.1	40.2	51.4	54.2	48.5
Hungary	16.5	23.7	26.5	30.8	29.1
European Union	51.5	56.8	61.0	58.4	56.6
Insurance penetration ratio (premium written / GDP) (in %)					
Czech Republic	3.0	3.6	3.6	3.5	2.8
Poland	2.7	2.9	3.7	2.9	2.6
Slovakia	1.9	2.5	3.2	2.9	2.6
Hungary	2.3	2.6	2.8	2.6	2.6
European Union	5.2	5.4	5.5	5.6	6.8
Insurance density ratio (premium written / population) (US Dollar)					
Czech Republic	175	426	718	711	663
Poland	118	194	427	453	418
Slovakia	106	276	535	543	517
Hungary	201	207	294	271	346
European Union	2 541	3 252	2 616	2 610	2 374

Note:

1. Data in brackets represent the share of the gross written premium of a given country in the gross premium written of the European Union (data in %).
2. Data in brackets represent the share of the number of insurance companies in a given country in the number of insurance companies in the European Union (data in %).

Source: the authors' own research based on: OECD Statistics, EIOPA Statistics databases and Swiss Re (2020).

The analysis of data characterizing the insurance markets of the Visegrad Group countries shows that their share in the EU insurance market, measured by gross written premium in the analyzed period, ranged from 0.67% in 1999 to 2.5% in 2019. The largest insurance market is the Polish market, whose share in the EU market ranged from 0.38% to 1.35% of gross written premium, and the smallest is the Slovak market, whose share in the EU insurance market was from 0.04% to 0.21% of the premium gross written off. The number of insurance companies on the insurance market of the Visegrad Group constituted from 3.43% in 1999 to 4.94% of the total number of insurance companies operating in the EU. Also, according to this criterion, the largest insurance market was the Polish market. The assessment of the structure of the insurance

market, i.e. the share of life insurance in the insurance market, shows that it generally does not exceed 50% (except for selected periods in relation to Poland and Slovakia) and differs quite significantly from the EU insurance market, where the share of insurance in life in the analyzed period amounted to about 60% of total insurance. The insurance penetration ratio, reflecting the importance of the insurance sector in the economy of a given country, ranged from 1.9% (in 1999 in Slovakia) to 3.7% (in 2009 in Poland). The similar value of this indicator in the analyzed countries (it is noticeable especially in 2019) indicates a similar importance of the insurance sector in the national economies of the surveyed countries. It should be noted that the EU insurance market has a much higher insurance penetration ratio - almost 7% in 2019. The insurance density ratio, which is used to assess the level of development of the insurance market, should be interpreted similarly. The EU insurance market is characterized by a much higher level of this ratio. It should be noted that the Czech and Slovak insurance markets achieved a better insurance density ratio than Poland and Hungary.

Summing up, it should be stated that the insurance markets of the Visegrad Group countries are diversified both in terms of their size and structure as well as their development and importance in the economy. However, this is not too much differentiation, allowing the analyzed insurance markets to be treated as a homogeneous group. The described differences result to a large extent from the size of a given country, the number of its inhabitants, and the degree of its development.

### 3.2. Measures of the insurance markets integration degree and their picture in the Visegrad group

We have presented our concept of the insurance markets integration degree measures in the book: *Insurance Markets Integration in the European Union* (Bukowski, Lament, 2022).

“We assume that a higher integration degree of country *i*'s insurance market into foreign markets means a higher share of the written premium from insurance for foreign residents abroad in the total written premium of the home companies in country *i*. To begin with, we propose the following approach. We assume that one of the main indicators in the field of insurance is the written premium. We treat that indicator as a base for the construction of the insurance markets integration indicators.

Let's look at the main variables:

$$WP_{hi,t} = WP_{hi,t}^L + WP_{hi,t}^P \quad (1)$$

$$WP_{fi,t} = WP_{fi,t}^L + WP_{fi,t}^P \quad (2)$$

$$WP_{hfi,t}^T = WP_{hi,t} + WP_{fi,t} \quad (3)$$

$$II_{i,t} = \frac{WP_{fi,t}}{WP_{hfi,t}^T} \quad (4)$$

where:

$WP_{hi,t}$  – total written premium of home companies from the insurance for home residents,  $i$  country in period  $t$ ,

$WP_{fi,t}$  – total written premium of home companies from insurance for foreign residents abroad in the region (home company directly),  $i$  country in period  $t$ ,

$WP_{hi,t}^L$  – written premium of home companies from the insurance for home residents,  $i$  country in period  $t$  – life insurance,

$WP_{hi,t}^P$  – written premium of home companies from the insurance for home residents,  $i$  country in period  $t$  – non-life insurance,

$WP_{fi,t}^L$  – written premium of home company from insurance for foreign residents abroad (home company directly),  $i$  country in period  $t$  – life insurance,

$WP_{fi,t}^P$  – written premium of home company from insurance for foreign residents abroad (home company directly),  $i$  country in period  $t$  – non-life insurance,

$WP_{hfi,t}^T$  – total written premium of home companies from the insurance for home residents and for foreign residents,  $i$  country in period  $t$ ,

A higher value of the indicator means a higher degree of country  $i$  integration into foreign insurance markets in the period  $t$ .

For all groups of countries:

$$\Pi_g = \frac{\sum_{i=1}^n \Pi_{i,t} d_{i,t}}{\sum_{i=1}^n d_{i,t}} \quad (5)$$

where:  $d_{i,t}$  – number of inhabitants in country  $i$  in period  $t$  as the weight.

A higher value of the indicator means a higher degree of integration of insurance market into the group of  $n$ -countries (for example EU, the euro area's countries) in the period  $t$ .

We also propose other indicators based on the concept of the quantity-based indicators.

$$Q_{i,t}^P = \frac{PI_{i,t}^h + PI_{i,t}^f}{GDP_{i,t}} \quad (6)$$

where:

$PI_{i,t}^h$  – the portfolio investment of the country  $i$ 's insurance companies abroad in period  $t$ ,

$PI_{i,t}^f$  – the portfolio investment of foreign insurance companies in country  $i$  in period  $t$ ,

$GDP_{i,t}$  – GDP in country  $i$  in the period  $t$ .

A higher value of the indicator means a higher degree of country  $i$ 's integration into foreign insurance markets in the period  $t$ .

For the group of countries:

$$Q_g = \frac{\sum_{i=1}^n Q_{i,t}^P d_{i,t}}{\sum_{i=1}^n d_{i,t}} \quad (7)$$

where:  $d_{i,t}$  – number of inhabitants in country  $i$  in period  $t$  as the weight.

A higher value of the indicator means a higher degree of integration of an insurance market into the group of  $n$ -countries (for example, the EU, the euro area's countries) in the period  $t$  (Bukowski, Lament, 2022, p. 100).

We adopt in this paper those measures to our analysis of the insurance markets integration in the Visegrad Group.

In order to illustrate the extent of variables concerning insurance markets studied and their distribution in the time examined, the following tables (Table 2 and Table 3) contain key statistics for those variables.

**Table 2.**

*Basic statistics concerning the variables studied of the Visegrad Group insurance markets in 1999-2019 – gross written premium*

Specification	$WP_{hi,t}$ (Total)	$WP_{hi,t}^L$ (Life)	$WP_{hi,t}^P$ (Non-life)	$WP_{fi,t}$ (Total)	$WP_{fi,t}^L$ (Life)	$WP_{fi,t}^P$ (Non-life)	$WP_{hfi,t}^T$ (Total)
N importance	84	84	84	84	84	84	84
Average	6228.933	2987.023	3252.594	43.757	19.482	24.275	6248.384
Median	4053.364	1878.941	2079.954	3.878	0	0.2835	4053.3645
Maximum	24641.334	16181.845	11202.089	376.439	218.159	318.571	24641.334
Minimum	574.271	190.218	353.672	0	0	0	615.136
Variance	29804002	9215051.79	6975490.54	7416.44	1843.34	4827.477	29860022.1
Standard deviation	5459.304	3035.630	2641.115	86.118	42.934	69.48	5464.432

Note:

$WP_{hi,t}$  – total written premium of home companies from the insurance for home residents (US Dollar, Million).

$WP_{hi,t}^L$  – written premium of home companies from the insurance for home residents (US Dollar, Million).

$WP_{hi,t}^P$  – written premium of home companies from the insurance for home residents – non-life insurance (US Dollar, Million).

$WP_{fi,t}$  – total written premium of home companies from insurance for foreign residents abroad in the region (home company directly) (US Dollar, Million).

$WP_{fi,t}^L$  – written premium of home company from insurance for foreign residents abroad (home company directly) – life insurance (US Dollar, Million).

$WP_{fi,t}^P$  – written premium of home company from insurance for foreign residents abroad (home company directly) – non-life insurance (US Dollar, Million).

$WP_{hfi,t}^T$  – total written premium of home companies from the insurance for home residents and for foreign residents (US Dollar, Million).

Source: the authors' own research based on STATISTICA 13.

**Table 3.**

*Basic statistics concerning the variables studied of the Visegrad Group insurance markets in 1999-2019 – investments of insurance companies*

Specification	$PI_{i,t}^h$	$PI_{i,t}^f$
N importance	84	84
Average	1620.424	8139.533
Median	1004.478	6228.316
Maximum	5766.964	26051.843
Minimum	0.00	282.637
Variance	3650604.45	34350825.6
Standard deviation	1910.655	5860.957



Note:

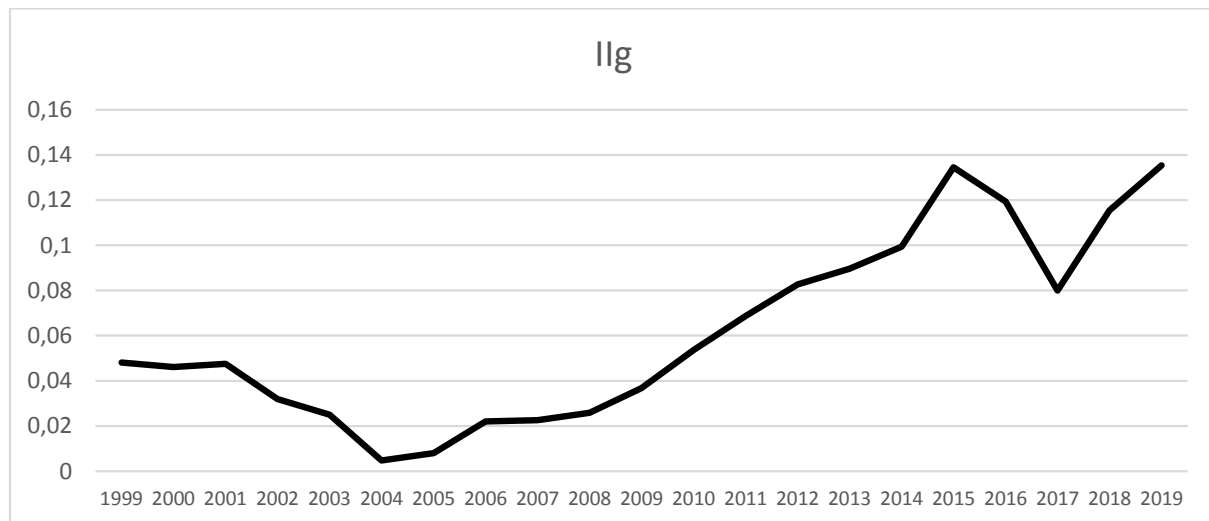
$PI_{i,t}^h$  – the portfolio investment of the country's insurance companies abroad (US Dollar, Million).

$PI_{i,t}^f$  – the portfolio investment of foreign insurance companies in country (US Dollar, Million).

Source: the authors' own research based on STATISTICA 13.

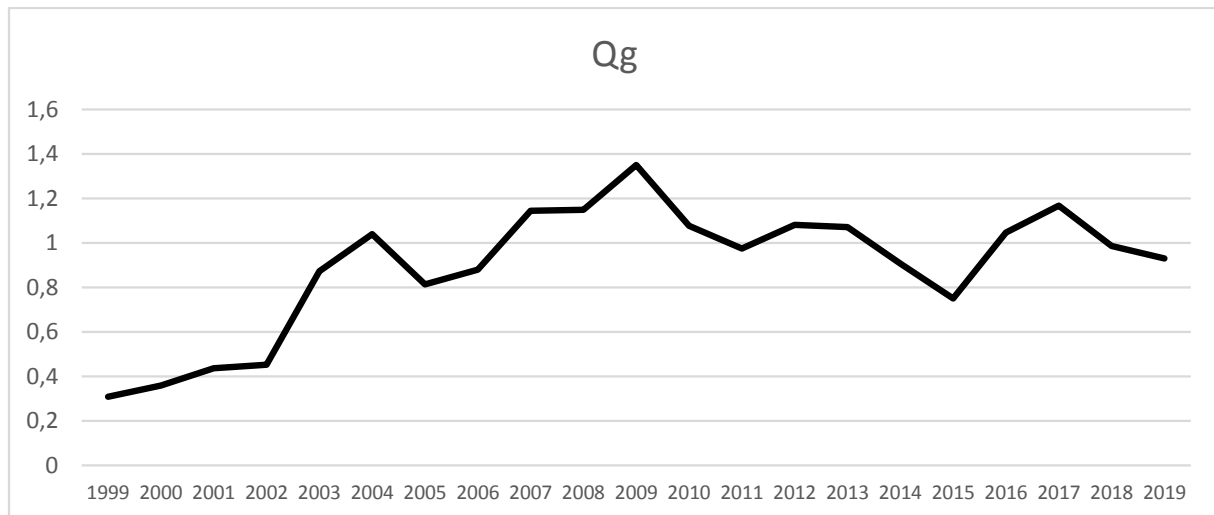
An analysis of the data in Table 2 and in Table 3 shows the variables for the premium and investments of insurance companies active in the Visegrad Group markets in 1999-2019 are internally diversified. This is affirmed by both the variables assessing the dispersion – variance and standard deviation, which demonstrate a dispersion of the variables around the average – and those estimating the maxima and minima, evidence of a large diversity of the variables' distribution. Causes of the considerable dispersion in the distributions of the variables examined can be attributed to a diversity of their insurance markets' development, and the rather long period of research, which the basis statistics show to have been varied – hence the large differences between the minimum and maximum values of the variables.

Figures 1 and 2 present the integration of insurance markets in the Visegrad Group countries in 1999-2019.



**Figure 1.** Degree of insurance markets integration in the Visegrad Group in 1999-2019 – indicator IIG.

Source: own estimation.



**Figure 2.** Degree of insurance markets integration in the Visegrad Group in 1999-2019 – indicator Qg.  
Source: own estimation.

Both of the indicators IIG and Qg indicate that generally we can note increase in integration degree of insurance markets since 1999 till the 2019. But of course, we can observe that there were some periods when the degree of integration decreased (as for example 2015-2017). On this stage of our research it is difficult to say why.

We can also observe that there are differences in indication of the measure IIG and Qg. But it is normal, because each of both indicator is based on the different variables. The same on the lower scale we can observe in the case of the synthetic measures of the degree of financial markets integration, which are applied in the report: *Financial integration in Europe* (Bukowski, 2020).

#### 4. The impact of the insurance markets integration on economic growth – results of model estimation

The data from OECD Statistics and EIOPA Database (the figures concerning the insurance markets), AMECO Database and ECB Statistical Data Warehouse (macroeconomic and monetary data) databases are utilised. The research period covers years 1999-2019.

The research was carried out using the GRET software.

To determine the impact of the insurance markets' integration on economic growth in the Visegrad Group countries, the following model is constructed:

$$\ln GDP_t = a_0 + a_1 \ln GFCF_t + a_2 \ln IIG_t + a_3 \ln Qg_t + u_t \quad (8)$$

where:

$GDP_t$  – gross domestic product in the Visegrad Group countries, respectively, in constant price terms (2010),

$GFCF_t$  – gross fixed capital formation as a proxy for gross investment in economies for the  
Visegrad Group countries respectively, in constant price terms (2010),

$I_g$  – the ratio of insurance market integration,

$Q_g$  – the ratio of insurance market integration,

$u_t$  – random factor.

Model was built with using step wise regression with backward elimination. As a criterion we have taken collinearity and correlation between independent variables and explanatory variable.

Results of the Engle – Granger test for cointegration:

Augmented Dickey-Fuller test for uhat

testing down from 1 lags, criterion AIC

sample size 19

unit-root null hypothesis:  $a = 1$

test without constant

including one lag of (1-L)uhat

model:  $(1-L)y = (a-1)*y(-1) + \dots + e$

estimated value of  $(a - 1)$ : -0.994745

test statistic:  $\tau_{ct}(4) = -3.92366$ , with critical value – 1.95 (significance level 0.05)

asymptotic p-value 0.1608

1st-order autocorrelation coeff. for e: -0.182.

The Engle-Granger test for cointegration of times series indicates that all used in the model time series are cointegrated.

We used AR (1) – Prais-Winsten a method of model's estimation. It was dictated by existing heteroscedasticity and autocorrelation. Results of the model estimation are shown in Table 4.

**Table 4.**

*Results of model estimation. Model: Prais-Winsten, using observations 1999-2019 (T = 21).  
Dependent variable: l\_GDP, rho = 0.955643*

	Coefficient	Std. Error	t-ratio	p-value	
const	14.1740	2.08556	6.796	<0.0001	***
l_Ig	0.00927044	0.0113047	0.8200	0.4235	
l_Qg	0.0717104	0.0255228	2.810	0.0121	**
l_GFCF	0.539858	0.0806612	6.693	<0.0001	***
Statistics based on the rho-differenced data:					
Sum squared resid	0.009554	S.E. of regression	0.023706		
R-squared	0.990915	Adjusted R-squared	0.989311		
F(3, 17)	26759.23	P-value(F)	2.02e-31		
rho	0.267827	Durbin-Watson	1.336939		
Statistics based on the original data:					
Mean dependent var	28.04691	S.D. dependent var	0.202066		

Cont. table 4.

Test for normality of residual	
Null hypothesis:	error is normally distributed
Test statistic:	Chi-square(2) = 4.96129 with p-value = 0.0836892
Test for ARCH of order 1	
Null hypothesis:	no ARCH effect is present
Test statistic:	LM = 1.05932 with p-value = $P(\text{Chi-square}(1) > 1.05932) = 0.30337$

Note:

\*\*\* The variable is significant at the significance level of 0.01,

\*\* The variable is significant at the significance level of 0.05,

\* The variable is significant at the significance level of 0.1.

Source: the authors' own calculation with GRETLM.

The test for normality of residual and test for ARCH of order 1 indicated that residuals have the normal distribution and there is not ARCH effect.

The model has a good (R-squared equal 0.99 and adjusted R-squared equal 0.98). The changes the explanatory variables values explain in 99% (98%) changes of the explained variable. The impact of the insurance market integration's degree (measured by Qg) on economic growth is rather weak. Variable Iig is statistically insignificant. Throughout the EU and euro area insurance market integration influence economic growth much harder the coefficient of Qg are appropriate 0.28 and 0.28. It is also interesting that for the euro area variable Iig is also statistically insignificant, but significant in the case of EU (Bukowski, Lament, 2022).

## 5. Discussion

The analysis of the literature on the subject shows that the research so far has not in principle assessed the degree of insurance markets integration, except research Bukowski, Lament (2022). The integration of insurance markets was studied mainly as one of the factors of market development and improvement of their efficiency. Two studies – Jurkiewicz, Wycinka (2006) and Kozarević et al. (2013) – concern the assessment of the degree of insurance markets integration, however, the proposed research methodology does not constitute a comprehensive approach, but only covers selected elements. Research by Kozarević et al. (2013), Njegomir, Marović (2012) and Andelić et al. (2010) indicate that the insurance market integration influences the development of the insurance market. The conducted research on the subject literature allowed for the formulation of the following research hypothesis: the degree of the insurance market integration affects economic growth.

The insurance market integration on the international scale influences economic growth like it does the other financial markets like the stock exchange market, bond market, money market, credit and deposit (banking) market. It affects the development of insurance market as

a component of financial development. The latter influences economic growth. This is confirmed by studies conducted by Kozarević et al. (2013); Njegomir, Marović (2012) and Andelić et al. (2010). However, the above-mentioned authors did not examine the degree of the insurance market integration, but the impact of integration processes on the development of insurance markets. Proprietary measures for assessing the degree of insurance markets integration were proposed by Bukowski, Lament (2022). The authors assessed the degree of the insurance markets integration of the European Union and the euro area. The results of the research presented in this article cover a different research group and concern the insurance markets of the Visegrad Group. Research on the insurance markets integration in more homogeneous groups is confirmed by research conducted, among others, by Cummins, Rubio-Misas (2022) - for the life insurance markets.

The research carried out in relation to the insurance markets of the Visegrad Group countries shows that:

- firstly, the degree of insurance markets integration, measured by integration indicators, is quite high and there is a tendency to its further growth. The obtained results are similar to the results obtained for the European Union insurance markets and the euro area (Bukowski, Lament, 2022),
- at second, the impact of the insurance market integration's degree (measured by  $Qg$ ) on economic growth is rather weak. Variable  $Ilg$  is statistically insignificant. The obtained results are different in relation to the results of the research carried out by Bukowski, Lament (2022) - positive, and statistically significant impact of the variations of  $Ilg$  and  $Qg$  on economic growth in the European Union countries. The situation in the euro area is similar, although the effect of variable (ratio)  $Ilg$  is statistically insignificant, whereas the impact of  $Qg$  changes on the rate of economic growth is statistically significant and quite strong.

Thus, the conducted research shows that the degree of insurance markets integration, measured by integration indicators, is poorly related to the economic growth in the Visegrad Group countries in the analyzed period.

Subsequent research should rely on testing the developed measures for assessing the degree of integration of insurance markets and cover other groups of insurance markets. This will be the subject of further research by the authors of the article.

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## THE SIGNIFICANCE AND CHARACTERISTICS OF SOFT SKILLS IN THE PROCESS OF EFFECTIVE MANAGEMENT OF PERSONS WITH DISABILITIES

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**Purpose:** To identify the factors determining the opinions of employees and employers regarding the importance of soft skills in the process of disability management.

**Design/methodology/approach:** The objective of the study will be accomplished by conducting an anonymous survey at businesses employing people with a recognized disability condition, directly and indirectly (through agencies).

**Findings:** based on the analysis of the research history in the project under consideration, identification of factors was attempted.

**Research limitations/implications:** The limitations in the study process arise from the diagnostic survey method used. The respondents' opinions (both open-end and multiple-choice answers) are based on declarations, leaving the researcher with a degree of uncertainty as to whether the study participants gave their honest answers. Possible inconsistencies may be due to the respondents' fear of consequences, overinterpretation, misunderstanding the questions.

**Practical implications:** The study results may be used by organizations employing people with disabilities, they serve as a reflection on building soft skill-based relationships, show the interviewees' perspectives and attitudes to the issues being discussed. Based on the findings, managing staff can pay attention to those aspects of management that affect cooperation in diverse teams and eliminate problems that arise from employees' lack of knowledge and concerns by offering workshops and training.

**Social implications:** The study may contribute to an improvement of the knowledge and understanding of the matters of disability and have a positive effect on forming attitudes and opinions (emotional, cognitive and executive factors).

**Originality/value:** The paper is targeted at employees, managing staff, emphasizing the importance of soft skills based on an individual's sensitivity in the process of disability vs. diversity management as a key component of good collaboration among employees, professional success in the personal dimension. The paper is addressed at employees, managing staff, researchers, students, practitioners.

**Keywords:** collaboration, disability, disability management, organization, rehabilitation, soft skills.

**Category of the paper:** research paper.

## 1. Introduction

With the rapid changes occurring in the world around, an individual has to depend on intellectual reflection in the process of adjusting and adapting to the new reality and challenges, and such reflection is becoming a sort of a necessity. The expanding job market, with increasing numbers of people with various types of disability, is certainly this kind of a situation. The social consequences of the regulations setting out the standards for employment and vocational rehabilitation of disabled people include certain changes in the awareness of the general public, which are seen as a long-term, diverse and uncontrolled process. Multiple concepts are proposed in subject-matter literature referring to the classification and characteristics of an individual's competences, both those determining our functioning in a professional context and those which are personal. Soft skills (competences) include, among others: interpersonal skills, communication skills, organizational skills, creativity, analytical thinking, independence, resistance to difficult situations and stress; they are strongly unique of an individual, substantially affecting specific behaviors of that individual. They may be labeled as personal, as they encompass the individual's social skills and their autonomy (Chmielecka, Matuszczak, 2020, p. 15). In that sense, competences can be divided into personal (handling stress, time management, emotional intelligence) and interpersonal (motivation, team work ability). The other group comprises hard skills, i.e. expert knowledge and specific skills affecting our performance targeted at achieving certain goals. The difference between hard and soft skills is that the former are measurable and can be assessed, unlike soft skills which are a matter of interpretation, often depending not only on the person's knowledge but also their perspectives, attitudes and experience. They are viewed as showing in specific behaviors of an individual, and as such they can be observed and interpreted. "Professional competence" is the function of the knowledge, skills, attitudes as well as the professional ability and talent. These are defined as socio-technical. Another description that can be found in literature is 'universal skills', meaning those which an individual can use in a variable environment to adapt to change (Chmielecka, Matuszczak, 2020, p. 13).

## 2. Disability

A real-life effect of creating policies for people with disabilities is the orientation on the individual as a subject, employment in the open job market, organization of support in achieving independence in various areas of life, including presence in the public debate (Kubicki, Pawlak, Mica, p. 23). However, numerous research projects and expert opinions demonstrate that we are experiencing successes and failures in the area of creating policies for the disabled people,

despite the unambiguous directives and recommendations arising from the EU legislative framework. The causes of failure which are most commonly mentioned in subject-matter literature are the following: the incomplete reform of disability certifications, access barriers for services, diagnosing but not responding to disabled people's issues and needs, enforcement of disabled people's rights, particularly in respect of gaining self-sufficiency and independence, inclusive education and adaptation of the schooling system (Kubicki, Pawlak, Mica, pp. 25-26). In the definition of social capital of people with disabilities, we refer to certain environmental and cultural conditions that indicate the need for transformation of social awareness in the perception of disabled people. Adoption of a humanistic perspective serves this purpose most efficiently, as it contributes to the development of social sensitivity (empathy) and building a social model for resolving the issue of disability based on the assumption that disability is a normal condition and the objective is reintegration and professional activation (Rymsza, 2016, pp. 18-19). The direction of change is oriented towards a belief that disabled people take decisions for which they take responsibility (Maslyk, 2016, p. 29). A measure of vocational rehabilitation is a change of attitudes among the people with disabilities themselves, so that they perceive themselves in terms of their vocational qualification and not their disability (Ruman, 2017, p. 91). This is particularly important in a knowledge society, oriented towards conscious and permanent growth. Lifelong learning leads an improvement of professional qualifications and skills, as well as knowledge management. Vocational activity cannot be detached from the entirety of the process of rehabilitation of a person with disability. Vocational adaptation, or rather the vocational adaptation process, is essential as it is based on unique experiences which may support or hinder someone in taking new challenges in their work environment. The proactive attitude and innovation in the business itself may be highly relevant, as it is a stimulus for maintaining the relationship between the disabled person and the work environment (Chodkowski, 2019a, p. 83). A measure of vocational adaptation is the matching of the work conditions with the employee's needs, both those arising from the disability as such and those being the consequence of their current living situation. Striving towards building and maintaining a state of relative balance between the requirements set by the organization and the individual's capacity illustrates the dynamic of the adaptation process. The rehabilitation-work relationship is bidirectional: on one hand, work may trigger the need for intensive rehabilitation in a person, and on the other hand effective rehabilitation improves the disabled person's adaptation to work. Within the framework of comprehensive rehabilitation impacts, we can distinguish medical, psychological, vocational and social rehabilitation. Each of these helps neutralize and minimize the consequences of disability while at the same time expanding the life perspective of a person with disability. We cannot disregard the integrative function of adaptation, which affects the level of professional satisfaction in an employee as well as the financial profits and reputation of the business (Chodkowski, 2019a, p. 85). However, as we analyze the trend for social activation of people with disabilities, we can see a certain dissonance in that excessive care measures may lead to reduced activity in

life and maintaining the present model of functioning, while restricting and blocking the opportunities for change for disabled people (Rymsza, 2016, p. 21).

### **3. Overview of research on the vocational activity of people with disabilities**

Vocational orientation studies conducted in the group of people with disabilities show that the strongest orientation in that group is the vocation to work and career orientation. Occupation orientation is the least powerful factor. The level of education of the interviewees is a strongly distinguishing factor (Kasprzak, Michalak, 2016, p. 75). The authors of the studies believe that people with disabilities are perceived as being weaker and less performing, which may be the cause of blocking and disregarding them in the process of career development in accordance with their potential (Kasprzak, Michalak, 2016, p. 81). Masłyk (2016, pp. 35-36) compared the feeling of political empowerment with the level of social capital in various countries of Europe on the basis of the European Social Survey of 2014. Based on his analysis, he claims that persons with disabilities tend to view their empowerment as lower than people with no disability, yet the higher the level of democratization in a specific country, the stronger the people's belief in their empowerment. The author believes that the differences may be rooted in the functioning of the institutions, the social structure and the historical considerations. Social capital reinforces the order, thus leading to social integration through development of positive attitudes towards support, help, social solidarity. In that sense, social capital can be understood as the resources of social networks (Masłyk, 2016, pp. 43-44). Among the factors hindering the implementation of effective solutions in the field of employment, there are the organizational, economic, cognitive and cultural considerations. One of the barriers affecting employment of people with disabilities may be the employers' belief of their lower performance and work quality, periods of absence and health conditions caused by their disability, as well as concerns about being responsible for safety (Dykcik, 2010, p. 296). Another barrier are the employer's biases and stereotypes, concerns about non-disabled personnel accepting the persons with disabilities, and insufficient knowledge about the possibilities to use the potential of people with disabilities and managing their issues (Giermanowska, Raław, 2014, p. 119).

Data analyses show that Poland, despite undertaking multiple initiatives in this area, is among low vocational activity countries, with the majority of the disabled people staying outside the job market (Giermanowska, 2016, p. 69). Job market analyses indicate that vocational activation of people with disabilities is linked to their needs. Based on the analysis of conference materials, A. Migas (2006, pp. 39-40) tries to address the method of realization of disabled people's potential needs. The comparison indicates that it is possible when the following are engaged in such measures: the public sector, the private sector, non-government

organizations, employer organizations, local governments, rehabilitation and social integration centers. Work has a number of functions in an individual's life:

- The growth/development function facilitates personality and competence improvement.
- The economic function builds the feeling of stability and safety.
- The psychological function, understood as a source of vocational and non-vocational activity.
- The rehabilitation function, i.e. improvement and maintenance of health, welfare.
- The socialization function, i.e. preventing exclusion, maintaining social contacts (Kasprzak, Michalak, 2016, pp. 67-68).

In her analysis of the findings of research projects dedicated to the disadvantages and advantages of work by people with disabilities, Giermanowska (2016, p. 80) enumerates the factors that increase the level of satisfaction with one's work, including the opportunity to establish interpersonal relations, sense of accomplishment, financial gains. She recognizes the following as disadvantages: low salaries, excessive work burden, inconvenient working times, inadequate aspirations, failing to take into account the limitations arising from disability. The fears arising from lack of knowledge, reproduction of stereotypes and bias, affect the direct contacts (Giermanowska, p. 81).

#### **4. Managing disability in an organization**

Human resources management with due consideration of the aspects of disability of an individual is a challenge for contemporary organizations. Even though it functions as a standard of the contemporary job market, important for building a reputation for a business. In the present model of social policy, employers create the disabled persons employment policy by creating new jobs, identifying barriers in employment and readiness to undertake and solve problems that arise from an individual's disability (Giermanowska, Raclaw, 2014, p. 118). At the same time, it is known that without changing the employers' and employees' attitudes to the barriers arising from practice, no change of the model will be possible.

The process of competence management is dynamic, process-oriented and subject to continuous change; hence, we may speak of its continuous improvement and striving to accomplish a state of balance. The subject-matter literature indicates that this relationship may encompass a state of complete divergence, balance, mismatch, shortage or excess of competences. The state of balance is the most desirable option as it facilitates fulfillment of needs and affects compliance with management standards, albeit with regard to ongoing situations (Walkowiak, 2007, p. 32). However, the situation context may favor creative searches and resolutions, or initiate adaptation to change and attempts to adjust to the situation. New challenges may be a source of an innovative approach, interpretation and changes in

implementation of the regulations, and solutions matching the needs and expectations of people with disabilities. In this perspective, disabled people's entry onto the job market may be viewed as creating and building a new reality, based on extensive, multidirectional relationships, collaboration and understanding.

Disability as a kind of impediment in vocational adaptation can be viewed in a personal or social context. Considering the disability certification system for employment purposes, 3 degrees of disability are distinguished: minor, moderate and major, as well as 12 groups of potential causes of disability (Journal of Laws of 2023, item 100, p. 5, Articles 3 and 4; Journal of Laws of 2021, item 857, § 32). Some of the above are characterized by a very complex context and affect the barriers and stereotypes involved in vocational activation and employment.

Disability management in the workplace has been defined by the International Labour Organization as a process in the workplace designed to facilitate the employment of persons with a disability through a coordinated effort and taking into account individual needs, work environment, enterprise needs and legal responsibilities (ILO 2013, p. 4; Uścińska, 2015, p. 8). The specific recommendations state that a disability management strategy should be linked to a workplace-level policy on the level of individual feeling of safety through eliminating the risks and hazards, adaptation of the workplace and the responsibilities to the actual ability, and enabling employees with a disability (including those who acquire a disability while in employment) to receive early intervention and referral to treatment and rehabilitation. A mission thus defined should be incorporated in the social policy of the state as well as the success and growth strategy of the enterprise. The fundamental principle of a disability management strategy is an equal opportunity policy, comprising the recruitment and retention process (Giermanowska, 2009, p. 86). The information received by the author in discussions with employers indicate that those organizations which pursue a more open policy towards disability understand the importance of knowledge in overcoming stereotypes and biases of the population. They can also perceive the relationship between building a positive image of the business and employing people with disabilities (Giermanowska, 2009, p. 94). Disability management should be coordinated by people with appropriate training in the field of issues arising from the characteristics of disabilities, or in regular contact with experts. Consultation and giving regular support to employers, both on the national and the international level, serve to support and build the strategies mentioned above. Another integral part of an informed policy of an enterprise is the provision and organization of specialist support for employees with disabilities by third party organizations. The manner of presentation and discussion of matters related to disability transposes directly to the approach towards the understanding of the relevant matters by all the workforce. Employers creating and organizing situations that favor acquisition of reliable and available knowledge will not only facilitate building positive perspectives among employees and managing staff regarding disability, but also help to build mature attitudes. Procedures applicable to employment of persons with disabilities should be

an indispensable part of human resources management. Investing in human capital is the key component of disabled people's employment policy (Chodkowski, 2019b, p. 123; Lipińska-Grobelny, Wolan-Nowakowska, 2017, p. 59). The contemporary concepts in subject-matter literature define diversity management as the ability to perceive differences among employees within and outside the organization. Such differences may depend on individual identity-defining qualities, determining the direction and history of socialization, as well as the manner of performing certain social roles. The objective of that strategy is to prevent discrimination, to support equal rights and to maximize the use of an employee's potential (Mazur-Wierzbicka, Wieczorek-Szymańska, Leoński, 2022, p. 40). This would not be possible without identifying the differences among employees on the basis of a reliable analysis and knowledge which is free from bias and stereotype. Comprehensive diversity management encompasses rational, emotional and operational measures.

## 5. Own research

The presented study was carried out using the diagnostic survey method. The purpose of the study was to gather opinions on the significance of soft skills in management of disability at organizations that employ persons with a certified disability condition. An anonymous questionnaire, composed of 25 questions, was filled in by employees of commercial businesses working together with persons with disabilities. Ultimately, 120 correctly filled questionnaires were approved for the analysis. Managing staff, including managers, leaders and business owners, were interviewed on managing diversity teams, comprising a total of 30 persons from the commercial services, food service and hotel sector. The study covered 54 female and 76 male respondents. The employees were diverse in terms of age: 31 of them (26%) were within the 18-25 age range; 52 persons (43%) in the 26-35 range; 25 (21%) in the 36-45 range; and 15 (13%) over 46 years of age. Further differences included the work experience: the largest group of 63 persons (53%) were employees with 10 to 15 years of experience. The study questions were about the following aspects:

1. Can soft competences affect the readiness and attitude to work together with persons with disabilities and if so, to what extent?
2. What issues tend to occur in terms of work organization in teams where disability management takes place?
3. Which factors determine the awareness and perception of the needs of persons with disabilities in the work environment among their colleagues?

Non-disabled employees view soft skills as the ability to establish and initiate contact (85% answers), own proactive attitude in relationships (62%) and open-mindedness (51%). None of the interviewees considered them to mean sensitivity, and only one in four respondents

believed that soft skills were relevant to the ability to collaborate in a team. The respondents mentioned such arguments as the ability to reach an agreement, compromise, and responsibility for one's duties. The employees opined that persons with disabilities exhibit a low level of a proactive attitude in the process of taking decisions and defending their positions. Based on their own experience and observation, the respondents claim that persons with disabilities are distanced in social relationships (52% of answers), withdrawn (40%) and passive (30%). In the opinion of some of the respondents, this is due to them being a minority (25% of answers), being shy (20%) and avoiding conflict (33%). At the same time, 42% of respondents could not or would not provide any arguments. Even though the majority of the surveyed employees can see a link between having a job and succeeding, they were unable to determine whether having a job is a success for a person with a disability - there were as many as 68 undecided persons (57%), most of them in the youngest age groups. 75 respondents believe that their company pays little attention to team integration and fails to consider the employees' expectations in this respect, while the measures they are undertaking are viewed as copying schematic patterns or earlier projects. A group of 35 respondents with longer work experience declared readiness to offer help and support to a person with a disability at the workplace. At the same time, 33 persons are not ready to take this responsibility, they believe that a disabled person may be too engaging, demanding attention and pushing their duties to others. Interestingly, this group of interviewees had little experience with disability, which may somehow explain their opinions as a product of their perspectives and attitudes instead of their own experience. 12 respondents (10%) declared that they witnessed intolerant behaviors towards a person with a disability from other employees and superiors. The interviewees mentioned malicious comments, ignoring someone, disregarding them, using obscene language and expressing negative opinions.

In the opinion of employers and managing staff, the following important problems are raised by non-disabled workers: fear of layoffs as a consequence of hiring persons with disabilities (65% of answers), believing in preferential terms of employment applicable to persons with disabilities (44% of answers). Yet no employer confirmed the existence of an employment policy based on preference in treatment of persons with disabilities. It may be surprising that 22 employees declared to have received such information from their direct superior. Such concerns are definitely more common among employees with lower levels of professional competence. Well-educated employees, on the other hand (12%), view persons with disabilities as competitors. Among the problems in their organizations, the managing staff mentioned certain stereotypes about disability which could be observed in the work relations, particularly as to the grounds and consequences of the disability (89%). Managers believe that the bias is due to non-disabled employees' lack of knowledge, concerns, belief in people with disabilities having lower capacity and performance at work. Managing staff note that employees are not willing to reveal their concerns and they avoid confronting the person with a disability directly. It was clearly noticeable that they engage their superiors and other colleagues in resolving



problems and conflicts with persons with disabilities. Managing staff believe that this is the result of a certain awkwardness in the relationships.

As a factor potentially determining the knowledge and awareness of non-disabled persons, the interviewees mentioned prior experience working with persons with disabilities in social relations and situations (91%). The following explanations were provided: people they knew from where they live. As regards the perception and understanding of needs, prior experience and quality of such experience turned out crucial. Better experience leads to a normalized attitude and positive declarations among the respondents as regards their readiness to offer support and help to a person with a disability. Only 18 respondents (15%) declared participation in a workshop on disabilities. A certain divergence was noticed here, as the managing staff declared that they were organizing such workshops and meetings dedicated to disabilities regularly, yet only 1 in 8 people have taken part in this form of building their knowledge and awareness of disability. The assessment of barriers at a workplace indicates that most employees tend to notice these in the common workspace. They mentioned the following items: narrow corridors, lack of adaptation in resting areas and conference rooms.

## 6. Summary

It has been determined on the basis of the study that organizations employing persons with disabilities create space for broadly defined collaboration and cooperation among employees. Creating and modifying space formed by diverse groups of employees requires commitment and sensitivity among the managing personnel as well as a proactive approach among the employees. Sensitivity to the issues and needs of others, being able to perceive them and, first of all, to respond to them seems to be a top priority for an organization. Having a job plays an important role in an individual's life, not only giving them the balance but also the feeling of individual safety, offering an opportunity for professional accomplishment and succeeding. It has been determined through the analysis of employees' opinions that the concept of career and professional success of persons with disabilities played a minor role in the normalization attempts. The respondents' indecision and uncertainty may suggest contesting the things which are a natural component of everyone's work. This requires intervention and response, so as to avoid increasing the gap and the beliefs regarding inequality, which may be based on disregarding people's needs. Specifically the perception of difficult situations and conflicts provides grounds for diagnosing the employees' and employers' expectations and perspectives. The matters related to the ability to respond, diagnose and resolve issues have an essential impact on collaboration within a team and on the quality of such collaboration. Investing in the formation and improvement of soft skills among employees and managing staff can be viewed as a positive factor for disability and diversity management. Hence, any initiatives serving the

improvement of employees' potential and creativity define the search and pursuit of solutions to normalize the matters of employment of persons with disabilities. Signs of intolerance, which are shown directly or indirectly, should be viewed as strongly concerning. Moreover, the respondents' disputing the decision-making skills of people with disabilities may contribute to exclusion in social contexts and to building inadequate beliefs about capabilities.

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## THE POST-COVID-19 PANDEMIC QUALITY OF LIFE: A STUDY OF SPORTS DEPARTMENT STUDENTS

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**Purpose:** This study aims to evaluate the relationship between the post-covid-19 pandemic quality of life (QoL), body composition and physical activity (PA), and to investigate the gender differences in this relationship among college students. The article presents the results of a study on the impact of physical activity and body composition on the quality of life after the COVID-19 pandemic, focusing on sports department students. The study aims to comprehensively understand this complex phenomenon and provide significant insights for the academic community and the broader society.

**Design/methodology/approach:** The experimental study included a group of 54 women (age  $22 \pm 1.63$ ) and 89 men (age  $22 \pm 1.85$ ). The study included an examination of body composition and BMI and two questionnaires on physical activity level and quality of life. Body composition and BMI analysis was performed using a SECA mBCA 515 (seca GmbH & Co. KG, Hamburg, Germany) with eight electrodes. The same group also completed the International Physical Activity Questionnaire Short Version (IPAQ-SF) and the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF).

**Findings:** The primary findings of this study highlight notable gender disparities in Quality of Life (QoL), physical activity, and body composition among college students following a series of study interruptions and one year of remote learning due to Covid-19. The research revealed that young women exhibited relatively higher levels of physical activity during the pandemic, resulting in better performance on body composition tests compared to the men in the study.

Despite the adverse conditions brought about by the pandemic, including the closure of sports facilities and gyms, the authors did not observe any negative changes in women's body composition after 12 months. Conversely, significant and observable changes were noted in men's body composition. Furthermore, the women in the study reported relatively higher QoL levels compared to men in various aspects, including the physical, psychological, social relations, and environmental domains, following the Covid-19 pandemic. The findings of this research may provide valuable insights into the long-term effects of the pandemic on young individuals. It may also offer recommendations for universities, policymakers on how to support and enhance the quality of life for students as they navigate the unique challenges of a post-pandemic society.

**Research limitations/implications:** The main limitation of the included study is a relatively small research group. In future studies, it is also possible to refer to different culturally diverse groups. In this study, the research group was culturally homogeneous, which can also be considered as a research limitation.

**Originality/value:** The enhanced quality of life observed in women is likely attributed to their higher level of physical activity, a conclusion supported by research on body composition. Conducting gender-specific analyses of quality of life data, including studies related to COVID-19 and other specific investigations into sex differences, is of utmost importance. Having insights into these gender disparities in quality of life would serve as a crucial resource for comprehending the effects of a health crisis on both individuals and communities. It would also aid in the development of effective and equitable policies, public health initiatives, and targeted strategies necessary for achieving sustainable development. Undoubtedly, further extensive research in this area is needed to address this issue thoroughly.

**Keywords:** quality of life, covid-19 pandemic, physical activity, body composition, gender differences sustainability, public health management, sustainable development.

**Category of the paper:** Research paper.

## 1. Introduction

The issue of quality of life of people is highly significant. Quality of life is a multidimensional and very broad category. It is associated with symptoms, side effects, functioning in many spheres of life, and perception of one's own satisfaction and quality of life (Revicki et al., 2014). Cultural resilience, community viability and sustainability are also associated with quality of life (Beyer, 2022). Determinants of quality of life include health, nutrition, mental activity (including education) and physical activity, education and social environment (family, friends and acquaintances, as well as a social group of a similar age) (Babicz-Zielńska et al., 2021).

Results of some earlier studies indicate that decreased quality of life is often associated with the prevalence of psychosomatic and motor function disorders as well as with impaired social performance. Physical activity (PA) improves overall health and quality of life (Fitzgerald, Boland, 2018). In addition, PA is associated with several aspects of quality of life (QoL) (Lobo et al., 2018) and is considered an important factor in increasing QoL (Bize et al., 2007).

This relationship has been consistently reported in previous studies (Guedes et al., 2012; Rejeski, Mihalko, 2001), which showed that physically active individuals rated some of their quality of life domains higher than their physically inactive counterparts (Puciato et al., 2013; Chai et al. 2010; Omorou, 2013).

Physical activity, defined as any movement produced by skeletal muscles and requiring energy expenditure (WHO), plays an important role in human life. Recommended by the World Health Organization, the minimum time per week that adults should devote to physical activity is 150 minutes during moderate exercises or 75 minutes during intense exercises (Guthold et al., 2018). Regular physical activity is an important factor affecting the composition of the human body. Insufficient physical activity can lead to an increase in body weight, an increase in body fat, and a decrease in bone and muscle mass (Kostencka et al., 2016; Ratamess et al., 2009; Roubenoff, 2007), while a high level of physical activity reduces body weight and fat mass and decreases BMI (Štefan et al., 2017; Zaccagni, Barbieri, Gualdi-Russo, 2014). A reduction in body weight and body mass index is considered an indicator of improved health (Domaszewski et al., 2023; Roh et al., 2020), and a reduction in relative fat mass is directly related to a lower risk of cardiovascular disease (Janssen et al., 2004). Many studies have shown that visceral fat mass is even more strongly correlated with metabolic risk factors and health (Głuszek, 2020; Han, Richmond, Lean, 1997; Moon et al, 2020; Domaszewski et al, 2022). Other factors that may negatively affect physical well-being include smoking, alcohol consumption (Croezen et al., 2009), and psychological stress (Atlantis, Ball, 2008). Interestingly, psychologists warn that excessive concern about one's body and slim figure can lead to disorders such as anorexia, bulimia, bigorexia, or orthorexia (Svensson, Hallberg, 2011).

From an economic perspective, physical activity is primarily evaluated for its influence on quality of life, and as a result, on the health status of a specific segment of society. Conversely, the enhancement of this situation is linked to social development, which encompasses a series of profound transformations within a particular society, with the ultimate aim of fostering social well-being. Quality of life, as an interdisciplinary concept, extends beyond physical health and encompasses various dimensions, including mental health, autonomy, social connections, and the natural and spiritual environment, as defined by the World Health Organization (1997). Health and well-being are also part of Sustainable Development Goal No. 3 - to ensure a healthy life and well-being for everyone. However, this is not a hermetically sealed goal. Behaviors related to physical health are also accompanied by others, related to adequate amount of sleep (rest) and sensible diet, and therefore also with the goals of: No. 2. zero hunger; No. 3. clean water and sanitation, and No. 12. responsible consumption and production. The Good Health and Well-Being Goal includes the promotion and use of physical activity, particularly as part of Task 3.4. related to reducing premature mortality from non-communicable diseases by one-third by 2030 through prevention and promotion of well-being (United Nations).

Physical activity includes: sporting activity (exercise), communicative activity (movement to/from work and school), occupational activity (professional work), and non-occupational activity (homework and physical activities). It can be varied due to energy expenditure, intensity of sport activity, duration and body weight, ambient temperature, as well as health, gender, age, capabilities (skills and mobility) and physique (Domaszewski et al., 2023; Drygas et al., 2021). Physical activity has an impact on a person's psychophysical condition, and therefore on his life expectancy – one of the synthetic measures of health. Thus, it is associated with a reduction in expenditure on health care and, in quantitative and qualitative terms, on the group of people of working age and able to work. For example, an increased level of physical activity in free time is often the domain of people with a higher socio-economic status and is treated as an element supplementing the lack of movement in mental work (Puciato et al., 2013).

In developed and developing countries, physical activity is an important factor affecting the health of a citizen, and is part of a health promotion strategy. In addition, in order to prevent adverse lifestyle changes in society, leading to deterioration of health, an important element is the continuous monitoring of the level of physical activity, especially among young people (Haase, Steptoe, Sallis, Wardle, 2004). The aspect of energy expenditure for physical activity purposes in population surveys is measured using primarily the survey method (Stupnicki, Biernat, 2005).

Taking into account the obesity epidemic and the increase in the incidence of cardiovascular diseases, increasing energy expenditure as part of physical activity is one of the most important challenges of the modern world (Drygas et al., 2021). In Poland, there is a trend indicating that people with lower education and living in large agglomerations and smoking cigarettes are much less physically active and more exposed to civilization diseases. Restrictions related to COVID-19 have significantly reduced the level of physical activity of Poles (Zdrojewski et al., 2021), thus affecting the deterioration of health and increasing the risk of civilization diseases.

The aim of this study was to investigate the relationship between quality of life, body composition and physical activity level of post-pandemic sports students COVID-19 in relation to gender. The research hypothesis is that post-pandemic females had higher levels of physical activity and therefore exhibited higher quality of life. Knowledge of gender differences in the pandemic outbreak COVID-19 would be a fundamental tool to understand the impact of a health emergency on individuals and communities, and to implement effective and equitable policies, public health interventions, and targeted solutions. Moreover, knowledge about the mechanisms related to maintaining a relatively high quality of life despite potential lockdowns is crucial in preventing potential threats associated with physical, social, and psychological health challenges.



## 2. Literature review

The Covid-19 pandemic has undoubtedly contributed to the decline in people's quality of life. Scholars indicate that COVID-19 is expected to exert a significant influence on the functioning and well-being of survivors (Rooney et al., 2020; Simpson, Robinson, 2020). Nonetheless, because the SARS-CoV-2 pandemic has been relatively short-lived, there is only a restricted and fragmented pool of scientific data regarding the physical function and health-related quality of life repercussions of COVID-19 (de Oliveira et al., 2023).

It is interesting that women after recovery report more symptoms and a lower quality of life than men (Lindahl et al., 2022). In addition, due to the pandemic, negative changes in eating habits have been observed that directly and indirectly worsen the quality of life, both on a physical and mental level (García-de-Miguel et al., 2022). In addition, COVID-19 has also become a potent stressor with people experiencing fear and isolation over a long period of time, leading to an increased vulnerability to anxiety, depression, and acute stress that affect women more than men (Mauvais-Jarvis et al., 2020). Proof of this is the higher prevalence and severity of symptoms of anxiety, depression, and acute stress observed in females during the initial phase of the pandemic (Liu et al., 2020).

The COVID-19 pandemic has affected not only the quality of life of people affected by CONTRACTING COVID-19 but also that of people with other mental illnesses (Kvarstein et al., 2022). The emergence of COVID-19 has led to lifestyle changes in both ill and healthy people, popularization of home-based living, reduction in social interaction and physical activity (including popularization of a more sedentary lifestyle), and increased online activity.

The pandemic is also associated with changes in intimate life and the quality of sexual life (Mitchell et al., 2022). This was and is the case because of the severe restrictions put in place to eliminate COVID-19. These range from the promotion of physical activity to the planning and revitalization of residential areas and public spaces (Erfani, Bahrami, 2022) to burial practices (Long et al., 2022). The literature on this topic indicates that COVID-19 patients require multidisciplinary rehabilitation approaches to address persistent symptom profiles and restore quality of life prior to COVID-19 (Faghy et al., 2022; Rodríguez-Galán et al., 2022). During the pandemic COVID-19, the development of the e-economy, the improvement of air quality (in relation to the first months of the pandemic (Aboagye et al., 2021), and the increase of clinical competence were observed. In addition, SARS-CoV-2 had adverse effects on all aspects of quality of life, including sleep, mood, relationships and satisfaction with work, and productivity. The above effects were observed in different parts of the world. In particular, the stress aspect of contact work (contact with other people) has been highlighted as it occurs in health professionals (Abatia et al., 2022; Al Kandari et al., 2022), banks (Kim, 2022). The impact of COVID-19 blockade on the quality of life of the youngest - children - is mainly measured by analysing the observed increase in body mass index (BMI), the phenomenon of

obesity, and decreasing physical fitness (including performance). This has been observed in children in the United Kingdom (Basterfield et al., 2022) and in children and adolescents in Spain and Brazil (López-Gil et al., 2022), among others. Restrictions on the use of public spaces affected the frequency and duration of physical activity behaviours (physical activity, sedentary lifestyle, and sleep) and outdoor activity among children and adolescents. Those who implemented around-the-clock physical activity guidelines had higher quality of life than those who were less physically active (López-Gil et al., 2022). Teenagers spent more time in front of smartphones, computers, and televisions during the pandemic, which affected psychological aspects of quality of life more often in boys than girls (Cheung et al., 2022). Among students, the change in classes forced by the pandemic negatively affected life satisfaction, increases in depression, and feelings of anxiety and stress (Gómez-García et al., 2022).

However, international research by the team of Bachmann et al (2021) shows that life satisfaction in a COVID-19 environment is not identical, but varies according to geographical location. In Western Europe, it is negatively correlated with the prevalence of COVID-19, while in Southern and Western Europe it is slightly correlated. This is due to the stringency of policies, which is negatively correlated with life satisfaction in the West. Strict pandemic policies may alleviate the symptoms of a pandemic but also reduce perceptions of life satisfaction (Geirdal et al., 2021). In addition to lifestyle changes, pandemic vaccination itself has also been found to affect perceived quality of life (related to avoidance of health-promoting problems) (Lin et al., 2022). Similarly, with recreational areas - appreciation of the natural, scenic, and healing values of the landscape, the importance of which increased during the pandemic, affects people's perceived quality of life (Bernat et al., 2022).

Assessing the quality of life is a crucial aspect of studies involving COVID-19 survivors. Findings of de Oliveira et al. (2023) indicate a decline in the health-related quality of life among individuals who have survived COVID-19. Valent et al. (2020) have pointed out that COVID-19 patients may experience more frequent physical and psychological aftereffects due to restrictions on visitation and limitations on social interactions and rehabilitation support, all stemming from concerns about transmission risk. Additionally, Iqbal et al. (2021) have described how COVID-19 survivors often face discrimination and bias from their communities, driven by irrational fears that they remain contagious even after recovery. Consequently, it is imperative to dispel any misconceptions that perpetuate the notion of contagion in COVID-19 survivors post-recovery. This will not only help reduce stigma but also facilitate the swift reintegration of these individuals into society.

### **3. Material and Methods**

#### **3.1. Study Group**

The experimental study involved a group of 54 women (age  $22 \pm 1,63$ ) and 89 man (age  $22 \pm 1,85$ ). The admission programme for the present experiment was preceded by an information and education campaign including a lecture on diet and healthy lifestyle. The study included an examination of body composition and BMI, as well as two questionnaires on the level of physical activity and quality of life. An analysis of body composition and BMI was performed using a SECA mBCA 515 (seca GmbH & Co. KG, Hamburg, Germany). The same group also completed the International Physical Activity Questionnaire Short Version (IPAQ-SF) as well as the World Health Organization Quality of Life (WHOQOL-BREF) Questionnaire.

All participants of the study signed an informed consent form. All tests were carried out in the physiological laboratory of the Opole University of Technology (Poland).

#### **3.2. Data Collecting Tools**

##### **3.2.1. Body composition**

An analysis of body composition and BMI was performed using a SECA mBCA 515 (seca GmbH & Co. KG, Hamburg, Germany) analyser with eight electrodes. All body composition measurements were taken in the morning, on an empty stomach.

##### **3.2.2. Physical Activity (PA)**

Participants assessed their habitual physical activity with the International Physical Activity Questionnaire Short Version (IPAQ-SF). The IPAQ-SF includes items assessing the frequency and duration of physical activity in three intensity domains: vigorous physical activity (VPA = 8.0 metabolic equivalents [METs]), moderate physical activity (MPA = 4.0 METs), and low physical activity (LPA = 3.3 METs) in a range of domains, including leisure, home and garden (yard), and work-related and transportation-related activities during a typical week of their lives. Based on the data collected on the frequency and duration of physical activity and estimated energy expenditure (EE) expressed in MET·min/week, respondents were classified into three groups according to their physical activity level: 1) High physical activity level (HPAL) - meeting one of the following criteria: 3 or more days of intense physical activity of at least EE 1,500 MET·min/week or 7 or more days of any combination of activities of three intensity ranges of at least EE 3,000 MET·min/week. 2) Moderate physical activity level (MPAL) – 3 or more days of intense activity of at least 20 minutes/day, 5 or more days of moderate- or low-intensity activity of at least 30 minutes/day, or 5 or more days of any combination of low-, moderate-intensity or intense activity of at least EE 600 MET·min/week. 3) Low physical activity level (LPAL) – no physical activity reported or some activity reported but not enough to meet at least the MPAL criteria (physical activity below 600 MET·min/week).

### 3.2.3. Quality of Life (QoL)

Quality of life was assessed using the World Health Organization Quality of Life (WHOQOL-BREF) instrument. The WHOQOL-BREF comprises 26 items: two measuring GQOL and perceived health condition (PHC), respectively, which were examined separately, and 24 measuring quality of life in four broad domains: PHYD (seven items), PSYD (six items), SD (three items), and ED (eight items). Particular facets incorporated within the domains included the following:

1. Physical domain PHYD: activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity.
2. Psychological domain PSYD: bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality/ religion/personal beliefs, thinking, learning, and memory and concentration.
3. Social relationships domain SD: personal relationships, social support, and sexual activity.
4. Environment domain ED: financial resources, freedom, physical safety and security, health and social care: accessibility and quality, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment (pollution/noise/traffic/climate), and transport. Each item was scored from 1 to 5. Higher scores denoted higher quality of life and better perception of health condition. For the first two items, the numerical scores were the basis for further analysis. The scores to the remaining 24 items were transformed on a special 4- to 20-point scale.

Quality of life (QoL) was assessed using the validated version of the WHOQOL-BREF. The brief version of the WHOQOL-BREF contains 26 items, with each item representing one facet. The four main domains have the following facets: (1) physical health domain: to be free of any pain, sleep and rest, mobility, having energy, mobility, activities of daily living, to be free of dependence on medication and treatments, and work capacity; (2) psychological health domain: happiness and enjoyment of life, to be able to concentrate, feeling positive about yourself, bodily image and appearance, to be free of negative feelings, and religion/spirituality/personal beliefs; (3) social relationships: sexual activity, personal relationships, and social support; (4) environment: feeling physical safety and security, home environment, financial resources, to be able to adequate health care, changes of getting new information and knowledge, participation in recreation/leisure, adequate transport and physical environment. All items on the WHOQOL-BREF are scored on a 5-point Likert Scale (The World Health Organization Quality of Life - WHOQOL).

### 3.3. Statistical Analysis

Evaluation of all dependent variables was subjected to factor sex (Male, Female) and 2 times (pre and post) mixed ANOVA with repeated measures of the last factor. When significant interactions were identified ( $p < 0.05$ ), Tukey pairwise follow-up analyses were applied as post-hoc tests. The effect size was calculated as partial eta-squared  $\eta^2_p$  and was interpreted as follows: small = 0.01, medium = 0.06, large = 0.14. All tests were conducted with free and open software JAMOVI, Version 2.0. A Pearson's chi-square test of independence was performed to examine the association between SEX and Physical activity intervals. Pearson's chi-square test analysis was carried out in Statscloud software (<https://statscloud.app/beta/>).

## 4. Results

### 4.1. Body composition

Table 1 shows the body composition parameters in which there was a statistically significant difference between BASELINE and FOLLOW-UP. In the three parameters analyzed (VFM, RFM, BMI), there was a statistically significant interaction between the effect of SEX (between) and TIME (within). For the RFM parameter significant main effects were found for SEX,  $F(1, 141) = 45.81$ ,  $p < .001$ ,  $\eta^2_p = 0.135$  and TIME,  $F(1, 141) = 12.96$ ,  $p < .001$ ,  $\eta^2_p = 0.084$ . There was also a significant interaction between TIME and SEX,  $F(1, 141) = 6.03$ ,  $p = .015$ ,  $\eta^2_p = 0.017$ . In this study was a significant main effect for SEX for the RFM parameter,  $F(1, 141) = 45.40$ ,  $p < .001$ ,  $\eta^2_p = 0.134$ . There was no significant main effect for TIME,  $F(1, 141) = 1.56$ ,  $p = .214$ ,  $\eta^2_p = 0.011$ . There was a significant interaction between TIME and SEX,  $F(1, 141) = 5.72$ ,  $p = .018$ ,  $\eta^2_p = 0.016$ . It was a significant main effect for SEX for the BMI parameter,  $F(1, 141) = 67.90$ ,  $p < .001$ ,  $\eta^2_p = 0.190$ . There was no significant main effect for TIME  $F(1, 141) = 3.03$ ,  $p = .084$ ,  $\eta^2_p = 0.021$ . There was a significant interaction between TIME and SEX,  $F(1, 141) = 5.34$ ,  $p = .022$ ,  $\eta^2_p = 0.015$ .

Table 2 shows the descriptive statistics of the individual body composition parameters that were tested at the beginning of the experiment and afterwards.

**Table 1.**

*Results of statistical significance of individual effects and interactions between effects, in selected body composition parameters*

Factors	<i>F</i>	<i>p</i>		$\eta^2_p$
<b>VFM</b>				
<b>TIME</b>	12.955	< .001		0.08
<b>Gender</b>	45.811	< .001		0.25
<b>TIME * gender</b>	6.028	0.015		0.04

Cont. table 1.

RFM				
TIME	1.561	0.214		0.01
Gender	45.399	< .001		0.24
TIME * gender	5.718	0.018		0.04
BMI				
Time	3.027	0.084		0.02
Gender	67.896	< .001		0.33
Time * gender	5.337	0.022		0.04

**Table 2.***Changes in total soft tissue content in the male and female control group*

	Male		Female	
	Baseline	Follow-up	Baseline	Follow-up
BMI (kg/m <sup>2</sup> )	24.48 ± 2.87	24.67 ± 2.84	21.04 ± 2.17	20.91 ± 1.71
Relative fat mass (%)	14.76 ± 6.02	15.83 ± 6.06	22.02 ± 6.20	21.39 ± 4.99
Absolute fat mass (kg)	12.79 ± 7.21	13.93 ± 7.76	13.60 ± 5.11	12.95 ± 4.09
Fat-free mass (kg)	69.65 ± 8.63	70.11 ± 8.53	46.48 ± 3.55	46.69 ± 4.19
Skeletal muscle mass (kg)	34.91 ± 4.85	35.21 ± 4.76	21.47 ± 2.17	21.48 ± 2.31
Waist circumference (cm)	84.67 ± 8.28	86.25 ± 7.51	68.85 ± 11.34	69.09 ± 10,98
Weight (kg)	82.44 ± 14.15	84.04 ± 14.33	60.08 ± 7.53	59.64 ± 6.65
Visceral fat mass (l)	0.93 ± 0.89	1.10 ± 0.86	0.22 ± 0.20	0.23 ± 0.23

#### 4.2. Physical activity and quality of life

When quality of life was analysed in relation to gender (Tab. 3), it was found that women had higher scores for the body domain (Mdn = 23.00) than the male group (Mdn = 21.00). A Mann-Whitney U test showed that this difference was statistically significant; U = 1682.00, p = .003, r = 0.25. In addition, the female group had higher psychology domain scores (Mdn = 24.00) than the male group (Mdn = 22.00). A Mann-Whitney U test showed that this difference was statistically significant; U = 1636.00, p = .001, r = 0.27. The analysis also showed that the female group had higher social relations domain scores (Mdn = 13.00) than the male group (Mdn = 10.00). A Mann-Whitney U test showed that this difference was statistically significant; U = 1767.00, p = .008, r = 0.22.

In addition, the female group had higher environmental domain scores (Mdn = 31.00) than the male group (Mdn = 28.00). A Mann-Whitney U test indicated that this difference was statistically significant; U = 1720.50, p = .004, r = 0.24.

**Table 3.***Relation between quality of life and gender according to Mann-Whitney U results*

Outcome	Predictor	Group	Median	U	p
Physical domain	Gender	F	23	1682	0.003
		M	21		
Psychological domain	Gender	F	24	1636	0.001
		M	22		
Social relationships domain	Gender	F	13	1767	0.008
		M	10		
Environment domain	Gender	F	31	1720.5	0.004
		M	28		

Repeated Measures ANOVA was conducted to examine the effects of gender and physical activity intervals on each quality of life domain, namely: Physical domain, Psychological domain, Social relationship domain, Environmental domain (Fig. 1).

When analysing the influence of gender and physical activity on the first domain, i.e. physical domain, there was a significant main effect for SEX,  $F(1, 137) = 6.97$ ,  $p = .009$ ,  $\omega^2p = 0.040$ . No significant main effect was found for physical activity intervals,  $F(2, 137) = 0.65$ ,  $p = .524$ ,  $\eta^2_p = -0.005$ . There was a significant interaction between SEX and physical activity intervals,  $F(2, 137) = 3.53$ ,  $p = .032$ ,  $\eta^2_p = 0.034$  (Tab. 4).

However, when examining the effect of SEX and the physical activity intervals on the psychological domain, a significant main effect was found for the physical activity intervals,  $F(2, 137) = 4.61$ ,  $p = .012$ ,  $\omega^2p = 0.048$ . No significant main effect was found for SEX,  $F(1, 137) = 3.26$ ,  $p = .073$ ,  $\omega^2p = 0.016$ . There was no significant interaction between SEX and physical activity intervals,  $F(2, 137) = 1.08$ ,  $p = .342$ ,  $\eta^2_p = 0.001$  (Tab. 4).

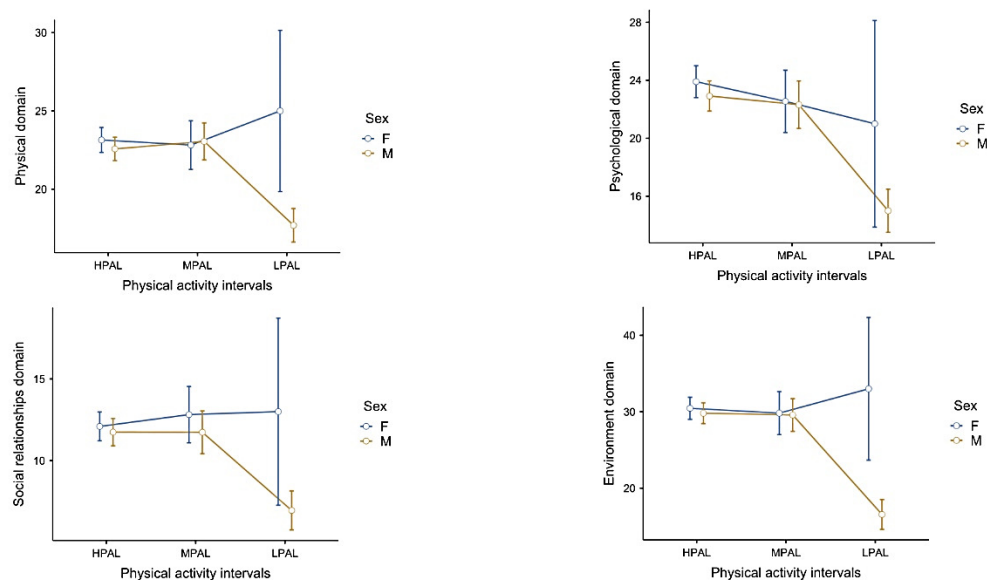
Though, when analysing the effects of SEX and the intervals of physical activity on the domain of social relations, a significant main effect was found for SEX,  $F(1, 137) = 7.96$ ,  $p = .006$ ,  $\omega^2p = 0.046$ . No significant main effect was found for physical activity intervals,  $F(2, 137) = 1.66$ ,  $p = .195$ ,  $\omega^2p = 0.009$ . There was no significant interaction between SEX and physical activity intervals,  $F(2, 137) = 2.78$ ,  $p = .065$ ,  $\eta^2_p = 0.024$  (Tab. 4).

Finally, when examining the effects of SEX and the intervals of physical activity on the environmental domain, a significant main effect was found for SEX,  $F(1, 137) = 10.94$ ,  $p = .001$ ,  $\omega^2p = 0.065$ . No significant main effect was found for physical activity intervals,  $F(2, 137) = 2.38$ ,  $p = .096$ ,  $\omega^2p = 0.019$ . There was a significant interaction between SEX and physical activity intervals,  $F(2, 137) = 5.28$ ,  $p = .006$ ,  $\eta^2_p = 0.056$  (Tab. 4).

**Table 4.**

*Statistical significance values of the differences between the study groups in each parameter, analysed by ANOVA with repeated measures test*

Dependent Variable	Factors	F	p	$\eta^2_p$
Physical domain	Gender	6.975	0.009	0.05
	Physical activity intervals	0.648	0.524	0.01
	SEX * Physical activity intervals	3.531	0.032	0.05
Psychological domain	Gender	3.259	0.073	0.02
	Physical activity intervals	4.613	0.012	0.06
	SEX * Physical activity intervals	1.082	0.342	0.02
Social relationships domain	Gender	7.956	0.006	0.05
	Physical activity intervals	1.657	0.195	0.02
	SEX * Physical activity intervals	2.784	0.065	0.04
Environment domain	Gender	10.935	0.001	0.07
	Physical activity intervals	2.382	0.096	0.03
	SEX * Physical activity intervals	5.28	0.006	0.07



**Figure 1.** The effects of gender and physical activity intervals on individual areas of quality of life: Physical domain, Psychological domain, Social relationships domain, Environment domain.

## 5. Discussion

There is no doubt that the quality of life has decreased due to the pandemic COVID-19 (Ferreira et al., 2021) and it is extremely important to find a way to improve it. Currently, only data on gender indicators or patients admitted or deceased are available, but there are no analyses on other gender indicators (Ambrosino et al., 2020). Knowledge of gender differences in the onset of COVID-19 would be a fundamental tool to understand the impact of a health emergency on individuals and communities and to implement effective and equitable policies, public health interventions, and targeted solutions. Further studies evaluating sex-disaggregated data are needed to fill numerous knowledge gaps. Such data would improve our understanding of the complex interactions between these variables and their impact on disease severity and sex-specific outcomes (Lina Ya'qoub et al., 2021).

The main findings of our study suggest that after a series of lockdowns and a year of remote study significant gender differences among students in quality of life, physical activity and body composition were found.

The literature on this topic shows, as has also been observed in Europe and China (Gebhard et al., 2020; Liu et al., 2020; García-Fernández et al., 2021), that women exhibit more severe symptoms of anxiety, depression, and acute stress, suggesting an increased arousal response to stress in women (Bangasser, Wicks, 2017), supporting sex differences in stress response systems, including during COVID-19. The study by García-Fernández et al. 2021 shows that



women living alone exhibit higher levels of anxiety, which was not observed in men, supporting the existence of gender differences in response to COVID-19 and maybe related to women's predominant role as family caregivers and greater vulnerability to social isolation (Gebhard et al., 2020; Spagnolo et al., 2020).

Similarly, the experience of domestic violence during the pandemic period is associated with greater depressive symptomatology only among women. These findings provide valuable information and support gender differences in men's and women's concerns during COVID-19, which focus on economic and social impacts for men and family health and well-being for women (Van der et al., 2020).

On the other hand, there is a relationship between body composition and quality of life in the elderly. Jiao Zhang et al (2019) point out the association between BMI and health-related quality of life (HRQOL), especially for the population with obesity. This is confirmed by Zhu YB et al. (2009). Many studies have shown that the "obesity paradox", a "paradoxical" decrease in morbidity and mortality with increasing BMI, exists in the elderly or patients with chronic diseases (Curtis et al., 2005; Lavie et al., 2010; Lavie et al., 2014). Recent studies have extended the "obesity paradox" to HRQOL outcomes, suggesting that overweight and obesity may paradoxically correlate with higher HRQOL, termed the "obesity-HRQOL paradox" (Zhu et al., 2015; Tsai et al., 2004). There is some emerging evidence that the association between obesity and HRQOL is stronger in women than in men.

Nevertheless, these studies are largely concerned with older women. It turns out that in the case of young women, this relationship may be different. Our research showed that during the pandemic, young women were characterized by relatively higher physical activity, and therefore obtained better results in the body composition study than examined men.

Despite the adverse conditions resulting from the pandemic and isolation, the closure of sports facilities and gyms, the authors of the article did not observe negative changes in body composition in women after 12 months. In men, however, these changes were visible and statistically significant. Although BMI, free fat mass, waist circumference, and skeletal muscle mass changed only slightly, the increase in relative fat mass and visceral fat mass was significant. The changes indicate that the men gained more than 1 kilogramme of additional adipose tissue without any change in other components. In the men, the initial low fat mass may be the key factor in these changes and appears to correlate with the young age of the participants. Furthermore, this seems to translate into a relatively better quality of life in the young women studied compared to the men.

Studies show that body composition is related to quality of life. Normal BMI, relatively low body fat percentage, and high free fat mass are associated with metabolic health (Pickhardt, 2021). In our study, it was confirmed that studied women had relatively higher quality of life after pandemic COVID-19 compared to studied men. The analysis showed that women had higher scores than men in all domains of quality of life - physical domain, psychological

domain, social relations domain, as well as environmental domain. In each quality of life domain, the gender differences were statistically significant.

It seems that the higher quality of life in women is due to the higher physical activity of this group, which was also confirmed by studies on body composition. In our opinion, it is very important to perform a sex-specific analysis of quality of life data and COVID-19 as well as other specific studies to evaluate sex differences. Knowledge of gender differences in quality of life would be a fundamental tool to understand the impact of a health emergency on individuals and communities and to implement effective and equitable policies, public health interventions, and targeted solutions or appropriate strategies to achieve sustainable development. This issue undoubtedly requires further in-depth research in this area.

Understanding disparities between genders in terms of quality of life and physical activity can contribute to more effective future management of public healthcare. Public health management is instrumental in shaping and enhancing the quality of life for both individuals and communities. Its multifaceted role encompasses a comprehensive approach to elevate overall well-being and quality of life by preventing diseases, encouraging healthy lifestyles, ensuring healthcare accessibility, tackling environmental influences, and establishing support systems for individuals and communities. This way, the healthcare system can become more sustainable.

## 6. Conclusions

The main results of this study indicate that significant gender differences in body composition of the students were found after a series of suspensions and a year of distance learning. In this study, it was established that young women were characterized by relatively higher physical activity during the pandemic and therefore performed better in body composition testing than the men studied. Despite the unfavourable conditions resulting from the pandemic and isolation, closure of sports facilities and gyms, the authors of the article did not observe any negative changes in body composition in women after 12 months.

In men, however, these changes were visible and statistically significant. In our study, it was confirmed that the examined women had a relatively higher quality of life after the Covid-19 pandemic than the studied men. This has been confirmed in all areas of quality of life: physical area, psychological area, area of social relations, as well as environmental.

Having a deep understanding of gender disparities in quality of life is a crucial resource for comprehending how a health crisis affects individuals and communities. It also provides a solid foundation for enacting effective and fair policies, public health interventions, and tailored solutions or suitable strategies aimed at promoting sustainable development. Undoubtedly, further extensive research in this field is imperative. In future studies, it would be worthwhile

to consider the ethnic backgrounds of respondents and investigate whether it is associated with their approach to physical activity and their perception of quality of life.

As the authors of this study, we encourage further research on this topic and the implementation of support programs for students and the academic community that promote physical activity and a healthy lifestyle. This will enable to better prepare for future challenges and enhance overall quality of life after navigating through difficult periods, such as the COVID-19 pandemic.

## Disclosure

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## THE IMPORTANCE OF LEADERSHIP STYLES IN STIMULATING THE DEVELOPMENT OF ORGANISATIONS FROM THE MINING INDUSTRY

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*Your fate is the reflection and result of your character*

Johann Gottfried von Herder

**Purpose:** in the cognitive space, the article focuses on the study of the leadership style in organisation from the mining industry<sup>1</sup> at the same time, in the utilitarian sphere, on the activity of improving the organisation so that it focuses on the needs of people and production at the same time, i.e. being able to choose the ideal management style.

**Methodology:** the theses presented in the article were verified using Blake and Mouton's method of examining management styles (managerial grid).

**Result:** the result of the research in organisation from the mining industry in an interdisciplinary way supports the view that developments in the theory and practice of organisational management lead to changes in both. The interdisciplinarity in the space indicated should focus on the pursuit of change that develops and perpetuates best practice in the management and organisation of -Plant from the mining industry - in two caesuras, up to 2025 with an outlook to 2030.

**Originality:** in the space of Plant from the mining industry, the outcome of the research determines the contribution to its development, which consists in identifying knowledge that becomes a unique body of work that develops, on a cognitive and practical level, the canon of the functioning and development of the organisation and the possibilities of managing it in a dynamically changing socio-economic environment.

**Keywords:** human, knowledge, organization, management.

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<sup>1</sup> The authors of the article reserve the confidentiality of information enabling identification of the organization where the research was conducted.

## 1. Introduction

Management theorists and practitioners have long tried to define reality somehow, if only for the conviction of their own stability and security. The relatively precise definition of elements and phenomena in an organisation creates a false sense of knowing what is at stake. The question of what people are like, what can be expected of them, how they might react in certain situations, arises very often in organisations, as it reduces the level of uncertainty. It applies to both subordinates and managers. Both sides of management want to know as much as possible about the behaviour of the other side. This is because it gives them the opportunity to choose the right behaviour (Foltny, 2006, pp. 83-97).

Choices - and this is very important - are made in an increasingly complex environment. At present - and this is something that managers, supervisors and subordinates alike should bear in mind - a picture is emerging of a future in which people, industry and the reality around them will be shaped by processes such as automation, digitisation and robotisation, which are developing at an unprecedented rate. The processes indicated are accompanied by the development of directions of global development hitherto unknown to societies, determined by Revolution 4.0. leading to the emergence of knowledge-based economies (Śledziwska, Włoch, 2020).

It appears that the processes and patterns described may lead to the disappearance of a world determined by the industrial age and a transition to a new era shaped by technologies dominated by data flow and analysis. The changes taking place will focus on selected economic fields and social areas (Kłak, 2010, pp. 13-29). In this light, it seems that the future of human teams and their associated management styles will be determined by two trends. In the first of these, teams and management styles will be on the margins of those taking place. In the successful variant, they will, on the basis of their development potential, become involved in the indicated processes of change and the described regularities, As a result of their inclusion, they will derive the resulting benefits - through management styles appropriate to the surrounding reality - on an equal footing with the other participants.

## 2. Leadership and the key concepts of Blake and Mouton

In the field of social sciences, the discipline of management science and quality - narrowing down - management theory the leadership of employee teams by means of so-called soft actions is referred to as leadership. In this perspective, it is assumed that managers should behave towards their subordinates in a certain way. According to the Encyclopaedia of Management, leadership is defined in different ways, as it is a term that does not have a recognised and

accepted single definition. In broad terms, leadership can be understood as the ability to influence individuals or a group to achieve certain results. Managed, on the other hand, should be understood as the ability to influence employee behaviour in order to achieve specific goals. Leadership is based primarily on a person's authority and the power that others voluntarily accept. Leadership is about setting direction, developing a vision for the future of the organisation, as well as giving direction to people. Leadership is also about motivating and inspiring, releasing energy in people. Leadership is necessary to create change and management is necessary to produce results in a systematic way (Encyklopedia Zarządzania, <https://mfiles.pl/pl/index.php/Przyw%C3%B3dztwo>). Anticipating the above definition, leadership behaviours perceived as the ability to influence individuals or a group to achieve specific outcomes are classified in the literature as management styles. As Hanna Fołtyn notes in this cognitive area, two key management styles can be defined democratic and autocratic, although their interpretation is currently not at all that clear (Fołtyn, 2006, pp. 83-97). In another view, a potential management style is a rationally conceived model (pattern) of a manager's organisational behaviour towards subordinates in order to optimally (most favourably) fulfil managerial roles (to achieve set goals) (Żukowski, Galla, 2009, p. 22). Mroziewski classifies management styles in an equally interesting way, who lists three approaches (Mroziewski, 2005):

- personal, which relates to the individual characteristics of the manager and his or her views on directing,
- situational, which assumes that leadership is influenced by circumstances, conditions and requirements external to the leadership process,
- personality-situational, which is a synthesis of the first two approaches.

In the literature, further classifications of management can be found, including:

- a classification derived from Blake and Mouton's theory, already described, called the theory of the managerial grid, which, as has been noted many times before, describes two key elements for classification, which are people orientation and task orientation analysed on a scale of 1-9 (Farey, 1993, pp. 109-121),
- the classification according to Likert and Bales, who defined two further styles: autocratic, autocratic benevolent (Wojnarowska, Winiarska, 2011, pp. 173-183),
- leadership styles according to Reddin: sociable (friendly), comprehensive (integrated), isolated (separative) and zealous (self-sacrificing) (Evans, 2004).

In conclusion, it is possible to distinguish from among the known management styles three basic ones: autocratic, democratic and liberal (also known as *laissez-faire*) and the complementary mixed style (Roślak-Olczyk, 2015, pp. 237-252).

Following Fołtyn, it seems most appropriate - despite the diversity of definitions of management styles or the term management itself - to adopt the traditional approach corresponding to the two styles of democratic and autocratic. This approach corresponds most

closely to the method used in the research, called the leadership grid theory (Fołtyn, 2006, pp. 83-97). Most generally - in the perspective of the leadership grid method - the democratic style focuses on the people-oriented, democratic behaviour of the leader (manager, manager). In this style, the leader delegates a significant amount of authority, but retains ultimate responsibility for task performance and the means of control and intervention to ensure that the team's goals are met. Subordinates have a large degree of freedom to divide up tasks and determine how they are to be carried out. Two-way communication between the managerial and executive levels prevails. The advantage of this management style is that it fosters employee involvement by providing opportunities for participation in decision-making. On the other hand, its disadvantage is that it is a participative way of making decisions, which is time-consuming.

In contrast, the autocratic style is characterised by the leader retaining all authority and responsibility. Decisions are made without consulting subordinates. Tasks and how they are carried out are determined by the leader and one-way communication - leader, employees - is dominant. A distinct advantage of this management style is the orderliness of the organisation (team) and predictability of results. The weakness - undoubtedly - is the weakening of the initiative and independence of thought and action of the members of the team (organisation) (Kuratko, Hornsby, Bishop, 2005, pp. 275-291). In summary, according to the management grid method, taking into account other members of the team (organisation) in the management activities corresponds to a people-oriented approach, i.e. a democratic behaviour of the manager. In contrast, focusing on the structure of the organisation is regarded as adopting a task-orientation, i.e. autocratic behaviour.

Focusing solely on the management grid method, it is worth noting that Robert R. Blake - an American management theorist - was a psychologist by training. He received a master's degree in psychology from the University of Virginia in 1941. In 1947, he received his Ph.D. in psychology. at the University of Texas at Austin, where he worked until 1964. Robert Blake also taught at Harvard University, Oxford University and Cambridge University, among others. Together with Jane Mouton, he developed the concept of a grid of management styles in 1964, which described them according to the degree of the supervisor's attitude towards people and tasks. American management theorist Jane Srygley Mouton, on the other hand, received a master's degree in psychology from the University of Florida in 1951. In 1957, she received her doctorate at the University of Texas.

Empirical research and theoretical analysis allowed the authors of the managerial grid to distinguish 5 areas (fields) in the grid, relating to 5 basic managerial styles: 1. task style - in which the manager manifests exclusive and high interest in tasks; 2. personality style - exclusive and high interest in people; 3. evasive style - no interest in people and tasks; 4. conservative style - medium interest in tasks and people; 5. optimal style - high interest in tasks and people.

The main assumption of Blake and Mouton's concept is that the ideal leadership style is one that is simultaneously people-oriented and task-oriented. On this premise, the "Managerial Grid - Management Styles" is a method of assessing management style, and its purpose is to teach managers the activities of organisational improvement so that they focus simultaneously on the needs of people and production, i.e. they are able to choose the ideal way of behaving. "The Management Grid" serves not only, to make managers realise what they are like and what they need to do to change for the better, but also questions a little about the possibilities and direction of management style conversion.

### **3. The leadership styles grid - a method of research**

The anticipation of theoretical considerations of leadership and management styles determined the application of research in the set organisation using Blake and Mouton's method of the concept of management styles (leadership grid). As noted earlier, the research was conducted in H1 2022. The object of the research is a plant operating at Institution, within which, on the day of the research, full-time and permanent employment was characterised by a total of 37 employees. From this population, the site manager selected a group of nine experts for the study. The indicated group was deliberately selected on the basis of a subjective criterion, which was the assumption that the employee entering the sample was a leader in his or her area of professional activity. In the entire participating population, only one person did not have a university degree. The research was conducted under the criterion of anonymity.

The research was carried out by the indirect interview method, using a tool - a survey questionnaire developed by Blake and Mouton, with the CAWI technique - (Computer-Assisted Web Interview). This is a technique for collecting information in quantitative market and opinion research in which the respondent is asked to complete a survey electronically.

The questionnaire makes it possible to self-evaluate leadership in the surveyed organisation and to diagnose subjective behaviour, participants in two key areas: a) people management and b) task management. In the research, the participants' attention is focused on a precisely described few specific work situations that they most often deal with or have to deal with. The survey questionnaire consists of nine cognitive areas. In each area there are five possible answers, which most closely correspond in the first variant to the research participant's most frequent way of acting or thinking in similar circumstances. In the second variant, the research participant answers identical questions, but from the perspective of an alternate solution, i.e. the solution they would have adopted if the first solution had not been possible for some reason (Appendix).

The results obtained from the study were analysed according to the results table developed by Blake and Mouton (Tab. 1). For each of the nine cognitive areas, five response scores are assigned according to the given numerical values. The first value refers to the responses concerning habitual behaviour. The second refers to the alternate solution. The answers obtained in these variants are to be summarised.

**Table 1.**  
*Blake and Mouton scoreboard*

Area/ question	A	B	C	D	E	Column 1 Customary behaviour	Column 2 Alternative solution
1	0.5/0.5	0/0	0/1	1/1	1/0	/	/
2	1/1	0/0	1/0	0.5/0.5	1/1	/	/
3	1/0	0/0	0/1	0.5/0.5	1/1	/	/
4	0.5/0.5	1/0	0/0	0/1	1/1	/	/
5	0/1	1/1	0.5/0.5	1/0	0/0	/	/
6	1/1	0.5/0.5	0/1	0/0	0.5/0.5	/	/
7	1/1	1/0	0/0	0/1	0.5/0.5	/	/
8	0/0	1/0	0.5/0.5	1/1	0/1	/	/
9	0.5/0.5	0/1	1/0	1/1	0/0	/	/
Total						/	/

Source: based on: Wołyszyn, Wiedza dla eksperta, [http://adik.57.pl/style\\_kierowania.pdf](http://adik.57.pl/style_kierowania.pdf), 6.02.2022.

In the next activity, the result should be transferred to the management grid in order to determine the dominant management style in the surveyed establishment. According to the described research methodology, on the X-axis the results corresponding to the sum of column one - habitual behaviour - are marked. On the Y-axis, the results corresponding to the sum of the second column - the alternate solution (Fig. 1).

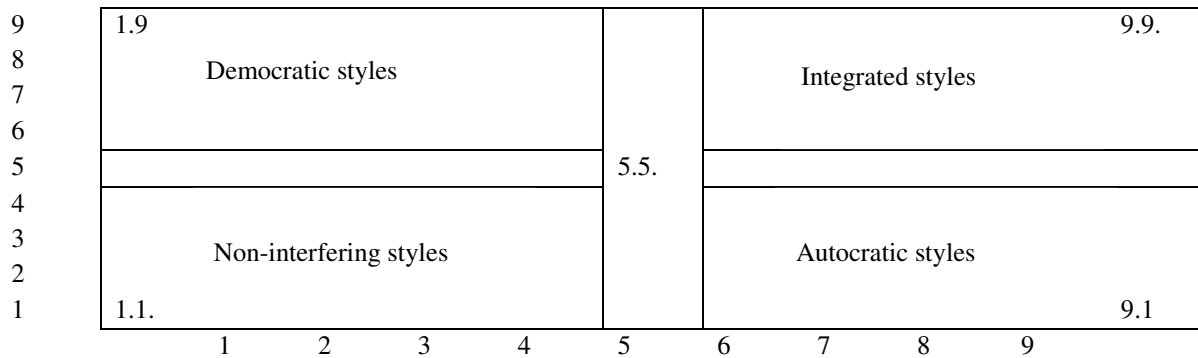
9	X										X
8											
7											
6											
5											
4											
3											
2											
1											
		1	2	3	4	5	6	7	8	9	

**Figure 1.** Blake and Mouton results grid.

Source: based on: Wołyszyn, Wiedza dla eksperta, [http://adik.57.pl/style\\_kierowania.pdf](http://adik.57.pl/style_kierowania.pdf), 6.02.2022.

The results obtained in the research are interpreted according to two key schemes. In the first scheme, by management group (Fig. 2).

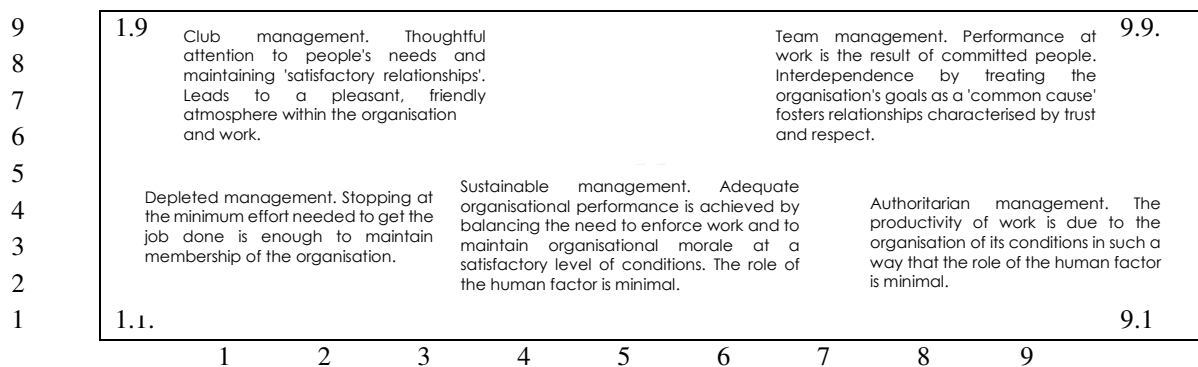




**Figure 2.** Blake and Mouton's performance grid by management group.

Source: Fołtyn, 2006, pp. 83-97.

In the second view, by management group with the classic names (Fig. 3).



**Figure 3.** Blake and Mouton's performance grid by leadership style.

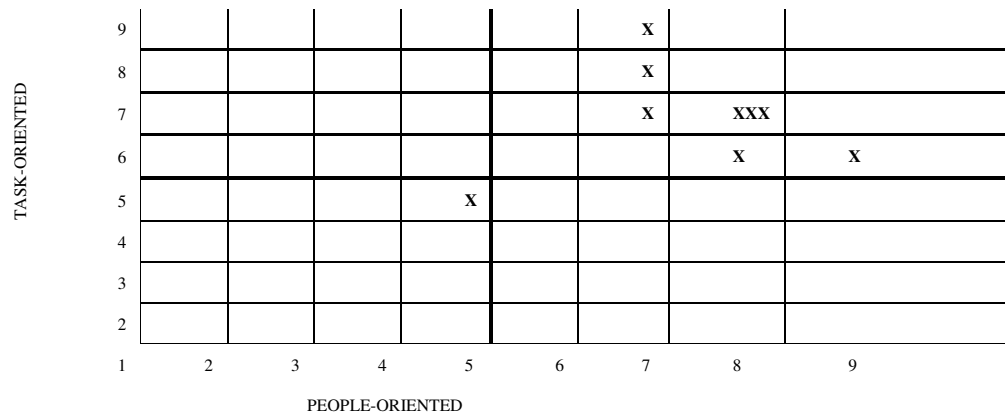
Source: Fołtyn, 2006, pp. 83-97.

To summarize this part of the article, it is worth emphasizing that the interpretation of the research results using the Blake and Mouton's method is a key step in understanding the preferences and management style of a given person or team. This method is mainly used in the context of management and personal development. The essence of interpreting the results of this method is to understand what the preferences of a given person or team are in terms of two main variables:

1. Interest in people. It is a measure of how much a given person or team pays attention to needs, feelings and interpersonal relationships in the management process. This may include aspects such as support, empathy and developing relationships.
2. Interest in the task. It is a measure of how much a person or team focuses on goals, tasks, results and achievements in the management process. This may include aspects such as efficiency, planning and achieving goals.

## 4. The leadership style grid - research findings

The results of the study clearly revealed an integrated management style in the organisation. The diagnosed style determines the achievement of results at work as a result of the committed attitude of people (the organisation's leaders). The diagnosed management style reveals interdependence by treating the organisation's goals as a 'common cause', which fosters relationships characterised by trust and respect. The traditional management styles are evident in Figure 2: democratic, of which style 1.9 is an extreme case, autocratic (with extreme case 9.1), non-interfering (extreme case 9.1). Finally, a style of leadership not considered in classical theories called integrated, the extreme case of which is style 9.9 described as ideal. It is this style that managers should strive to use if they can locate their existing attitude on the management grid (Fig. 4).



**Figure 4.** Grid of the results of the leadership survey.

Source: own calculations.

The management style revealed in the study indicates that Plant X is aiming for market success by 2025 (with an outlook to 2030). Based on the research, the following strategic objectives are identified by 2025 (with an outlook to 2030), the achievement of which will perpetuate the integrated management style. In this space, a key objective is to strive to maintain among the leaders of the studied plant X:

- existing commitment and attitudes to performance,
- interdependence by treating the goals of plant X as a "common cause",
- relationships characterised by trust and respect,
- high expectations of staff, including themselves and their subordinates,
- focus on teamwork,
- effectiveness of the incentives chosen to ensure that tasks are carried out efficiently,
- working together to achieve defined objectives,
- cooperate and support each other,
- the possibility to combine specialisations,
- collective responsibility of staff for the performance of tasks.

In the light of the strategic objectives identified above, the research carried out gives rise to the following challenges by 2025 (with an outlook to 2030). In this area, the leadership group should aim to:

- developing HR management with a task- and employee-oriented approach,
- consolidating the belief that staff want to and can work well,
- engaging staff according to their capabilities,
- ensuring staff satisfaction with their tasks,
- actively involve each member of staff in planning the tasks they will be involved in,
- inspire everyone to show their maximum potential in the tasks at hand,
- consolidating the principle of team evaluation of tasks carried out and regularly reviewing the activities carried out,
- limit the excessive autonomy of workers.

In view of the results obtained with the grid method of managerial research, it is particularly worthwhile to discuss the integrated style in greater detail (Figure 2). In the most general terms, it can be said that the integrated style, already recognised as ideal, is characterised by a high degree of task-orientation and people-orientation at the same time. A person who is a leader - a manager - manifests a working style in which the belief that people want to and can work well prevails. He or she engages the team (its members) according to their capabilities, taking care to ensure that they are satisfied with their tasks. He or she tries to actively bring everyone into the process of planning the tasks in which they will be involved. The leader (manager) in this style of management simultaneously occupies the position of a member of the team (organisation), inspiring all team members to demonstrate their maximum potential in the tasks at hand. He or she prefers team evaluation of task performance and regular monitoring of the activities carried out. The only weakness of this method of leadership is the excessive autonomy of the team members, which can be disadvantageous in certain circumstances (Cwalina, Sobek).

In the above perspective, it is worth noting the indications of J.W. Reddin, who, in his classification of management styles, significantly enriched Blake and Monton's theory (managerial grid) by developing its content with a further element, which is management effectiveness. As a result of many years of work, Reddin identified four styles of leadership effectiveness: a - separative, b - self-sacrificing, c - sociable, d - integrated and the following eight complementary styles, which he named: deserter, bureaucrat, autocrat, benevolent autocrat, missionary, developmental, compromiser and administrator. Reddin considered the style called compromise to be the least effective. A person representing this style is very susceptible to the influence of the environment, agreeing with everyone and always. He or she focuses mainly on solving current issues, leaving tactical and strategic issues aside. A much more effective style is that of the administrator, or leader, who knows how to make and sets high demands on himself and his subordinates. He focuses on teamwork. He or she is able to select incentives effectively, ensuring that tasks are completed efficiently (Zieleniewski, 1981).

It seems equally important to look in the context of strengths and weaknesses at the integrated management style diagnosed at Plant X, in which teamwork is a key success factor. When defining the term teamwork, it can be assumed that it is a basic form of work organisation, which is understood as a specific degree of organisational bonding of team members in the work process needed to perform specific tasks and objectives (Encyklopedia Zarządzania, [https://mfiles.pl/pl/index.php/Zalety\\_pracy\\_zespo%C5%82owej](https://mfiles.pl/pl/index.php/Zalety_pracy_zespo%C5%82owej)). In another approach, teamwork is defined as a type of collective action in which the execution of specific, ordered sets of activities and operations is entrusted to a specific group of people. These are also activities that they perform as a team and have been commissioned individually for each of them. Narrowing down the reflection on teamwork - given the subject of consideration - it is also worth defining another term 'team'. In this cognitive area, we find the work of M. Trotsky, in which he defines a team as a group of people who have a common goal to achieve, complementing each other with knowledge and skills, where the members are jointly responsible for the performance of a task (Trocki, 2014, p. 83.). In this light, it is worth focusing on the characteristics that determine the success of teamwork, which is a key factor in guaranteeing the functionality of an integrated management style, these are (Lencioni, 2016, p. 76):

- cooperation, working together towards a common goal,
- cooperation, helping each other,
- co-partnership,
- the possibility of combining specialties,
- collective responsibility for performing a task.

In light of the above findings teamwork is characterised by numerous advantages and benefits, which can be considered strengths. There are also a number of limitations associated with this form of work, which negatively affect the effectiveness of teamwork and sometimes may even make this work impossible, leading to the break-up of the team, which should be called weaknesses. Both strengths and weaknesses of teamwork are presented in Table 2.

**Table 2.**  
*Strengths and weaknesses of teamwork*

Weaknesses of teamwork	Strengths of teamwork
<ul style="list-style-type: none"> <li>• the danger of placing personal goals and intentions above primary goals, team members may priorities their own goals over those of the team in order to gain advantage,</li> <li>• striving to maintain one's own distinctiveness - the individual seeks to present their own distinctiveness,</li> <li>• domination by an individual - especially by a stronger, more attractive individual, even if he or she has less analytical skills than others, this individual may end up having the greatest influence on the final decision,</li> <li>• the phenomenon of minority suppression - there are times when those with a different opinion than the majority are ignored and mistreated,</li> <li>• longer decision-making time - decisions made by a team take more time than if made by an individual, in addition, as the time required to make a decision increase, so do the costs,</li> <li>• lack or excess of leaders - a disadvantage can be the lack of a person to coordinate all the work of the team, to ensure that tasks are carried out, as well as too many such people,</li> <li>• the need to plan - there are many things that need to be planned in order for the team to work successfully, such as the time and place of meetings, and which involve an investment of time and money,</li> <li>• chaos - the danger of confusion if team members discuss different issues at the same time.</li> </ul>	<ul style="list-style-type: none"> <li>• team members are motivated to act, teamwork produces better results than individual work. There is a synergy effect of teamwork, which is a combination of cooperation and synchronisation,</li> <li>• productivity increases,</li> <li>• job satisfaction increases, as team members can perform tasks that are suitable for them,</li> <li>• there is a lower sense of dependence on the supervisor,</li> <li>• team integration increases, the group becomes a whole and jointly takes care of the interest of the whole,</li> <li>• there is less turnover, thus reducing the costs associated with it, faster information flow,</li> <li>• there is a more favourable division of labour, a common pace of work,</li> <li>• barriers related to individual attitudes are overcome,</li> <li>• self-control is activated,</li> <li>• communication increases, thanks to a faster flow of information,</li> <li>• the need to belong to a group is fulfilled,</li> <li>• it is less painful to feel failure, because failure is spread over the whole team,</li> <li>• there is an opportunity to share ideas and select the best ones,</li> <li>• there is a higher quality of work,</li> <li>• team members motivate each other,</li> <li>• accidental errors are less frequent.</li> </ul>

Source: own elaboration based on: Stracke et al., 2013, p. 6; Kisielnicki, 2011, p. 226.

In conclusion, in the perspective of the whole of the above reflection, the following overarching regularity becomes apparent. The division of management styles in the simplest terms adopts a two-dimensional structure, in which one direction is defined by the supervisor's strongly goal-oriented action and the other by people-oriented behavior (Penc, 2005).

## 5. Summary

Summing up the research in Department X - in the light of Blake's concept and Mouton - it should be considered successful in determining the key management style in the surveyed team. It clearly confirms that the key to achieving harmony in teamwork at the Department is to simultaneously direct the management style towards people and towards tasks. In this perspective, managers should focus on activities improving the organization so as to focus management both on the areas of deprivation (needs) and on the services that the

researched team performs in everyday work. They were able to make such choices that will determine the team to approach ideal attitudes and behaviors.

Equally important in this context is management interpreted in a radically functional way as maintaining a balance between the organization and its environment and between all its subsystems. Maintaining balance in the organization's relations with the environment consists in providing it with appropriate supplies that will allow the organization to maintain its separateness and integrity in this environment (in other words - survive) and the ability to formulate goals and its own strategy, as well as the ability to implement them (Bielski, 1997). The overriding goal of management and its measure of quality is the survival of the organization and its adaptation to the environment (Obłój, 1987).

The relations indicated above reveal another important regularity. The researched management styles can determine the success or failure of the researched organization. The disclosed management style indicates the market success of the researched team. For this reason alone, it is worth deepening the knowledge related not only to the surveyed leaders who are part of organization X, but also from the perspective of its other employees.

In the light of the above content and the described regularities, processes and dependencies, it is worth remembering the words of Konosuke Matsushita – a Japanese expert in management science – in whose opinion, in a globalized and internationalized economy, it is necessary to optimally extract every bit of intelligence of each employee (Matsushita, 2000).

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## Appendix

Variant I - the most common way of acting or thinking

### 1. Execution of tasks:

- A. I am thoroughly informed about the progress of each employee's work and regularly summarize the performance of tasks with subordinates.
- B. I rarely intervene. I believe it's better to leave people to solve their problems at work on their own.
- C. I make sure that everything is going well and that no one is missing anything.
- D. I am up to date with the essentials. If necessary, I discuss goals and implementation plans with stakeholders.
- E. I keep a close eye on my co-workers.

### 2. Decisions:

- A. I make my own decisions, because the role of the boss is to lead and take responsibility.
- B. I try to ensure that my decisions are in line with the ideas of my superiors.
- C. I gather my selected collaborators and together we analyze what needs to be decided.
- D. I meet with each of the interested parties separately to find out their opinion. Then I make a decision and explain it.
- E. I try to "sell" my decisions to my colleagues so that they will accept them.

### 3. In case of violation of the rules:

- A. Uniform rules are necessary for proper functioning. If someone does not follow them, it should be made clear that they must be respected.
- B. If a rule is broken, it is better to close your eyes; many rules are made to be broken.
- C. The rules should be reminded only in important cases; rules are guides, too rigid a control would cause them to fall apart.
- D. Rules must be respected and employees must understand that they are in the general interest.
- E. When a violation of a rule occurs, discusses it with stakeholders to find reasons and determine whether or not there is a need to change the rule.

### 4. If a subordinate questions a manager's decision:

- A. I'm explaining my decision again to make sure it's right understood. If my co-worker still persists, I explain to him that he should do it, even if the decision seems wrong to him.
- B. I tell the worker: "It's an order: I know better what to do, please do what I recommended."



- C. I repeat my decision. If it's still being discussed, I say, "Okay, you can do what you want.
  - D. I am suspending the decision to avoid unnecessary confusion.
  - E. I give reasons for my decision, explaining those points that may not have been known. I will then become acquainted with new facts that could possibly lead me to change my mind.
5. At the request of the management, I have to revoke the decisions made:
- A. I don't think this change is beneficial. I have fought this notion, but no my objection was taken into account.
  - B. The decision has been postponed because... Let's try to use the experience gained to make decisions in the future.
  - C. That's how we're going to proceed. I had to make a change because...
  - D. Here are the new instructions. Now we will proceed like this.
  - E. Once again they changed their minds. Here are their new instructions.
6. My Own Superior:
- A. I believe I share responsibility with my boss. We are a team.
  - B. I want to get results with minimum friction. I expect my boss to be realistic. I report to him when something unusual happens.
  - C. I try to emphasize the good atmosphere of my team. My relationship with my boss must be cordial: he must understand that we will not be more productive without internal friction.
  - D. The less I see him, the better I feel. I prepare all reports and statements on time.
  - E. I try to let my results speak for me. I want my boss to leave me free to act as long as everything is going well.
7. Conflicts between subordinates:
- A. I bring them all together and we try to find a solution through discussion: conflicts must be faced.
  - B. Conflicts are unacceptable: they must be fought with all determination.
  - C. It's best to let employees handle their own affairs.
  - D. I meet with them and calm the "hot heads" by convincing them that it's not that important.
  - E. I split the sides, I talk to them to convince them that they are wrong. I look for the best compromise and let them know that arguing can be harmful to everyone.

8. To motivate employees:

- A. It is best to stimulate effort and enthusiasm by telling employees that they must serve the company by allowing them to work in peace.
- B. People prefer to take positions that require little thought and little responsibility.
- C. Most employees value a balance between performance demands and the ability not to be overly concerned about it.
- D. To keep coworkers interested in the job, give them the opportunity to make decisions for which they feel responsible.
- E. For most of my subordinates, it is more important how much they earn than what they do.

9. A holistic command concept:

- A. Be fair but steadfast. Establish a high level of satisfaction among team members. Watch over a good friendly atmosphere. Don't require too much work.
- B. Maintain a high level of satisfaction among team members. Watch over a good friendly atmosphere. Don't require too much work.
- C. Anticipate goals with an increased degree of difficulty, reward individuals who achieve these goals, and pay attention and admonish others. Organize, coordinate and control work so that employees do not reduce work efficiency.
- D. Meticulously deliver instructions. Give tasks to employees and give them a free hand. Prepare reports on the implementation of tasks.

Variant II - substitute (sets of questions as above)

## MOTIVATION OF STUDENTS FOR REMOTE LEARNING ON THE EXAMPLE OF FRENCH LANGUAGE CLASSES AND THE ROLE OF THE STATE IN DISTANCE EDUCATION

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**Purpose:** The most important goal of the article is to present the results of a study on the motivation to learn French among students of Romance philology and to indicate the role the state should play in implementing appropriate solutions that will improve distance education.

**Design/methodology/approach:** A survey method was used to collect empirical material among students. A survey questionnaire was used in the study.

**Findings:** Motivation affects our efficiency, concentration and memory. Regardless of the form of learning, we should look for appropriate motivators that will make it easier for us to acquire knowledge and thus achieve our goal. However, the aspect of distance education discussed in the article is closely related to the role of the state, which plays an important element in the entire learning process.

**Practical implications:** Adapting the education plan to the existing situation, as well as to the students' abilities, and monitoring the teaching process by the teacher. It is also extremely important for the teacher to stimulate his or her motivation, which has an impact on the learner's motivation. The variety of exercises that make the remote lesson more attractive also turns out to be crucial. On the other hand, it is necessary to support the lecturers themselves by organizing training, workshops and courses for them to acquire/expand technical and IT skills or to acquire knowledge adequate to the existing remote working conditions. As the study shows, the provision of broadly understood psychological assistance by specialists also plays an important role in the discussed issue of distance learning.

**Social implications:** Drawing the respondents' attention to the need to establish and maintain direct interpersonal contacts. Moreover, realizing the important role the state plays in providing the infrastructure necessary for distance education, and thus in counteracting the phenomenon of digital exclusion among students and lecturers, as well as in ensuring safety against threats - cybersecurity.

**Originality/value:** The article is addressed to lecturers, teachers and state authorities. Difficulties faced by students during distance learning and proposals to increase their motivation were presented.

**Keywords:** motivation, motivating, emotions, role of the state, remote education.

**Category of paper:** Research paper.

## 1. Introduction

“The ability to learn gives you an edge in life”

*Brown, Roediger, McDaniel (2016, p. 14)*

Motivation is a concept with many different meanings, but most often it is defined as a state of human readiness to take a specific action. Motivation to learn can be defined as a state or factor that makes us want to learn and acquire new knowledge. Motivation to learn combined with the right learning methods guarantees lasting success.

The purpose of this article is to reflect on the issue of students' motivation to learn during remote education and the role of the state in this process.

Learning a foreign language remotely can be difficult and require a lot of motivation. Therefore, it was decided to examine Romance philology students and check what factors influence their motivation as well as whether distance learning causes them stress. Collaboration with other learners and your lecturer is very important and can help you overcome isolation and nausea, as well as gain support and feedback. The originality of the considerations is created by the combination of developing motivation to learn a foreign language among students remotely, emphasizing the mission of the lecturer and the role that the state should play in providing help and support.

During the study, attempts were made to obtain answers to the following research questions: What are the effects of remote learning compared to stationary learning? What are the preferred forms of work in language classes that students miss the most in remote learning? What is the relationship between the level of acquired knowledge and the lack of interpersonal contacts in the class group? What is the level of satisfaction with remote classes? What is the level of motivation for language learning remotely in relation to learning in the traditional mode, i.e. stationary?

Research hypotheses were also developed:

H1: Learning a language is more effective in the stationary form and brings better results than teaching remotely.

H2: Direct contact of students with groups and the teacher has a great impact on the level of knowledge acquisition.

H3: Students feel greater satisfaction from learning a language on a full-time basis, which also translates into their greater motivation to learn.

H4: During distance learning, students have problems with proper time management due to the great freedom/independence in managing their time.

H5: The level of perceived stress during on-site or remote classes is comparable and is closely related to the personality of each student.

The study was also aimed at checking the level of stress and coping with time management during remote learning.

At the end, the most important conclusions and recommendations resulting from the analyzed topic are presented.

## **2. The role of the state in distance education**

The role of the state in remote education is a very important topic, which we could experience especially during the Covid-19 pandemic. The state should support distance education by providing appropriate technological infrastructure, tools and platforms for distance learning, financing educational projects and programs, promoting cooperation between domestic and foreign universities, and ensuring the quality and availability of teaching materials.

Poland's accession to the European Union resulted in the need to adapt the Polish educational system to the European system. The European Union has always cared about education issues and its desire was to build an information society, the so-called knowledge society. A significant step was the provisions of the Maastricht Treaty (February 7, 1992), where Article 126 referred to the issue of education for the first time, and moreover, to remote education. The article contains the following provision: "(...) The community should cooperate in order to create a high-quality educational system by supporting and animating cooperation between members (...) The aim of the community's activities is: (...) - encouraging the development of distance learning" (Różewski, Kusztna, Zaikin, 2023, p. 16). As society enters the globalization zone, the entire system and educational organizations need a new way of operating, and thus a mission and its implementation (Różewski, Kusztna, Zaikin, 2023, p. 12).

"Open and Distance Learning is a concept of teaching organization in European Union universities. Its basic idea was presented in the Bologna Declaration. The implementation of each concept regarding a new way of organizing the functioning of the social system requires a precise analysis of the structure of the future system as an object of management" (Różewski, Kusztna, Zaikin, 2023, p. 12). In Poland, legal regulations regarding distance learning can be found in the Act on the Education System, the Act - Law on Higher Education and the Regulation of the Minister of Science and with universities, student organizations, academic teachers and other stakeholders to ensure an effective and fair system of remote education.

## E-learning in education

Distance learning has many advantages, such as work flexibility and time saving and money, but also many disadvantages, among which the lack of contact with other students and lecturers, technical and organizational problems, low quality of teaching materials or lack of support from lecturers should be distinguished. Many students emphasize weaker motivation to learn (Table 1).

**Table 1.**

*Selected advantages and disadvantages of distance learning*

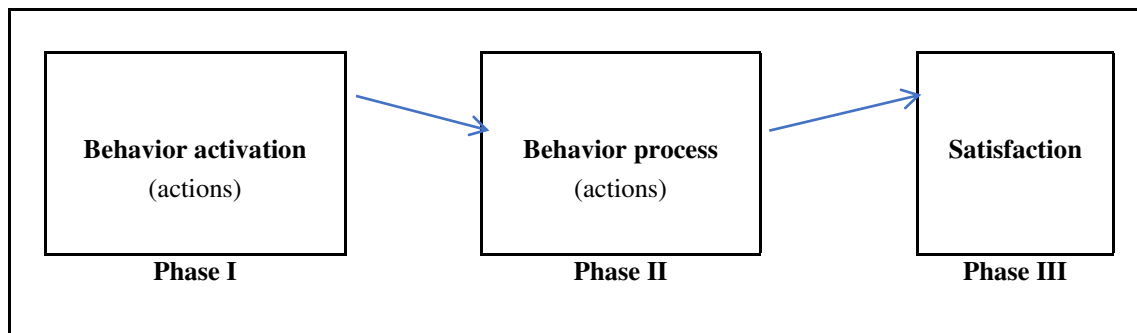
<b>Advantages</b>	<b>Defects</b>
Availability of learning regardless of time and space constraints.	Lack of sufficient technological facilities that do not keep up with the needs and expectations of training participants.
Individualization of learning pace.	No "live" teacher-student contact.
Efficiency of the educational process.	Shortage of properly prepared teaching staff.
Lower learning costs (no obligation to accommodate, travel, etc.).	In some countries, there are still no regulations allowing the recognition of diplomas obtained in the process of distance education as a formal confirmation of the acquired qualifications.

Source: Distance learning in selected European countries, [https://orka.sejm.gov.pl/WydBAS.nsf/0/E44171B2451A3C20C12585F4003EF0FD/\\$file/4.1\\_Organizacja%20pracy%20szko%C5%82y.pdf](https://orka.sejm.gov.pl/WydBAS.nsf/0/E44171B2451A3C20C12585F4003EF0FD/$file/4.1_Organizacja%20pracy%20szko%C5%82y.pdf), p. 515. DOI: <https://doi.org/10.31268/d.dziewulak.2020.01>.

Research on education during the Covid-19 pandemic points to a significant increase in the use of digital solutions by teachers at all levels of education. This form of teaching is not only a challenge for students, but also for lecturers who should not only find themselves in the new reality, but also be creative in creating curricula while supporting and motivating students to learn.

## 3. Motivation

Motivation is at the heart of success in the learning process. Motivation to learn determines the readiness of an individual to direct his/her activity and conduct towards the reception of knowledge and maintaining this attitude at the right intensity for a certain period of time (Müller, 2004, p. 76). For psychologists, motivation is the orientation of views and the need to perform a specific action (Myers, 2005, p. 497). Motivation refers to factors explaining the totality of reasons and needs used in an activity (e.g. online self-education) that activate, determine or regulate individual behavior (Dassler, 2004, p. 97).



**Figure 1.** Phases of motivation.

Source: Król, Ludwiński, 2014, p. 318.

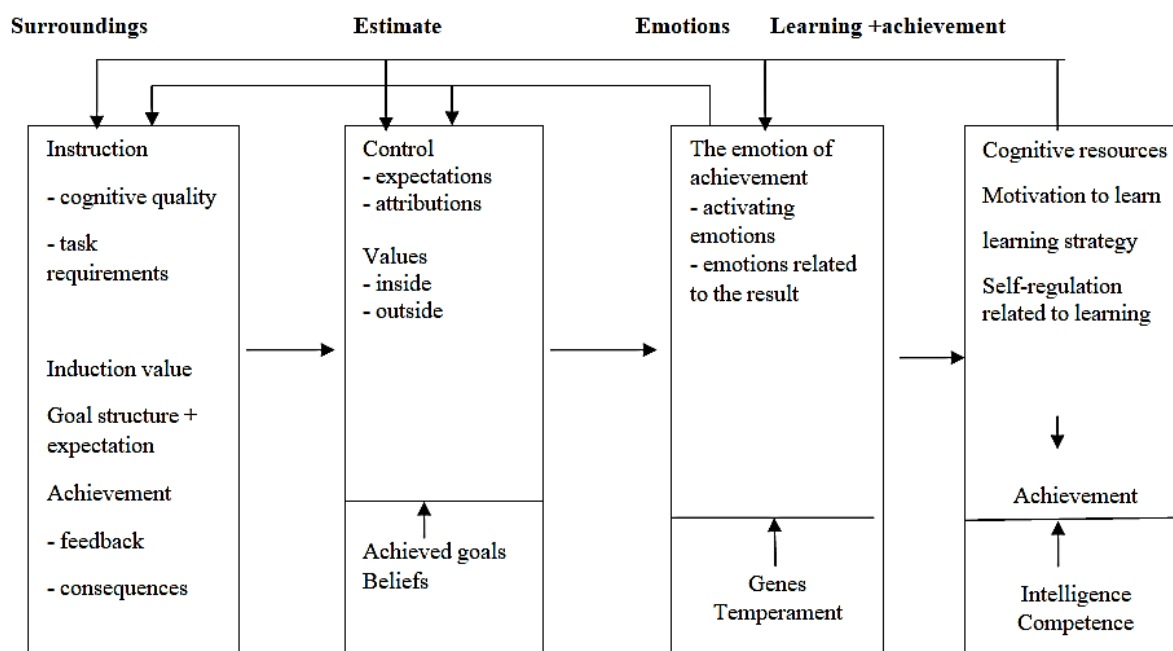
Motivation consists of three phases, which are presented in Figure 1. The first factor is the so-called "motivation", it triggers readiness to act, i.e. it triggers certain behaviors. Then a choice is made, a certain way of behavior that is to lead to the effect - the result (phase II). In the last, third phase, there is satisfaction or lack of it. This is of course a very simplified scheme of motivation, but it illustrates it in a very clear way.

According to Professor Zimbardo, "Motives are internal dispositions to behave in a certain way, although they are influenced by various factors, both internal and external" (Zimbardo, 2017, p. 5). Many of our motives are a combination of biological and psychological needs. External motivation includes external stimuli provoking the body to action - for students, grades are one of the strongest external motivators, for working people, money can be such an incentive (Zimbardo, 2017, p. 7).

There are huge deposits of motives in man, located in his consciousness. According to Professor Szuman (1959, pp. 145–158), the ease or difficulty of learning motivation is based on the four-factor theory of development and depends on:

1. our capabilities and properties - they have a genetic basis,
2. our activities change with age,
3. the environment in which we live, which affects us and to which we adapt,
4. how we are brought up and how and what we learn.

Our motives to act depend on the interaction of the factors mentioned above and on the learning process. Describing the mechanisms of shaping motivational behaviors in terms of achievements, the role of emotions should also be emphasized. So the question arises, what are emotions? Generally speaking, it is a subjective mental state - a state of some kind of displacement, disturbance, regardless of its source. Many studies show a significant relationship between emotions with achievements. Examples of such emotions include: curiosity, anxiety, shame, anger, boredom, or generally positive or negative affect. It is important to be able to assess which emotions play a special role in understanding achievement motivation (Gasiul, 2018, p. 262). Figure 2 illustrates the theory of value control through achievement emotions.



**Figure 2.** The theory of value control by the emotions associated with achievements.

Source: Gasiul, 2018, p. 264.

Achievement motivation requires consideration of many explanatory variables. In general, it can be said that the final criterion and the basis for explaining the motivation of achievements are simply the so-called “I” motifs (Gasiul, 2018, p. 264).

Achievement motivation is related to our desires, values and goals, as well as our perception of our own capabilities and risk of failure (openstax.org). Achievement motivation can have various sources and manifestations. Some of them include: striving for perfection, i.e. using all one's abilities and skills, striving for prestige, recognition - climbing the social ladder or striving to show one's advantage, dominance, constantly comparing oneself with others.

To sum up, motivation depends on many factors, and above all on individual needs and goals we are aiming at. Speaking of motivation, let's never forget about the emotions that accompany it.

## 4. Empirical research

### 4.1. Research tool

The survey method was used to collect empirical material among students. The study used a questionnaire containing 10 questions. The study was conducted among students who participated in classes conducted remotely using the MS Teams platform for three semesters and who started studying Romance philology in the academic year 2019/2020.

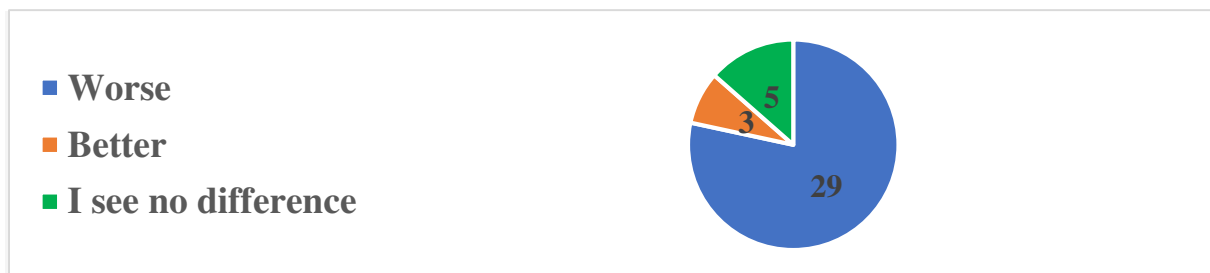


## 4.2. Study participants

The study was conducted on a group of 37 students of the second year of Romance philology full-time undergraduate studies at the Pedagogical University of Krakow. It concerned learning French as part of Practical French classes conducted remotely. The students covered by the study study this subject 6 hours a week, which gives 180 hours a year. Classes are conducted at B2 level. The respondents, apart from French as the leading language, indicated the simultaneous learning of other foreign languages: English (17 people), Spanish (7 people) and Italian (3 people). The respondents included 32 women and 5 men.

## 4.3. The research results

The essence of the study was to collect information on foreign language education in virtual reality from the learner's perspective. It mainly concerned classes in practical learning of French, which were conversational in nature and shaped all language competences in a comprehensive way.

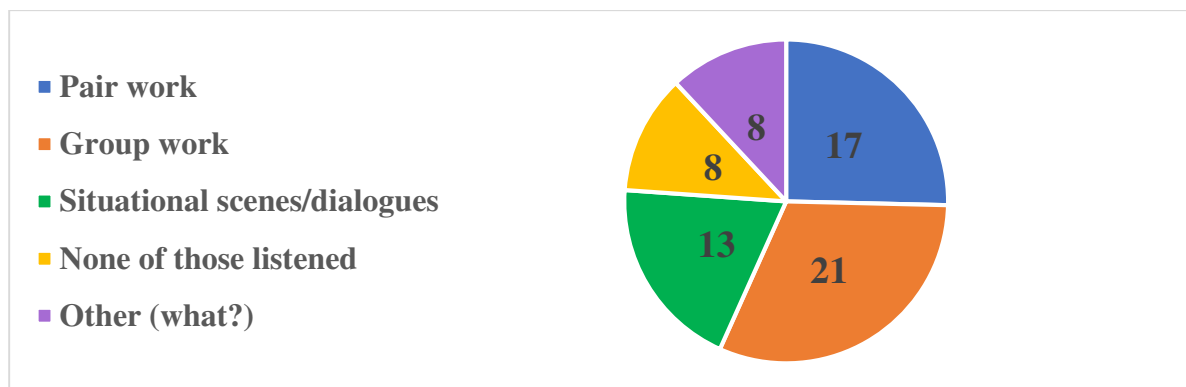


**Figure 1.** The level of effectiveness of remote language learning compared to stationary learning.

Source: own study.

The opening question of the survey was: "What are the effects, in your opinion, of remote learning compared to stationary learning?". The answers received here allow us to observe that for 78% of the respondents, remote learning brings worse results than stationary learning. 8% of respondents hold the opposite opinion, while 14% of respondents see no difference in this regard. The significant decrease in the effectiveness of learning knowledge in remote learning, emphasized by students, will also be confirmed in the answers given to the questions that will be quoted and discussed below.

At the same time, the hypothesis was confirmed H1: Learning a language is more effective in the stationary form and brings better results than teaching remotely.

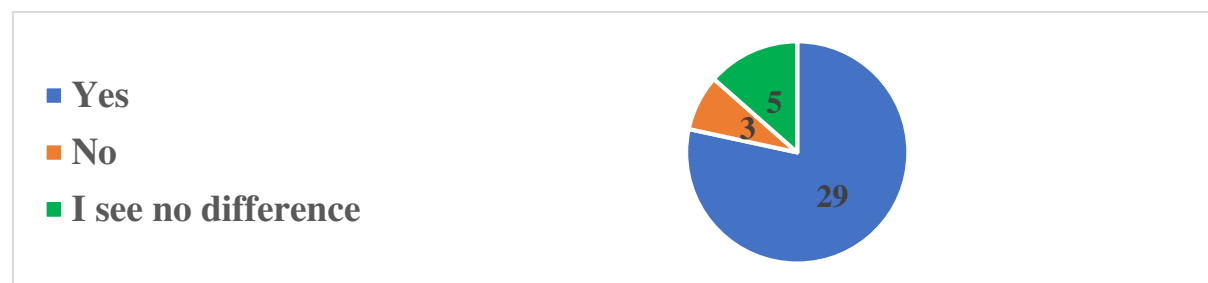


**Figure 2.** Forms of work preferred by students, which they miss the most in remote learning in PNJF classes.

Source: own study.

Looking at the evaluation of the forms of work in PNJF classes favored by students of Romance studies, it should be stated that group work is one of those that they miss the most due to the introduction of remote classes (56%). The next are: work in pairs (45%) and role-plays/situational dialogues (35%). Among those not mentioned by the interviewee, and indicated by the respondents as "other", the answer "written papers" is repeated. This state of affairs allows us to see how important it is for students in language education to develop communication skills, while improving speaking, listening, understanding, memorizing or learning from each other, interacting, discussing, negotiating (Brown, 2001; Ortega, 2007). Similar conclusions can be drawn referring to the question: "Does the lack of direct interpersonal contacts within the PNJF class group affect the level of knowledge acquired by you?".

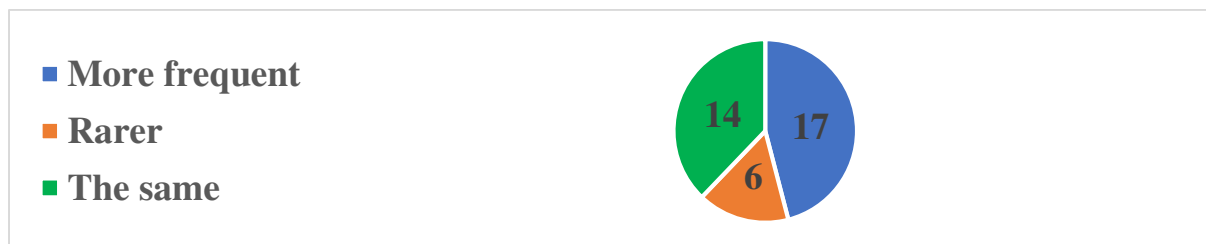
The chart below shows that for 78% of all respondents, the lack of direct interpersonal contacts has an impact on the level of knowledge acquired by them. Those who do not notice a difference in this process account for 14%, while for 8% of those interested, such a relationship does not matter. However, it should be emphasized that peer relations, in addition to the teacher-student relationship, affect the quality of education, becoming its key component (Pyżalski, 2020, p. 117). Thus, these relations become present in the educational space.



**Figure 3.** Relationship between the level of acquired knowledge and the lack of interpersonal contacts in the PNJF class group.

Source: own study.

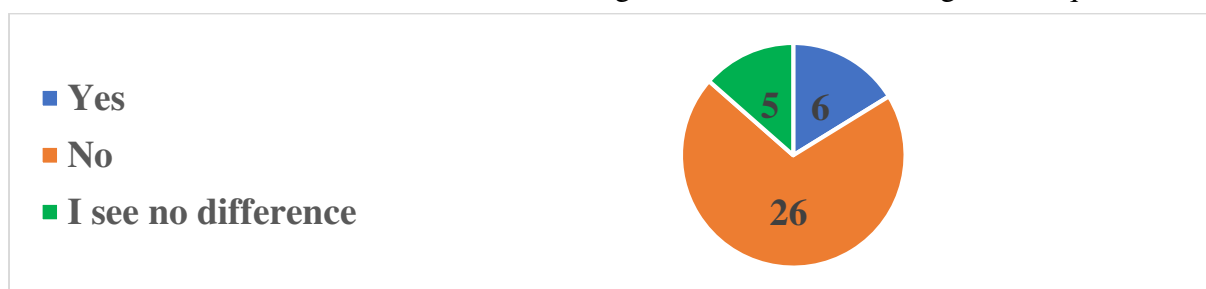
The hypothesis was confirmed H2: Direct contact of students with groups and the teacher has a great impact on the level of knowledge acquisition.



**Figure 4.** Peer help and distance learning.

Source: own study.

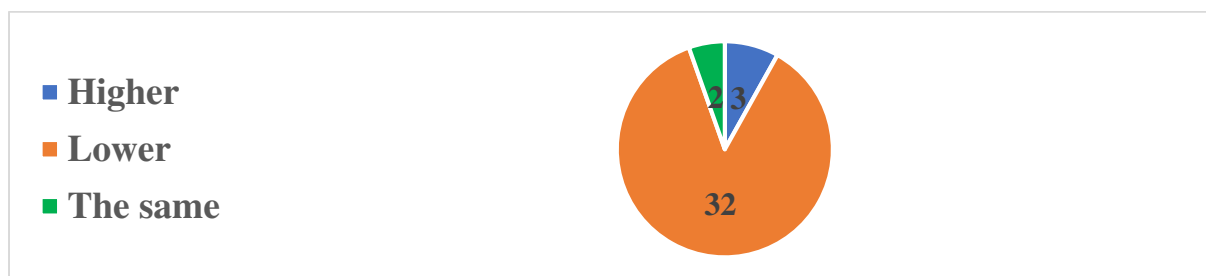
Citing further data, this time on peer support during remote education, the surveyed students note that in the realities of online learning, the use of peer support is more common compared to face-to-face learning, which is indicated by 46% of respondents. For comparison, 38% of them use such support just as often, and only 16% say that they do it less often. This situation may be caused by more frequent difficulties related to the correct understanding of the content transmitted via links, the student's sense of being lost or his lack of courage to ask questions.



**Figure 5.** The level of satisfaction resulting from the implementation of classes in a remote form.

Source: own study.

Referring to another issue identified in the survey, i.e. the level of satisfaction resulting from the implementation of classes remotely, it should be noted that in the opinion of 70% of future Roman scholars, remote learning does not bring the same satisfaction as stationary learning, while for 16% of them online education is as rewarding as face-to-face. The difference is not noticed by 5 people (14%).



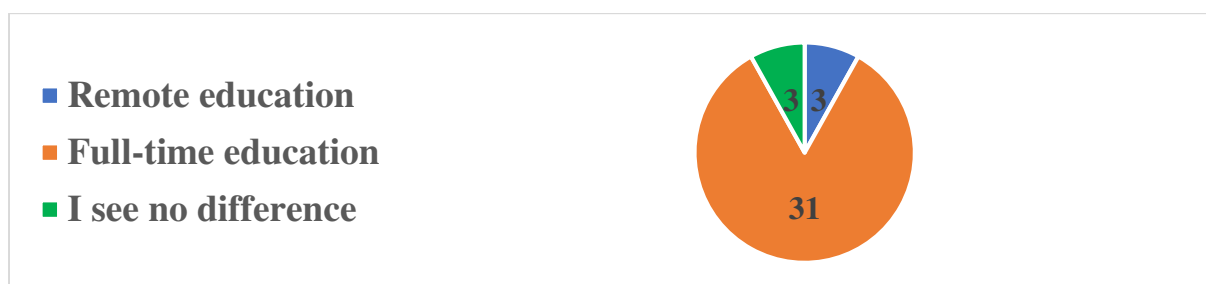
**Figure 6.** Comparison of the level of motivation for language learning remotely vs. Stationary.

Source: own study.

We are able to draw similar conclusions by looking at the answers given to the question: "What is your level of motivation to learn a language remotely in relation to learning in a traditional mode, i.e. stationary?". The graph above illustrates that the overwhelming majority of people (86%) state that the level of motivation for language learning remotely is lower than learning in the traditional mode. Few students observed a higher level of motivation to learn the language in a new form and these are 3 people (8%). The same level of motivation for both forms of learning is declared by 5% of the respondents.

As the study proves, also the stationary form of classes disciplined the students asked to prepare themselves and actively participate in PNJF classes to a greater extent (83%). Those who sympathized with remote education in this respect and those who do not see the difference in this regard account for exactly 8%.

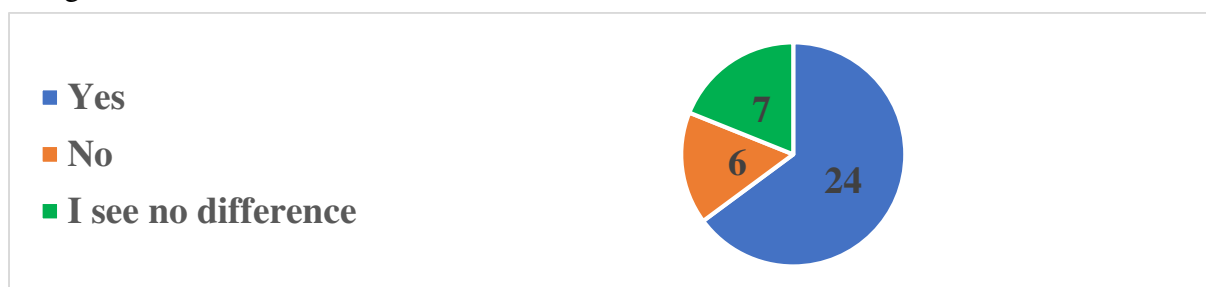
The above answers confirm the hypothesis H3: Students feel greater satisfaction from learning a language on a full-time basis, which also translates into their greater motivation to learn.



**Figure 7.** The level of discipline to prepare and actively participate in PNJF classes.

Source: own study.

Such results may be the result of, for example, the compulsion to stay in isolation, staying in one place all the time, lack of direct communication with other people or tiredness and weariness resulting from working for long hours, weeks and finally months in front of a computer screen. Organizational difficulties, which are presented in the chart below, may also be significant.



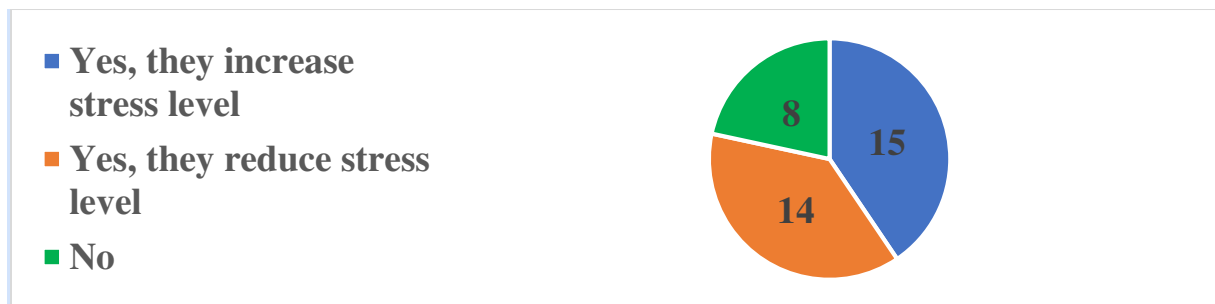
**Figure 8.** The level of difficulty regarding the time spent on independent work.

Source: own study.

Although remote education may be conducive to, for example, self-management of time dedicated to learning or independent work, future Romanists, when asked "has remote teaching caused you difficulties with the proper organization of time for independent work?" indicated,

in the majority, problems with the proper management of educational duties (64%). Only 16% of respondents did not experience such problems, and 18% of them did not notice any changes in this matter. As a consequence, the often mentioned benefits of remote learning, which include greater autonomy and flexibility of work, increased self-control or a largely personalized rhythm of professional activity, are not reflected in the majority of respondents.

At the same time, the hypothesis was confirmed H4: During distance learning, students have problems with proper time management due to the great freedom/independence in managing their time.

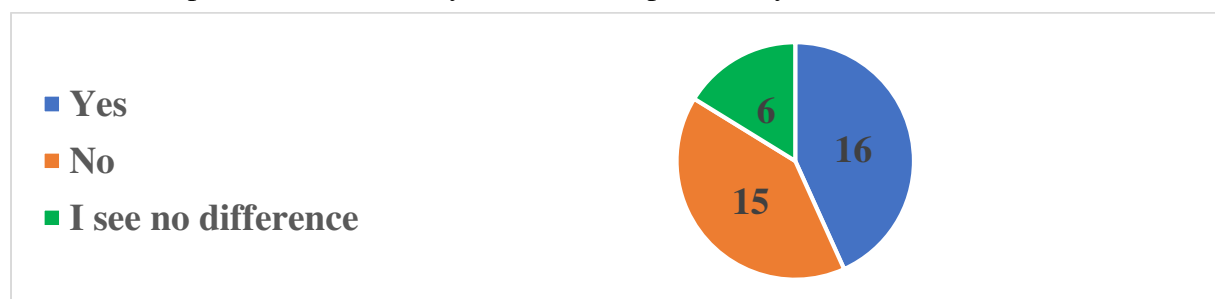


**Figure 9.** Influence of classes conducted remotely on the level of stress.

Source: own study.

Participants of the study, when asked whether "PNJF classes conducted remotely have an impact on the level of stress you feel?" declare that the vast majority of classes conducted remotely have an impact on the level of stress they feel, with 15 people (41%) of the opinion that this level has increased, and 14 people (38%) of the opinion that this level has decreased reduction. According to 8 respondents (22% - No), remote classes do not affect the level of stress they feel in any way. It should therefore be stated that students, regardless of the form of classes, are exposed to stress and related tensions related to university education itself (exams, credits, contact with lecturers, etc.). The answer refers to the previously mentioned emotions, the personality of each student. As in the case of emotions, when analyzing motivation, it is worth considering its four levels, i.e. predispositions, dispositions, states and processes.

The hypothesis was confirmed H5: The level of perceived stress during on-site or remote classes is comparable and is closely related to the personality of each student.



**Figure 10.** Comparison of the level of concentration in both forms of learning.

Source: own study.

When analyzing the impact of distance learning on the level of concentration of students during classes, it can be noted that there is a slight difference between those for whom this level increased (16 people (Yes) - 43%) and those for whom the level of this concentration is lower (15 people (No) - 41%). The difference in the level of concentration in relation to both forms of classes is not noticed by 6 respondents (16%).

The impact of distance learning on the level of student concentration may therefore depend on many individual and situational factors, such as personality, learning style, preferences, goals, expectations, home environment, quality of educational materials and methods, and availability of support and communication.

## 5. Summary

The conducted survey and analysis of the literature on the subject allowed to draw conclusions and present them in the form of recommendations:

1. The education plan should be adapted to the existing situation and the abilities of learners/students. Remote learning, and thus the student's work (learning, knowledge acquisition) should be adapted not only in terms of content, but also based on setting new goals and priorities in terms of learning outcomes. It should be remembered that the new requirements should be realistic and adapted to the students' abilities.
2. The lecturer should monitor the didactic process - follow the progress in acquiring the knowledge and competences of their students. The exchange of observations - a dialogue between the lecturer and the student - is very important. On this basis, you can react - modify the course of the education process and thus improve its quality.
3. Lecturer's motivation and attitude influence students' motivation. You can say that they are connected vessels.
4. With regard to the language, the form of study is also of great importance. According to the study, students are more motivated to learn the language in the traditional form, i.e. stationary. Direct contact with the teacher facilitates communication and building relationships with the group. Stationary reality also causes greater discipline in learning among students. At this point, it is worth considering how the lecturer can increase the level of student engagement during remote work. Certainly, the variety of activities, exercises and encouragement used by the teacher will change the attitude of the participants.

5. The support of lecturers - academic staff through training tailored to individual needs (technical and IT related, for example, to the use of distance learning programs, as well as soft skills) is also important. The lecturer himself faces the challenge of remote work. At the same time, he should be a mentor and support for the recipients of this learning process.
6. Providing broadly understood psychological assistance by specialists also plays an important role in the discussed issue of distance education. As for the teacher, it is crucial for him to pay attention to the emotional sphere of students, to show them support and understanding. Conversation and vigilance, which is difficult in remote education, are important and valuable. We should also think about more training, workshops, courses that will allow the teacher to acquire new knowledge adequate to the existing conditions and equip him with the appropriate tools for action.
7. Providing the infrastructure necessary for remote education and counteracting the phenomenon of digital exclusion not only among students, but also among lecturers revives on the occasion of e-learning. Remote education requires the guarantee of appropriate technical facilities (equipment/devices or Internet connection). In this case, the role of the institutions, and thus the state, is to ensure that all participants in such a learning process can work without interruptions. The state also has the obligation to ensure security against threats - cyber security.

It cannot be unequivocally stated that due to remote education, the entire generation that has to face remote teaching during the pandemic is at a loss Covid-19. It is necessary to take into account the individual characteristics of students, pupils, environment, where they are brought up. Parents and teachers also play important roles in this process.

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## HIGH FOOD QUALITY BY CONSUMERS IN THREE TIME FRAMES – BEFORE, DURING AND AFTER THE COVID-19 PANDEMIC

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**Purpose:** The aim of this study was to check how the COVID-19 pandemic influenced the perception of the high quality of food products.

**Design/methodology/approach:** The research process consisted of the following stages: developing research methodology, consultation of the research tool, sample selection, implementation of the measuring phase of the survey; developing a statistical report; elaboration of a final report. The research was made by a professional company operating in quantitative research method. Information on the assumed scope of the study was obtained through the use of a tool - a quantitative questionnaire. The questionnaire was built of closed-typed questions. The sample consisted of 2000 people selected taking into account the place of residence (region), gender and age.

**Findings:** The global crises observed in the recent horizon, including the crisis caused by the COVID-19 Pandemic, are changing our reality while becoming a source of stress for many people around the world. Due to the restrictions introduced for many of us, obvious shopping behaviour, i.e. access to shops, restaurants, etc. They are becoming more difficult and sometimes even impossible. According to studies carried out, the taste of food has gained importance as an indicator of high food quality. Still (before, during and after the pandemic), the three most popular characteristics of high-quality food are: no food additives, organically grown ingredients, HACCP/ISO 22000 information, and product branding has lost importance and given way to taste. However, after the COVID-19 pandemic, the importance of HACCP/ISO 22000 information increased, demonstrating the importance of the role of hygiene, food safety and the need for information that consumers can trust.

**Research limitations:** Research limitations result from the analysis of a purposively selected case (food market in Poland), which does not allow general conclusions to be formulated. Nevertheless, the article refers to the perception of food quality on the territory of the whole country.

**Practical implications:** Our findings should be of interest to decision-makers responsible for shaping the quality of food produced, especially if they want to maintain a competitive advantage in the food market by including customer orientation in their strategies.

**Originality/value:** This is the first article to present the results of a study on the impact of the crisis on consumers' perceptions of quality food products considering three time perspectives: before, during and after the COVID-19 pandemic.

**Keywords:** Food, food quality, consumers, consumer behavior, COVID-19.

**Category of the paper:** Research and review publication.

## 1. Introduction

The Covid-19 pandemic has changed the world around us and influenced many aspects of our lives including food choices and behavior of consumers (Ammann et al., 2022; Meiselman, 2022). As WHO reports COVID-19 is the disease caused by a new coronavirus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China<sup>1</sup> Covid-19 can easily spread when an infected person coughs, sneezes or talks. You can also get infected if you touch anything that has been sprayed with the carrier's respiratory droplets and then touch your face – your nose, eyes, ears and mouth (<https://www.gov.pl/web/coronavirus/general-information>). On the 11<sup>th</sup> March 2020 the World Health Organization (WHO) declared COVID-19 as a pandemic<sup>2</sup>. The first case of COVID-19 in Poland is dated on the 4<sup>th</sup> of March 2020. On the 12<sup>th</sup> March 2020, epidemiological threat was announced in Poland. Many restriction were implemented to avoid the spread of COVID-19 such as: wearing masks, keeping the distance, disinfections, limitation of the contacts with other people, where applicable working at home. The total number of infections from the beginning of the pandemic in Poland is 6 496 176 (on 31<sup>st</sup> of March 2023, information from the Polish Ministry of Health)<sup>3</sup>. The highest number of daily infections in Poland was on the 27<sup>th</sup> of January 2022 and it was 57659 infections daily.

The COVID-19 pandemic has been a part of our lives and changed our interactions with other people, frequency of travelling, food consumption and food choice. The pandemic has many consequences such as: job losses, shutdown of the regular patterns of social interaction, lower trust in institutions (Vabova et al., 2021; Scapatucci et al., 2022; AlTarrach et al., 2021). The pandemic has become an element of our everyday life to such an extent that we are talking about the world before and during (after) the pandemic.

The aim of this study was to check how the COVID-19 pandemic influenced the perception of the high quality of food products. The pandemic, restrictions, fear and lack of safety influenced consumers behavior so the perception of high food quality, too. The indications of

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<sup>1</sup> <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19>.

<sup>2</sup> <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.

<sup>3</sup> <https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2>.

the high food quality before, during and after the pandemic in Poland are being discussed. Due to the fact that the pandemic is also the source of stress and insecurity, PSS (Perceived Stress Scale) scale was used to assess the level of consumers stress and then to check if it influenced the way they perceived the high food quality. Although the relationship between the perceived stress and the perception of food quality hasn't been checked yet, many authors declare the influence of the stress on the structure of consumption, i.e. the higher stress influences the lower consumption of fruits and vegetables, and the higher consumption of fast food or 5-40% of people increase their food intake when experiencing stress, whilst the remaining proportion either decrease or do not change their food intake in response to stress (Yang et al., 2022; Hill et al., 2022). The next characteristics that may differentiate the perception of high food quality may be the level of trust as it also influences our decisions.

## **2. Consumer behavior in the food market - before and after the pandemic**

Globalisation, the transformation of the socio-demographic situation in the country, the acceleration of the pace of life of contemporary consumers or the observed change in behavioural patterns are only selected factors which have a significant impact on changes in the general consumption model of Polish society. In a relatively short period of time, the Polish consumer has become a modern consumer moving towards consumptionism, who in his/her purchasing decisions is most often guided by two fundamental and extreme needs: striving to conform and the desire to stand out. In the period of economic transformation, dating back to the 1990s, consumer behavior in Poland began to show a significant correlation with other countries and is now analogous to, for example, changes in consumer behavior in Western European countries and the United States. In the analysis of the scientific output to date, one dominant approach in the way of classifying the determinants of consumer behaviour on the food market is noticeable, and its dynamic character only proves the variability of this phenomenon, suggesting to contemporary enterprises operating on the food market the necessity of its constant monitoring. Two mutually exclusive trends are increasingly outlined in the behavior of contemporary consumers - individualisation of consumption patterns and lifestyles and imitation of consumer behavior and lifestyles. As far as the second trend is concerned, there are all sorts of barriers to the imitation of consumption patterns, which in particular include: income level, social class or the consumer's level of education.

For example, Mowen (1987), Solomon et al. (2006), Kotler et al. (2007), Peter and Olson (2008) focus their attention mainly on psychological (internal) factors that significantly shape consumer behavior. On the other hand, in the papers of, among others, Trommsdorff (2004), Balderjahn and Scholderer (2007) and Foscht and Swoboda (2007) two groups of determinants

of consumer behavior become apparent: individual factors (psychological, internal) and social factors (environmental, external).

Chukwu et al. (2019), in their study, argue that consumer purchasing behavior is influenced by several emotional, psychological and physical factors. These factors may include, among others, the availability and price level of alternative products or the income level of the consumer. In contrast, according to Valaskov et al. (2015), customers' purchasing behavior is strongly influenced by social norms and their personal economic situation.

Analysing the last three years (2020-2022), consumer behavior is influenced by a number of factors: objective and subjective. Recent years have shown that COVID-19 pandemic (World Health Organization, 2020a) was one such factor (Consumers and the new reality, 2020; COVID-19 impact on consumer food behaviours in Europe, 2020; Global Consumer Insights Survey 2020, Loxton et al., 2020). In addition to the basic purchasing criteria of price, availability and convenience, a new criterion has emerged - hygiene (Prasetyo et al., 2021).

In turn, the criterion of self-safety has gained new importance in the interpretation of food market consumers (Soon et al., 2021; Loxton et al., 2020; Zandi et al., 2020; Joia, Lorenzo, 2021). Consumer preferences shifted to local brands (Sumarliah et al., 2021) and the percentage of spontaneous purchases including a certain group of consumers decreased and 'gave way' to the percentage of planned purchases (increase in percentage) (Eger et al., 2021). Additionally, as indicated by the results of a study by Laato et al. (2020), consumers in some countries were forced to switch to alternative brands due to the unavailability of commodities of some brands during the pandemic, mainly due to the accumulation of excessive food stocks by consumers (Ciheam, 2020; Tsao et al., 2019; Naeem, 2021; Beard-Knowland, 2020; EY, 2020). In most European countries, consumers focused on stockpiling nonperishable food items (e.g. flour, pasta, groats, rice, canned foods, etc.) to reduce the risk of future shortages (FAO, 2020, Filimonau et al., 2021). In addition, consumers tended to prioritise purchasing food products that meet their basic needs (Eger et al., 2021) and certain restrictions, such as purchasing unpackaged products (Szymkowiak et al., 2020).

Gulf News (2020) reported that sudden announcements of restrictions due to COVID-19 led to panic buying, which revealed a trend of impulse buying (Anas et al., 2022; Belbag, 2021; Addo et al., 2020; Mejia-Trejo, 2021; Chiu et al., 2021), which then led to shortages of goods in markets and delays in the supply chain. (Choudhuri, 2021). Panic buying and subsequent excessive stockpiling in the form of food products were among the first responses of food market consumers to the COVID-19 pandemic (Billore, Anisimova, 2021; Huang 2020, Wang, Na, 2020). Such behavior ultimately led to shortages of many essential commodities (Tanveer et al., 2020). Analysing the consumption pattern based on transactional data, it can be inferred that in the initial phases of the pandemic, consumers were just hoarding essential commodities such as food items (Chenarides et al., 2021; Güney et al., 2020). Today's food consumer is increasingly a conscious consumer, moving towards a trend of reducing food waste (zero waste) (UNDP, 2020). Compulsive purchasing behavior may have increased the price level of food

products, the amount of food purchased, resulting in exacerbating overconsumption, stock shortages (inventory) and inequitable access to food (Omar et al., 2021).

The pandemic has undoubtedly affected the lifestyles and behaviors of modern society. Some of these changes in behaviors and attitudes, as indicated by the analysis to date, mainly concern food purchases (Sheth, 2020; Kumar, Dwivedi, 2020), individual and collective consumption preferences (Ben Hassen et al., 2021a; Husain, Ashkanani, 2020; Mumena, 2020), and attitudes related to food safety (Osaili et al., 2021; O'Hara, Toussaint, 2021; Kar et al., 2021). Many studies also highlight changes in the quantity and quality of food consumed. The most common change in dietary patterns discussed was an increase in the consumption of 'unhealthy' foods in both the pandemic and post-pandemic periods related to, among other things, the amount of sweets consumed (Adams et al., 2020; Di Renzo et al., 2020; Gornicka et al., Ulqinaku et al., 2021; Laguna et al., 2020; Papandreou et al., 2020; Pellegrini et al., 2020; Romeo-Arroyo et al., 2020; Ruiz-Roso et al., 2020; Scarmozzino, Visioli, 2020) and alcohol consumed (Gordon-Wilson, 2021; Pantano et al., 2021). The increased consumption of the above-mentioned food groups may be an individual's emotional response to eating to reduce stress level. Many studies also indicate an increase in the overall amount of food consumed (Ammar et al., 2020; Carroll et al., 2020; Castellini et al., 2020; Di Renzo et al., 2020; Gornicka et al., 2020; Papandreou et al., 2020; Pellegrini et al., 2020; Romeo-Arroyo et al., 2020; Scarmozzino, Visioli, 2020; Sidor, Rzymiski, 2020). Some researchers diversify the changes in purchasing behavior of contemporary consumers by identifying them with the pandemic phase. A large number of consumers showed panic behavior, impulsive buying behavior only in the early phase of the COVID-19 pandemic (Aljanabi, 2021; Stuart et al., 2021) and compulsive buying behavior (Samet, Gözde, 2021). While shopping behavior in the middle of the COVID-19 pandemic was characterised by high mobility (Gao et al., 2020; Tao et al., 2022; Zhang et al., 2020; Lu et al., 2021). In contrast, as indicated in their study by Baker et al. (2020) we can observe a great deal of variability in the food economy over the last three years. While the level of expenditure on out-of-home consumption has declined (mainly during the lockdown period), expenditure on food at home has increased due to, among other things, the closure of caterers, increasing the proportion of households preparing meals at home. Similar changes in food purchasing behavior during COVID-19 pandemic were observed worldwide (Alaimo et al., 2020; Bohlouli et al., 2021; Chenarides et al., 2021a; Chang, Meyerhoefer, 2021; Hirvonen et al., 2021; Janssen et al., 2021; Kansime et al., 2021; Eriksson, Stenius, 2020; Gao et al., 2020; Goddard, 2020; Segovia et al., 2021). The COVID-19 pandemic also changed food buying and purchasing behavior. Before the pandemic, a greater proportion of consumers still preferred to buy groceries from large supermarkets (Wamda, 2019). With the COVID-19 pandemic, an online shopping trend emerged among consumers, which undoubtedly accelerated the digital adaptation of societies, requiring significant changes in food retailing (Bohlouli et al., 2021; Chang, Meyerhoefer, 2021).

Additionally, as Bounie et al. (2020) point out in the results of their study consumers are shifting to online shopping options, which mitigate the overall impact of shock and reduce the level of fear of both shopping and the fear of being in a shared social space (Sherman et al., 2021; Naeem, 2021a; Omar et al., 2021; Sidor, Rzymiski, 2020; Kumar, Abdin, 2021). Mobile applications and social media platforms are identified as drivers of change in contemporary consumer behavior (Ramos et al., 2019). Accordingly, online shopping has experienced a significant expansion since the beginning of the pandemic (Alhaimer, 2021, Accenture, 2020; EY, 2020; Gu et al., 2021, Alessa et al., 2021; Tran, 2021; Xayrullaevnamet al., 2020), mainly due to modern consumers' avoidance of crowded hypermarkets. At the same time, there is such a group of shoppers who still purchase food in person because they prefer to check the quality and freshness of the food, which cannot be done online (Ben Hassenn et al., 2022). Nevertheless, many studies highlight the fact that the increased trend of online shopping that intensified during the pandemic will also continue in the post-pandemic setting (Dannenberg, et al., 2020). As the results of current research indicate, the likelihood of increased online shopping is also influenced by whether or not a person is a reflexive buyer (Naeem, 2021; Gu et al., 2021).

The modern consumer has also adopted healthier eating patterns and reduced food waste (Jaggers et al., 2020; Toiba et al., 2022). Some studies also highlight the fact that consumers increasingly prefer local food (Severo et al., 2021). Being aware that, as a consequence of past events, consumers have not only been affected economically but also psychologically, we can identify five new trends in the behavior of contemporary consumers in the food market, taking into account the internal conditions of an individual: the demand for simplicity, time saving, thoughtful consumption, green consumerism and ethical consumerism. It is also projected that COVID-19 will not only be a health problem but will lead to a global economic recession, increased unemployment and escalating poverty rates, especially in developing countries, thus also affecting access to food, the quality of nutrition and its level of diversity (Fitzpatrick et al., 2020; Laborde et al., 2020) and thus food security (HLPE, 2020).

In conclusion, we can infer that factors such as price, availability, convenience, food safety and hygiene are still important to most consumers when making food purchasing choices in both pandemic and post-pandemic periods. Many current studies on consumer behavior emphasise that health fear is becoming a strong factor influencing current consumer purchasing behavior (Sumi, Ahmed, 2022; Yuen et al, 2020; Samet, Gözde, 2021). Taking into account the current conditions of the food market in the territory of Poland, the question should be asked: What transformations await the Polish food market, after the pandemic crisis? What impact will the COVID-19 pandemic and other current crises<sup>4</sup> have on the behavior of today's consumers in the nearest time scope? According to the authors, the most important transformations are identified mainly with the following trends: 1. An increase in the frequency of buying local food

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<sup>4</sup> War in Ukraine, environmental crisis, energy crisis, inflation.

products, 2. Concern for their own safety, 3. Changing the preferred channels of contact with food suppliers (online transactions), 4. Convenience and ease of shopping, 5. The growing importance of value for money, 6. The abandonment of cash in transactions (cashless transactions), 7. Excessive stockpiling, 8. Impulsive buying, 9. Reduced spending on higher-order needs (dormant demand, demand suppression), 10. Conscious consumption, 11. Consciously planned shopping, 12. Health and nutrition as a priority in food choices.

### **3. Selected characteristics of food quality**

In utilitarian terms, quality can be defined as the fitness for consumption which should meet the consumers requirement so to satisfy them. Food quality is a complex and multi-dimensional concept. The characteristics contributing to food quality are (Food Quality Knowledge for policy (europa.eu)): food safety, ethical, aesthetical, functional, convenience, authenticity, sensory, nutrition, origin. Considering the history of defining the food quality it can be seen that quality has been primarily understood as the absence of a defect, fraud and adulteration. Later, more attention has been paid to expected properties such as organoleptic and nutritional characteristics or resulting benefits, and finally, desirable characteristics likely to justify added value, i.e. organic farming, country of origin (Feldmann, Hamm, 2015). Brunso et al. (2002) characterized four types of food quality: (1) product-oriented quality, (2) process-oriented quality, (3) quality control, (4) users-oriented quality. These four types of quality are interrelated. Three types of the objective quality (product-oriented, process-oriented, quality control) affect the subjective users-oriented quality. The decision of the consumer to buy a product depends on the subjective evaluation, the perception of the important food product characteristics from his point of view. Looking at various information on the food package consumers can expect a certain level of food quality. Truong et al. (2022) showed the importance of certification on the evaluation of the food quality by consumers. Food certification is becoming more and more popular and commonplace but for many consumers it is a sign of high quality (Bailey, Garforth, 2014; Tran, Goto, 2019). Of course, there is always a question about the trust in the certification. Truong et al. (2022) concluded in their research that the higher the level of trust in the certification, , the lower the need for trust in food actors. They stated that consumer trust in certifications depends on their perceived trustworthiness of the food system and its actors to deliver certified food. Consumers also pay attention to the brand of the product because they are unable to check the quality of food before the purchase (Sadilek, 2019). Of course to some extent consumers can check the freshness of the food product they buy, i.e. the change of the color, the texture, but this is very limited.

Quality is a set of consumer requirements such as: safety, nutritional, sensory, production context and others. Considering these various requirements Peri (2006) divided them into two categories: 1) requirements toward the product as a food and 2) as an object of trade. If we consider the characteristic of a product as a food, we can list the following characteristics: safety requirements, conformity to standards, nutritional requirements, sensory requirements, production context and ethic. If we look at the food as the object of trade, we then consider the characteristics such as: certification, traceability, functional and aesthetic requirements of packaging, information, convenience, availability, price. As it was shown quality is a very complex issue. Although quality characteristics can be assessed by objective measurements, it is still subjective due to the evaluation of the consumer who finally decide to buy and consume a food product. When defining the food quality from the consumer point of view we can identify the intrinsic characteristics. i.e taste and other organoleptic properties and also external factors such as, i.e. origin, labelling what refers to the division of food product into food to be consumed and product of the trade exchange (Bernues et al., 2003; Mascarello et al., 2015). The perception of the food quality as high influence various aspect of consumer activities. As Toudert and Bringas-Rabago (2021) show the subjective perception of high quality has a positive impact on satisfaction with gastronomy or tourism. Zait et al. (2021) divided quality attributes of animal-source foods into seven dimensions and between consumers and producers, processing actors. When we talk about the food quality from the consumer perspective the following attributes should be mentioned: sensory, nutritional, image. When the perspective of food producers is considered: technological attributes, commercial attributes. For both consumers and producers: safety attributes and convenience attributes.

Stylidis et al. (2020) said that perceived quality is a complex, multifaceted adaptive system where a human is a main agent. Zaithaml (1988) defined the perceived quality as “the consumer's judgment about a product's overall excellence or superiority”. Debanjan and Golder (2006) defined the perceived quality as ‘perception of the customer’ and oppose it to the ‘objective’ quality. A similar definition was given by Aaker (2009) as *the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives*. Castleberry and McIntyre (2011) explain perceived quality as “a belief about the degree of excellence of a goods or service that is derived by examining consciously and/or unconsciously, relevant cues that are appropriate and available, and made within the context of prior experience, relative alternatives, evaluative criteria and/or expectations”. It is worth to remember that perceived quality play an important role because significantly influences the customer's opinion and, therefore, has an impact on the purchase decision and the customer satisfaction. It depends on the person as the perception of quality characteristics is a subjective process and happens consciously as well as unconsciously in order to satisfy evident and hidden customer needs (Falk et al., 2017).



The consumer's perception of quality depends on (Ophuis et al.,1995):

- the perception process - the consumer's judgment about the quality of a product, taking into account its visible and invisible features, which have been judged by experience or which the consumer expects. The perception of quality depends on the product, the person of the consumer and the place,
- the product - the same characteristic for different products has a different meaning when assessing the quality, e.g. the fat content is an important feature in the case of meat and meat products (both positive and negative), and in the case of vegetables and fruit, it is insignificant,
- people - consumers differ in terms of preferences, experience, perception abilities, therefore they perceive quality in different ways,
- places (context, purpose of product use) - e.g. tomatoes can be assessed as low quality in order to use them e.g. in a salad, but suitable for preparing a soup or sauce.

Wheelock (1992) proposed to divide the features that can be taken into account when assessing quality into two categories:

1. Genuine genuine quality: selection of product ingredients (e.g. a product made of wholesome meat or offal), distribution method - which allows to maintain the appropriate properties of the product, nutritional value, durability of the product, protection against contamination.
2. Pseudo-quality - phrases placed on the packaging that are supposed to suggest higher quality, such as: no preservatives - most consumers are afraid of ingredients marked with the alphanumeric code E + number and consider them to be preservatives that consumers avoid.

It is worth to investigate the consumer perception/evaluation of food quality because it helps the marketers to adjust their strategies to consumers expectations (Petrescu, 2022).

#### **4. Material and Methods**

The research process consisted of the following stages:developing research methodology, consultation of the research tool, sample selection, implementation of the measuring phase of the survey; developing a statistical report; elaboration of a final report. The research was made by a professional company operating in quantitative research method. Information on the assumed scope of the study was obtained through the use of a tool - a quantitative questionnaire. The questionnaire was built of closed-typed questions. The sample consisted of 2000 people selected taking into account the place of residence (region), gender and age. Respondents were asked to indicate high food quality characteristics three times: before, during and after the COVID-19 pandemic (in January 2020, in March 2022 and in March 2023). In order to put the

pandemic in Poland on a timeline, it is worth noting that the first case of COVID-19 in Poland was reported on the 4th of March 2020, in May 2022 was the official end of the pandemic. Respondents were also characterized in terms of education and material status and the role during the food purchase. The study was carried out using the CAWI (Computer Assisted Web Interviewing) technique based on conducting a computer-supervised internet survey. Numeric variables were characterized using basic descriptive statistics: cardinality (N), arithmetic mean (mean), standard deviation (SD), median, lower and upper quartile (IQR), minimum and maximum values (range). Categorical variables are presented in terms of numbers and interest. Group comparisons were made using the Kruskal-Wallis or U Mann-Whitney test (for continuous variables) and the Chi-square test or Fisher test (for categorical variables). The value of significance (p) was set at 0.05. Calculations were made in the R program (ver. 3.5). 2000 respondents took part in the surveys. The exact distribution of the sample taking into account gender, age and place of residence is presented below (Table 1). It reflects the structure of the population of adult Poles residing in the country.

**Table 1.**

*Respondents of the survey in 2020 (before the COVID-19 pandemic)*

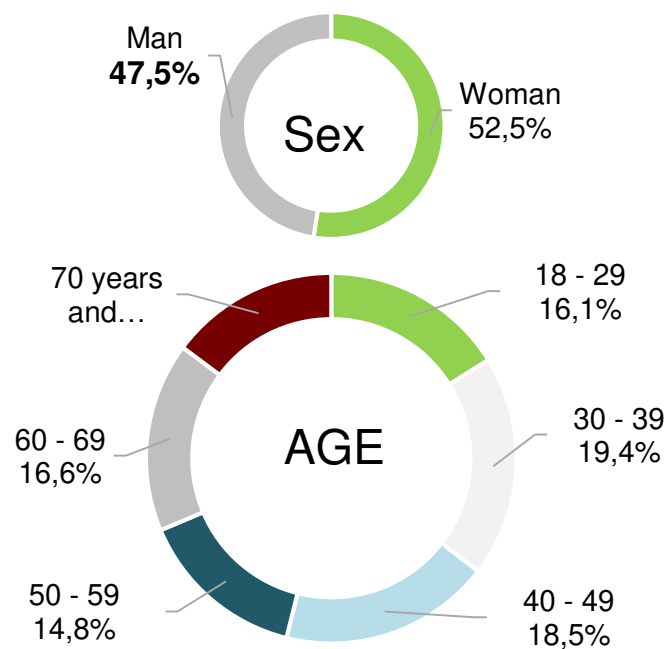
Regions	Woman (age)						Man (age)						Total
	18-29	30-39	40-49	50-59	60-69	+70 lat	18-29	30-39	40-49	50-59	60-69	+70	
Dolnośląskie	12	16	13	11	15	13	12	16	13	11	13	8	153
Kujawsko-pomorskie	10	10	9	9	10	9	10	11	9	8	8	5	108
Lubelskie	10	10	9	9	10	10	10	11	9	8	8	6	110
Lubuskie	4	5	5	4	5	4	5	5	5	4	4	2	52
Łódzkie	11	12	11	10	13	13	11	12	11	9	10	7	130
Małopolskie	16	18	15	13	14	15	16	18	15	13	12	9	174
Mazowieckie	23	29	25	20	25	25	23	28	25	19	20	14	276
Opolskie	4	5	5	4	5	5	4	5	5	4	4	3	53
Podkarpackie	10	11	9	9	9	9	11	11	10	9	8	5	111
Podlaskie	6	6	5	5	5	6	6	6	5	5	4	3	62
Pomorskie	11	12	10	9	10	9	11	12	11	9	9	6	119
Śląskie	19	23	21	20	22	21	20	23	21	19	19	13	241
Świętokrzyskie	6	6	5	5	6	6	6	6	6	5	5	4	66
Warmińsko-mazurskie	7	7	6	6	7	6	7	8	6	6	6	3	75
Wielkopolskie	16	18	16	14	16	14	16	19	16	13	13	8	179
Zachodnio-pomorskie	7	9	8	7	9	7	8	9	8	7	8	4	91
<b>Total</b>	<b>172</b>	<b>197</b>	<b>172</b>	<b>155</b>	<b>181</b>	<b>172</b>	<b>176</b>	<b>200</b>	<b>175</b>	<b>149</b>	<b>151</b>	<b>100</b>	<b>2000</b>

Among the respondents, 42.4% were the sole decision-makers in the purchase of food products. About 49.7% of respondents said they make the majority of purchasing decisions for the household. The smallest group (7.9%) were people for whom someone else makes the majority of purchasing decisions. In the survey, respondents also specified their education, size of place of residence and net income per family member. Most respondents had secondary education (32.2%) and basic vocational education (30.7%). Persons with higher education constituted 26.9%, and the remaining 10.3% of respondents had primary/lower secondary education. Persons with a net income not exceeding PLN 1200 (about 300 €) per person

constituted about 19.1% of the total number of respondents. One-fifth of survey participants (20.0%) indicated an income of PLN 1201 to 1600 (301 to 400 €), and respondents declaring income per person within PLN 1601-2000 (401 to 500€) net constituted 20.7% of all respondents. Income in the amount of 2001-2400 (501 to 600 €) was indicated by 19.5% of respondents and 20.9% of respondents had income per one person exceeding PLN 2400 (+600 €) net.

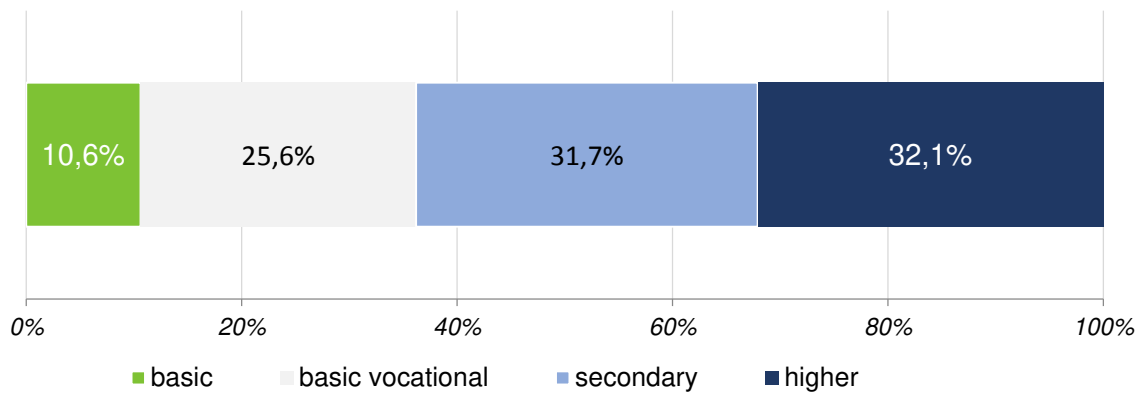
People living in the village accounted for 19.9% of the total, while about 23.0% of the respondents were city dwellers up to 50,000 inhabitants. Approximately 29.0% of respondents were residents of cities with 50 to 250 thousand inhabitants, and 14.7% lived in cities with 250 to 500 thousand inhabitants. The least 13.5% of respondents lived in cities with over 500,000 inhabitants.

In the same way, in 2022 (during the COVID-19 pandemic) the research sample consisted of 2000 respondents selected in a quota manner. The selection of respondents reflected the actual structure of sex, age and region of residence of adult Poles. The distribution of the research sample was analogous to that obtained in a similar study carried out in 2020 (Figure 1-6). Because of the COVID-19 pandemic in the survey made in 2022 and 2023 the additional socio-characteristic was added – Perceived Stress Scale (Cohen et al., 1983), and also the case of trust as trust plays an important role during various crises (Figure 7 and 8). It is one of the most commonly used tools to measure perceived stress (Mondo et al, 2021). The perceived stress influences consumers decisions and also the perception of high food quality and may result in i.e. searching for the objective proofs of high food quality such as for example the certificates. Consumers were asked to assess their level of stress.



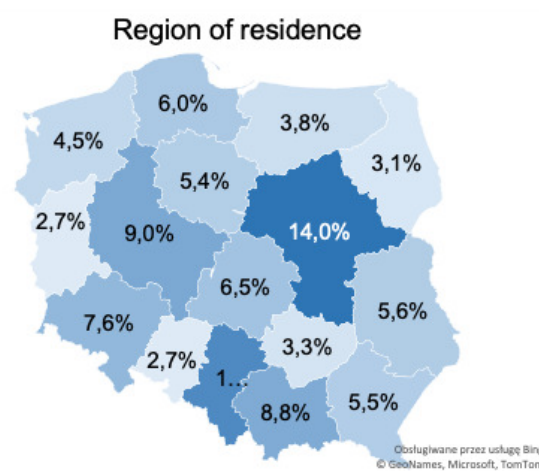
**Figure 1.** Characteristics of respondents in 2022 – the sex and the age.

Source: own elaboration.



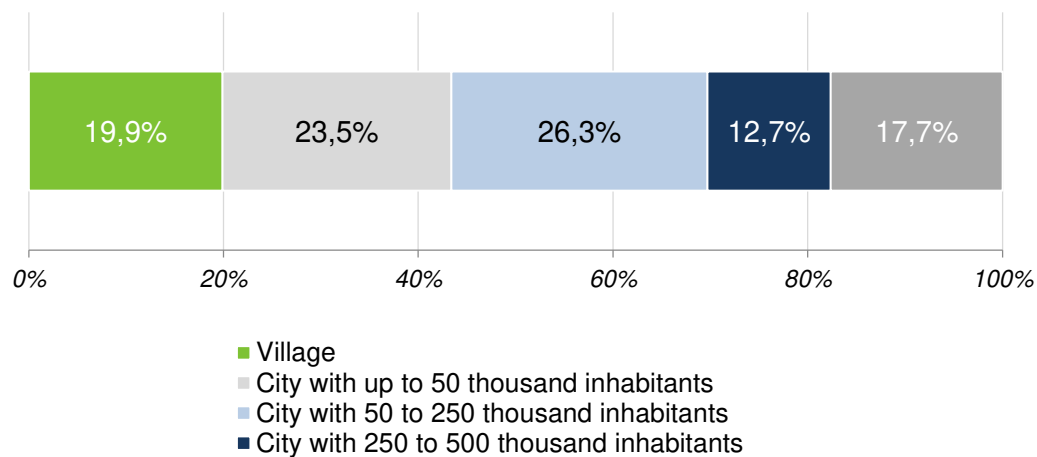
**Figure 2.** Characteristics of respondents in 2022 – the level of education.

Source: own elaboration.



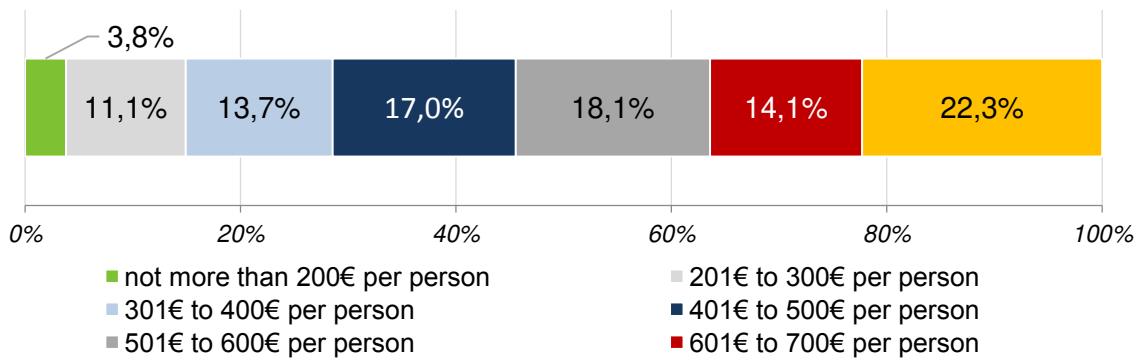
**Figure 3.** Characteristics of respondents in 2022 – the region of residence.

Source: own elaboration.



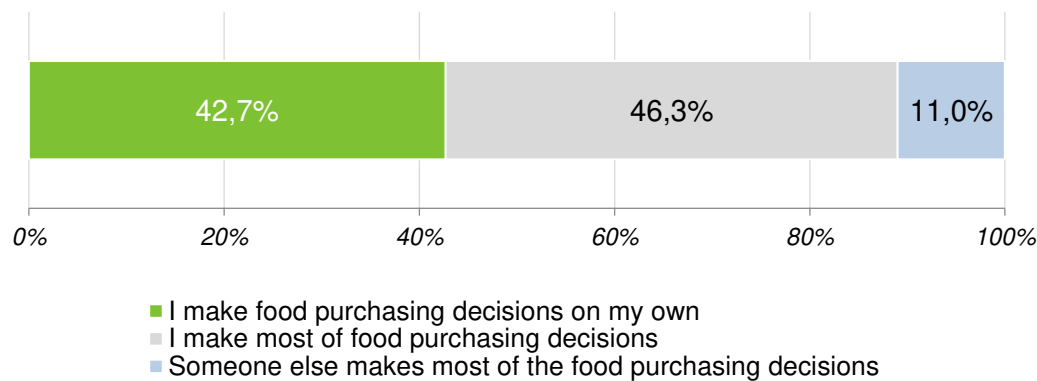
**Figure 4.** Characteristics of respondents in 2022 – the place of residence.

Source: own elaboration.



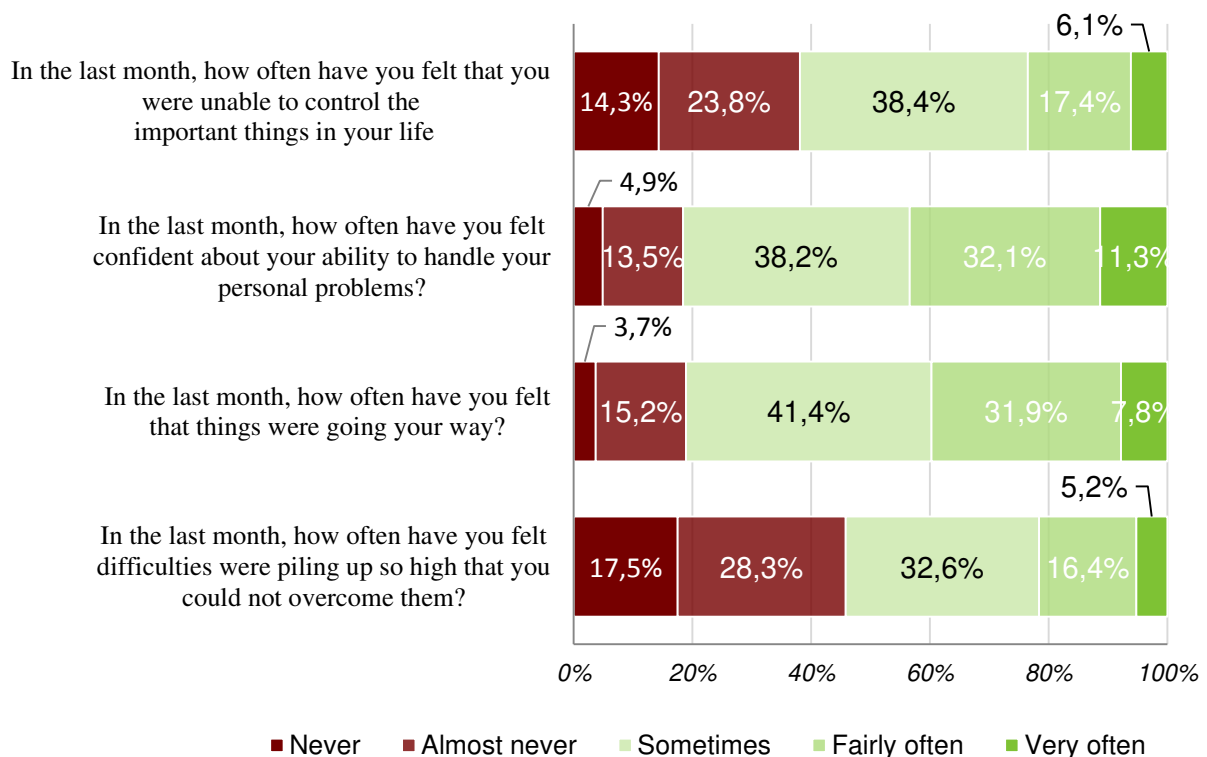
**Figure 5.** Characteristics of respondents in 2022 – the monthly income.

Source: own elaboration.



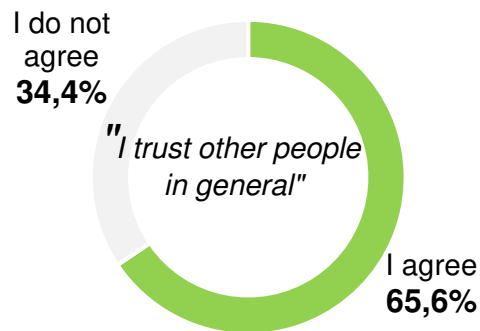
**Figure 6.** Characteristics of respondents in 2022 – responsibility for the buying decisions.

Source: own elaboration.



**Figure 7.** Characteristics of respondents in 2022 (during the pandemic) – perceived stress.

Source: own elaboration.

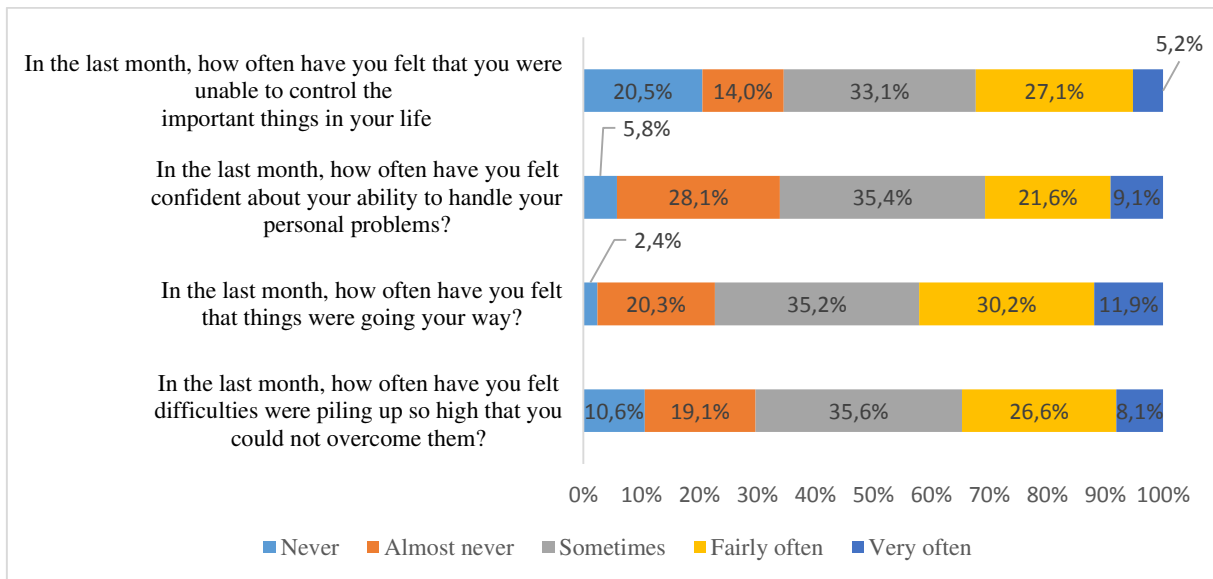


**Figure 8.** Characteristics of respondents in 2022 – trust.

Source: own elaboration.

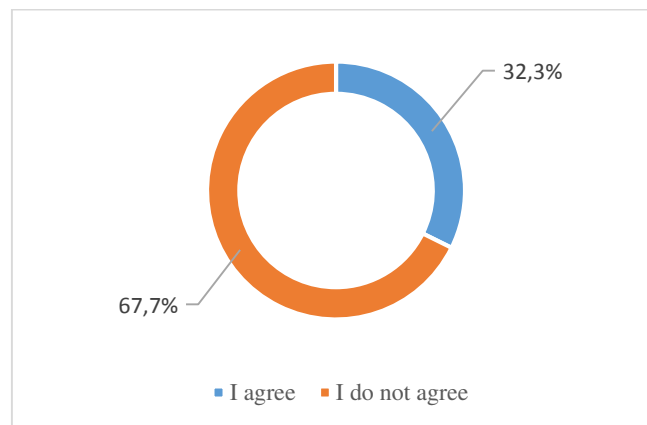
In the third survey (year 2023) 1253 women and 747 men gave their opinions. The highest number of respondents were between 40-49 years old (28.6%). Most of them had higher education (46.2%) and lived in cities between 50-250,000 citizens (37.7%). Every fifth person participating in the study (20.5%) lived in the southern region of Poland - 10.9% of the inhabitants of the province Śląskie and 9.6% of the inhabitants of the province Lesser Poland. People living in the Mazowieckie region accounted for 18.1% of the research sample, being the most numerous region in Poland. The monthly household budget declared by every fourth survey participant (25.4% of respondents) was over 700 € net per person. The surveyed people whose households had relatively the lowest budget (no more than 200 €) formed the smallest group - 3.4% of all survey participants.

The participants of the study were also characterized due to their participation in the decision-making process regarding the purchase of food products. The sole decision-makers in the field of purchasing food products accounted for 38.6% of the respondents. Other respondents admitted that they make decisions jointly with another household member. About 50.8% indicated that they make most decisions on their own. In the results of the study, the authors did not identify the population of people who indicated that in their household someone else makes most of the decisions (0%). Respondents were also asked to assess their perceived stress (Figure 9) and trust (Figure 10).



**Figure 9.** Characteristics of respondents in 2023 (after the pandemic) – perceived stress.

Source: own elaboration.



**Figure 10.** Characteristics of respondents in 2023 – trust.

Source: own elaboration.

On the basis of the literature review the following hypothesis were formulated:

- H1: Due to the influence of the COVID-19 pandemic consumers perceived as more important the country of origin of the food products, the domestic origin is a sign of high food quality.
- H2: The pandemic has caused the higher importance of taste as the indicator of high food quality.
- H3: Consumers indicate higher ranges (bigger frequency of indications) to the quality of food during and after the pandemic than before because of the more attention paid to the food and its connection to health.
- H4: The importance of the objective characteristics of food quality i.e. food standards and certification is of higher importance during and after the pandemic than before.
- H5: The percentage of indications of high food quality characteristics was higher among the consumers who trust other people/institutions.

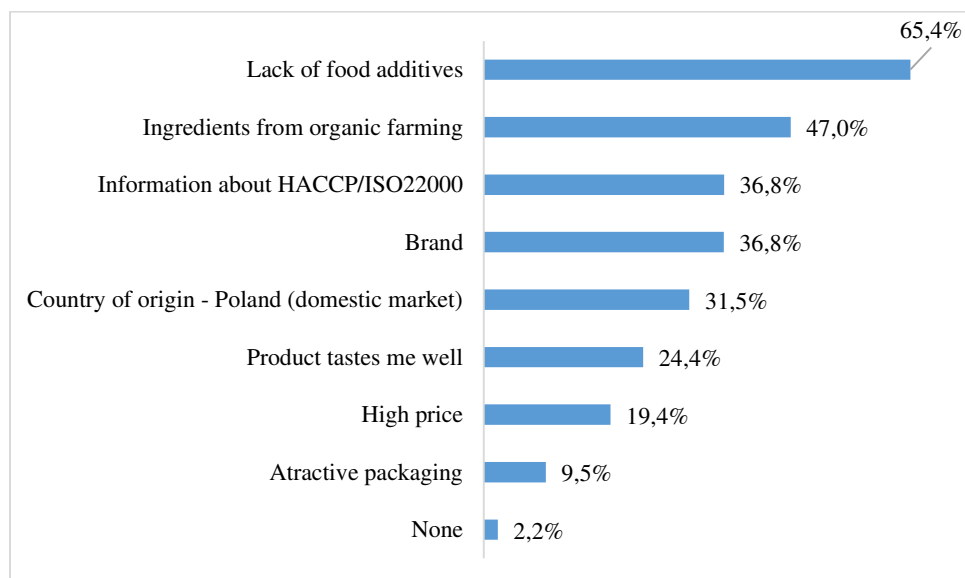
## 5. Results

The results of the studies show that for consumers, the determinants of high-quality food are primarily (in 2020 before the pandemic): no food additives (65.4% of indications), ingredients from organic farming (47.0%), information that the food was produced in accordance with the principles of HACCP/ISO 22000 (36.8), product brand (36.8%).

The respondents consider the lack of food additives to be a determinant of high-quality products, which may be one of the reasons why the most frequently checked information on labels is the composition of the food products they buy (the answer most often mentioned in the previous question in the survey). The opinion that ingredients from organic farming are a determinant of high quality products was expressed by 47.0% of respondents. It may also confirm that the respondents attach great importance to the composition of the food they buy.

It should also be noted that for one third of the consumers (36.8%), the information confirming the production of food in accordance with the HACCP/ISO22000 principles and other certifications confirms that the food products are of high quality.

Women more often than men believed that the determinant of high-quality food was the information that the food had been produced in accordance with the principles of HACCP/ISO 22000, ingredients from organic farming and the country of origin - Poland. Men more often considered the price and the brand as an aspect of high quality. The data discussed are presented in the figure below (Table 2, Figure 11).



**Figure 11.** The indicators of high food quality – survey in 2020 (before the COVID-19 pandemic).

Source: own elaboration.



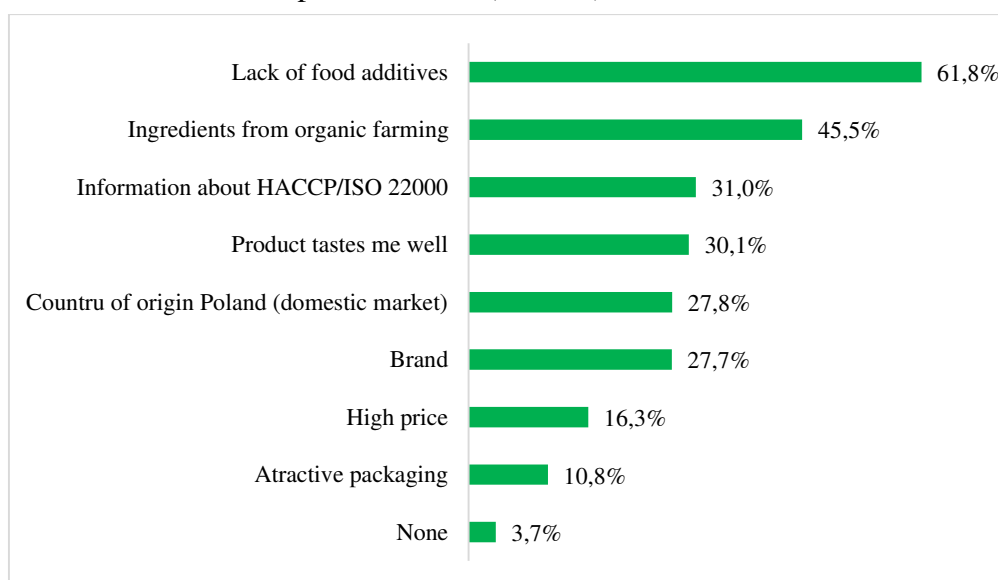
**Table 2.***Results of Pearson's Chi square test in 2020 (before the COVID-19 pandemic)*

Characteristic of food	Gender		Age		Education		Role	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	0.000186	***	0.031258	*	0.540633		0.057429	
Attractive packaging	0.013627	*	0.578349		0.300517		0.001229	**
Country of origin - Poland (domestic market)	0.286168		0.001585	**	0.301932		0.052928	
Brand	0.00014	***	0.01652	*	0.020006	*	0.014233	*
Lack of food additives	0.011132	*	0.325276		1.36E-05	***	0.000217	***
Information about HACCP/ISO22000	2.43E-05	***	2.56E-05	***	0.912034		1.63E-05	***
Product tastes me well	0.160675		0.243414		0.625447		0.05784	
Ingredients from organic farming	2.51E-06	***	0.002583	**	0.015832	*	0.000765	***
None	0.745018		0.182164		0.89842		0.64847	

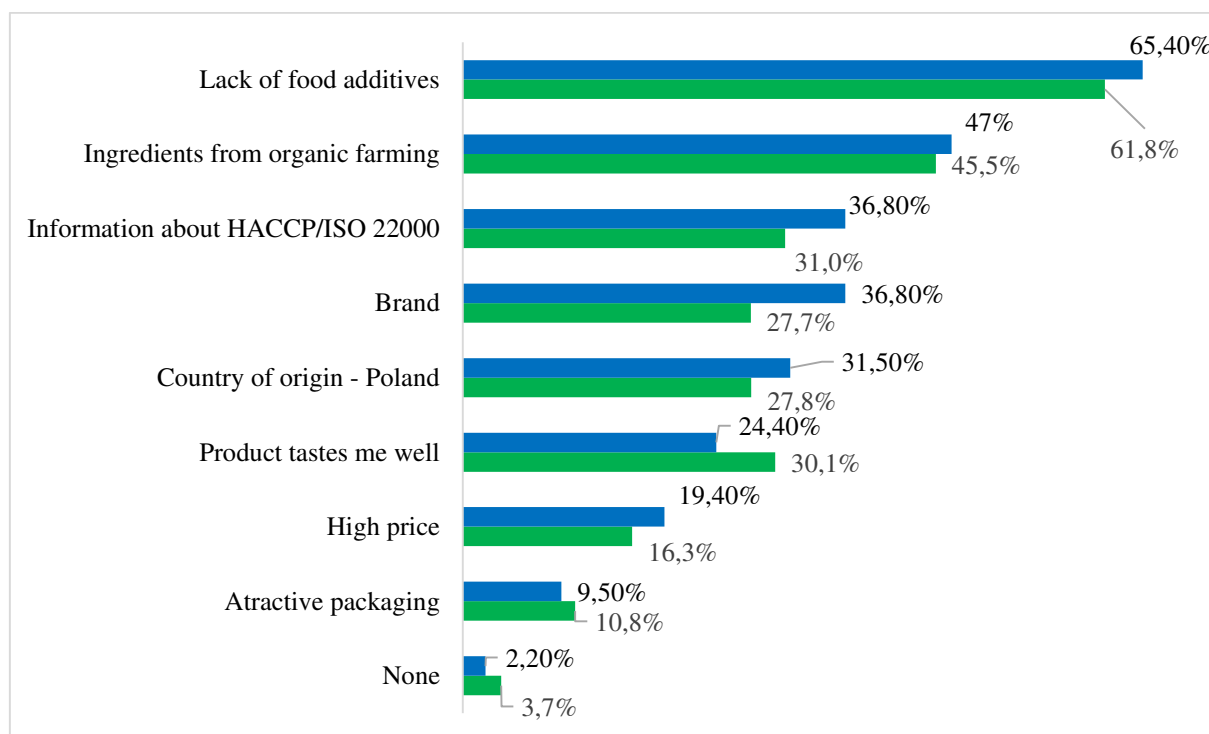
Source: own elaboration.

Information about the production process in accordance with HACCP/ISO 22000 principles was especially important for consumers at the age between 50 to 70 years old. Young consumers much less often paid attention to this information as the indicator of high quality of food products. Information for HACCP/ISO 22000 principles was important for consumer who made all purchase decisions.

Information about the lack of food additives was particularly important for consumers with higher education, consumers with lower education less often paid attention to this information. Lack of food additives was also important for consumers who make most of the food purchase decision. For them the information about the organic origin of the ingredient was more important than for other groups of consumers. The lower the decisiveness of food purchase was, the lower indications of the importance were (Table 2).

**Figure 12.** The indicators of high food quality – survey in 2022 (during the pandemic).

Source: own elaboration.



**Figure 13.** The indicators of high food quality – the comparison of the results in 2020 (before the pandemic – in blue) and in 2022 (during the pandemic – in green).

Source: own elaboration.

**Table 3.**

*Result of Pearson's Chi square test in 2022 (during the COVID-19 pandemic)*

Characteristic of food	Gender		Age		Education		Role	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	0.008676	**	0.000386	***	0.486650		0.405122	
Atractive packaging	0.479626		0.035428	*	0.422816		0.015847	*
Country of origin - Poland (domestic market)	0.930273		0.040003	*	0.598476		0.010056	*
Brand	0.000124	***	0.242920		0.560309		0.336595	
Lack of food additives	7.0878E-05	***	0.059713		0.002859	**	0.053719	
Information about HACCP/ISO22000	0.008947	**	0.013336	*	0,107173		0.206587	
Product tastes me well	0.000890	***	0.094431		0.276898		0.556512	
Ingredients from organic farming	1.16743E-05	***	0.304724		0.164229		0.014617	*
None	0.047618	*	0.194039		0.556790		0.019090	*

Source: own elaboration.

**Table 4.**  
*Perceived Stress and high food quality characteristics*

Characteristic of food	1		2		3		4	
	Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test		Pearson's Chi-squared test	
High price	5.70661E-05	***	0.884437		0.002744	**	2.98351E-08	***
Attractive packaging	2.75934E-06	***	0.532302		0.074305		7.07778E-12	***
Country of origin - Poland (domestic market)	0.424425		0.054425		0.004021	**	0.863514	
Brand	0.665937		0.148687		0.151124		0.451190	
Lack of food additives	0.009769	**	0.014460	*	0.127312		4.33785E-05	***
Information about HACCP/ISO22000	0.038765		0.015701	*	0.023064	*	7.59487E-05	***
Product tastes me well	0.684356		0.568118		0.151960		0.488693	
Ingredients from organic farming	0.750270		0.119117		0.363808		0.208468	
None	0.223955		0.285542		0.001199	**	0.110177	

1. In the last month, how often have you felt that you were unable to control the important things in your life?
2. In the last month, how often have you felt confident about your ability to handle your personal problems?
3. In the last month, how often have you felt that things were going your way?
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Source: own elaboration.

Based on the answers, the level of stress of each of the participants was determined, which is the arithmetic mean of the answers given to all of the above-mentioned questions. Before calculating the mean, the rating scale for two questions was reversed so that a low rating (answer 1 - never) meant a positive (expected) state, and a high rating (answer 5 - very often) indicated its opposite. For the purposes of the analysis, the following division of respondents in terms of the perceived level of stress was adopted:

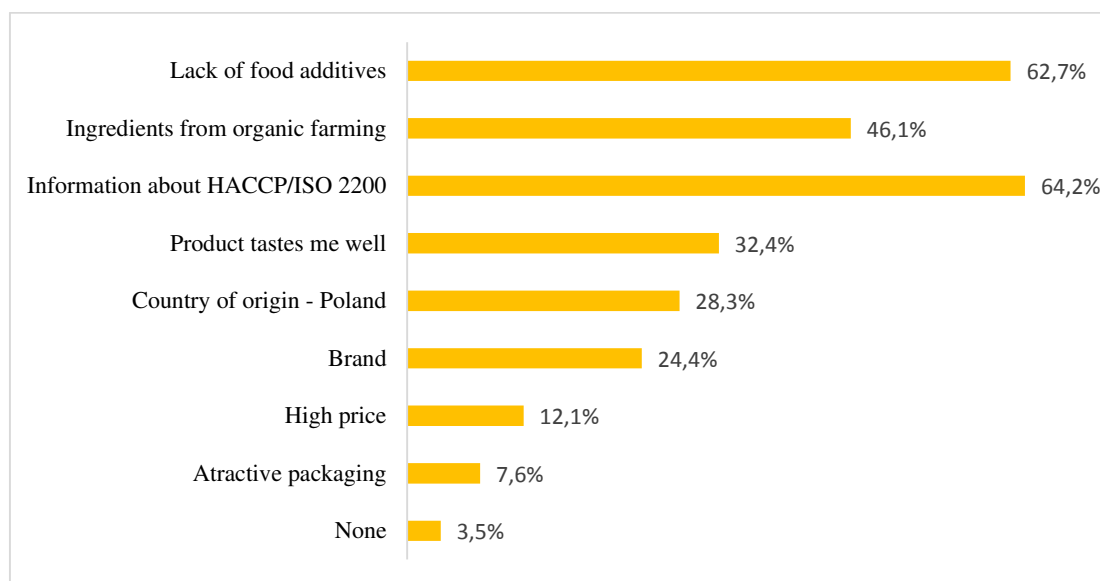
- very low - average from 1 to 2;
- low - average above 2 to 3;
- moderate - average above 3 to 4;
- high - average above 4.

Most of the surveyed consumers (59.6%) were characterized by a low sense of stress. People with a high level of perceived stress constituted only 1.8% of the surveyed consumer group, while very low level of stress concerned 19.1% of the respondents. The perceived level of stress of the remaining respondents was described as moderate (19.5% of all respondents) (Table 4).

**Table 5.***Level of perceived stress and high food quality perception*

Characteristic of food	Level of perceived stress- percentage of answers				
	Total	Very low	Low	Moderate	High
High price	16.3	10.2	17.7	18.0	17.1
Attractive packaging	10.8	5.2	12.8	10.5	5.7
Country of origin - Poland (domestic market)	27.9	29.0	27.7	27.8	17.1
Brand	27.7	29.2	27.5	26.5	31.4
Lack of food additives	61.8	71.0	58.3	62.2	74.3
Information about HACCP/ISO22000	31.0	40.5	29.1	28.5	20.0
Product tastes me well	30.1	31.9	30.2	27.8	31.4
Ingredients from organic farming	45.4	50.1	43.4	47.6	42.9
None	3.7	2.3	4.6	2.6	0.0

Source: own elaboration.

**Figure 14.** The indicators of high food quality – survey in 2023 (after the pandemic).

Source: own elaboration.

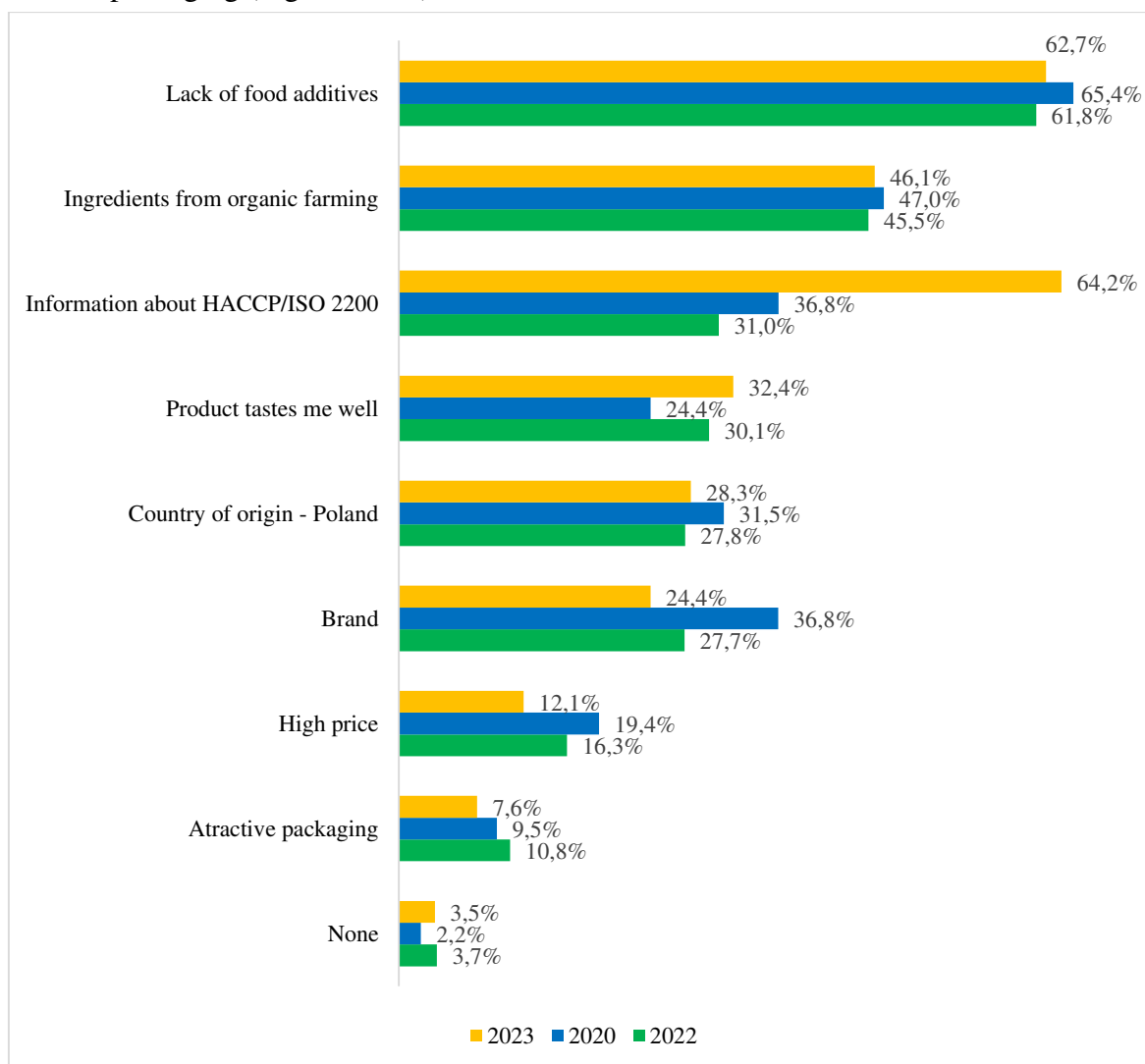
For consumers whose the average perceived stress was high the most often mentioned indicators of high food quality were lack of food additives and ingredients from organic farming. So these indicators that are connected with the influence of health (most food additives are perceived to have the negative impact as well as the usage of pesticides (Table 5). This situation was observed both in 2022 and in 2023 (during and after the pandemic).

In 2022 according to the majority of the surveyed consumers (61.8%), the indicator of high-quality food products is the lack of food additives. More than every fourth survey participant believes that the determinant of high-quality food is (Figure 12, Figure 13):

- the presence of ingredients from organic farming (45.5% of respondents),
- production in accordance with the principles of HACCP / ISO 22000 (31.0%),
- appropriate taste - "whether I like the product" (30.1%),
- country of origin - Poland (27.8%),
- brand (27.7%).

Relatively the least number of participants chose attractive packaging (10.8%) and high price (16.3%) as a indicator of high-quality food. It is worth noting, however, that the high price was a feature indicated by more than every third respondent (34.2%), whose household budget does not exceed 200€ per person. Among the more affluent people, the high price was chosen by a significantly smaller percentage of respondents (11-20%). Moreover, people who admitted that they generally do not trust other people relatively less frequently considered attractive packaging as a determinant of high-quality food (6.9% of people who trust other people indicated this factor) (Figure 16).

Over the last two years (2020-2022), a clear change of opinion has been observed in the perception of the brand as a determinant of high food quality. In survey (2022), 27.7% of consumers considered the brand as a determinant of high-quality food, while the percentage of respondents who expressed such an opinion in 2020 was 36.8%. However, the participants of (2022) study more often indicated the taste of the product ("whether I like the product") and the attractive packaging (Figure 11-13).

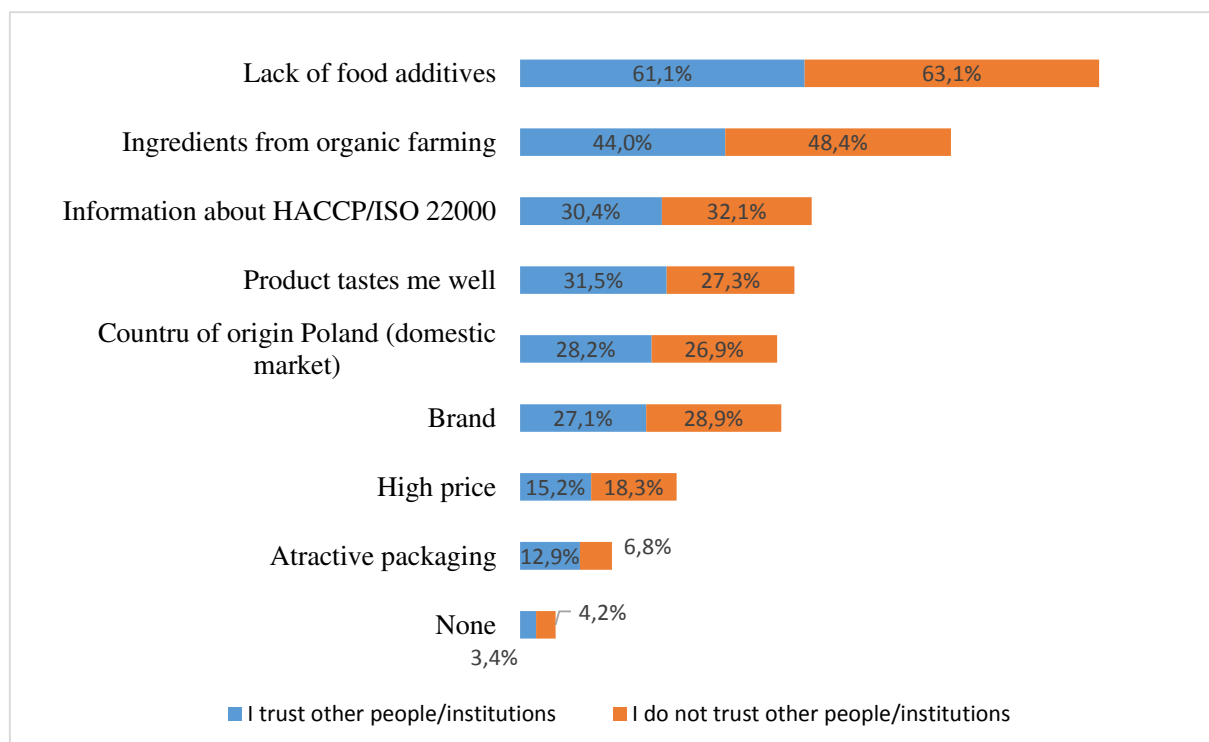


**Figure 15.** The indicators of high food quality – the comparison of the results in 2020 (before the pandemic – in blue) and in 2022 (during the pandemic – in green), and in 2023 (after the pandemic - in orange). Source: own elaboration.

The results of the third survey (after the pandemic, 2023) show the growing importance of the information of HACCP/ISO 22000 and other quality and safety certification as the indicators of high food quality (Figure 14, Figure 15). As other authors show (Zanetta et al., 2022; Ali et al., 2021; Liu et al., 2021; Niewczas-Dobrowolska, 2023; Bolek, 2020; Borda et al., 2021; Wu et al., 2021) the meaning of food certification has been increasing. It may be also correlated with the lower trust after the pandemic as the food certification show the level of good quality and safety, and has the objective character.

The second mostly mentioned high food quality indicator is lack of food additives, after this – ingredient from organic farming and the taste of the product. On the basis of the comparison of the results of these three surveys it can be concluded that the lack of food additives, the ingredients from the organic farming remain very important. The higher importance of the certification was observed as well as the higher importance of the food taste when to compare results during and after the pandemic with the results before the pandemic. The brand has been evaluated lower as well as the food packaging and the price.

Consumers' perceptions of the characteristics of high-quality food differed by gender. Women more often considered the lack of food additives, ingredients from organic farming and the compliance of production with the HACCP/ISO 22000 principles as distinguishing features of high-quality food. The opinion of men emphasized the importance of the brand and taste, i.e. whether they liked the product (Table 3). The same situation remain in 2023.



**Figure 16.** Trust and the high food quality indicators.

Source: own elaboration.

One consumers characteristics was very different between 2022 and 2023 (during and after the pandemic). It was the attitude toward trust. It shows the complete opposite situation. In 2022 most of the respondents (65.6%) agreed that they trust other people/institutions (Figure 8). However, in 2023 only 32.2% agreed the trust other people/institutions (Figure 10). Other reports/article also show that the pandemic caused the crisis of trust (Deloitte, 2020). Perhaps this lower level of trust may be caused by other external factors (not only by the pandemic) such as the war in Ukraine, lack of food security or the growing rate of inflation.

## 6. Discussion

Changes in consumer behavior in times of current threats are mainly the result of the consumer's perception of the crisis itself rather than its practical effects. As highlighted by El Bilali (2020) and McKinsey and Company (2020), the immediate impact of the pandemic varies from country to country and depends on, among other things, the epidemiological situation, the form and timing of the containment and retreat, and the level of socio-economic development prior to the COVID-19 pandemic. As indicated by numerous sources presented in this paper, the long-term impact of COVID-19 on consumers is projected, which not only has changed their consumption behavior but also affected their personal lives by determining their daily routines.

The COVID-19 pandemic had and has had the impact on various aspect of our lives. It was unexpected and expanded globally, impacts the entire food chain (Barman et al., 2021). Global restriction, limitations influenced the food chain from farm to fork (Galanakis, 2020) and also influenced consumer behavior decreased shopping trips, stockpiling, online shopping, increased stress and anxiety etc. (Accenture, 2020; Ahmed et al., 2020; Akter, 2020; Lazzerini, Putoto, 2020), food consumption patterns and diets (Abbas et al., 2020; Heck et al., 2020). During the pandemic emotions such as stress, anxiety, depression have been reported by many authors. They influence consumers choices and perceptions (Albott et al., 2020; Elbay et al., 2020; Pedrozo-Pupo et al., 2020).

Shen et al. (2020) showed in their research some relationships between the perceived level of stress and food choices/characteristics. The total effect between perceived stress and health of food was no significant. The lack of the significance of the relationship was also observed for the sensory appeal, weight control, ethical concerns. However, in case of food convenience, natural content, price and familiarity the total effect was observed. As Gruner et al. (2022) stated consumers with stronger negative emotional reactions to the pandemic were more likely to change their attitudes or behavior.

As many researchers indicate the COVID-19 pandemic influence food choices in three main issues: (1) consumers pay more attention to healthy food choices in order to protect themselves and their immune system, hence the increased demand for functional food, (2) more attention

is given to food safety to prevent the spread of the coronavirus in the food chain, (3) fears about food availability (Rodríguez-Pérez et al., 2020; EIT Food..., 2020; Pressman et al., 2020; Chiwona-Karltun et al., 2021; OECD..., 2010; Dudek, Spiewak, 2022).

On the basis of the results the hypothesis can be verified as follows:

H1: Due to the influence of the COVID-19 pandemic consumers perceived as more important the country of origin of the food products, the domestic origin is a sign of high food quality.

The H1 was verified negatively. Looking at the results of these three surveys (before, during and after the COVID-19 pandemic) the importance of the domestic origin wasn't indicated mostly more frequently. It shows the growing importance of the food certification and remain the importance of the lack of food additives and the ingredients from the organic farming as the indicators of the high food quality.

H2: The pandemic has caused the higher importance of taste as the indicator of high food quality.

H2 was verified true. Yes, taste of the food (answer if the food tastes me well) was indicated more often during and after the pandemic than before it. It may be caused by the fact that taste is the source of pleasure that was needed as the escape from the problems regarding the pandemic or the fact that the COVID-19 virus results in the lack of smell and taste so many consumers started to value more the taste of food.

H3: Consumers indicate higher ranges (increased frequency of indications) to the quality of food during and after the pandemic than before because of the more attention paid to the food and its connection to health.

It is difficult to answer unequivocally. The hierarchy of high food quality indicators based on the frequency of indications in general is similar before and during and after the COVID-19 pandemic. The top four characteristics before the pandemic are: lack of food additives, ingredients from organic farming, information about HACCP/ISO and the brand. During the pandemic the hierarchy looks almost the same except for the fourth place that was the taste. After the pandemic the importance of the four top food quality indicators in descending order is: information about HACCP/ISO 2200, lack of food additives, ingredient from organic farming and the taste of food. It may be caused by the connection with health but also with the need for pleasure as well as the lower level of trust.

H4: The importance of the objective characteristics of food quality i.e. food standards and certification is of higher importance during and after the pandemic than before.

Yes and no. The only one high food quality characteristics that was chosen more frequently during the pandemic than before was the taste of the food – “if the food tastes me well” what shows the subjective perception. On the other hand, when to compare the results before and during the pandemic with after the pandemic it is shown that the importance of food standards as the indicators of high food quality has increased what represents the objective characteristic.



H5: The percentage of indications of of high food quality characteristics was higher among the consumers who trust other people/institutions.

Not always. The consumers who trust other people/institutions usually less frequent indicated the high food quality characteristics. This problem needs further studies. Maybe it was caused by the fact that if they trust other people/institutions, they do not need to pay attention to many characteristics of food as others are responsible for food quality. This situation changed after the pandemic when the level of trust was much lower. Then the most consumers paid attention to food certifications.

## 7. Conclusions

The COVID-19 pandemic has changes our reality. It has been the source of stress for many people around the world. Due to the restrictions implemented for many of us the obvious buying behavior was unable, i.e. the access to shops, restaurants etc. As this research shows the taste of food has increased in its importance as the indicator of high quality of food. Perhaps because of a greater appreciation of the taste of food, as COVID-19 often caused the taste to disappear, or the taste of food is a source of pleasure, which helps to relieve tension and stress caused by, among others, the pandemic. Still (before the pandemic and during and after it) the three most popular characteristics of high food quality are: lack of food additives, ingredients from organic farming, information about HACCP/ISO 22000 while the brand of products has lost importance and has given way to taste. However, after the COVID-19 pandemic the importance of the information about HACCP/ISO 22000 has increased what shows the importance of the role of hygiene, food safety and the need for the information consumers can trust. The level of perceived stress and trust trust in other people and institutions, and their impact on perceptions of high-quality food were also examined. It was shown that consumers who are characterized by the high average perceived stress as well as consumers who generally do not trust other people or institutions most often mentioned lack of food additives and ingredients from organic farming and food certification as the indicators of high food quality.

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## CRITICAL DETERMINANTS OF SUCCESS FROM THE FILM INDUSTRY PERSPECTIVE

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**Purpose:** The goal of this research is to identify factors related to the future success of film production and synthesize the scattered literature of the subject. Another goal is to propose a classification of pre-selected factors of film production's success.

**Design/methodology/approach:** This study uses the narrative literature review method. Studies were collected by searching various data bases in July-November 2022: Scopus, ISI Web of Science as well as Google Scholar. Then studies were filtered in two stages based on inclusion and exclusion criteria.

**Findings:** Starting from Bourdieu's concept of different forms of capital, we may classify critical determinants of box office success into four main categories: human assets, product features, financial sources and costs, as well as market-related factors.

**Research limitations/implications:** The results may be somehow limited as only preselected data bases in a specific period and with predefined inclusion and exclusion criteria were used during the process.

**Originality/value:** The article synthesizes the scattered literature of the subject and proposes a classification of box office success factors thus filling the existing research gap. Our findings are relevant for both film theoreticians and practitioners.

**Keywords:** film industry; box office performance; literature review.

**Category of the paper:** literature review; research paper.

### 1. Introduction

Creative industries are based primarily on people's ingenuity, talent, and creative activity. In developed countries, the creative sector contributes to social cohesion and generates economic growth through innovation and job creation. It is estimated that it accounts for 7.5% of the European Union (EU) workforce, making it the third, after the construction and food

sector, employer that generates the added value of around EUR 509 billion (*European Parliament resolution of 13 December 2016 on a coherent EU policy for cultural and creative industries (2016/2072(INI))*, 2016). Part of the creative sector is the audiovisual industry, to which Europe attaches particular importance in its cultural policies and programs. The European audiovisual market is worth around EUR 130 billion. Germany, the UK, and France account for almost half of this market, while the top ten European countries account for 78% of it (*Yearbook 2020/2021. Key Trends. Television, Cinema, Video and On-demand Audiovisual Services*, 2021). The global audiovisual production market has been changing rapidly in recent years, and film production is competing for viewers with new forms of entertainment, especially on the Internet. Moreover, the film industry has always been amazed by the unpredictability of success and failure. A single movie can be the difference between millions of dollars of profits or losses for a studio, so film producers and scientists have been striving for years to determine the factors of a film's high box office (Eliashberg, Elberse, Leenders, 2006).

The film's success is not a one-size-fits-all concept and can be understood differently. On the one hand, it can be considered through the prism of receiving festival awards or enthusiastic reviews from critics and viewers. On the other hand, a film production may be regarded as successful if it earns money. Although some filmmakers are interested in making niche, artistic films that, by definition, will not reach such an audience as blockbusters, we may assume that, generally, films are made for viewers. Moreover, because creators indeed care about the audience, the number of viewers may be one, but not the only, measure of competitiveness in the film market (Orankiewicz, Majer, 2018).

The competitiveness of enterprises in the market may be defined as the ability to compete and gain a competitive advantage (Gorynia, 2002; Skawińska, Zalewski, 2016). The sources of competitive advantage, in turn, may be determined through the Key Success Factors (KSF), also known as the Critical Success Factors (CSF). The concept appeared in the literature as early as the 1970s and concerned enterprises in various fields of industrial activity. According to Bullen and Rockart (1981), the CSF are the few critical areas of activity in which favorable results are necessary to reach the company's goals. In other words, the CSF concept allows focusing managerial attention on vital organizational issues that could determine the company's competitive position and development opportunities and thus ensure its overall high performance (Boynton, Zmud, 1984; Gierszewska, Romanowska, 1995).

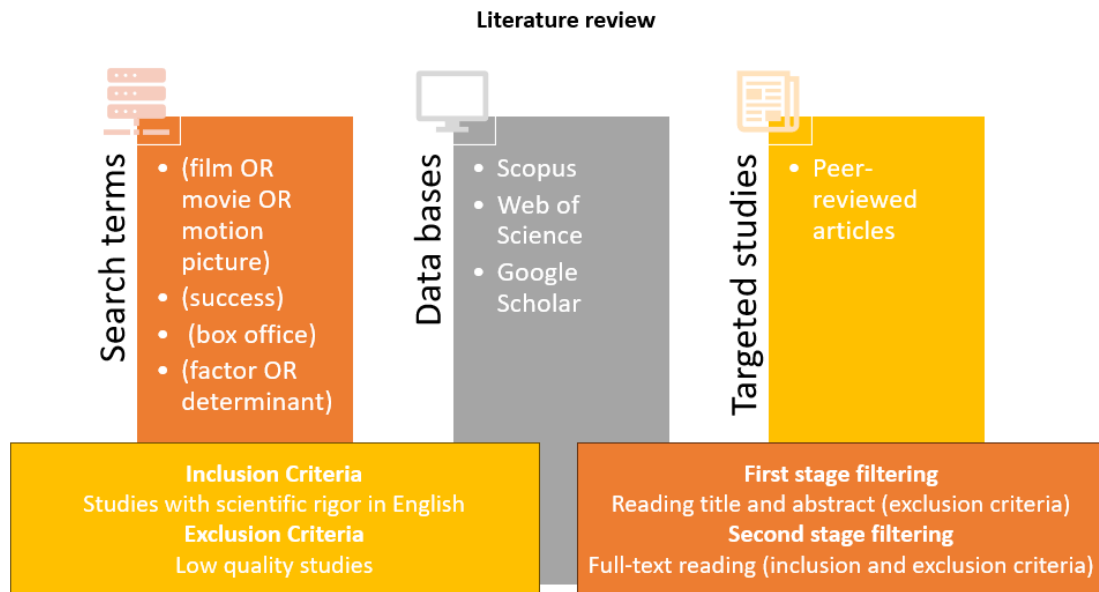
Our research aims to determine what factors of film production success affect the box office of films. Therefore, based on the narrative literature review, we systematize the existing knowledge of the scattered literature of the subject and identify the determinants of the film's success. Then, starting from Bourdieu's concept of different forms of capital, we propose a classification of their sources and common features and thus the findings of our study are relevant and fill the existing research gap.

This paper is divided into five sections. First, after short Introduction, we discuss a research method behind this study (Section 2). Section 3 describes the proposed classification of the film's success factors and presents main findings, while Section 4 offers discussion and concluding remarks. Finally, Section 5 shows the limitations and possibilities of further research.

## 2. Methods

This study uses the narrative literature review method (Alamouh, Ballini, Ölçer, 2021). The main goal of this research is to identify factors related to the future success of film production and thus summarize as well as synthesize the scattered literature of the subject. Such an approach enables us to propose our own classification of pre-selected factors of film production's success into four groups which is added value of this article and fills the existing gap in this regard.

Studies were collected by searching various data bases in July-November 2022: Scopus, ISI Web of Science as well as Google Scholar. The search within titles and keywords employed iteratively the following search of terms: (film OR movie OR motion picture) AND (success) AND (box office) AND (factor OR determinant). We targeted peer-reviewed articles in English and excluded repetitive and low-quality studies. We were mainly interested in articles with qualitative research conducted in different countries. Then studies were filtered in two stages based on inclusion and exclusion criteria. First stage filtering consisted of reading the title and abstract while applying exclusion criteria. Second stage filtering, in turn, included full-text reading while applying both inclusion and exclusion criteria. Accordingly, 23 studies presented in Table 1 were included and further used in our study. Only abridged studies that are relevant to our subject and entailed scientific rigor were included. Consequently, the literature we present concerns mainstream and art films released both in relatively small film markets where Hollywood films are the dominant power (e.g., Italy, Australia, Spain) and, contrarily, in the US, India, or S. Korea, where local films are rather dominant. The Fig. 1 presents the main stages of the research process of our study.



**Figure 1.** The research stages.

Source: own elaboration.

**Table 1.**

*Factors affecting a film's success identified and analyzed in previous studies*

<b>Authors/Year</b>	<b>Identified factors</b>
(Prag, Casavant, 1994)	advertising, awards, film ratings, genre, marketing expenditures, production cost, sequels, star performers
(Bagella, Becchetti, 1999)	cast and director <i>ex-ante</i> popularity, movie subsidies, production and distribution companies, specialization genres
(De Vany, Walls, 1999)	budgets, genres, producers, directors, and actors with marquee value, ratings, screens, sequels
(Basuroy, Chatterjee, Ravid, 1997)	budget, film reviews, stars
(Jansen, 2005)	age restrictions, awards, budget, directors, distributors' size, genre, reviews, stars
(Gemser, Van Oostrum, Leenders, 2007)	budget and movie advertising, number and size of film reviews, stars, trailers, word of mouth
(Hennig-Thurau, Houston, Walsh, 2007)	advertising, awards, certification, consumers' quality perceptions, cultural familiarity, director and star power, early box-office information, genre, number of screens, production budgets, reviews, sequel, timing
(Simonton, 2009)	adaptations, advertising, genre, major distributor, market competition, marketing expenditures, movie ratings, rewards and reviews, number of screens, production budget, production cost, remake, season of release, sequel, stars, trailers, word of mouth
(Agnani, Aray, 2010)	awards, subsidies
(Terry, Butler, De'Armond, 2011)	advertising, budget, distribution, genre, industry awards, number of screens, production costs, rating, release date, reviews, sequel, stars
(McKenzie, Walls, 2013)	advertising, distribution, genre, opening screens, prequels and sequels, production budgets, rating, reviews, season of release, stars, subsidies
(Pangarker, Smit, 2013)	Academy award, advertising, award nominations, date of release, film reviews and ratings, genre, major distributor, opening screens, production budget, production cost, sequels, stars, story
(Teti, 2013)	famous actors and directors, production budget, production cost, reviews, sequel



Cont. table 1.

(Teti, Collins, Sedgwick, 2014)	awards nominations, awards received, subsidies
(Gmerek, 2015)	advertising expenditure, audience rating, critics rating, genre, market power of the distributor, number of prints, production budget, release date, reputation of the film's main contributors, sequel, screenplay, word of mouth
(Ding et al., 2017)	advertising, number of concurrent movie showings, political views of the moviegoers, pre-release search activities, ratings, reviews, Wikipedia status
(Garcia-del-Barrio, Zarco, 2017)	actor's popularity, advertising, critical reviews, distribution, genre, movie budget, movie content, Oscar awards, prize nominations, remakes, talent concentration, word of mouth
(Meloni, Paolini, Pulina, 2018)	awards, critical reviews, genre, subsidies
(Bae, Kim, 2019)	advertising, awards, competition, critic reviews, genre, Internet promotion and media activity, movie title, MPAA ratings, number of screens, production country, release date, sequel, star power
(Walls, McKenzie, 2019)	budget, genre, opening screens, ratings, sequel, stars
(Hugenholtz, Poort, 2020)	awards, budgets, recognition, reputations, territorial licenses, trailers
(Kim, Trimi, Lee, 2021)	advertising, director, distributor, genre, film reviews and ratings, number of screening days (number of the audience), producer, promotion, stars, story, target audience, word of mouth
(Peng et al., 2021)	date of release, genre, Internet media buzz, movie awards and ratings, remakes, sequels, star power

Source: own elaboration.

### 3. Results

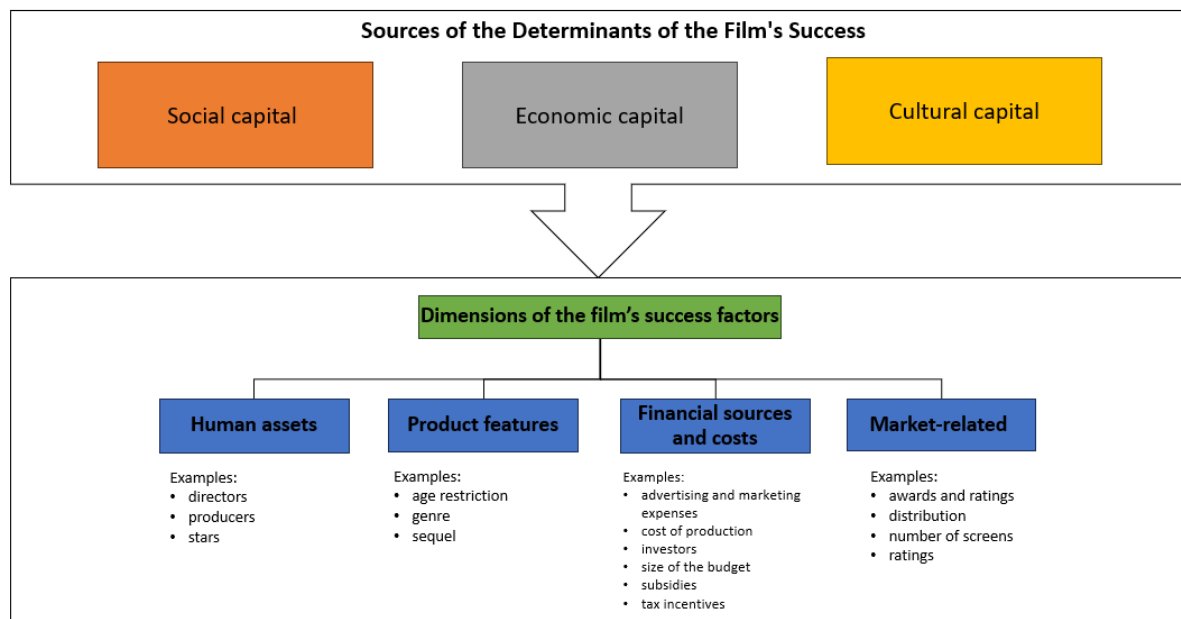
According to Bourdieu (1986), resources held by each unit can be treated as their capital (symbolic capital). Capital can be actively used to achieve goals. Moreover, it can be exchanged, multiplied, and converted into other forms of capital. Symbolic capital determines the chances of success in a given subject of social life (including economics), regardless of whether we consider a human unit or the organization of such units.

Bourdieu distinguishes three components of symbolic capital: economic, social, and cultural. Although his theory of symbolic capital was developed to understand the rules governing the social world and social inequalities, there are some parallels between the types of capitals Bourdieu identified and the capitals that may have an impact on inequalities in the film industry. Economic, social, and cultural capitals provide a source of advantages in the film production market. On the other hand, these advantages can be used to identify the factors influencing the film's success.

Social capital is the aggregate of the actual or potential resources linked to membership in a group that provides each member with the backing of the collectively owned capital. It is related to formal and informal belonging to professional groups, interpersonal and interinstitutional relations, or networks of horizontal and vertical contacts. Then, cultural capital can exist in the form of cultural goods, ideas, knowledge, skills, and objects with cultural values that people acquire while participating in social life. Competencies and knowledge determine

this form of capital, the world's perception, and ways of thinking about it, knowledge of communication codes, and specific information important for, e.g., film production. Economic capital, in turn, is at the root of all other types of capital and may be divided into technological and financial. Technological capital may be defined as a total of tangible and intangible components. The tangible component includes the active part of the firm's tangible fixed assets and consists of, e.g., technologies, technical equipment, and production processes. The intangible component comprises intangible assets related to product manufacturing and production management, such as knowledge, know-how, and organizational capital. Finally, financial capital refers to the ability to finance a project, while internal and external funding sources determine its size.

Based on the previous studies, in this article, we propose to assign film success factors mentioned in the literature and indicated in Table 1 to four exclusive categories: human assets, product futures, financial sources and costs, and market-related factors. The first group refers to the talent and creativity of the people responsible for the film (Peng et al., 2019). Viewers are usually drawn to cinemas by the names of famous actors or directors who become, in a way, a 'guarantor' of a good-quality product. The second group of factors focuses on the characteristics of the film (Bae, Kim, 2019). It is associated with all decisions directly related to the form and shape of the final product, like a sequel or the film's genre. In the group 'financial sources and costs', there are factors related to financial flows, both from the cost side and the income side, i.e., the source of financing (Teti, Tomasi, Barchitta, 2019). The budget size determines the costs incurred at each stage of film production, from initial script work, through production to post-production and then promotion and distribution. The studio may finance the production and be responsible for it from start to finish, but external financial resources are the most important in Europe. They include public funds (e.g., in the form of subsidies) as well as private funds (investments, debt instruments, and co-production) (Majer, Orankiewicz, Wróblewska, 2019). Finally, the market-related factors relate to these factors that affect the film after the film production ends. In the context of the film's success, the number of screens (Kim, Trimi, Lee, 2021), the size of the distributor (Bartosiewicz, Orankiewicz, 2020a, 2020b), and received awards and reviews (Filson, Havlicek, 2018) may be listed among the most crucial factors after the production process. The Fig. 2 summarizes described sources and classification of the essential film's success factors. The Table 2 presents examples of these factors divided in the four groups proposed by us. It should be emphasized that the proposed groups do not constitute a closed set of factors.



**Figure 1.** Sources and classification of the film's success factors.

Source: own elaboration.

**Table 2.**

*Factors affecting a film's success categorized in four groups*

Group	Factors
Human assets	contributors' reputation, talent concentration and celebrity appeal (e.g., cast and director popularity or star power)
Product features	age restrictions, genre, production country, screenplay, special effects, story (e.g., adaptation, prequel, remake, sequel), trailer
Financial sources and costs	advertising, co-production, marketing expenditures, movie promotion, production budget, production cost, state subsidies, territorial licenses
Market related	critical appraisal (e.g., awards, certification, film reviews and ratings, prize nominations, word of mouth), market competition, number of opening screens, release date, size of distributor, tax incentives

Source: own elaboration.

### 3.1. Human assets

Among 'human assets' the most important aspect is the so-called 'star power' role. Prag and Casavant (1994) prove that star power is the most significant predictor of a film's success. Also, Jansen (2005), conducting an empirical analysis of the determinants of German film performance in terms of audience numbers and rates of return, concludes that film performance can be influenced by the skills of people closely involved in business management and the development and execution of film projects. He even defines the coefficient to control for the effects of the ex-ante popularity of actors. If there are superstar effects, the coefficient should be more significant than one. More recently, Peng et al. (2021) also stated that in China the total effect of star power on box office revenues is positive and significant. On the contrary, De Vany and Walls (1999) find that most films with huge gross returns have no stars. They conclude that the audience makes a film a hit, and no amount of star power or marketing hype can change that. At the same time, they propose that one of the ways that star power might

work is by getting a film released on many screens at the opening, thus increasing initial revenue. Also Basuroy, Chatterjee and Ravid (2003) underline that star power and big budgets appear to blunt the impact of negative reviews only and thus may be sensible investments for the film studios. Hennig-Thurau, Houston, and Walsh (2007), in turn, argue that the use of star power is problematic and needs a deeper understanding of its relationship with the box office and profitability. It is in line with the findings of Bagella and Becchetti (1994) who claim that any result in support of the presence of superstardom effects must be considered with care given that it is extremely sensitive to the scale adopted for the quality filter.

### **3.2. Product features**

According to previous research, some people are drawn to such product features as particular genre or a sequel/prequel or remake of the previous production. For example, Prag and Casavant (1994) discover that dramas are typically less successful than other genres once quality is controlled, while sequels tend to be lower-quality films. According to Terry, Butler, and De'Armond (2011), sequels have a positive and statistically significant impact on box office performance while most of the highest-grossing films are derived from the children's genre. Pangarker and Smit (2013) also confirm that continuing a previous success is one of the key drivers of global box office revenue. At the same time, they claim that the film genre plays a less significant role as regards a film's success. Moreover, the results obtained by Gmerek (2015) show that the movie type – sequel or adaptation, genre and scope of the movie's release are closely related to box office, influencing it in a positive way. Garcia-del-Barrio and Zarco (2017), in turn, reveal that violent contents in movies bring forth greater box-office revenues while a more intensive recourse to profanity or sex and nudity implies smaller box-office revenues. More recently, Bae and Kim (2019) showed that in South Korea a movie title that contains information about its genre or storyline has a positive impact on box office revenue for an under-promoted movie while this impact decreases as prerelease promotional activities increase.

### **3.3. Financial sources and costs**

De Vany and Walls (1999) conclude that most films with huge gross returns have tiny budgets, while Prag and Casavant (1994) find that when marketing expenditures are considered, the impact of certain variables on box office earnings vanishes. Furthermore, Teti (2013) shows that significant investment in production can increase the likelihood of a higher box office but is not a guarantee for a positive return on a project. At the same time, McKenzie and Walls (2013) discover that even though Australian films are advertised more heavily and released more widely than non-Australian films, *ceteris paribus*, they earn less at the box office.

The impact of subsidies, in turn, has been approached many ways, yielding different results. Most studies find that subsidies do not significantly impact the success or failure of a film. For example, Bagella and Becchetti (1999) discover that public subsidies do not influence total admissions, daily revenues, or per-screen daily admissions. Along the same line, Agnani and Aray (2010) do not notice any impact of public subsidies on box office revenues in Spain. They use regional data on movie production and panel data regression, as their data on subsidies are only available for a short period. Also, McKenzie and Walls (2013), in the case of Australia, find that government subsidies have no impact on a film's financial success at the box office. Similar conclusions about the effects of subsidising film are drawn from research conducted in the Italian market by Teti, Collins, and Sedgwick (2014). Their final data set include only those titles whose essential data – costs, box office takings, and film producer information – is complete and reliable. The authors reveal that the system of direct public support in Italy does not ensure the survival of this sector, which is inherently risky and does not allow for wider theatrical distribution of local productions. Meloni, Paolini and Pulina (2018) also investigated the Italian market. Their findings show that although public funding has an overall negative impact on quantity and quality, there are some differences when considering public subsidies by genre. According to their findings, dramas and thrillers are the genres that should be primarily financed by public agents. Only Jansen (2005) discovers that public subsidies in Germany tend to support producers who have consistently had above-average success in their movie performances.

### **3.4. Market-related factors**

Market-related factors such as critical appraisal may also influence box office performance. Prag and Casavant (1994) prove that critics' ratings and academy awards are positive determinants of movie prediction. However, since their sample includes older G-rated films that have been re-released, the inflation correction biases the coefficient on those films' ratings. Agnani and Aray (2010) also find a significant positive impact of awards on film production in the study sample, while Gemser, Van Oostrum, and Leenders (2007) note the impact of reviews on the success of the opening weekend and cumulative ticket sales revenue from art films. However, they do not draw similar conclusions concerning the behaviour of mainstream film audiences. Then, Terry, Butler, and De'Armond (2011) discover that adult content movies with an MPAA-restricted rating have lower box office performance. Nevertheless, their research data is collected from different online databases, threatening data incomparability. Pangarker and Smit (2013), in turn, find that box office successful films are productions with one or more Academy nominations with a higher budget, released by a major studio. Then, Ding et al. (2017) have proposed Facebook 'like' as an effective social marketing tool before the release of movies. Their empirical results indicate that the pre-release 'likes' exert a significantly positive impact on box office performance. Moreover, as the release date approaches, the pre-release 'like' impact becomes stronger, suggesting that the latest pre-release 'likes' are more effective

in driving box office performance. Finally, Kim, Trimi and Lee (2021) prove that the film rating affects not only the target audience but also the film's box office success while to assure the success of a film, the production firm should consider the target audience and its size (film ratings).

#### **4. Discussion**

After a narrative literature review, we identified and classified film success's determinants into four groups: human assets, product features, financial sources and costs, and market-related factors. Among the essential human assets, we listed contributors' reputation, talent concentration and celebrity appeal (e.g., cast and director popularity or star power). A group of factors related to 'product features' focuses on the characteristics of the movie, such as age restrictions, genre, production country, screenplay, special effects, story (e.g., adaptation, prequel, remake, sequel), or trailer. Critical financial sources and costs include advertising, co-production, marketing expenditures, movie promotion, production budget, production cost, state subsidies, or territorial licenses. Finally, market-related factors affect the film after the end of the production process and are often beyond the filmmaker's control. They include critical appraisal (e.g., awards, certification, film reviews and ratings, prize nominations, word of mouth), market competition, number of opening screens, release date, size of distributor, or even tax incentives.

The identified success factors can be further divided into internal and external. The film producer may influence and control internal factors such as film quality, production method, employment, management process (innovation, entrepreneurship), or structure and size of costs. On the other hand, external factors remain beyond the producer's control and depend on the company's environment, the country's economy, the type of market, or financial processes.

Without a doubt, film quality has a significant impact on its success. However, quality, especially in the case of cultural goods, has many faces and can be assessed differently. The feature of the film is that quality can be assessed only after watching it (Garcia-del-Barrio, Zarco, 2017), i.e. after many crucial decisions are made at the stage of its production and distribution. It is challenging to assess what films will gain viewers' sympathy in the future and how they will change. Viewers may have expectations and ideas about the likely quality of a film, but these expectations may need to be met or exceeded. Films can be considered an experiential good (Elliott, Simmons, 2008). When deciding to go to the cinema to watch a film, the viewer, of course, has some observable indicators of the film's features at his disposal. The reputation and achievements of people involved in the production may be a signal or a premise for the presumption of high quality of the film, but they do not guarantee the film's success. Sometimes, the film is a sequel, wherein experience and reminders from the previous

film will help determine willingness to watch the following one. Also, large production budgets can herald a film's box office success. However, large budgets provided by different funding sources usually make little difference in film success, though it can significantly reduce the impact of negative reviews. However, it still does not guarantee a film's popularity in cinemas and its box office success.

It should also be remembered that box office success does not have to be the only goal of making a film. Although, as previously cited studies pointed out, public subsidies do not guarantee increased cinema viewership of a given title, they may contribute to creating a valuable, niche cinema with educational value. In this dimension, quality has a different meaning. Audiovisual art can play an essential role in shaping societies, emphasizing their cultural diversity, and referring to the traditions of individual countries and regions. Therefore, they should be treated as cultural goods reflecting the identity of EU countries and regions.

In summary, research on film success factors is intended to support producers and investors in making decisions in an industry widely considered risky (De Vany, Walls, 1999; Eliashberg, Elberse, Leenders, 2006; Teti, Tomasi, Barchitta, 2019). It should be emphasized, however, that the research results so far do not provide a straightforward recipe for cinema success. It is related to the uniqueness of each new film work. Existing research only outlines the areas to consider when producing a film. Although, as William Goldman said, 'nobody knows anything', an empirical analysis of the factors that determine a film's success can provide helpful insight into the factors that may influence a film's performance in the theatre.

## **5. Limitations and further research**

This research aimed to identify the film's success determinants and classify their sources and commonalities. Further research could examine the differences in the success factors for individual film markets. In such a way, we could answer an exciting and fundamental research question about what market features make certain success factors vital for each market. Moreover, further empirical research could investigate the relationship between the success factors listed in our study and the box office performance in the Polish market. Our research has its limitations, too. The study uses the narrative literature review method. Thus, the results may be somehow limited as only preselected data bases in a specific period and with predefined inclusion and exclusion criteria were used during the process.

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## ON THE RELATIONSHIP OF BUSINESS ETHICS AND CORPORATE SOCIAL RESPONSIBILITY

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**Purpose:** The aim of the article is to indicate several important relationships between business ethics and corporate social responsibility (CSR). The author points out both the differences between them, but also tries to discover some similarities.

**Design/methodology/approach:** The article analyzes selected, available literature on business ethics and CSR. Apart from literature review, the author uses the method of analysis and logical construction.

**Findings:** The article presents the issue of the relationship between corporate social responsibility and the business ethics concepts. Despite the differences between these two concepts, research seems to show that CSR can be treated as a subset of business ethics.

**Research limitations/implications:** The text refers to a limited number of studies. The issue of detailed relations between business ethics and CSR in individual sectors of economic activity obviously requires further research.

**Originality/value:** The article refers to selected literature in the field of CSR and business ethics. The value of this article is the indication of the close relationship between business ethics and CSR, but also their fundamental importance for economic activity as such.

**Keywords:** Business ethics, corporate social responsibility, moral values.

**Category of the paper:** Conceptual paper.

### 1. Introduction

The very concept of business in its broader sense has been known at least since the ancient Sumerians, who had extensive trade and records around six thousand years ago (Kramer, 1977). The concepts of business ethics and CSR are very important for modern management science. Both concepts have been actively discussed for many years in scientific and business circles. Despite the fact that both of them are a product of the 20th century, it is worth remembering that the view that business is an ethical activity and has a certain responsibility towards society has been around for centuries (Adi et al., 2015).

There is no single universally accepted definition of business ethics. This term functions in different meanings depending on the adopted definition of ethics itself. It is also difficult to determine precisely the moment of birth of business ethics. In its modern meaning, the term “business ethics” began to function in the United States in the 1970s (De George, 2005). The attitude towards business as such has undergone historical changes. Business ethics is currently understood as an area of interest of general ethics, which formulates the ethical foundations and canons of human activity in economic life. It establishes a set of rules specifying the scope of management and indicates moral standards of conduct for business people. Business ethics examines the moral and ethical principles and problems that arise in business activities, both those relating to individuals and entire organizations (Donaldson, 1982).

The term "corporate social responsibility" (CSR) was first used by H.R. Bowen in a book published in 1953 entitled *Social responsibility of a businessman*. According to Bowen (1953), entrepreneurs have a duty to be aware of the expectations, goals and values of society and to implement these goals and expectations in their activities. Since then, the concept of CSR has had many different theoretical approaches. There is currently no single definition of CSR accepted by researchers. However, a certain evolution of this concept can be noticed, consisting in a gradual departure from its original meaning as philanthropic activity to its multidimensional understanding (Mosca, Civera, 2017). This evolution was caused by various changes taking place in socio-economic life.

Currently, one of the most frequently cited CSR definitions is the one found in the International Standard ISO 26000 Guidance on Social Responsibility of 2010. According to this definition, CSR is the responsibility of an organization for its decisions and actions towards society and the natural environment. Its goal is the sustainable development of the organization's environment (ISO 26000, 2013). Therefore, the analysis of the environment in which the organization operates becomes a necessary condition for the effective implementation of CSR principles. It should be remembered that it is not the company that sets the direction of its socially responsible strategy, but the needs of individual groups of stakeholders determine the area in which socially responsible activities are expected.

In view of the above statements, it should be recognized that CSR is an important trend that is almost always discussed in the area of reflection on business ethics. The concept of CSR is based on three pillars: economy, ecology and ethics. In this article, we are particularly interested in the latter aspect.

## 2. Research methodology

In order to achieve the research objectives of this article, the study used techniques such as literature review to collect, analyze and synthesize relevant information from a wide range of sources. The databases were searched based on the following keywords: business ethics, corporate social responsibility, moral values. The literature review is based on the Google Scholar and Science Direct platforms.

The method of logical analysis was also used in the article. The use of this method is particularly important when accepting the view that both concepts need much more conceptual clarity and consistency (Enderle, 2010). The above mentioned method relies mainly on the idea expressed in the belief that logic is a tool that helps distinguish correct arguments from incorrect ones. In a sense, logic and its methods allow us to discover the structural aspects of our thinking and actions (Peregrin, Svoboda, 2017). Since the rules of logic govern the most general rules of our natural language, the analysis of text written in such a language is the most precise tool for detecting relationships between concepts.

The author does not use formalisms. The aim is only to apply the method of logical analysis to capture the most central issues of the concept of business ethics and CSR. In other words, only the notions that constitute the conceptual framework of the eponymous concepts are analyzed.

There are many studies analyzing the relationships between business ethics and CSR. Although most academic works on business ethics and the definition of CSR are conflicting, there is a consensus that business ethics is more about decision-making by individuals and social units, and CSR is more about the impact on stakeholders. The selection of literature was made taking into account works that constitute a comparative study of both analyzed concepts.

## 3. The concept of business ethics and its brief history

Business ethics is a field of ethical reflection devoted to moral issues that arise in economic activity. In this context, a proper understanding of the essence and tasks of business ethics requires at least an outline presentation of the essence and tasks of ethics as such.

In the most general sense, ethics is a philosophical study of morality. Despite the fact that the birth of business ethics falls on the 70s of the twentieth century, ethical issues appear in business activities from its beginning (Bowie, 2020). Considerations about a fair price one can find, for example, in the Code of Hammurabi written nearly four thousand years ago (Hoffman, et al., 2014). Aristotle, one of the greatest ancient Greek philosophers, also analyzes the virtues and vices of tradesmen and merchants (Klimoski, 2006). Cicero, in turn, wrote: "To everyone who proposes to have a good career, moral philosophy is indispensable" (Hoffman et al., 2014). Problems of ethical business conduct appear in the Old and New Testaments, the Jewish

Talmud and the Koran. The considerations in those distant times were about the right way to do business. Such issues as fraud, theft, just prices, proper weights and measures, competition and free entry or usury were analyzed. In the scriptures of the great religions, the problems of business were considered in relation to the problems of wealth and poverty. Ethics as a science, however, was born in ancient Greece.

Socrates is considered the first ethicist in the Western tradition. The ethical theories formulated by the Greek philosophers are theories about the good life; their point of departure is the question Socrates asks in the Platonic dialogue *Gorgias*: how to live in order to be happy? Greek philosophers after Socrates assume that happiness, identified with the good life, is the object of desire of every human being. The view that happiness is the goal of life and the highest value is called eudaimonism (Greek: εὐδαιμονία-eudaimonia commonly translated as 'happiness' or 'welfare'). The Greek thinkers, of course, differed on the nature of the good life. However, since the time of Socrates the view, shared by most Greek philosophers, that recognizes the virtues as belonging to the good life, either as a means, or as an ingredient, or even as identical with it, can be noticed. Eudaimonism was adopted and developed in many respects by philosophical schools of the Hellenistic period, such as Stoicism and Epicureanism. Richards (2013) points out that the Hellenistic thought found application after many centuries in the search for the principles of a good life and the formulation of the ethics of environmental virtues.

Aristotle's works in the field of ethics developed the model of eudaimonistic ethics established by Socrates and Plato. He defines the virtue of character as a disposition to make decisions adequate to what is determined by reason. He also analyzes the different types of virtues and the relationships between them. In his *Nicomachean Ethics* Aristotle says that the good we are looking for must be something sought always for its own sake and never for the sake of something else, and it must be self-sufficient, that is, it must be something which taken on its own makes life worthwhile and lacking in nothing. These are the properties of happiness (Richards, 2013). According to Aristotle, if life is to be worth living, it must be for something that is an end in itself.

It seems reasonable, at this point, to ask how ancient ethical theories are combined with modern business ethics? First of all, it should be noted that morality was not regarded in antiquity as based on rules until the time of the Stoics (Striker, 1987). The issue of the foundations of moral principles becomes crucial in ethics developed in the following centuries. Each epoch, of course, makes its own contribution to ethical thought. However, Aristotle's analyzes set a trend in the scientific treatment of ethics. It is also worth to remember that the deliberations of this philosopher also gave rise to economics within Western European tradition. This view is shared especially by economists (Meikle, 1997). Aristotle distinguished two different meanings of what we call economics. The first of them was *oikonomikos*, i.e. the art of household, which he praised and considered necessary for the functioning of any society, even a slightly complex one, and the second one is *chrematisike*, i.e. the art of obtaining money. The Stagirite considered the latter activity to be completely immoral, completely devoid

of virtue. His criticism of the wicked and unproductive craft of the usurer remained valid well into the 17th century.

The Christian tradition of business ethics also focuses on condemning unfair business practices, especially usury. Jesus banished merchants and moneylenders from the temples, and Christian thinkers from Paul of Tarsus to Saint Augustine, Thomas Aquinas and Martin Luther followed His example, strongly condemning most of the activities that we today call business. However, it should be remembered that the attitude towards business changed during the development of Christianity.

Bay et al. (2010) distinguish five stages of this development: (1) early Christianity, (2) Patristic period, (3) Dark and Middle Ages, (4) the Reformation, and (5) the Enlightenment. The above-mentioned authors analyze changes taking place in Christian business ethics using the example of five issues: (1) the purpose of work, (2) land ownership, (3) wealth, (4) interest on loans and (5) profits. They point out that the direction of the evolution of Christian philosophers was such that what was initially considered unacceptable and immoral becomes acceptable and admired. An example would be the attitude towards property. Early Christian thinkers taught that personal wealth should be given to the poor or collected in common stockpiles. As time passed, however, being rich was becoming more and more acceptable, and eventually the thesis of keeping one's wealth for oneself was accepted.

It is worth remembering that the idea of the social responsibility of businessmen can also be found in the interests of many Puritan and Protestant writers. One of the factors shaping Christian views on business ethics was the position of the Church in each of these eras. It seems that the characteristic feature of business ethics practiced by Christian philosophers, which determines their views in this area to the greatest extent, is the belief that God has set a goal for business people that goes beyond the profit motive (McMahon et al., 2015). The most important task for Christian business ethicists is how to reconcile faith with business.

Business ethics grew out, therefore, of a long tradition of ethics as a theoretical reflection on the essence of moral phenomena and behaviors, and what is particularly important, the characteristics of human character traits as the subject of moral actions. We should agree with the opinion that "The history of ethics in business goes back as far as both ethics and business" (De George, 2005, p. 339). Within this history, two trends in business ethics have developed: religious and secular. They are parallel but often intertwine.

Abend (2014) argues that morality consists of three levels:

1. the behavioral level: moral or immoral behavior;
2. the normative level: moral understandings and norms;
3. the moral background: moral concepts existing in a society. This division shows that business ethics is a comprehensive approach to moral phenomena occurring in economic activity treated as a part of the social life, as an integral part of the social structure.

Svensson G. and Wood G. (2008) propose a model of business ethics consisting of three essential elements (i.e. expectations, perceptions and evaluations) which are interconnected by five sub-components (i.e. society expectations; organizational values, norms and beliefs; results; society assessment; reconnection). This model leads to several important conclusions allowing for a better understanding of the nature of business ethics. First of all, according to this model, business ethics is a continuous and iterative process. This process is subject to constant changes caused by phenomena such as the development of new technologies, changes in the approach to the use of natural resources or the development of a global business network. The above-mentioned phenomena are accompanied by a growing awareness of the importance of ethics in running a business. Research shows that the list of potential consequences of ignoring ethical principles in business activity is very long (Wolska, 2013).

Due to the difficulties in defining the concept of ethics as such, business ethics, which is its subdiscipline, encounters similar difficulties. However, in the field of applied ethics, business ethics, alongside medical and legal ethics, occupies a unique position. Unlike medical and legal ethics, business ethics deals with this area of human activities whose entities do not enjoy a very high professional status and whose motives, to put it mildly, are considered not very noble. It is often believed that the only motive for running a business is "greed" (previously "avarice"). Therefore, it is not easy to find positive opinions about this type of activity in the history of business ethics.

It is worth noting that there is a current position called Economistic Business Ethics Denial, according to which modern business is significantly inconsistent with ethics (Von Kriegstein, Scott, 2023). It assumes that all actions undertaken out of moral goodness are ethical. Supporters of this view claim that business activities are undertaken out of a desire for profit and are therefore immoral. In contemporary business ethics, however, they are a distinct minority.

In contemporary business ethics, one can see its philosophical and religious roots. Also today, economic activity raises many interesting philosophical problems, such as: responsibility, truth, manipulation, exploitation, justice, charity and more (Moriarty, 2019). The change in attitude towards business did not happen suddenly, of course. It was a long process of changes taking place in the sphere of ideas, which took place under the influence of phenomena such as urbanization, rapid technological progress, industrial development and the accompanying development of needs, desires, as well as social structures. In modern ethical theories profit is no longer condemned as immoral and businesses are no longer seen as deprived of ethical principles entities. Instead the question arises about the place of profit in the context of business activity and social responsibility, as well as about how businesses as complex communities can best serve its employees and society as a whole.



#### 4. The Concept of Corporate Social Responsibility (CSR)

There is no single universally accepted definition of CSR. The earliest and best-known is that given by H. Bowen, called the father of corporate social responsibility (Carroll, 1999). Bowen writes: "Are businessmen, by virtue of their strategic position and their considerable decision-making power, obliged to consider social consequences when making their private decisions? If so, do they have social responsibilities that transcend obligations to owners or stockholders? The answer to both these questions is clearly yes. (...) The term social responsibilities of businessmen will be used frequently. It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society" (Bowen, 2013, pp. 4-6).

Classic of management theory and practice, P. Drucker concludes: "society is not just the environment of the enterprise. Even the most private of business enterprise is an organ of society and serves a social function (...). the very nature of the modern business enterprise imposes responsibilities on the manager (Drucker, 1955, p. 375). Drucker developed his concept of CSR in subsequent works. He points out that until the sixties, the discussion on CSR was not about "the social responsibility of business, but with the social responsibility of businessmen" (Drucker, 1974, p. 314). In short, a prominent management theorist mentions here increasing interconnectedness of business and society. It is worth noting that in the light of intensifying globalization processes, his remarks turned out to be true.

Another scholar from the early period of CSR development, H. Johnson, writes: "A socially responsible firm is one whose managerial staff balances a multiplicity of interests. Instead of striving only for larger profits for its stockholders, a responsible enterprise also takes into account employees, suppliers, dealers, local communities, and the nation" (Johnson, 1971, p. 50). The concept of responsibility is treated very broadly in the above definition. This shows that already at a relatively early stage of development, researchers were aware of the multidimensionality of the category of responsibility in the context of running a business. This would not be possible without a long period of development of ethics as a scientific reflection and the issue of responsibility developed within it.

The above opinion is not trivial in any way, i.e. it was not always the case that scientists shared the view on business responsibility in such a broad sense. Just point to the example of Columbia professor A. Berle, who believed that managers are responsible only to the company's shareholders (Berle, 1954). A different opinion was expressed at that time by Harvard professor, E.M. Dodd, who stated that managers are also responsible to society as a whole because a large company is supported by the law precisely since it serves the community, not because it brings profits to the owner (Dodd, 1932). This discussion is the evidence of the development of the CSR concept.

Nowadays, one of the most frequently used definitions of CSR is the mentioned above formulated by the European Commission, according to which: "CSR is a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (2010). This definition is simple, but it seems to capture the essence of CSR quite well. Moratis (2016) analyzing the above definition of CSR, calls it "out of the ordinary" because, unlike the currently dominant instrumental definitions, it clearly promotes a moral perspective when it comes to the obligations of enterprises towards society.

Hamidu et al., (2015) note that the lack of a single definition of CSR may be related to the constantly changing role of CSR in company management practices. Definitions formulated in the fifties and sixties indicate the need for business to be philanthropic and contribute to the prosperity and development of society. The task of CSR in that period was interpreted as volunteering and contributing to social well-being. The next stage was a period of growing concern and awareness of employee rights, stakeholder satisfaction, relationship management, regulated CSR practice and consumer protection. The final stage is the period of instrumentality and sustainability, in which CSR is treated as a strategic tool in achieving organizational goals. CSR is now highly institutionalized and standardized by various international indicators for responsible investment and sustainable development. One should remember, however, that CSR is a concept but also a set of actions embedded in the ethicality of the business.

There are interesting attempts undertaken by some researchers to determine the trends characterizing the development of the CSR concept by analyzing its various dimensions. Dahlsrud (2008) compared thirty seven definitions of CSR used in the subject literature over the last twenty years of the twentieth century. He noted that the concept of CSR is socially constructed in specific contexts. He distinguishes five dimensions of CSR definitions:

1. Environmental dimension.
2. Social dimension.
3. Economic dimension.
4. Stakeholder dimension.
5. Voluntariness dimension.

The distinguished dimensions of the CSR definitions seem to show the increasing degree of rationalization of this concept (Lee, 2008). It is also noticeable that the analyzed concept is increasingly closely linked to the company's financial goals. One should also note that this is consistent with the above expressed opinion that ethical reflection is moving away from condemning economic phenomena as immoral. At the same time, it points to the problem of the relationship between business ethics and CSR, which is of particular interest in this article. It turns out that both business ethics and CSR concepts evolve according to a similar principle.

Rahman (2011) notes another interesting regularity in the development of the definition of CSR, manifested in the departure since the mid-twentieth century from thinking dominated by "social responsibilities" to a concept that appeared in the twenty-first century, which

emphasizes the importance of issues such as: economic development, the integration of social and environmental aspects, or transparency of activities undertaken in business. The list of dimensions is significantly expanded by this author. He lists:

1. Obligation to the society.
2. Stakeholders' involvement.
3. Improving the quality of life.
4. Economic development.
5. Ethical business practice.
6. Law abiding.
7. Voluntariness.
8. Human rights.
9. Protection of Environment.
10. Transparency & accountability.

The evolution of the CSR concept outlined above can be understood as a response to society's needs related to business development in particular historical periods (Orbik, Zozul'aková, 2019). The modern theory of CSR emerged as a result of the transformation that started at the beginning of the twentieth century. The importance of the development of the CSR concept for contemporary business is aptly characterized by the following words: "Over the past several decades corporate social responsibility (CSR) has grown from a narrow and often marginalized notion into a complex and multifaced concept, one which is increasingly central to much of today's corporate decision making" (Cochran, 2007, p. 449). Indeed, it is difficult today to imagine a company operating, at least in the Western world, which activities would be indifferent to principles resulting from the CSR strategy.

Nowadays, we can talk about open and closed CSR models (Gorova, Qiwen, 2021). In the open CSR model, companies take responsibility for solving problems in society and include CSR in their overall strategy. Operating according to a closed CSR model assumes the existence of both, formal and informal institutions, through which companies' responsibility for social interests is agreed with business representatives and thus their compliance is ensured. The current state of CSR development may be the result of the influence of many theories from both ethics and economics on this concept. In this article, the interest is, of course, focused on the former ones (Lindgreen, Swaen, 2010).

Implementing CSR principles, which should also be remembered, also brings many different benefits. The most important include improving the image of the organization, more effective implementation of innovations, but also a beneficial impact on the natural and social environment (Orbik, 2022).

## 5. Discussion

After clarifying the meaning of the concepts of business ethics and CSR, a question arises: are we dealing with two completely different concepts or are they synonymous? Moreover, what are the fundamental differences or similarities between them in terms of the content of these concepts?

Let us note that the term ethics is a combination of two well-known terms: "ethics" and "business". CSR, on the other hand, is a term that combines three terms: "corporate", "social" and "responsibility" (Dimitriades, 2007). The meaning of the terms constituting the above-mentioned concepts also determines, at least in some sense, the meaning of the concepts we are interested in this article (Zhou, 2022).

The two eponymous concepts have been discussed above. A brief history of business ethics as part of general ethics and various dimensions of the CSR definitions have been also presented. Companies doing business activities are an integral part of social, economic and biological life. Conducting business in accordance with the principles of CSR results from the belief which has accompanied people for a long time that business is not an amoral field and therefore, like any type of human activity, it is also subject to ethical assessment.

The concept that connects CSR with ethics is moral responsibility, especially the moral responsibility of an organization. Most often, the organization's responsibility for ensuring financial success and economic growth was emphasized, leaving aside moral considerations (Ulrich, 2008). This view suggested that managers or employees do not need to focus on moral issues related to decision-making in the company. The concept of economic responsibility dominated this approach.

However, if an organization chooses an action plan based on moral rather than economic responsibility, the ethical behavior of the organization is then manifested in social systems such as CSR policies, codes of conduct or ethical principles developed within ethics (Eriksson et al., 2013; Ha-Brookshire, 2017). Many studies show that the individual moral responsibility of organizational employees and the moral responsibility of the organization are interrelated (LoMonaco-Benzing, Ha-Brookshire, 2016; Poonamallee, Joy, 2018). This is a relation of the type that if the set goals of the organization are consistent with the principles of moral responsibility, then it strengthens the moral responsibility of employees and vice versa.

The close connection between the moral responsibility of an organization and its employees results from the fact that organizations are social institutions. If we realize that ethics also arises as an attempt to organize interpersonal relations, then we see a direct relationship between business ethics and CSR.

The following definition of CSR seems to be explanatory according to which CSR is "the integration of an enterprise's social, environmental, ethical and philanthropic responsibilities towards society into its operations, processes and core business strategy in

cooperation with relevant stakeholders” (Rasche et al., 2017, p. 6). In the light of the above definition, the concept of CSR appears as an attempt to implement various dimensions of responsibility, including social responsibility, in business. It should also be remembered, although this issue requires a separate study, that practitioners and academic researchers have a different view of the relationship between business ethics and CSR (Ferrell et al., 2019).

The development of business ethics and the concept of CSR in a practical dimension has given us the paradigm of an entrepreneur as a person who combines business life with ethical life. This is a person who produces goods and services for society but also treats other stakeholders in a fair and equitable manner. The summary of the quite long scientific discourse on CSR shows that this concept has not lost its vitality. Some problems were caused by framing CSR as an issue related to the actions or results of a single entity, subject to self-regulation within legal limits with a wide range of possibilities, and resulted in a frustrating and in many respects futile discussion (Owen, Kemp, 2023). Linking the issues of CSR in the context of business ethics, i.e. in the social context, allows us to avoid these difficulties. Also, responsibility outcomes are better viewed from the point of view of multiple actors. because one is always responsible to someone.

## 6. Conclusions

Both the concept of business ethics and Corporate Social Responsibility are concepts that are actively discussed in the scientific literature. Let us indicate the most basic common features of business ethics and CSR.

It turns out that business ethics as a concept is changing in the context of new technologies, new ways of using resources, and the evolution of social practices and development towards a constantly connected global business network. These phenomena introduce business ethics as one of the most important elements of the discussion about social norms (Goel, Ramanathan, 2014). Literature analyzes show that the concept of CSR is also undergoing an evolution that takes place in specific social contexts. The close relationship between the two is indicated by the tendency characterizing both the historical development of business ethics and the CSR concepts, which is to move away from a negative assessment of business activity as such.

The close relationship between business ethics and CSR concepts is also evidenced by the fact that some researchers just call the latter one "corporate ethics" (Carroll, 1998). However, these two eponymous concepts should not be easily equated. Nevertheless, the opinion that the condition for understanding the CSR concept is to understand business ethics seems to be accurate (Kilcullen, Ohles Kooistra, 1999).

First of all, it should be recognized that business ethics not only created the foundation for CSR but also, by pointing to the ethical dimension of business activities, justified the need for companies to operate in a socially responsible manner (Jastrzębska, 2010).

It is also worth bearing in mind that the concept of CSR also had its opponents, especially among supporters of the free market (Friedman, 1970). Their arguments, however, do not seem serious and are based on the erroneous assumption that profit is the only goal of business (Salomon, 1997).

One should remember that CSR is not only a theoretical concept, but also a set of activities embedded in business ethics. It is also worth emphasizing that the research also shows that customers equally value activities undertaken as part of business ethics and CSR. Despite the fact that both concepts are often combined in academic discourse, they are concepts with a common origin and, although synonymous, are not the same.

CSR is a practical dimension of business ethics. It is based on the concept of responsibility, which has been developed for centuries within ethical considerations. Various thinkers treated this responsibility as individual responsibility. Only in the concept of CSR was it recognized as a responsibility occurring between social groups: on the one hand, the organization, on the other, society as a whole. Corporations are basic structures of society (Berkey, 2021).

An issue requiring further research is the social perception of activities undertaken by businessmen within the framework of CSR. There are reasons to assume that the term CSR still has primarily an academic dimension (Atif et al., 2023).

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## FINANCIAL LIQUIDITY AND PROFITABILITY ASSESSMENT OF TRANSPORT AND LOGISTICS COMPANIES LISTED ON THE WARSAW STOCK EXCHANGE

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**Purpose:** An assessment of the condition of companies listed on the Warsaw Stock Exchange, operating in the 'Transport and Logistics' sector, taking into account liquidity and profitability indicators.

**Design/methodology/approach:** The study was carried out using ratio analysis in the areas of liquidity and profitability. Consolidated financial data obtained through the Notoria Serwis database was used. In assessing the company's liquidity situation, ratios in static terms were used, such as the current liquidity ratio, the accelerated liquidity ratio, and the immediate liquidity ratio. The return on equity and the return on assets were used to examine the profitability area.

**Findings:** The results showed that the companies surveyed between 2015 and 2021, were characterised by a negative liquidity situation. This represents a significant problem, especially given the range of challenges facing companies today. The best situation in the period under study was characterised by the company Stalexport Autostrady S.A included in the sub-sector "transport and logistics: other". Slightly better results of the companies in the subsectors under consideration were recorded in the area of profitability, both equity and assets.

**Originality/value:** The assessment of the financial situation in the perspective of the last few years of business entities' activities is a valuable source of information for both theory and practice, as it allows the identification of areas requiring corrective action on the part of the analysed entities. This is important especially in the context of a number of challenges facing businesses today and adapting to the changing socioeconomic environment (e.g. the resilience of business entities to crisis situations). It is also possible to mention necessary actions aimed at preserving the principles of sustainable development.

**Keywords:** economic and financial analysis, profitability, liquidity, transport and logistics sector.

**Category of the paper:** Research paper.

## 1. Introduction

Viewed as a cognitive instrument of economic science, economic and financial analysis influences the perception of general regularities, including the establishment of economic indicators for the evaluation of economic activity. In practical terms, it refers to the examination of selected business units on the basis of financial documentation, including financial statements and the measures calculated on this basis, which illustrate the situation of the enterprise from the point of view of its various areas of activity. Economic analysis makes it possible to obtain an authoritative assessment concerning the current condition of the entity, but also to establish the basis for making forecasts of its economic and financial performance. This is an important point of consideration, and there is a high demand for this type of activity in economic life (Paduszynska, 2017, p. 29). Moreover, the management of a company requires continuous improvements to these tools in order to meet any objectives set by the company in a changing environment (Brach 2019: 88). Nowadays, more and more importance is being attached to the concept of business through the lens of sustainability (Gorczyńska, 2013, p. 102; Kozar, 2017, pp. 62-74; Kozar, Oleksiak, 2022, p. 19).

The purpose of the study is to assess the condition of companies listed on the Warsaw Stock Exchange (WSE) operating in the "Transport and logistics" sector, in terms of financial liquidity and profitability, based on economic and financial analysis tools. The source of financial data for the analysed companies were the resources of the Notoria Serwis database. The study was conducted using ratio analysis in the area of financial liquidity and profitability.

## 2. Essence and importance of economic and financial analysis

An important tool for decision-making in an enterprise is economic analysis, defined as a set of research activities concerning the economic state of a given entity, the results obtained and the methods of action adopted (Leszczyński, Skowronek-Mielczarek, 2004, p. 13). Economic analysis can be regarded as a method of scientific research in which an in-depth observation of a given entity or phenomenon is made, from the point of view of a number of component elements (Paduszyńska, 2017, p. 28). The purpose of conducting an economic analysis is to detect facts with the indication of the reasons for their occurrence and to evaluate the activity of the entity or phenomenon in question (Hasanaj, Kuqi, 2019, p. 17; Paduszyńska 2017, p. 29). It should be used primarily to determine the effects of the activities carried out using information on characteristics, relationships, and structures (Dudycz, Wrzosek, 2000, p. 10).

The literature proposes a division of economic analysis into the following sections, i.e. financial analysis, technical-economic analysis and strategic analysis (Stępień, Kasperowicz-Stępień, 2007, p. 169). Financial analysis, according to the literature, is the oldest division of economic analysis. It covers issues related to the overall financial situation of an entity, the main categories of capital and assets, the analysis of revenues and costs, or the financial efficiency of an entity (Bednarski, 2001, p. 7). The content of the financial analysis is considered to be the economic quantities that have been expressed in a monetary unit. In addition, the capital stock and the overall financial situation of the entity under study are of significant importance. The recent period has contributed to the creation of new qualitative and quantitative values referred to in the literature as "soft" generators that enable insight into aspects of the strategy covered, such as, for example, the product life cycle or the customer's relationship to the enterprise (Waśniewski, Skoczylas, 2004, p. 6).

### **3. Financial statements as a source of information for assessing the health of companies**

Financial statements are created based on the measurement of documentation and the recording of events occurring as part of the accounting process. The main purpose of reporting is to present a fair picture of the financial position of an entity (Koter, 2016, p. 93; Anđelić, Vesic, 2017, p. 10). The entrepreneur's obligation to prepare a report is based on the accounting law. Financial reporting refers to different types of reports, which can be prepared from the perspective of different time frequency, levels of generalisation, title of addressing different audiences, or due to their individual or collective (consolidated) nature (Sojak, Stankiewicz, 2008, p. 585, Kotler, 2016, p. 93).

The balance sheet is an accounting document that forms an integral part of the financial statements, being a determinant of the greatest information capacity, as it presents a summary of the assets and their sources of financing in the economic entity (Siudek, 2004, p. 10; Furman, 2011, p. 102). On the other hand, the profit and loss account (income statement) is a statement in which revenues from various types of activity and the related costs are shown in accordance with the matching principle (Sierpińska, Jachna, 2010, p. 64 Zaleska, 2012, p. 16; Zasuwa, 2016, p. 188). Both the revenues, costs and financial results generated by an entity form a kind of stream (Sierpińska, Wędzki, 2010, p. 33). Keeping a profit-and-loss account is an important information function. All the information contained in the report is a determinant for determining the dynamics of the financial result, as well as allowing one to predict the level of future functioning of the enterprise, including, among others, the level of profitability of the company. The information also helps to refine the scope and modus operandi necessary to make rational economic decisions, the accuracy of which depends primarily on the degree of

adherence to the principles that prevail in the preparation of the income statement in its reporting version (Artnewicz et al., 2020, p. 14). The cash flow statement is a reporting document that is closely related to the income statement and the balance sheet. The main purpose of its preparation is primarily to indicate the reasons for changes in the financial position and, in the main, to assess the company's ability to generate cash. It is noted that the statement is mainly useful for the internal organisation of the enterprise, being a factor supporting the planning, management and control process. The relevant analysis of the report impinges on the entity's view of its financial policy, thus enabling subsequent control and achievement of objectives (Wypych, 2007, p. 171).

#### **4. Application of ratio analysis in the area of company liquidity and profitability**

Using data from a company's financial statements, it is possible to determine indicators describing various areas of its operations. The basis for assessing a company are the economic and financial results achieved, as a rule, over the last 3-5 years, the current financial situation and the market environment in which the company operates (Juszczak, 2015, p. 71). Financial liquidity (supplemented by debt analysis) and the profitability and efficiency of use of the company's assets are considered the most typical areas of the company's ratio analysis.

Financial liquidity is the ability of a company to meet its current liabilities on time (Burzykowska, Duraj, 2009, p. 8-14). It is worth emphasising that the concept of financial liquidity should not be equated with terms such as payment capacity, asset liquidity and solvency (Lesiak, 2021, p. 221). However, there are approaches in the literature in which these terms are used interchangeably. For example, I. Olchowicz argues that "there should be consistency between the maturity of liabilities and the liquidity of assets, which is expressed by the entity's payment capacity, i.e., solvency" (Olchowicz, 2002, p. 314). For an overview of the definitions of payment capacity, liquidity and solvency, see the article by K. Stępień (Stępień, 2013, p. 93-102). Thus, it can be seen that financial liquidity is a rather complex economic category as highlighted by the different approaches found in the literature (Kuciński, Byczkowska, 2017, p. 60-62). Two groups of indicators are used to measure financial liquidity, i.e. static and dynamic indicators (Olzacka, Pałczyńska-Gościniak, 2004, p. 137-152). With regard to indicators of financial liquidity in dynamic terms (which are based on specific figures within cash flow), measures such as, for example, the operating cash flow generation capacity indicator, the external financing dependence indicator, the overall cash sufficiency indicator and the cash sufficiency indicators for sales, assets and profit are distinguished (Kuciński, Byczkowska, 2017, p. 64). In terms of ratios of a static nature depicting the liquidity situation of the company as of a specific moment (i.e., the period for which individual measures

are determined based on data taken from the balance sheet and the income statement), the following are distinguished: the current liquidity ratio (describing level III of financial liquidity), the accelerated liquidity ratio (describing level II of financial liquidity) and the immediate liquidity ratio (depicting level I of financial liquidity). This is a very important area of analysis, and maintaining liquidity by a company should be one of its priority objectives. This is because the loss of liquidity may even lead to the bankruptcy of an entity (Prętnicka, 2017, p. 4).

The current ratio (defined as: current assets/short-term liabilities) allows an assessment to be made of the potential of a given company to settle its short-term liabilities on time using its current assets (Dębski, 2013, p. 78). The optimal theoretical values of this measure are in the range of 1.2-2 (Sierpińska, Jachna, 2010, p. 147). The accelerated liquidity ratio (determined as: current assets - inventories - short-term accruals/short-term liabilities) determines the ability to settle liabilities on time through highly liquid assets. The recommended level of this ratio oscillates around the value of 1.0-1.3. The combination of the results for the current and accelerated liquidity ratios gives information about the amount of capital frozen in the company's inventories (Lesiak, 2021, p. 223). It is important to remember that the theoretical recommended values should not be treated as universal values that apply to all companies. It is necessary in refer to the situation to the industry in which the company operates. On the other hand, the immediate liquidity ratio, which represents level I liquidity, is determined by dividing the amount of cash and cash equivalents by the amount of short-term liabilities. It is difficult to indicate its recommended size. In some studies, it can be found that the value of this ratio should be 0.2 (and thus the company should be able to settle 20% of its liabilities with the most liquid assets, i.e. cash and cash equivalents (Waśniewski, Skoczylas, 2004, pp. 439-441; Prętnicka, 2017, p. 10). It should be considered as a complement to the other liquidity measures (Kuciński, Byczkowska, 2017, p. 65).

In turn, profitability analysis is used to determine the profitability of an economic entity's activities over a specific period of time. The concept of profitability can be defined as the relationship between the revenue generated by an enterprise and the costs incurred (Machala, 2011, p. 450). Profitability is associated with a positive financial result. If this is not the case, one should speak of a deficit, i.e. when the enterprise records losses (Jerzemowska, 2004, p. 285). Both profitability and deficit can be considered in absolute terms (in terms of a specific result) as well as in relative terms (i.e., in relation to the result for a given financial category). Profitability ratios therefore express an entity's ability to generate profits and thus indicate a company's development prospects (Jerzemowska, 2006, p. 201). They are subject to analysis in three dimensions, i.e. assets, equity and sales. The basis, but also the most popular approach, is the profitability dimension in terms of a company's assets and equity.

The return on equity (calculated as: net financial result/equity) provides information on what rate of return a company can obtain from a given investment. Return on equity is a key measure of profitability assessment for business managers (Misztal, 2015, p. 97). Return on

assets (calculated as net financial result /total assets) indicates the level of a company's ability of its assets to generate profits. In other words, it illustrates the degree of efficiency in managing its assets, i.e., how much net profit accrues for each PLN of assets held. The higher the values of the ratios listed here, the more favourable the situation of the company.

## 5. Research methodology

The study using ratio analysis, taking into account the area of liquidity and profitability, was carried out on the basis of consolidated financial data obtained through the Notoria Serwis database for joint-stock companies operating in the "Transport and logistics" sector (430), according to the nomenclature of the Warsaw Stock Exchange (WSE, 01.06.2023) including the following subsectors: "Transport" (431), "Means of transport" (424), "Transport and logistics: Other" (439) listed on the Warsaw Stock Exchange (hereinafter GWP) as of: 14.05.2023. 7 companies were finally classified for the analysis, viz: Newag S.A., Wielton S.A. (sector: means of transport), Enter Air S.A., OT Logistics S.A., PKP Cargo S.A., Trans Polonia S.A. (sector: transport, where the company KDM Shipping Public Ltd. was excluded from the analysis due to unavailability of financial data for the last 4 years) and the company Stalexport Autostrady classified to the transport and logistics sector: other. Industry analytical indicators were also used for the analysis, according to the section of PKD within which the company operates (Industry indicators, 5.05.2023). For companies classified according to the WSE nomenclature in the "means of transport" sector, industry indicators for section C according to the PKD 2007 classification were used, for companies in the "transport" sector, industry indicators for section H were used, while for a company in the "transport and logistics: other" sector, indicators for section F were used. This was dictated by the section in which the company operates (Notoria Serwis, 14.05.2023). The range of data covers the years 2015-2021 (the time range was dictated by the inclusion of the latest available data in the Notoria Serwis database for all companies considered).

In order to examine and assess the financial situation of the selected entities, traditional financial analysis tools were used, i.e. a set of ratios characterising various areas of the company's activity indicating its condition in terms of financial liquidity and profitability. In order to assess the company's situation in terms of financial liquidity, ratios in static terms were used, such as: current liquidity ratio, accelerated liquidity ratio and immediate liquidity ratio. The return on equity and the return on assets were used to examine the profitability area.



## 6. Research results

Analysing the liquidity of companies operating in the 'means of transport', 'transport' and 'transport and logistics (other)' sectors from the point of view of the current ratio, it can be concluded that only half of them were characterised by the required ability to pay their current liabilities between 2015 and 2021 (Table 1).

**Table 1.**

*Liquidity performance of companies operating within the transport and logistics sector*

Manning allocation of the company	Company name	Financial liquidity							Dynamics 2021/2015
		2015	2016	2017	2018	2019	2020	2021	
Current ratio									
Transport means	Newag	1,23	1,21	1,14	1,46	1,50	1,83	1,74	141,26
	Wielton	1,14	1,28	1,28	1,16	1,23	1,15	1,21	106,13
Transport	Enter Air	1,62	1,35	0,88	0,75	0,51	0,26	0,63	38,99
	OT Logistics	1,26	0,80	0,54	0,36	0,29	0,27	0,48	37,90
	PKP Cargo	0,91	1,32	1,39	1,20	1,02	0,83	0,65	71,98
	Trans Polonia	1,10	1,18	2,05	2,08	1,75	2,51	3,09	280,87
Transport and logistics: Other	Stalexport Autostrady	1,11	2,19	1,51	2,34	2,22	2,66	1,78	160,49
Accelerated liquidity ratio									
Transport means	Newag	0,80	0,55	0,65	1,01	0,77	0,96	0,79	98,24
	Wielton	0,48	0,72	0,71	0,60	0,64	0,65	0,65	134,71
Transport	Enter Air	1,60	1,33	0,86	0,73	0,49	0,25	0,62	39,00
	OT Logistics	1,24	0,79	0,53	0,35	0,28	0,27	0,46	37,46
	PKP Cargo	0,80	1,22	1,27	1,08	0,91	0,71	0,56	70,04
	Trans Polonia	1,08	1,18	2,05	2,07	1,75	2,51	2,94	272,24
Transport and logistics: Other	Stalexport Autostrady	1,10	2,17	1,50	2,33	2,21	2,64	1,76	160,42
Immediate liquidity ratio									
Transport means	Ursus	0,15	0,01	0,03	0,13	0,03	0,21	0,23	155,40
	Newag	0,07	0,13	0,11	0,05	0,10	0,13	0,13	189,56
	Wielton	1,06	0,65	0,32	0,36	0,21	0,15	0,48	45,53
Transport	Enter Air	0,17	0,14	0,12	0,07	0,07	0,04	0,06	33,49
	OT Logistics	0,23	0,65	0,42	0,33	0,38	0,22	0,15	63,63
	PKP Cargo	0,15	0,36	0,25	0,94	0,84	1,43	1,89	1258,86
	Trans Polonia	1,01	2,07	1,40	1,98	2,05	1,43	1,65	163,45
Transport and logistics: Other	Stalexport Autostrady	0,15	0,01	0,03	0,13	0,03	0,21	0,23	155,40

Source: own compilation based on data obtained from Notoria Serwis, 14.05.2023.

The best current liquidity situation was characterised by companies in the "means of transport" and "transport and logistics: other" sectors. However, taking into account the data for the most recent year, i.e. 2021, the current ratio only for Newag S.A. was above the value of the ratio for the industry (i.e. 1.53). In the case of companies in the "transport" sector, the relatively good current liquidity situation was characterised by Trans Polonia S.A. (over-liquidity was recorded in 2017, 2018, 2020 and 2021 which, in turn, may indicate some unproductivity in terms of current assets). In the case of the remaining companies in this sector, the recorded results in terms of current liquidity may indicate problems of these entities,

as the value of the indicator in 2021 was below the indicator for the entire industry, i.e. the level of 1.53. In the case of the company Stalexport Autostrady S.A. from the sector "transport and logistics: other", the value of the indicator indicates overliquidity in the period 2018-2020, where it was significantly above the result for the industry, that is, the level of 1.88.

In the case of the accelerated liquidity ratio, with regard to the "means of transport" sector, it can be noted that this one was below the theoretical values, i.e. 1.0-1.2 throughout the entire period under review, and what is equally important, in the case of the companies under consideration, in the years 2017-2021, the value of the ratio was below the result for the industry. On the other hand, it should be noted that these companies, despite their good current (Level III) liquidity situation, were characterised by a negative liquidity situation after excluding the least liquid assets (i.e. inventories and accruals). The accelerated liquidity ratio, as far as companies from the "transport" sector are concerned (except for Trans Polonia S.A., where over-liquidity was recorded), indicates liquidity problems of these entities, which was also observed in the case of the measure depicting third-degree liquidity (i.e. taking into account the entity's total current assets). This situation signals potential difficulties for these entities to settle their liabilities within the required timeframe.

When considering the situation in terms of immediate liquidity, in the case of companies belonging to the "means of transport" sector, it can be observed that they maintained small cash resources during the study period under consideration. In the case of companies in this sector, the value of the indicator did not exceed the level of 0.2 during the years under study, which indicates a small stock of the most liquid assets. As regards companies belonging to the "transport" sector, the company Trans Polonia S.A. held the most cash in the surveyed years, followed by PKP Cargo S.A. and Enter S.A.. The worst situation occurred in the company OT Logistics S.A., where the level of the indicator as of 2018 was below 0.1, which may indicate problems in settling current liabilities. This situation is also confirmed by the current and accelerated liquidity ratios. A turnaround plan has been implemented at the company in 2018-2019 to improve operational synergies, liquidity, and broader financial performance. In turn, a strategy was adopted to stabilize the financial situation was adopted in 2020-2021 (OT Logistics, 2023). In the case of Stalexport Autostrady S.A., the company's immediate liquidity shows high over-liquidity - the ratio remained at an average of 1.66 in the years under review. This is an important element of financial analyses especially in the context of a number of challenges facing companies today and adapting to the changing socio-economic environment (e.g., the resilience of business entities to crisis situations). For example, in the context of the outbreak of the COVID-19 pandemic and the resulting disruption to business entities, the need to build greater business resilience to economic shocks becomes apparent. Another point for assessing the health of companies is the analysis of profitability. The results in this regard are presented in Table 2.

**Table 2.**

*Performance of companies operating within the transport and logistics sector in terms of profitability*

Manning allocation of the company	Company name	Profitability							Dynamics 2021/2015
		2015	2016	2017	2018	2019	2020	2021	
Return on equity (ROE)									
Transport means	Newag	15,98	2,68	7,33	20,78	17,12	34,28	0,12	0,73
	Wielton	16,54	22,84	26,85	20,91	15,12	6,57	0,20	1,21
Transport	Enter Air	31,58	24,07	24,58	22,83	25,57	-54,41	-0,79	-2,51
	OT Logistics	5,65	2,90	12,87	-25,50	-32,06	135,63	1906,87	33749,91
	PKP Cargo	0,89	-4,06	2,48	5,41	1,04	-6,83	-0,07	-8,19
	Trans Polonia	8,87	11,71	11,01	13,45	6,06	6,64	0,20	2,26
Transport and logistics: Other	Stalexport Autostrady	32,80	32,73	24,71	24,79	10,05	11,01	0,11	0,35
Return on assets (ROA)									
Transport means	Newag	7,11	1,23	3,17	8,48	7,01	15,90	0,06	0,85
	Wielton	7,68	9,45	9,68	6,00	4,12	1,90	0,03	0,37
Transport	Enter Air	10,14	7,99	7,44	6,41	5,88	-8,96	-0,07	-0,67
	OT Logistics	2,18	1,03	4,36	-8,27	-7,21	-8,29	0,14	6,54
	PKP Cargo	0,51	-2,12	1,24	2,73	0,49	-2,88	-0,03	-5,82
	Trans Polonia	0,78	6,68	4,84	2,38	4,47	5,02	0,11	14,23
Transport and logistics: Other	Stalexport Autostrady	8,87	11,71	11,01	13,45	6,06	6,64	0,07	0,77

Source: own compilation based on data obtained from Notoria Serwis, 14.05.2023.

In the case of the return on equity indicator, companies included in the "means of transport" sector were characterised by a favourable situation in the years under review (in the case of Newag S.A., the growth rate in 2020 compared to 2015 exceeded 200%). However, the data for 2021 show a significant deterioration in profitability for companies in this sector (significantly below the results for the industry for return on equity, which amounted to 14.86%). Analysing the situation of companies included in the "transport" sector, taking into account the dynamics of change 2021/2015, the highest increase in the return on equity ratio was recorded by the company OT Logistics (with dynamics of over 33749% in 2021 compared to 2015). In the case of this company, a significant decrease in return on equity concerned 2018 and 2019, where the company's results were negative (a deficit of -25.5% and -32.06%, respectively). In PKP Cargo S.A., the results throughout the period under review were at a low level, below the values for the industry (in 2016 and 2020 - a financial loss was recorded). In the case of Enter Air S.A., there were high values for the return on equity ratio in 2015-2019, but a significant "in minus" adjustment occurred in 2020 and 2021 (a decrease of 182% in 2021 compared to the 2015 result). In contrast, Stalexport Autostrady S.A. recorded satisfactory levels of profitability (especially in 2015-2018, exceeding the level of the indicator for the industry in which the company operates).

For the companies in the "means of transport" sector, one can speak of a relatively good situation in terms of return on assets. In Newag S.A., ROA values have been above the industry value since 2018, while as regards Wielton S.A., this indicator has been steadily decreasing since 2018, and in 2021 a reduction of almost 100% was recorded compared to the 2015 value.

In the case of companies belonging to the 'transport' sector, the best situation was characterised by Trans Polonia S.A recording ROA values above the figures for the industry in 2016-2020. Significantly, the dynamics of change in 2020 compared to 2015 exceeded 600%. In the case of other companies, the worst ROA performance was recorded at OT Logistics S.A., where financial losses were evident from 2018 (a decrease of more than 300% in 2020 compared to 2015). In contrast, in the case of PKP Cargo S.A. (as in the case of ROE), performance throughout the period under review was at a low level, below the value for the industry (in 2016, 2020 and 2021, there was a deficit in assets). In the case of Enter Air S.A., high values of ROE were recorded in 2015-2019, but a significant correction "in minus" occurred in 2020. Stalexport Autostrady S.A., on the other hand, recorded satisfactory levels of profitability (especially in 2017-2018 above the industry index). A significant decrease in the return on assets concerns the last year of the analysis, i.e., 2021 (nearly 100% compared to the 2015 value).

## 7. Conclusions

Correct and reliable information on the assessment of the financial situation can be obtained by applying a method that is consistent with the determinants of the adopted research method. Of great importance among the tools of economic and financial analysis, both in theory and practice, is the ratio analysis. Its usefulness is determined not only by a properly conducted analysis, but also by the selection of financial indicators. Their selection should be conditioned by their cognitive value in relation to the objectives adopted.

The analysis of the financial situation of companies operating in the "Transport and logistics" sector shows that, in many cases, the financial liquidity performance was not adequate. In terms of current liquidity, between 2015 and 2021, only half of the companies surveyed were characterised by the required ability to pay current liabilities. This poses a significant problem, especially given the range of challenges facing companies today. We are talking, for example, about actions aimed at sustainable development by entities. Such initiatives involve significant financial outlays (e.g. in terms of adapting technical infrastructure or the need to replace the means of transport used with less polluting ones). This can create a significant challenge in terms of the need for liquidity.

Companies belonging to the "means of transport" sector, despite a relatively good situation in terms of the third degree of liquidity, were characterised by a negative liquidity situation after excluding the least liquid assets (i.e. inventories and accruals). In the case of companies included in the "transport" sector (except in the case of Trans Polonia S.A., where excess liquidity was recorded), liquidity problems can also be indicated in the years under review. The situation of the companies surveyed was more favourable in the case of profitability ratios,

both equity and assets. Companies included in the "means of transport" sector, were characterised by a good situation, with profitability results above the results for the industry. Analysing the situation of companies included in the "transport" sector, the best results in terms of return on equity and return on assets were recorded by Trans Polonia (with ratios above the figures for the industry). The case of Stalexport Autostrady S.A., which is included in the "transport and logistics: other" sector, shows that, in comparison with the other sectors analysed, the situation in terms of liquidity and profitability developed most favourably in the period under review.

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## CORPORATE GOVERNANCE IN BANKS: A LITERATURE REVIEW

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**Purpose:** Corporate governance has been attracting growing attention of researchers during last years. As a consequence, empirical analyses of corporate governance mechanisms are run on both, non-financial and financial companies. Increasingly, the special interest is being paid to banks. A stable functioning of banks plays a crucial role for the soundness of financial system and safety of whole economy. In consequence, it is of high importance to determine possible associations between corporate governance and bank activities. The aim of this article is to study the literature on corporate governance in banks. In particular, the purpose is to organise and summarise studies examining the role of corporate governance mechanisms and their impact on bank profitability, efficiency and risk-taking. This approach reveals the research problem which is to show the scope of empirically examined relationships between corporate governance and main areas of bank functioning.

**Design/methodology/approach:** To reach the goal of this paper, the analysis of the relevant literature and the methods of verbal description have been applied. The literature taken into account focuses mostly on empirical studies, but it has been preceded by an overview of a theoretical background with special attention paid to the regulatory context.

**Findings:** The literature review shows that corporate governance of banks is highly specific. At the same time, it is being demonstrated that different elements of corporate governance have been studied in banks. The empirical research conducted on banks include such areas of corporate governance as shareholder structure, earnings management, and board functioning. Ultimately, there are relationships between corporate governance mechanisms in banks and profitability, efficiency as well as risk-taking.

**Originality/value:** The paper provides a complex overview of corporate governance in banks, including the regulatory background and specificity of financial institutions in that field. As it summarises empirical studies devoted to this topic, main findings on relationships between corporate governance practices and certain areas of bank activity are organised. Therefore, it may be of a valuable reference for the bank management, policymakers or regulators in terms of decision-making process.

**Keywords:** Bank profitability; bank risk; corporate governance.

**Category of the paper:** Literature review.

## 1. Introduction

Corporate governance has been increasingly placed in the area of public interest since the global financial crisis. The collapse of financial markets shed light on the necessity to re-examine corporate governance practices adopted by banks. It highlighted the ineffectiveness of the internal and external control systems, severely damaging public confidence not only in corporations, but also in their statutory bodies, auditing, consulting or rating firms (Ježak, 2010). The need to regulate existing corporate governance mechanisms emerged (Salim et al., 2016). In particular, ensuring stable corporate governance has started to constitute an aim for shareholders, regulators and the banks themselves. Shareholders view the remuneration of statutory bodies' members as one of the corporate governance mechanisms. Regulators consider well-functioning corporate governance as a remedy for banks' insolvency and their lack of stability. Banks apply corporate governance mechanisms to strengthen oversight of board actions (Salim et al., 2016).

## 2. Corporate governance: international and domestic regulations

Corporate governance issues have been presented in the OECD Principles of Corporate Governance (Organisation for Economic Co-operation and Development, 2004). In this document, the authors use the concept of corporate governance and define it as the network of relationships between management and supervisory bodies, owners, and other stakeholders. Furthermore, according to the approach presented in this document, corporate governance creates a structure through which the objectives of the corporation, the means of achieving them and the tools to monitor can be established (Organisation for Economic Co-operation and Development, 2004).

The topic of corporate governance in banks has been raised in Corporate governance principles for banks (Basel Committee on Banking Supervision, 2014). The authors underline an important role of effective corporate governance for the proper functioning of the banking sector. At the same time, in this document is presented a view of the transmission of possible banks' governance weaknesses across the financial system and influencing the health of economy as a whole. The primary objective of corporate governance in banks is defined as "safeguarding stakeholders' interest in conformity with public interest on a sustainable basis" (p. 3). In addition, it is mentioned that shareholders' interest would be secondary to depositors' interest.

Last but not least, internal governance practices in financial institutions have received increased attention from European Banking Authority. The main aim of the Guidelines on internal governance under Directive 2013/36/EU (European Banking Authority, 2017) is to reinforce poor internal governance mechanisms in banks which have been uncovered in the aftermath of the financial crisis. In line with this document, internal governance includes all standards and principles regarding objectives, strategies and risk management framework, business organisation, the definition and allocation of responsibilities, setting up the reporting lines as well as accounting procedures and remuneration policies. Internal governance also involves areas on sound information technology systems, outsourcing arrangements, and business continuity management.

In the Polish environment, of particular note are Good Practices of Companies Listed on the WSE (Warsaw Stock Exchange, 2021), which contains a set of corporate governance principles applicable to issuers of shares listed on the WSE Main Market. This document reflects the current state of the law and the latest trends in the area of corporate governance. More specifically, it responds to issues raised by stock market participants on the topic of corporate governance.

Ultimately, in Polish banking sector of a crucial role in shaping corporate governance practices is assigned to the Principles of Corporate Governance for Supervised Institutions (The Polish Financial Supervision Authority, 2014). This document consists of a set of rules that determine the internal and external relations of supervised institutions with shareholders and clients, relate to their organisation and the functioning of the internal supervision, systems as well as functions. Statutory bodies and principles of their cooperation are also taken into account.

Corporate governance is visible not only in the regulations and rules imposed on market's participants, including banks, but also creates a topic for scientific research..

### **3. Concept of corporate governance**

The concept of corporate governance is an extremely broad aspect. Its issues have been raised by authors for many years, both internationally (Daily et al., 2003; Jensen, Meckling, 1976; Shleifer, Vishny, 1997) and domestically (Jerzemowska, 2002; Jeżak, 2010).

In line with an agency theory (Jensen and Meckling, 1976), corporate governance is oriented towards the study of the relationships that exist between the shareholders and the agents they hire. These agents manage and control the company on behalf of the owners, while at the same time are expected to maximise shareholder value. On the one hand, the owners delegate some of their powers to the agents so that they can fulfil their responsibilities. On the other hand, the owners await the decisions made by the agents to remain in line with

their interests. Referring to the agency theory, Shleifer and Vishny (1997) indicate that corporate governance is designed to ensure that owners receive a return on their capital. The authors emphasise that the main task of corporate governance is to deal with the separation of ownership and control. Moreover, managers' reputation and expectations of investors, regarding a return on investment, is being highlighted (Shleifer, Vishny, 1997). The attention is also devoted to the role of legal investor protection and shareholder concentration for the effectiveness of corporate governance mechanisms. These elements are considered to play an important role in obtaining returns on the investments made. In contrast, Daily et al. (2003) advocate a different concept of corporate governance than those provided by Jensen and Meckling (1976) and Shleifer and Vishny (1997). According to the authors, the control of top management interests and the protection of shareholders are taken into account when the separation of ownership and control occurs. Additionally, the concept of corporate governance is related to the extensive use of organisational resources being used to resolve problems arising between members of any organisation (Daily et al., 2003).

Corporate governance issues have been analysed on a country level in Poland. The main studies devoted to corporate governance in a Polish literature are those by Jerzemowska (2002) and Jeżak (2010). As Jerzemowska (2002) points out two primary approaches to corporate governance, which depends on its objectives. Namely, the shareholder model and the stakeholder group model. In the shareholder model, defined as a narrow view of corporate governance, the interests of owners are of the highest importance. According to this approach, top management act on behalf of shareholders and is expected to maximise shareholder value. This view is consistent with agency theory. Conversely, the stakeholder group model represents a broad approach to corporate governance. In this model, claims in the company can be asserted by both shareholders and stakeholders. In fact, corporate governance encompasses the network of formal and informal relationships within a company and their consequences for society as a whole.

In this vein, Jeżak (2010) underlines overly narrow meaning of corporate governance concept, which refers mostly to the enforcement of ownership rights, even though it extends the right of control to stakeholders other than shareholders and management. According to Jeżak (2010), the concept of corporate governance 'implies a broader, social and systemic context for companies to operate and the need to take into account the conditions and expectations stemming from the macroeconomic environment' (Jeżak, 2010, p. 121).

There are some studies relating to corporate governance in Polish banking sector (Kochaniak, 2011; Marcinkowska, 2012; Stępień, 2015). Kochaniak (2011) analyses the compliance between the interests imposed by different stakeholders and the interests of banks. In particular, it has been stressed that each group of stakeholders, such as depositors, employees, management and supervisory boards, shareholders, even the government, are willing to pursue their own needs. This behaviour relates to different risk appetite and leads to conflicts, at the same time diminishing the effectiveness of bank activity. It has been broadly observed

during the last financial crisis, and as a consequence, constituted the reason to implement new corporate governance rules, especially in terms of internal, organizational structures (Kochaniak, 2011).

Similarly, Marcinkowska (2012) devotes her research to key problems concerning corporate governance in banks and the related regulatory framework. In that vein, the special attention is paid to the codes of good practice, both the general principles of corporate governance and those addressed to banking sector. Marcinkowska (2012) investigates the compliance expressed by Polish commercial banks and chosen cooperative banks with Good Practices of Companies Listed on the Warsaw Stock Exchange. The analysis for the public banks is based on their corporate governance statements, and for other banks the findings are derived from a survey. Moreover, the compliance with BCBS corporate governance principles using survey data is examined by the author. The analysis provides conclusions on the areas of corporate governance needing enhancement, such as executives remuneration, credit risk management or internal control.

A possibility to balance of the interests of all bank stakeholders by effective corporate governance mechanisms has been underlined by Stępień (2015). This author links bank corporate governance and banking supervision as banking supervision is seen as a way to ensure the compliance of bank activities with applicable law and the principles of good banking practices. The special attention is paid to the problem of information asymmetry in banks and its possible solutions. The article also discusses the importance and role of the banking sector as a whole.

#### **4. Corporate governance and the special nature of banks**

The nature of banks as public trust institutions makes corporate governance highly specific and creates significant challenges in implementing its mechanism. Weaknesses in banks' corporate governance may have an adverse impact on economies. This is because of the important role banks play in mobilising and allocating capital what helps to lower the cost of capital and thereby stimulates economic growth (Levine, 2004). It has been argued that the traditional corporate governance approach, which focuses on the protection of shareholders' interests, is not sufficiently broad for banks. This is caused by features making banks different from non-financial companies (De Haan and Vlahu, 2016).

Firstly, banks being financial intermediaries are characterised by a high level of financial leverage as lending activities are financed with client deposits (De Anders, Vallelado, 2008).

Secondly, a special role is attributed to the high regulatory regime and strengthened supervision of the banking sector compared to other sectors (Levine, 2004). These numerous requirements stem from the great importance of banks for the stability of the payment system, the reduction of systemic risk and protection of depositors (De Anders, Vallelado, 2008).

Thirdly, as banks rely on public trusts, an important role is played by ethics in performing their activities (Hopt, 2020).

Fourthly, the complexity and limited transparency of banks' operations also attracts the attention of researchers (Brogi, Lagasio, 2018). The complexity of bank operations limits the ability of stakeholders to monitor management's decisions (De Anders, Vallelado, 2008). In turn, the limited transparency is often attributed to the great level of information asymmetry experienced by banks (Levine, 2004). For example, the quality of bank lending activity is not directly observable, and banks may make some discretionary decisions in order to distort the risk level they are taking.

Fifthly, banks can change the risk structure of their assets more quickly than non-financial firms (Levine, 2004).

There exist studies identifying differences in corporate governance mechanisms between non-financial and financial companies (Adams, Mehran, 2003; De Haan, Vlahu, 2016). A comparative analysis of bank holding companies and manufacturing companies on corporate governance was conducted by Adams and Mehran (2003), while relationships between selected elements of corporate governance and the performance of banks and non-financial firms were presented by De Haan and Vlahu (2016).

It has been found that banks are characterised by a larger average size of statutory bodies and they establish more committees within their structures than non-financial companies (Adams, Mehran, 2003). Additionally, there is a lower ratio of income earned by bank CEOs from options to total remuneration and bonuses. Moreover, CEOs hold less equity in banks than CEOs in non-financial firms. De Haan and Vlahu (2016) highlight that here is no link between the independence of statutory bodies and banks' profitability, in contrast to this positive relationship visible in non-financial firms. The higher level of performance in banks with larger boards also remains in contrast to the opposite relationship between these variables in non-financial companies. De Haan and Vlahu (2016) also draw attention to the inconclusive findings for CEO remuneration and holding of shareholdings and the level of risk taken by bank, justifying it by in the different motives of CEOs to achieve higher profits. Another area of corporate governance analyses constitutes associations of shareholder structure and profitably. De Haan and Vlahu (2016) emphasise ambiguous results between the degree of shareholder concentration and profitability. According to authors, the reason for this lies in the regulatory background. As it has been noticed by Arnaboldi (2019), there exists the fragmentation of the regulations and corporate governance codes that are imposed on banks in European Union countries. In addition, Arnaboldi (2019) underlines the growing importance of the board of directors for key strategic decisions in banks and the beneficial role of high diversified statutory

bodies. It has been shown that the benefits from the unique skills and experience of individual members outweigh the costs of large bank boards functioning.

There are many empirical studies focused on corporate governance in non-financial companies (Dalton, Dalton, 2011; Gelter, Puaschunder, 2021; Gupta et al, 2013). However, corporate governance is also being increasingly explored in banks (Adams, Mehran, 2003; Arnaboldi, 2019; Brogi, Lagasio, 2018; De Anders, Vallelado, 2008; De Haan, Vlahu, 2016; Hopt, 2020; Levine, 2004).

Authors focus on selected elements of corporate governance that may matter for different areas of banks' activities. Of considerable interest is the relationship between banks' corporate governance and their profitability (Aebi et al., 2012; Erkens et al., 2012), efficiency (Andrieş et al., 2018; Salim et al., 2016) or risk-taking (Anginer et al., 2018; Berger et al., 2016; Dell'Araccia, Marquez, 2010; Faleye, Krishnan, 2017; Gaganis et al., 2020; Laeven, Levine, 2009). However, there is a view in the literature that the corporate governance mechanisms in banks should be analysed together. Separating them may result in different conclusions over the effectiveness of the corporate governance practices adopted by banks (De Haan, Vlahu, 2016).

## **5. Profitability and efficiency and corporate governance in banks**

In terms of profitability, it has been shown on a sample of 372 banks at the end of 2006 that reporting directly by the Chief Risk Officer (CRO) to the board of directors is associated with higher bank profitability during the global financial crisis than when the CRO reports to the Chief Executive Officer (CEO) (Aebi et al., 2012). In particular, banks with reporting to the board of directors are characterised by higher stock returns and higher return on equity (ROE) in a crisis than banks with reporting to the CEO. The explanation for this relationship is found in the conflict of interest between the CRO and the CEO, and the insufficient attention paid to risk management by the chairman of the board. Aebi et al. (2012) also find either not statistically significant or a statistically significant but negative relationship between corporate governance indicators such as the presence of the CEO in the ownership structure, the independence of statutory bodies or shareholder rights and bank profitability.

The links between profitability or efficiency and corporate governance in banks are often analysed accounting for the global financial crisis. Erkens et al. (2012), analysing 296 banks from 30 countries between 2007 and 2008, show that during the crisis, banks with a higher independence of boards and a greater share of institutional investors in the shareholder structure have worse rates of return. According to the authors, this may be due to an increase in equity during the crisis in banks with more independent structures, which favours the transfer of wealth from shareholders to creditors. The source of this association may also be the greater risk-taking

of institutional investors in the pre-crisis period, which becomes apparent during the crisis. On the other hand, in the post-crisis period, banks applying corporate governance focused on protecting shareholders' interests perform worse than banks whose statutory bodies are less exposed to owners' influence (Hopt, 2020).

Another area of analysis addresses bank efficiency and corporate governance. On a sample of 139 commercial banks from 17 Central and Eastern European countries in the period 2005-2012 it has been proven that strict corporate governance practices promote higher bank costs and lower efficiency (Andrieş et al., 2018). These relationships are weaker in times of crisis and for better capitalised banks. Moreover, in line with study of Salim et al. (2016) on a sample of 11 Australian banks between 1999 and 2013, larger boards and higher frequency of committee meetings increases bank efficiency.

As mentioned above, the relationships between profitability or efficiency and bank corporate governance are being addressed by many authors (Aebi et al., 2012; Erkens et al., 2012; Hopt, 2020; Salim et al., 2016). Another area of bank activity affected by corporate governance is risk-taking.

## **6. Risk and corporate governance in banks**

Several authors have analysed the impact of corporate governance on bank risk-taking (Anginer et al., 2018; Dell'Ariccia; Marquez, 2010; Faleye, Krishnan, 2017), including bankruptcy risk (Berger et al., 2016; Gaganis et al., 2020; Laeven, Levine, 2009) and credit risk (Fiador and Sarpong-Kumankoma, 2021; Grove et al., 2011; Tahir et al., 2020; Tarchouna et al., 2017; Zagorchev, Gao, 2015). The period of the financial crisis is important in research on bank corporate governance and the level of risk-taking (De Haan, Vlahu, 2016). An important study summarising the research up to date in corporate governance and bank risk is that of Srivastav and Hagendorff (2016), which synthesises the existing literature. The authors pay significant attention to specific areas of corporate governance that may shape risk-taking by banks. These areas include the effectiveness of boards, CEO remuneration policies and risk management practices. Srivastav and Hagendorff (2016) attribute a special role to internal corporate governance mechanisms essential not only for shareholders, but also for creditors and taxpayers. Overprotecting the interests of owners may result in higher risk taken by bank and, as a result, expectations of other stakeholders not being fulfilled.

There is a broad area in the banking literature devoted to systemic risk and corporate governance. Dell'Ariccia and Marquez (2010) show the impact of corporate governance on bank risk, but also the reverse relationship, thus identifying sources of risk derived from corporate governance during expansion of banks into new markets. The authors take into account the legal structure of bank's activity and find that banks operating in the form of



subsidiaries are less exposed to risk than those of branches. In addition, Anginer et al. (2018), using a sample of US banks and non-financial firms for the period 1999-2014, provide evidence that shareholder-friendly corporate governance practices are associated with both greater bank risk and greater systemic risk in the banking sector. A positive relationship between shareholder-friendly corporate governance practices and the level of risk-taking is found in larger banks and in banks from countries with developed and strong financial safety nets.

A specific group of studies includes analyses on corporate governance and bank failure risk (Berger et al., 2016; Gaganis et al., 2020; Laeven, Levine, 2009). The dependent variables used in this type of research are either binary variables for bank failure during the global financial crisis (Berger et al., 2016) or indicators of bank failure risk, such as Z-score (Laeven, Levine, 2009), distance to default or probability of failure (Gaganis et al., 2020). The geographical coverage of banks in the work of Berger et al. (2016) are two distinct subsamples: 85 US banks that experienced failure and 256 from US banks that continued to operate from Q1 2007 to Q3 2010. Gaganis et al. (2020) use 356 banks from 50 countries over the period 2002-2017, and Laeven and Levine (2009) study 207 banks from 48 countries, including the 10 largest listed banks from each country based on total assets at the end of 2001.

The relationship between macro-prudential policy and corporate governance appears to be important for the probability of bank failure (Gaganis et al., 2020). The authors define corporate governance as an index consisting of 30 indicators which characterise the functioning and the structure of boards and remuneration policies. Researchers argue that corporate governance exhibits statistically insignificant or a negative relationship with bank stability only when macro-prudential policy tools are not implemented in the country or their presence is limited. An inverse relationship exists when the number of used macro-prudential policy instruments increases, what results in a link of corporate governance and a lower probability of bank failure.

Shareholder structure plays a key role for bank failure (Berger et al., 2016). The high ownership of non-executive directors significantly increases the risk of failure, whereas the presence of the CEO in a bank's ownership structure shows no statistically significant relationship with the probability of bank failure. The authors observe an explanation for this relationship in moral hazard, to which non-executive directors are more susceptible. Shareholder structure becomes important in identifying the level of risk-taking, once national banking regulation is taken into account (Laeven, Levine, 2009). The increasing propensity for riskiness occurs when shareholder power strengthens. The relationship between a risk-taking and capital regulation, deposit guarantee policies or restrictions on bank activities is different for dispersed shareholders and different for concentrated shareholders.

Corporate governance affects risk on lending activities (Faleye, Krishnan, 2017). Using a sample of 80 banks and 6099 borrowers over the period 1994-2008, the authors show that banks with more effectively functioning boards are less likely to lend to risky customers. However, these conclusions are subject to certain limitations. Firstly, they are narrowed down to crisis periods in the banking sector. Secondly, the strength of this relationship is greater in

banks with credit committees. The analyses on corporate governance and credit risk are continued in the studies relating to the share of non-performing loans.

Many authors address the relationship between corporate governance and loan quality (Fiador, Sarpong-Kumankoma, 2021; Grove et al., 2011; Tahir et al., 2020; Tarchouna et al., 2017; Zagorchev, Gao, 2015). These studies are carried out on diversified samples. Fiador and Sarpong-Kumankoma (2021) analyse 26 banks from Ghana between 2006 and 2016, while Tahir et al. (2020) use data on 21 listed Pakistani banks between 2005 and 2015. The work of Grove et al. (2011), Tarchouna et al. (2017) and Zagorchev and Gao (2015) includes US entities, both banks and other financial institutions. Grove et al. (2011) study 236 commercial, listed banks from 2005 to 2008, Tarchouna et al. (2017) analyse 184 banks over the period 2000-2013, while Zagorchev and Gao (2015) conclude from a research sample of 820 financial institutions over the period 2002-2009. Research on the level of non-performing loans examines the frequency of statutory bodies meetings (Tahir et al., 2020), the size of statutory bodies (Fiador, Sarpong-Kumankoma, 2021), the level of executive remuneration (Grove et al., 2011), good corporate governance practices (Zagorchev, Gao, 2015) and condensed corporate governance indicators (Tarchouna et al., 2017). There is a bunch of studies confirming links between certain corporate governance elements and loan quality.

Fiador and Sarpong-Kumankoma (2021) show that an increase in board size is associated with poorer loan quality as measured by the ratio of bad loan write-offs to total gross loans. The researchers also confirm a higher increase in the share of non-performing loans and an increase in the ratio of bad loan write-offs to total gross loans with a higher proportion of women in the boardroom. However, statutory bodies with a predominant share of non-executive members and the CEO's duality improve loan quality, as reflected in lower levels of non-performing loans. Tahir et al. (2020) demonstrate that a lower proportion of significant block-holders, a lower level of debt and a lower frequency of board meetings is associated to better loan quality (Tahir et al., 2020). On the other hand, a lower level of debt in the capital structure is found in banks with better quality loan portfolios (Grove et al., 2011; Tahir et al., 2020). The negative relationship between the number of affiliated audit committee or remuneration committee members and the share of non-performing loans in assets is shown by Grove et al. (2011). Grove et al. (2011) demonstrate a negative relationship of the share of non-performing loans in assets with the size of boards and executive remuneration.

More efficient corporate governance is reflected in lower risk-taking also by Zagorchev and Gao (2015). The authors show that good corporate governance practices are linked to better quality of both total loans and mortgages. These banks are characterised by a higher ratio of loan loss allowances and provisions. The results become stable after excluding the financial crisis period from the analyses.

The study of Tarchouna et al. (2017) differs from the others in the area of corporate governance and loan quality. Namely, these authors construct an indicator of corporate governance, consisting of the size and degree of independence of the boards, the CEO's duality,

majority shareholders and ownership by executive directors. A lower share of non-performing loans is found in smaller banks, which is attributed to strong corporate governance mechanisms seen in avoiding to engage in risky activities (Tarchouna et al., 2017). According to the authors, corporate governance mechanisms do not work efficiently in medium and large banks, which are characterised by poor loan quality and significant losses borne mostly during the global financial crisis. The researchers provide an explanation for this relationship in the high liquidity of banks, which encourages them to take more new investments generating potential risk and accompanying losses. Moreover, in medium and large banks, corporate governance mechanisms are weaker due to the high complexity of these institutions and the transfer of risk between international branches or subsidiaries and the parent bank (Tarchouna et al., 2017).

To sum up, corporate governance is an important factor affecting risk taken by banks. It is reflected in many studies related to bankruptcy risk (Berger et al., 2016; Gaganis et al., 2020; Laeven, Levine, 2009), lending to risky customers (Faleye, Krishnan, 2017) and loan quality (Fiador, Sarpong-Kumankoma, 2021; Grove et al., 2011; Tahir et al., 2020; Tarchouna et al., 2017; Zagorchev, Gao, 2015).

## 7. Conclusions

Analyses devoted to corporate governance have been undertaken for many years. A special category of empirical analyses is directed towards corporate governance structures in banks. They point to specific features of banks that differentiate them from non-financial companies. Particularly noteworthy are such characteristics of the banking system as high financial leverage, an intensified regulatory regime, an operating ethic linked to the banks' function as public trust institutions, or the higher average size of statutory bodies or appointed committees than that of non-financial enterprises. The complexity of bank corporate governance has resulted in numerous studies being carried out in this area.

Research on selected areas of corporate governance constitutes a rich body of literature in the banking field. Many studies investigate the relationship between elements of corporate governance and particular areas of bank activities. Authors examine the relationships between corporate governance elements and a bank's profitability (Aebi et al., 2012; Erkens et al., 2012), its efficiency (Andrieş et al., 2018; Salim et al., 2016), the level of risk taken (Anginer et al., 2018; Dell'Aricecia, Marquez, 2010) or the probability of bank's failure (Berger et al., 2016; Gaganis et al., 2020; Laeven, Levine, 2009). Of particular interest are empirical analyses on the relationship between corporate governance practices and the quality of banks' loan portfolios (Fiador, Sarpong-Kumankoma, 2021; Grove et al., 2011; Tahir et al., 2020; Tarchouna et al., 2017; Zagorchev, Gao, 2015).

As corporate governance influences main bank activities, the growing attention should have been paid to its effectiveness and compliance with law. A very important area constitutes recommendations and rules which play a crucial role in shaping bank's behaviour and adjusting specific corporate governance approach applied by banks.

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## THE WELL-BEING OF EMPLOYEES AND WORKING RELATIONS IN REMOTE WORKING – OPINIONS OF GENERATION Z

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**Purpose:** This article aims to present the views of representatives of Generation Z on the well-being of employees performing remote work concerning working relations.

**Design/methodology/approach:** The empirical part of the study is based on the results of a survey study conducted in December 2022 among young people who are representatives of Generation Z. The survey included a randomly selected representative sample of 387 Generation Z employees residing in Poland and working remotely.

**Findings:** The results of the survey indicate that respondents positively perceived the impact of remote working on employee well-being - in terms of the sense of work comfort, experiencing autonomy, and stress - but also in terms of maintaining a work-life balance. However, it is particularly noteworthy that the surveyed employees of Generation Z declared that they would like to work mainly stationary in the future, which is related to their negative assessment of remote working relations - both with co-workers and superiors.

**Research limitations/implications:** The limitations of the conducted research include the variation in the distribution of generations on the labour market that can be found in the literature, as well as limitations due to the nature of the conducted quantitative research, which only signals important aspects of the analysed issues. Future research can be extended to include the views of representatives of the management staff.

**Practical implications:** The presented research and the resulting findings can be used in the practice of managing people from the youngest generation on the labour market and, in particular, in measures supporting the well-being of employees from Generation Z who work remotely.

**Social implications:** By presenting the opinions of representatives of Generation Z, the results of this research may contribute to a better understanding of the factors shaping the well-being of employees from this particular generation performing remote work, and thus increase both the quality of their work and non-work life.

**Originality/value:** The research conclusions described in the article can provide a basis for managers to reflect and act when managing the remote work of people from Generation Z.

**Keywords:** employee well-being, Generation Z, remote working, employee relations, work-life balance.

**Category of the paper:** Research paper.

## 1. Introduction

Among the issues concerning human capital management in contemporary organisations, there is growing interest in the issue of employee well-being (Deloitte, 2022) generally understood as enjoyment, feeling well, satisfaction, and a sense of comfort in both professional and non-professional activities. The idea of building employee well-being is related to providing the company with staff having the proper skills and aptitude to work effectively, and creating working conditions that encourage employees to stay with the organisation. The implementation of this idea in management consists of corporate wellness programs treated as long-term organisational activities supporting the physical, mental, and social well-being of employees (Burke, Richardsen, 2014). Particularly for Generation Z, representing the youngest workers in the labour market, a sense of well-being refers not only to the quality of work but also to the overall quality of life. That is why promoting the well-being of these young employees working remotely takes on particular significance and, at the same time, poses many problems for managers (Duffy et al., 2018; Albrychiewicz-Słocińska, 2022).

This article aims to present the views of representatives of Generation Z on the well-being of employees performing remote work concerning working relationships. The empirical part of the study is based on the results of a survey conducted in December 2022 among young people who are representatives of Generation Z. The survey included a randomly selected representative sample of 387 Generation Z employees residing in Poland and working remotely. The following main research problem was posed in terms of the conducted study: How do Generation Z employees perceive the impact of remote working on shaping employee well-being? The survey also posed several specific problem questions, mainly concerning labour relations and work-life balance. Non-parametric tests were used to assess the significance of differences in terms of the analysed variables: the Mann-Whitney U test and the Kruskal-Wallis ANOVA test.

## 2. The well-being of employees - theoretical basis of the problem

The concept of employee well-being is presented in many different ways in the literature (Keyes et al., 2002; Simone, 2014; Zheng et al., 2015). Well-being in the context of work is defined as a situation in which the balance of emotions felt by the employee is positive and when the employee's own work (in a given organisation, with a given employer) is felt to be satisfying (Boniwell, Henry, 2007). The key factors regarding employee well-being are related to:



- matching the people employed, in terms of their competences and personality traits, to the nature of the work they do and the tasks assigned to them,
- working conditions and the ability of employees to set goals, make decisions and solve problems (Syper-Jędrzejak, 2019).

Applying the idea of wellness in human resource management is based on the premise that an employee's psycho-physical state translates into his or her effectiveness and commitment at work. In this context, corporate wellness is understood as a healthy lifestyle for employees, leading to well-being and psycho-physical harmony and thus ensuring maximum efficiency at work.

According to Syper-Jędrzejak (2019) employee well-being can be analysed in relation to its two pillars - physical well-being and the broadly-defined balance of employees. Physical well-being consists of: ergonomics of the workplace and work organisation, as well as the health protection of employees, and a health-promoting lifestyle. On the other hand, employee balance in a broad sense includes: taking care of internal balance and stress prevention, and shaping work-life balance, as well as supporting the development of non-work interests.

The emphasis on employee balance in the broadest sense is linked to the belief that, in addition to physical health, an employee's mental and social well-being is also important, enabling them to establish satisfying relationships and solve problems constructively. As the issue of work-life reconciliation affects every working person, regardless of their age, the result is that there is a wide variety of attitudes to the problem (Chen et al., 2009).

The method in which individuals from a given generation approach work-life balance issues is influenced by a number of factors, including: technological development, economic, social and cultural changes, as well as the life experiences common to many individuals from a given generation. However, how the representatives of a particular generation perceive the work-life balance is crucially influenced by their attitudes towards work and the place that work, family and leisure occupy among the values they follow (Beutell, Witting-Berman, 2008).

The relationship between work and non-work life is of particular importance for representatives of the youngest Generation Z on the labour market. Employees of this generation are perceived to place a high value on their private lives and, as a result, they expect freedom and flexibility at work to maintain a work-life balance (Singh, Dangmei, 2016; Dolot, 2018). Nowadays, managing the remote work of Generation Z employees is of particular importance, as these individuals are not only aware of their expectations in terms of professional and personal priorities, but are also able to defend the boundary between these two areas of life (Sanchez et al., 2021).

Shaping the well-being of employed people, including but not limited to dealing with work-life conflict, is supported by the proactive approach of companies that recognise that this has a major impact, not only on employee satisfaction and the atmosphere at work, but also on their motivation and the quality of their tasks (Dyrbye et al., 2016). Corporate wellness measures involve both education and competence development for employees in various areas (physical

activity, healthy eating, work-live balance, stress management) so that they can use their full potential and feel satisfied at work and in life (Burke, Richardsen, 2014). By initiating measures to promote employee well-being, organisational relationships are shaped that foster employees' feelings of security, psychological well-being and opportunities for professional development, while at the same time building respect and trust in the employer. A corporate image, built by implementing initiatives that meet the needs of the people employed, not only makes it possible to attract and retain talented employees, but sustains their commitment at the desired level and allows them to use their personal resources effectively (Peterson, 2022).

### 3. Methodology

The study was carried out in December 2022 among young people working remotely, representing Generation Z. The research results presented in this paper are part of a quantitative survey study entitled: "Managerial aspects of remote work management".

The presented excerpt from the survey results relates to the respondents' views on the impact of remote working on employee well-being. The following main research problem was posed in terms of the conducted study: How do Generation Z employees perceive the impact of remote working on shaping employee well-being? The study also posed several specific problem questions:

- According to Generation Z representatives, does remote working facilitate stress-free work and make the employee feel comfortable?
- In the opinion of Generation Z, does remote working allow for more freedom/independence at work?
- In the opinion of Generation Z representatives, does remote working help in achieving a balance between work and private life and protect the work-life boundary?
- In the opinion of Generation Z representatives, does remote working disrupt the rhythm of the day and night?
- In the opinion of Generation Z, does remote working make it easier to establish relations with co-workers and especially with a superior?
- In the opinion of Generation Z representatives, does remote working help build trust in terms of employee relations?
- According to Generation Z employees, does remote working facilitate forming emotional bonds with co-workers?

The study was carried out with the use of quantitative research methods which take advantage of the survey technique. The used research tool consisted in a standardized questionnaire consisting of 57 closed statements and 7 questions concerning the socio-demographic characteristics of the respondents and their workplace variables. The issues

related to remote work were divided in the questionnaire into several areas relating to: knowledge, information and learning, as well as communication, teamwork, work organization, motivation, employee relations and work-life balance. Several questions have been prepared for each research area. A Likert scale was used for the responses. The research tool consisted of:

- a metric containing the respondent's data on: age, gender, remote working experience, position, size and industry of the employing organisation, and the preference concerning the preferred form of employment,
- the main part containing statements to which it was necessary to respond by marking the appropriate point on a scale of 1-5, where: 1 meant - I completely disagree, 2 - I rather disagree, 3 - neither agree nor disagree, 4 - I rather agree, 5 - I fully agree.

The used research tool (questionnaire) was original and was prepared by a research team consisting of staff from the Department of Applied Sociology and Human Resource Management, Faculty of Management, Częstochowa University of Technology.

Due to the lack of statistical data concerning the number of people aged 15-34 performing remote work in Poland, people who are professionally active and represent the relevant age category were selected. Based on the 2021 Statistical Yearbook, the size of the working population in Poland, in the age range of interest to the researchers, was set at 4,802,000 people. For the population estimated in this way, the study sample size was set at 384 people with the following statistical assumptions: fraction size 0.5; confidence level 95%; maximum error 5%.

The study was carried out by Fieldstat sp. z o.o., a specialized market research agency, using quantitative research methods, CATI (Computer Assisted Telephone Interview - 50% of respondents) and CAWI (Computer-Assisted Web Interview - 50% of respondents). Ultimately, 387 correctly completed questionnaires were obtained.

STATISTICA software was used in the process of compiling the research results. Non-parametric tests were used to assess the significance of differences in analysed variables: Mann-Whitney U test (UMW), Kruskal-Wallis ANOVA test (AKW). Four questionnaire validity procedures have been used: content, face, construct and nomological ones. The scale reliability was validated using Cronbach's alpha that is a measure of internal consistency ( $\alpha = .970019$ ). For the analysis of the survey results, a number of statistical hypotheses were adopted regarding the existence of significant differences in the respondents' statements due to their socio-demographic characteristics and workplace variables. It was assumed that H0 constitutes the hypothesis concerning no differences due to the grouping variable, while H1 is an alternative hypothesis about the occurrence of such differences. These hypotheses were verified with the use of the aforementioned statistical tests, allowing to reject the null hypothesis concerning no significant differences and accept the alternative hypothesis about the existence of differences in respondents' answers with regard to the individual independent variables. The study presents the relationships verified with statistical tests, authorizing to draw conclusions on the regularities in the studied group.

A total of 387 people participated in the study, including 163 (42.12%) women and 224 (57.88%) men. The Generation Z employees participating in the study varied in terms of age. The least numerous were the youngest 76 (19.64%), between the ages of 15 and 24. The following age categories were represented by: 141 (36.43%) of people between 25 and 29 years of age, and 170 (43.93%) of people between 30 and 34 years of age. Employees with various levels of remote working experience took part in the survey. The majority of respondents - 296 people (76.49%) - worked in executive positions. The remaining respondents - 91 people (23.51%) were employed in managerial positions. Taking into consideration the size of the organisation where the respondents performed their remote work, micro organisations (with 1-9 employees) dominated with 182 (47.03%) indications, followed by small organisations (with 10 to 49 employees) with 86 (22.22%) indications, large organisations (more than 250 employees) with 64 (16.54%) indications, and medium organisations (50 to 249 employees) with 55 (14.21%) indications. Respondents also represented organisations that varied in terms of industry. Furthermore, respondents declared that in the future they would like to work: in a stationary mode (54.26% of indications), in a hybrid mode (28.17% of indications), and remotely (17.57% of indications).

#### **4. Results**

Regarding the issue under consideration, a number of indicators were selected from the complete research material that represent the respondents' views concerning the impact of remote working on employees' sense of well-being as well as related working relationships. The research question regarding the manner in which Generation Z representatives perceive their sense of comfort when working remotely was directly linked to the key research problem. Persons who participated in the survey were mostly convinced that an employee is comfortable performing work remotely. As many as 65.12% of respondents agreed with this statement (including almost one in four respondents who strongly agreed, 24.03%). Only 11.89% of respondents presented the opposite opinion and 23% did not provide a clear answer. The survey participants were also asked whether remote working promotes stress-free work. The largest number of respondents (64.08%) confirmed the positive impact of remote work on reducing the experienced stress related to work. The remaining respondents were divided between those opposed to this statement 10.34% and those with no clear opinion on the issue 25.59%. Moreover, when asked whether remote work allows for more freedom/independence, the respondents also expressed positive opinions in this regard. The majority of respondents, 66.41%, were of the opinion that remote working allows employees to have a greater sense of independence than stationary work (almost half of the respondents, 47.79%, strongly agreed

with this statement). Only 11.63% of respondents presented an opposite opinion and 21.96% were undecided on the issue (see Table 1 for a detailed list of the respondents' answers).

**Table 1.**

*Respondents' answers regarding selected aspects of employee well-being in remote work*

Remote work	strongly disagree	mostly disagree	neither agree nor disagree	mostly agree	strongly agree	negative ratings	positive ratings
makes the employee feel comfortable	3.36%	8.53%	23.00%	41.09%	24.03%	11.89%	65.12%
conducive to stress-free work	3.10%	7.24%	25.59%	34.63%	29.46%	10.34%	64.09%
gives more freedom/independence at work	2.33%	9.30%	21.96%	42.38%	24.03%	11.63%	66.41%

Source: own study.

The conducted statistical analysis revealed that respondents' opinions regarding their sense of comfort with remote work varied due to their: gender (UMW test  $p = 0.0303$ ;  $\alpha = 0.05$ ). Furthermore, studying the significance of differences shows a correlation between the respondents' indications concerning the positive impact of remote working on reducing the feeling of stress and the position they hold (UMW test  $p = 0.0158$ ;  $\alpha = 0.05$ ). Importantly, the respondents' opinions on experiencing comfort at work, experiencing stress, and the freedom/independence associated with remote working varied due to respondents' experience of remote working, as well as their preferred form of working.

According to statistical research, men were relatively more likely (67.41%) than women (61.97%) to agree with the statement that remote work provides a sense of comfort. Whereas, the positive impact of remote working on reducing feelings of stress was felt relatively more often (66.56%) by employees holding executive positions than by those in managerial positions (56.04%). The feeling that working remotely creates comfort, reduces the experience of stress, and allows for greater freedom/independence was relatively more common among employees with greater experience of working remotely than among those with the shortest work experience (up to 6 months) as well as among those preferring to work remotely than among respondents opting for hybrid or stationary work.

Questions regarding the possibility of work-life balance of remote workers were also related to the research problem under consideration. According to the obtained data, the majority of the surveyed Generation Z employees (54.01%) indicated that remote working allows for a work-life balance. Of these, 40.82% tended to agree with the statement and 13.18% completely agreed with it. Only 19.9% of respondents presented the opposite view and 26.09% gave no clear answer on this issue.

Additional light is shed on the assessment of the impact of remote work on work-life relations by respondents' answers regarding other factors impacting the formation of work-life balance. When asked whether remote work supports the protection of the work-life boundary, respondents were mostly (54.01%) positive about such a statement. Only 20.41% of

respondents perceived a disadvantageous impact of this form of work, and one in four respondents (25.57%) did not express a clear opinion on this issue. In addition, respondents were critical of the statement indicating that remote work disrupts the rhythm of day and night (blurring the boundaries between different times of day and the behaviours attributed to them). However, this opinion was expressed by fewer respondents (48.06%) in relation to the other analysed issues. As many as 33.85% of those surveyed were of the opposite opinion and 18.09% were undecided on the issue. This situation means that even though Generation Z employees perceive the relationship between remote work and work-life balance more positively, their opinions are more divided regarding the impact of remote work on maintaining day and night rhythms (Table 2).

**Table 2.**

*Respondents' answers regarding work-life balance in remote work*

Remote work	strongly disagree	mostly disagree	neither agree nor disagree	mostly agree	strongly agree	negative ratings	positive ratings
allows to reconcile work and private life	4.91%	14.99%	26.09%	40.83%	13.18%	19.90%	54.01%
allows to protect the border between work and private life	5.17%	15.25%	25.57%	34.37%	19.64%	20.42%	54.01%
disturbs the rhythm of day and night	17.31%	30.75%	18.09%	25.58%	8.27%	48.06%	33.85%

Source: own study.

The conducted statistical analysis revealed that respondents' opinions on balancing work performed remotely with private life varied due to their: gender (UMW test  $p = 0.0059$ ;  $\alpha = 0.05$ ), experience of working remotely (AKW test  $p = 0.0004$ ;  $\alpha = 0.05$ ), and the form of preferred work (AKW test  $p = 0$ ;  $\alpha = 0.05$ ). Men were relatively more likely (67.41%) than women (61.97%) to perceive the positive impact of remote working on work-life balance. This view was also shared more often by employees with more extensive experience working remotely than those working remotely for a short time.

Whereas the opinions of Generation Z employees regarding their ability to protect the work-life boundary varied according to their age (AKW test  $p = 0.0222$ ,  $\alpha = 0.05$ ), position held (UMW test  $p = 0.0048$ ,  $\alpha = 0.05$ ), and preferred form of work (AKW test  $p = 0.0444$ ;  $\alpha = 0.05$ ). The oldest participants in the survey, aged 30-34, were relatively more likely (60.59%) than respondents aged 25-29 (55.32%) or the youngest, aged 15-24 (36.84%) - to indicate that it is possible to protect the boundary between remote work and private life. Employees in executive positions were more likely (57.43%) to agree with this statement than those in managerial positions (42.85%). Positive views concerning maintaining a work-life balance and protecting the boundary between these two important spheres of life were relatively more often expressed by persons preferring to work remotely than those opting for hybrid or stationary work.

Moreover, statistical research revealed that the opinions of respondents regarding the impact of remote working on disrupting the day and night rhythms varied according to: the size of the organisation where they were employed (AKW test  $p = 0$ ,  $\alpha = 0.05$ ), experience in terms of remote work (AKW test  $p = 0.0012$ ;  $\alpha = 0.05$ ), and the form of preferred work (AKW test  $p = 0.0443$ ;  $\alpha = 0.05$ ). Survey participants who worked in micro organisations were relatively more likely (67.19%) than respondents employed in small (63.19%), medium (61.63%), and large (56.36%) companies - to indicate the possibility of remote working to disrupt the rhythm of day and night. This view was shared more often by those working remotely for a short period - up to 6 months (45.53%) than by employees with longer experience of working remotely - more than 3 years (22.58%). Blurring of boundaries between different times of the day and the behaviours attributed to them, among employees performing remote work, was indicated relatively more often by respondents preferring stationary work (36.67%) than those opting for hybrid (35.78%) or remote work (22.06%).

Due to the adopted purpose of the research and the associated research questions, the respondents were asked to provide their opinions concerning the statements regarding the impact of remote working on employee relations. According to the obtained data, almost half of the participants in the survey (48.06%) did not agree with the statement that remote working facilitates establishing relations with co-workers (29.97% of respondents had the opposite opinion and 21.96% did not provide a clear answer on this issue). The opinions of Generation Z respondents regarding contact with their superiors were similar. The largest number of respondents (45.48%) indicated that working remotely makes it difficult to establish a relationship with a superior, 28.17% had the opposite opinion, and 26.36% were not clear on this issue.

In the course of the survey, respondents were also asked whether remote working facilitated building trust and forming emotional bonds with colleagues. This is because these two aspects of employees' functioning in the work environment significantly impact the creation of positive work relationships and a working atmosphere favourable for experiencing well-being. Analysing the data received in the survey shows that only 26.87% of respondents confirmed the positive impact of remote working on trust between employees. Whereas, as many as 48.06% of the survey participants stated that remote working does not help in building trust with employees, and one in four respondents (25.06%) marked the answer "neither agree nor disagree". Moreover, as many as 50.39% of the respondents emphasised that remote work makes it difficult to build emotional ties with colleagues. In this case, 28.17% of respondents held the opposite view and 21.44% gave no clear answer on this issue (Table 3).

**Table 3.***Respondents' answers regarding employee relations in remote work*

Remote work	strongly disagree	mostly disagree	neither agree nor disagree	mostly agree	strongly agree	negative ratings	positive ratings
facilitates establishing relationships with colleagues	11.63%	36.43%	21.96%	21.45%	8.53%	48.06%	29.97%
facilitates establishing relationships with superior	10.34%	35.14%	26.35%	17.83%	10.34%	45.48%	28.17%
helps build trust in relationships with employees	19.64%	28.42%	25.06%	18.09%	8.79%	48.06%	26.87%
facilitates building emotional bonds with colleagues	19.12%	31.27%	21.44%	23.26%	4.91%	50.39%	28.17%

Source: own study.

The results of the statistical analysis indicate that respondents' opinions regarding the impact of remote working on all aspects of employee relations analysed in the study varied according to three variables, namely: gender, size of organisation and form of work preferred. Respondents' answers concerning the impact of remote working on relationships with colleagues varied due to the respondents' gender (UMW test  $p = 0.0002$ ;  $\alpha = 0.05$ ), the size of the organisation employing them (AKW test  $p = 0$ ;  $\alpha = 0.05$ ), and the form of preferred work (AKW test  $p = .0128$ ;  $\alpha = 0.05$ ). Women were relatively more likely (60.73%) than men (38.84%) to disagree with the statement that remote working facilitates establishing relations with co-workers. Respondents working in small (65.11%), large (64.06%), and medium (54.54%) organisations were relatively more likely to provide such an answer than those working in micro (32.42%) companies. Respondents preferring stationary work (63.81%) were also more likely to share this opinion than those opting for hybrid (33.02%) or remote work (23.53%). In addition, the conducted statistical research shows a similar relation concerning the impact of remote working on the relation with a superior. Importantly, the opinions of the surveyed Generation Z employees concerning trust-building in remote work showed a variation due to the gender of the respondents (UMW test  $p = 0.0011$ ;  $\alpha = 0.05$ ), the size of the organisation (AKW test  $p = 0$ ;  $\alpha = 0.05$ ), and the form of preferred work (AKW test  $p = 0$ ;  $\alpha = 0.05$ ). Women were relatively more likely (57.67%) than men (41.07%) to disagree with the statement that working remotely works in favour of building trust in relations with employees. Respondents employed in small (70.93%), large (64.06%), and medium (58.18%) organisations were relatively more likely to provide this answer than those from micro (28.57%) companies. Respondents preferring stationary work (61.43%) were more likely to share this opinion than those leaning towards hybrid (36.70%) or remote working (25%). Presenting the results of the statistical analysis, it must be emphasised that women were relatively more likely (63.19%) than men (41.08%) to disagree with the statement that remote working facilitates emotional bonds with coworkers (UMW test  $p = 0.0001$ ;  $\alpha = 0.05$ ). Analogous to the remaining questions, concerning employee relations, people from small (70.93%), large (65.63%), and medium (58.18%) companies were relatively more likely than employees from micro



(32.97%) companies to provide this answer (AKW test  $p = 0$ ;  $\alpha = 0.05$ ). This opinion was also shared more often by respondents preferring stationary work (63.81%) than those opting for hybrid (41.28%) or remote (23.53%) work (AKW test  $p = 0$ ;  $\alpha = 0.05$ ).

## 5. Discussion and limitations

Research concerning the manner in which Generation Z representatives perceive selected factors shaping the well-being of employees working remotely allows some important observations to be made in this regard. The conducted statistical analysis revealed, for example, that gender was a significant differentiating factor in terms of the answers provided by respondents. Men were relatively more likely than women to agree with the statement that working remotely provides a sense of comfort and has a positive impact on work-life balance. Whereas, women were more likely to disagree with the statement that remote work facilitates establishing relations with both colleagues and superiors. Additionally, women were more likely to have a critical view of the impact of remote working on building trust with employees and forming relations. Such opinions of respondents may result from the fact that the parental duties and housework performed by women may make it difficult and sometimes even interfere with remote working, resulting in a less comfortable work and work-life balance. The women's critical comments concerning the impact of remote working on establishing working relationships characterised by trust and emotional bonds indicate the difference they perceive in forming such relationships in face-to-face and virtual contact.

Study results allow for another important finding related to the impact their position has on their opinions concerning well-being. Reducing the perception of stress in remote working, as well as being able to protect the boundary between remote work and private life, was relatively more frequently cited by employees in executive positions than those in managerial positions. Therefore, this situation means that, according to Generation Z employees, remote work does not reduce the stress of managers, nor does it protect against the intrusion of work into the sphere of private life. This is why young employees often do not apply for managerial positions, perceiving being a superior as more of a nuisance than a benefit.

Another observation from the research indicates that employees with longer experience working remotely were more likely to feel that working remotely: reduces feelings of stress, allows for greater freedom/independence, creates comfort at work, and has a positive impact on work-life balance than persons working remotely for a short time. Therefore, the respondents' longer experience in remote working has a positive impact not only on their ability to adapt to this form of performing professional activities, but also on their assessment of the well-being of people working in this mode.

Additional light is shed on the assessment of the impact of remote working on employee well-being by respondents' views concerning employee relations. The data obtained indicates that survey participants working in large, medium, and small organisations - relatively more often than those employed in micro-companies - critically assessed the impact of remote working on: forming relationships with co-workers and superiors, building trust and positive emotional bonds. Such opinions of respondents may mean that remote working is the least disruptive to relations in small work teams and makes building trust and positive relationships even more difficult when interacting with numerous co-workers.

Furthermore, in an analysis of the perceived well-being of employees working remotely, it is not surprising that positive opinions on this topic were more likely expressed by Generation Z employees preferring to work remotely than respondents opting for hybrid or stationary work.

The information obtained from the survey corresponds with research described in the literature on employee well-being (Tabor-Błażewicz, 2021) and, in particular, factors affecting work-life balance (Sandoval-Reyes et al., 2021; Rusu, 2018; Rodríguez-Modroño, López-Igual, 2021), as well as employee relations in remote working (Felstead, Henseke, 2017). The presented opinions of respondents concerning the impact of remote work on feelings of independence and work-life balance relate positively to other studies on the subject. The beneficial effect of work autonomy on the development of work-life balance has been confirmed in numerous studies (Haar et al., 2019). However, as indicated by research, remote working can result in both positive and negative consequences (Stankeviciute, Kunsakaja, 2022; Shirmohammadi et al., 2022) which was confirmed by the critical opinions of the surveyed Generation Z employees concerning employee relations.

The conducted research, while fitting into the discourse on the well-being of Generation Z employees working remotely, did also include limitations. These include, inter alia, the heterogeneity found in the literature concerning the division of generations in the labour market, which results in adopting various boundaries related to the year of birth of people representing Generation Z. In addition, the limitations arising from the nature of the quantitative research carried out, which only signals important aspects of the issues analysed, should be taken into account. However, this research, despite its limitations, points to important issues that can be used in broader studies concerning the matter.

## **6. Conclusion**

Information obtained from Generation Z employees who had experience with remote work provided some interesting insights relating to the analysed issue. The results of the conducted survey indicate that respondents positively perceived the impact of remote working

on employee well-being - both in terms of experiencing comfort when working, experiencing stress and the freedom/independence associated with remote working - but also in terms of maintaining a work-life balance. However, it is particularly noteworthy that the surveyed Generation Z employees declared that they would like to work mainly stationary in the future (54.26% of indications). That is because only 17.57% of respondents indicated a desire to work remotely, and 28.17% in a hybrid form. The answer to the question of why those in the youngest generation in the labour market - who value well-being so much - do not want to undertake only remote work should be sought in the issue of labour relations. The results of the conducted research indicate that Generation Z representatives have a critical perception of remote working relations with both co-workers and superiors. Moreover, their declarations regarding their preference for stationary work indicate that working relations are very important to them and constitute a key factor in shaping well-being.

By presenting the opinions of young people from Generation Z, the results of this research provide a better understanding of their needs concerning shaping their well-being and, in particular, proper work-life balance in the context of remote work. Thus, they can serve as a basis for reflection and managers taking actions to improve both the effectiveness in performing professional tasks by these young employees and the quality of their private lives. In this context, however, the crucial importance of good continuous communication with superiors and co-workers should be emphasised, which enables support in problems related to building the proper relationship and, moreover, develops a sense of employee well-being, which is so important for Generation Z employees.

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## OPEN DATA AS A FUNDAMENTAL ELEMENT OF THE DEVELOPMENT OF THE SMART CITY

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**Purpose:** To determine the state of access to and reuse of public data in Poland, including identifying the reasons for the current level of data access and forecasting for the near future.

**Design/methodology/approach:** In-depth analysis of secondary data based on reports prepared by “The Expert Team of the Department of Data Management at the Chancellery of the Prime Minister”, regarding the reuse of public data in Poland.

**Findings:** In the year of the implementation of the Act on Open Data and Reuse of Public Sector Information (2022), a significant majority of cities and local government units (JST) do not make their data publicly available in accordance with the law or in any other way (around 60% in cities and over 80% in JST). The main reasons (in addition to lack of finances, tools, knowledge, demand, and employee competence) are the non-restrictive nature of the law, which makes open public data a matter of goodwill rather than an obligation, and even encourages offices to adopt a passive approach. In the near future (within a year), the number of units that provide data on the Dane.gov.pl portal should increase from the current level of nearly one-tenth to one-fourth.

**Research limitations/implications:** A pattern emerges that the larger the population managed by government units, the more frequently public open data are made available and the greater the quantity of such data. However, the report based on the research of local government units (JST) does not take into account differences related to the population size, as it is the case in the report on city research. Therefore, a research gap becomes apparent, which can be addressed in future studies.

**Practical implications:** Increasing the level of open data sharing by government offices will contribute to the development of the “smart city” concept.

**Social implications:** The widespread sharing of open data can bring numerous benefits to society, including increased transparency, civic participation, innovation, improved quality of life, and enhanced collaboration among various stakeholders, such as the public, private, and academic sectors.

**Originality/value:** Detection of shortcomings in the practice of open data sharing, highlighting the need for education, better legal regulation, and collaboration with research institutions. Also pointing out the potential for increased data sharing and the necessity of providing adequate resources and support, such as training and IT personnel, to effectively meet the requirements associated with open data sharing.

**Keywords:** management, open data, smart city.

**Category of the paper:** Research paper.

## 1. Introduction

In order to increase efficiency and improve the quality of life for residents, many cities are now focusing on the development towards smart cities, utilizing modern technologies and data analysis. One of the key elements in this process is open data from public administration, which enables a more precise and comprehensive approach to urban development.

Open data refers to publicly available information that can be used by anyone without restrictions, creating a foundation for innovative solutions. In the context of smart cities, open data from public administration enables a detailed analysis of residents' needs and identification of areas that require improvement. As a result, cities can manage more efficiently by delivering public services that are better tailored to the needs of the residents.

Open data are also crucial in the context of developing new technological solutions. Access to public data allows for a better understanding of how a city functions, thus enabling the creation of more precise tools and applications that can help solve various problems.

An example of this can be seen in the development of transportation systems based on the analysis of traffic data or the optimization of energy processes through precise monitoring of energy consumption. Another way in which open data can contribute to the development of a smart city is by improving sustainable urban development (Tura, Ojanen, 2022). Access to information about air pollution, noise levels, water quality, or chemical composition of soil can aid in taking actions to protect the environment and residents' health. For instance, if data indicates that a specific neighborhood has high air pollution levels, city authorities can implement measures such as increasing the number of trees, establishing car-free zones, or promoting public transportation to reduce emissions of pollutants (Sa´nchez-Corcuera et al., 2019, p. 9).

It is worth noting that open data brings benefits not only to the public sector but also to private companies and investors. Access to data allows for a better understanding of the needs and preferences of residents, enabling the creation of more tailored products and services. Open data also encourages investment in the city, which positively impacts its sustainable economic development (Manimuthu, Dharshini, 2020, p. 1).

In Poland, since August 2021, the Open Data Act has been in effect, imposing an obligation on public administration entities to provide data on the Dane.gov.pl platform dynamically and through APIs. This is a milestone in the development of open data in Poland, which will help utilize them for building smart cities (Dz.U. 2021, poz. 1641).

The wide availability of open data by public administration entities in one place (Dane.gov.pl platform) is essential for the development of smart cities. By accessing information about the city's functioning, specialists can create applications and tools that contribute to improving the city's operations and the quality of life for its residents. An example



of such an application could be one that utilizes data on traffic congestion to optimize routes for drivers, thus saving time and reducing air pollution.

It is also important for data sharing to be dynamic, which means that the data are updated in real-time. This allows specialists and programmers to have access to the latest information, enabling faster and more precise action. Additionally, it is crucial to provide data through an Application Programming Interface (API), which makes the data adaptable and compatible, facilitating easier usage by programmers and, in turn, more efficient utilization for the development of smart cities.

However, the level of commitment by public administration units to providing so-called open data may vary. Therefore, the aim of this study is to determine the actual state of affairs in this matter, as well as to identify its causes and possible measures to support the "open data" process. To achieve these research objectives, secondary data analysis was conducted using reports prepared by the "Expert Team of the Data Management Department of the Chancellery of the Prime Minister" on the reuse of public data in Poland (Dane.gov.pl/..., 2020-2022).

## 2. What are open data?

Open data are data that can be freely used, reused, and distributed by anyone, as long as the sources are properly attributed and the data are shared under the principle of "share and govern". The data must be available in their entirety and should not exceed reasonable reproduction costs, preferably in a convenient and modifiable format. Additionally, the data must be provided on terms that allow for their reuse and redistribution, including mixing with other data sets. No one should be discriminated against based on fields of activity or individuals or groups. Examples of open data can include government statistics, weather data, or financial information. It is important to be clear about the definition of open data to ensure interoperability, which refers to the ability of different systems and organizations to collaborate and combine different data sets to develop more advanced products and services. Focusing on the provision of non-personal data, which does not contain information about specific individuals, is crucial. However, some types of government data may be subject to restrictions related to national security (Open Data Handbook).

In Poland, open data are collected and provided by various institutions and organizations, both public and private. The most important ones are:

1. The Republic of Poland's Service - <https://dane.gov.pl/en>
2. Central Statistical Office - <https://stat.gov.pl/en>
3. National Digital Archives - <https://www.nac.gov.pl/en>
4. Public Information Bulletin - <https://www.gov.pl/web/en/public-information-bulletin>
5. Spatial Information Infrastructure Geoportal - <https://www.geoportal.gov.pl/en>

When it comes to data provided by the Central Statistical Office (GUS), Poland holds a very high position in the Open Data Inventory (ODIN) ranking in terms of open data availability. In 2022, Poland once again ranked 2nd in the world out of 192 countries. This ranking takes into account the availability and openness of data published by national statistical offices. Poland received an overall score of 87 points, which was 2 points higher than GUS's score in 2020. Poland achieved the highest score in the world in terms of the thematic coverage of published data (81 points) and moved up from 8th to 4th position in terms of data openness level (92 points). Poland has been recognized as a leader among Eastern European countries in both categories. The top performers in the ranking were Singapore (90.0 points), Poland (87.0 points), and Denmark (86.3 points). The ODIN ranking reflects the scale of data availability and the level of openness of the data published by the national statistical office (GUS, 2023).

### **3. Legislation on open data of public administration in Poland**

EU legislation requires the provision of open data in member states. The Directive Of The European Parliament And Of The Council 2003/98/EC was the first (although there were earlier regulations concerning the re-use of public sector information - 90/313/EEC of 7 June 1990 and 92/100/EEC of 19 November 1992) EU directive aimed at implementing uniform and consistent principles for the re-use of public sector information in all member states (Directive Of The EP And Of The Council, 2003/98/EC).

In 2013, the EU Council adopted a directive on the re-use of public sector information, which imposes an obligation on member states to provide and re-use public sector information. This directive establishes principles for the dissemination of public sector data, including the principle that such data should be available free of charge or at a low cost to facilitate their re-use by external entities. Additionally, the directive sets standards for data quality, formats, and dissemination procedures to facilitate the re-use of such data (Directive Of The EP And Of The Council, 2013/37/EU).

In 2019, the EU Council adopted the latest directive on open data and the re-use of public sector information, which replaces the previous directive from 2013 and introduces more stringent standards regarding the openness and re-use of public sector data (Directive Of The EP And Of The Council, 2019/1024/EU).

In Poland, the process of creating laws regulating the provision and reprocessing of data in the public sector has been ongoing since the 1990s. For example, the "Code of Practices for Accessible Intranet Offices" or the "Code of Practice of the Tax Office" were established.

In 2001, a law was passed regulating the right to access public information and the principles of providing public documents (Journal of Laws of 2001, No. 112, item 1198).

Subsequently, in 2002, a law was enacted on the principles of providing services electronically by public authorities and private entities (Journal of Laws of 2002, No. 144, item 1204).

In 2005, the Act on the Computerization of the Activities of Entities Implementing Public Tasks was passed, which, among other things, imposed an obligation on these entities to provide public information in electronic form and establish a Public Information Bulletin (Journal of Laws of 2005, No. 64, item 565).

In 2011, the Parliament adopted the Act on the Reuse of Public Information, which aimed to facilitate access to public information and increase its use. This law introduced, among other things, the obligation to provide public information in electronic form and defined the principles of public data sharing (Journal of Laws of 2011, No. 204, item 1195).

In 2016, the Parliament adopted the Act on the Computerization of Activities of Entities Implementing Public Tasks, which aimed to streamline the operations of public institutions through the use of modern information technology. This law introduced, among other things, the obligation to provide public data through Application Programming Interfaces (APIs) (Journal of Laws of 2016, item 352).

In 2018, the Parliament adopted the Act on the Reuse of Public Sector Information, which aimed to standardize and streamline the rules for the provision and reuse of public data in Poland. This law introduced, among other things, the obligation to provide data in an open format, allowing for easy processing and analysis. The law also established principles regarding fees for data provision and defined requirements for the protection of privacy and personal data in the context of public data sharing (Journal of Laws of 2018, item 1243).

In 2019, in Poland, the Act amending the Act on the Computerization of Activities of Entities Implementing Public Tasks and certain other acts was passed. This law introduced new provisions regarding the provision of public data. According to the law, public data are to be made available free of charge, in an open format, and in a manner that allows for their reuse, including for commercial purposes. The law also introduced the obligation for public entities to create and make available a register of public data and mandated entities to provide data in a bulk manner, such as through the provision of APIs (Journal of Laws of 2019, item 1446).

In 2021, another law was passed (the most recent and currently in force) - the Act on the Reuse of Public Sector Information (ISP). This is a law that implements EU regulations on open data in Poland. This law defines the principles of providing and reusing public data and requires public entities to create data sharing plans. The law also introduces an obligation for public entities to publish information about data that is not available in an open format, along with an explanation of why this is the case. Additionally, the law introduces new penalties for violations of provisions regarding the provision and reuse of public data, such as financial penalties or contractual penalties (Journal of Laws of 2021, item 1641).

All these laws aimed to facilitate access to public information and increase the use of public data, which is an important step towards improving the quality of life for citizens and fostering knowledge-based economic development.

#### **4. The method of providing open data on the website of the Polish government administration (<https://dane.gov.pl/pl>)**

The main platform for presenting and providing open data from administrative units in our country (Local Government Units - LGUs) is the Polish Republic Service (portal: Dane.gov.pl).

Data are made available here statically, in the form of interactive tables, charts, and maps. Users can browse through the available datasets, search for relevant information, and download them in various formats (such as CSV, XLS, or JSON) without any charges or licensing restrictions. This means that anyone can access and utilize the data in their projects.

The website also enables dynamic data sharing through the use of an Application Programming Interface (API). An API is a set of rules, protocols, and tools that allow programs to communicate with each other and exchange data. It allows developers to create applications that can utilize the functionalities of existing systems or services (API Standard, [www.gov.pl/...](http://www.gov.pl/...)).

API allows, for example, sending queries and retrieving data from web services, enabling the use of that data in applications or websites. With APIs, developers can also integrate their applications with other systems, such as social platforms, online payments, or map services (Jacobson, Woods, Brail, 2015).

API is crucial in today's times as it enables the creation of more advanced and complex applications that utilize various data sources (often stored in the cloud - Big Data in the Cloud - BIC) and services. This allows users to access the required information more easily and quickly and make use of various online services (Manimuthu et al., 2021).

#### **5. The idea of a smart city**

In Polish, the main translations used are the direct ones, such as „intelligent city” or „wise” as well as the English adjective „smart” (Gotlib, Olszewski, 2016; Stawasz, Sikora-Fernandez, 2015). Research conducted in the United Kingdom showed that only 4% of the surveyed residents could name a local initiative that meets the smart city standards (Ryba, 2017). The word „smart” in the context of devices is translated as „intelligent” but the concept of a smart city is not limited solely to the technological aspect (Kaur, Maheshwari, 2016,

pp. 1-5). Using the original English adjective is justified because it is already widely used and has a chance to become part of the Polish language.

Considering the above, I propose translating the definition of a smart city into Polish as „A city tailored to fit” (a city tailored to fit), as the solutions applied in it should be like a suit made for an individual, as not all IT, technical, and technological solutions are necessary or feasible for a given city, and their suitability will vary (ChuanTao et al., 2015, p. 4).

The concept of a smart city emerged in the early 21st century, but the idea of intelligent cities integrated with modern technologies has been gradually developing over many years. The first attempts to create smart cities appeared in the 1980s and 1990s, but they were mainly experimental projects rather than comprehensive concepts of future cities. The term "Smart City" began to emerge in the early 21st century, and the concept gained popularity with the advancement of information and communication technologies and the growing demand for solutions that enhance the quality of life in cities (Pięta-Kanurska, 2019, pp. 59-70).

Smart city is a developing concept that attracts more researchers worldwide, including in Poland. In cities, especially in Barcelona, Vienna, and Copenhagen, there is a growing number of projects implemented under the banner of "smart." Traditionally, Smart City involves the integration of the latest information technologies into urban spaces to improve the quality of life for city residents. However, this concept also relies on IT solutions (Information Technology) tailored to the specific needs of each city, which help make more efficient real-time decisions for city users.

According to T. Nam and T.A. Pardo, a smart city is a city that utilizes information to improve its physical infrastructure. As a result, the city becomes more mobile, efficient, and energy-saving, while also improving air and water quality. Additionally, the city has the ability to quickly identify and address issues and effectively utilize resources (Nam, Pardo, 2011).

Within the concept of smart city, increasing importance is placed on the development of smart people and smart governance. Both of these elements are equally important as technological advancements because technology alone is not sufficient to achieve a higher quality of life in cities and address disparities.

Currently, a relational approach to smart city is being promoted, where city residents participate in the city management process, particularly in decision-making and implementing smart projects. The goal of smart city is to manage a city where the relationships between local government, IT providers, academia, and city residents are crucial (Pięta-Kanurska, 2019, p. 59).

A. Meijer writes about four perspectives in smart city governance: governing the smart city, making smart decisions, smart administration, and smart urban collaboration (Meijer, Bolivar, 2016).

In summary, smart city governance is an approach to city management aimed at achieving sustainable development, well-being, and citizen engagement through various forms of social participation. Local governments should invest in city infrastructure such as sanitation,

electrical systems, public transportation, and other components to achieve social inclusion of residents. The goals of smart governance should be specific to each city, depending on the needs and priorities of its residents. Creating a better environment for knowledge and innovation development, such as through open data sharing, is also an important aspect. Policies regarding data collection and sharing should consider principles of confidentiality, intellectual property rights, and personal data protection.

## **6. Open data in the service of smart city**

Open data are essential elements of the smart city concept, enabling the efficient collection, analysis, and utilization of information about the city, accessible to all interested parties. This allows city residents to better understand how their environment functions and what problems need to be addressed (Jara, Genoud, Bocchi, 2014).

Various types of data are utilized in the development of smart cities, including data on traffic, air quality, energy consumption, water consumption, as well as data on public services such as public transportation, healthcare, and education. These data originate from various sources, such as sensors, traffic management systems, air quality monitoring systems, and Internet of Things (IoT) devices, such as smart energy meters and devices related to urban transportation (Azrou, Mabrouki, Guezzaz, Kanwal, 2021; Din, Guizani, Rodrigues, Hassan, Korotaev, 2019).

The sharing of this information and data also has a positive impact on citizen participation in the city management process, as it allows them to actively engage in decision-making and driving change. Openness of data also enables collaboration among different institutions, leading to better resource utilization and coordination of city-level actions. Implementing smart city projects based on open data contributes to better resource utilization, improved quality of life for residents, and more efficient city management (Nuaimi et al., 2015, p. 11).

## **7. Research Methodology**

In this study, a secondary data analysis method was employed based on data from three reports prepared by the "Expert Team of the Data Management Department of the Chancellery of the Prime Minister" on the topic of reusing public data in Poland (Dane.gov.pl/..., 2020-2022).

Report No. 1: A survey report on the provision of dynamic data by cities through application programming interfaces (APIs) - (the survey was conducted in 2021 before the implementation of the Act on Open Data and Reuse of Public Sector Information - Journal of Laws No. 1641). The aim was to analyze the extent to which Polish cities provide dynamic data through application programming interfaces (APIs). Questions were sent to 108 cities with a population of over 40,000 to determine how many of them provide data through APIs. 84 cities responded to these questions, indicating that the study was conducted at a level of 77.77%.

Distribution of the research sample by city size:

- Cities with 40,000 to 49,999 inhabitants - 21.4%.
- Cities with 50,000 to 99,999 inhabitants - 42.9%.
- Cities with 100,000 to 299,999 inhabitants - 27.4%.
- Cities with 300,000 or more inhabitants - 8.3%.

Report No. 2: Experiences of Local Government Units (LGUs) in data provision and utilization - a report on a study conducted in Local Government Units (carried out from October 3 to November 10, 2022, i.e., after the implementation of the Act). The aim of the study was to assess the level of advancement in the process of opening data in local government units at the level of district offices and provincial assemblies.

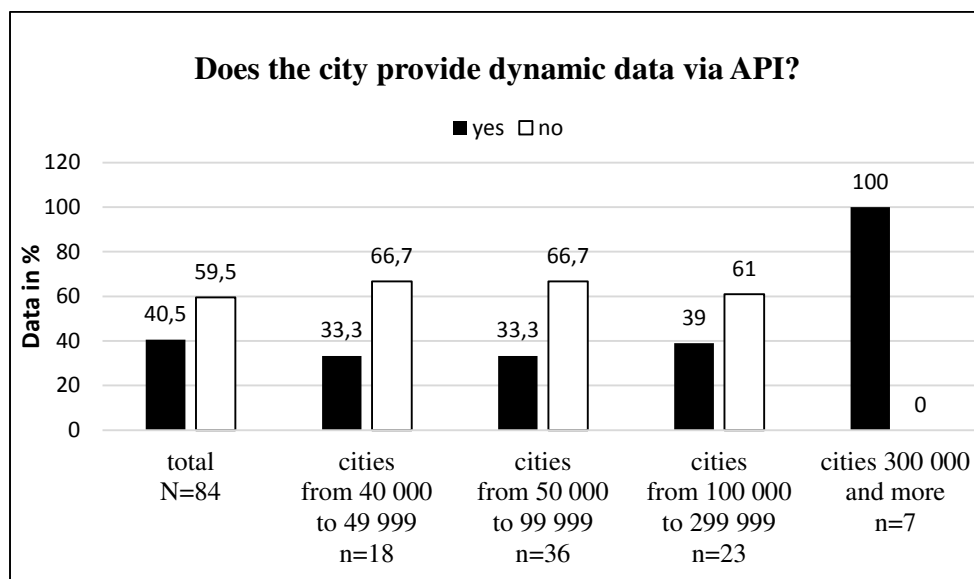
For the online survey (by posting the questionnaire in the attachment), 330 units (314 districts - excluding cities with county rights - and 16 provincial assemblies) were invited, and responses were obtained from 96 units (90 districts and 6 provincial assemblies), resulting in a research completion rate of 29.09%.

Report No. 3: Evaluation of the Dane.gov.pl portal - a report on a study conducted among users of this portal. The online survey was conducted from May 22, 2020, to January 18, 2022. The questionnaire, which was placed on the Dane.gov.pl portal, was completed by 384 users.

These research reports are presented to identify and describe the actions taken in the area of providing and reusing public data in Poland. Furthermore, the aim of this study is to compare the states before and after the implementation of the „Act of August 11, 2021, on Open Data and Reuse of Public Sector Information”, as well as to determine the size of the market and trends and preferences of users of the Dane.gov.pl portal.

## 8. In-depth research analysis of Reports No. 1, 2, and 3

### 8.1. Status of open data sharing by Polish cities through API (Report No. 1, 2021)



**Figure 1.** Scale of dynamic data sharing in the examined cities.

Source: Report No. 1 (2021).

A significantly higher number of examined cities (59.5%, or 50 cities) state that they do not share dynamic data via API compared to cities that do (40.5%, or 34 cities). The analysis of the results, taking into account the size of the examined units, shows that larger cities (with a population above 100,000) are more likely to share data through API than smaller cities (with a population below 100,000). Among the nine largest cities in Poland (with a population above 300,000), seven of them responded to the survey questions and all of them declared sharing dynamic data via API. In the group of cities with a population from 100,000 to 299,999, 39% of the examined units share data (9 cities). In cities with a population from 50,000 to 99,999 and from 40,000 to 49,999, 33.3% of the examined cities in each category declared data sharing, which corresponds to 12 cities in the first group and 6 cities in the second group.

When it comes to the shared thematic scope, the respondents primarily indicated the categories listed in Table 1 in descending order of overall indications.



**Table 1.**

*The number of datasets shared by cities, divided into thematic categories of dynamic data shared via API - overall and by city size (data in numbers)*

<i>The surveyed entities could indicate more than one category of data, and within each category, more than one dataset</i>	<b>cities providing data - overall</b>	<b>cities from 40,000 to 49,999</b>	<b>cities from 50,000 to 99,999</b>	<b>cities from 100,000 to 299,999</b>	<b>cities 300,000 and above</b>
	<b>n=34</b>	<b>n=6</b>	<b>n=12</b>	<b>n=9</b>	<b>n=7</b>
data regarding public transportation	17	2	4	3	8
data concerning air quality	10	3	3	2	2
data regarding address points	10	2	5	2	1
data concerning local spatial development plans	9		4	1	4
geodetic and cartographic data	9	1	2	5	1
environmental data	8	4	3		1
map services	6		1	2	3
tourism and recreation data	6	2	2		2
parking system data	5	1		1	3
meteorological data	5	1	1	1	2
election data	5	1	3		1
data on registers maintained by the city office	4		1	2	1
data on the availability of city bikes	3	1			2
real estate data	3	1		1	1
school district data	3	1	1		1
municipal services implementation data	3	2	1		
data on city events	2			1	1
data on city interventions	2			1	1
transportation and traffic data	2		1	1	
data from municipal library catalogs	2		2		
data from municipal heritage records	2	1	1		
other data (grave search engine, QR code generation, job recruitment announcements, queue reservation system, land use, investment offers, taxes, installations generating electromagnetic fields, streetlights and energy consumption points, playgrounds)	10	4	3	1	2
<b>total number of datasets provided</b>	<b>126</b>	<b>27</b>	<b>38</b>	<b>24</b>	<b>37</b>

Source: Report No. 1 (2021).

The respondents indicated that the largest number of datasets (17) contains dynamic data related to urban transportation, such as real-time schedules, vehicle locations, and delay information. Cities with a population of 300,000 or more provide the highest number of datasets in this area (8). In second place, in terms of the number of datasets, are data related to air quality and address points (10 datasets each). Furthermore, there are 9 datasets available in the areas of local spatial development plans, geodesy and cartography, as well as environment and environmental protection. There are 6 datasets each for map services and tourism and recreation data, and 5 datasets for meteorological data, election data, and parking systems (e.g., the number of available parking spaces). The remaining categories received fewer than 4 mentions as being available in the API.

## 8.2. Open data in Local Government Units (Report No. 2, 2022)

In the study of Local Government Units, 96 entities participated, out of which:

- 8 entities (8.9%) provide data on the Dane.gov.pl portal. Therefore, a staggering 55 out of 96 (91.1%) surveyed Local Government Units do not provide any of their data on the portal in any way.
- 17 entities provide data through an API.
- 16 entities do so dynamically.

Since the datasets - API, dynamic data, and those posted on the Dane.gov.pl portal - are not mutually exclusive, the study revealed that 6 units provide their data dynamically through the API, and one unit does the same on the portal. Only one of the surveyed entities provides data through both the API and the portal. It is noteworthy that no Local Government Unit was found to provide data in all three ways simultaneously: API, portal, and dynamic data.

### Sharing data on the Dane.gov.pl portal

Representatives of offices cite the following reasons for the observed lack of data sharing on the Dane.gov.pl portal: the most common reason is a lack of knowledge about the data that can or should be shared (22% of responses). 15.9% of units indicated staffing shortages or deficiencies as the reason for not sharing data, and 13.4% cited a lack of appropriate data to share. 9.8% of respondents emphasized a lack of demand or interest in the data held by their office, while nearly 7.3% pointed to technical barriers that hinder data sharing.

Furthermore, 11% of respondents claim that despite not currently sharing data, work is already underway to enable data sharing on the Dane.gov.pl portal. Half as many respondents (4.9%) indicate that their institution is planning to introduce an open data policy, which may lead to data sharing on the portal in the future (approximately one year from the survey, i.e., in 2023).

The study revealed that another reason why Local Government Units do not share data on the Dane.gov.pl portal is that the data are available elsewhere or in a different manner. 18.3% of respondents indicated that their data are shared on other portals, websites, or in other places, such as BIP, Geoportal, or through domain-specific systems. Respondents also mentioned data being transferred to other entities, which subsequently share the data, as well as their own open data portals.

### Data Sharing through APIs

More than half, specifically 53.1% of the surveyed units, do not share data through application programming interfaces (APIs). Only less than one-fifth of the surveyed units (17.7%) declare data sharing through APIs, while information regarding this aspect was not provided in nearly one-third of the surveys (29.2%).

**Table 2.***Reasons for not sharing data through APIs*

N=51	N	%
lack of tools, lack of technical capabilities, lack of software integrating with the API, absence of launched applications, absence of API, lack of interface installation	18	35,3
lack of knowledge about data sharing, insufficient knowledge about what data can or should be shared	6	11,8
lack of finances	5	9,8
lack of interest from residents, lack of demand	5	9,8
lack of data to be shared	3	5,9
lack of human resources	3	5,9
lack of possibilities, lack of adequate preparation	2	3,9
lack of legal basis, no legal obligation	2	3,9
lack of integration of domain systems	1	2,0
data are shared in other ways (through BIP, on Geoportal, upon request)	5	9,8
ongoing work related to the possibility of data sharing through APIs	1	2,0
no reason indicated	3	5,9
responses unrelated to the topic	2	3,9

The percentages do not add up to 100% because respondents were able to indicate more than one reason.

Source: Report No. 2 (2022).

The surveyed units do not provide data through API mainly due to a lack of technical capabilities, indicated by 35.3% of respondents. Lack of knowledge about which data can or should be made available through this method, lack of finances, and lack of interest in this means of data sharing were also mentioned as reasons. Approximately 10% of respondents stated that they do not provide data through API because they do so in another way, such as through BIP, Geoportal, or upon request. Insufficient personnel and lack of data suitable for API sharing are additional reasons for not providing data in this manner. Other reasons received less than 4% of responses.

### **Provision of dynamic data**

The study results indicate that only about one-sixth of the surveyed local government units (16.7%) provide dynamic data, while a significant majority, as much as 83.3%, do not provide this type of data.

Only 5.6% of the units that currently do not provide dynamic data have taken steps to start sharing it. In contrast, 94.4% of respondents stated that they have not taken any actions to provide dynamic data, which is a common phenomenon.

The majority of respondents (64.4%) do not see any obstacles to providing dynamic data, while 35.6% identified such barriers. The most frequently mentioned barriers were financial constraints (25 responses), personnel limitations (24 responses), and technical challenges (19 responses), such as equipment and software deficiencies. Other obstacles, such as lack of training, procedures, legal barriers, or awareness issues, received isolated mentions.

63.8% of the respondents do not have information about products, services, or applications that utilize data from their office and can be helpful for residents or businesses. On the other hand, just over one-third of the surveyed individuals (36.2%) are aware of the existence of such products or services that have been developed using data from their office. When asked to

provide examples of services, products, or applications that utilize data from their office, representatives of the surveyed institutions most frequently mention the Geoportal or the district Geoportal (18 mentions). The portal with geodetic services, such as surveyor services and an online geodetic store, is mentioned less frequently (5 mentions), as well as queue management systems like „queue machines” (3 mentions). Other services, products, or applications were mentioned only once.

On the Dane.gov.pl platform, a category related to Ukraine has been created, where various information about refugees, border movement between Poland and Ukraine, and the number of Ukrainians in Poland is provided. It turned out that one-fourth of the surveyed local government units have similar data that could be included there, while the vast majority (74.7%) does not have such information.

### **Barriers to data sharing by local government units (JST)**

The most commonly indicated difficulties in data sharing by JST are shown in Table 3.

**Table 3.**

*The most significant barriers to sharing public data/information by the office/authority*

<b>N=96</b>	<b>N</b>	<b>%</b>
Insufficient financial resources for building a portal for public data/information	48	51,1
Lack of knowledge regarding which data can or should be made available	47	50,0
Lack of interest in public data/information from stakeholders (such as residents, entrepreneurs, representatives of foundations, scientists, journalists)	43	45,7
Inadequate competencies for preparing data in open formats	31	33,0
Lack of or minimal interest in the topic of sharing public data/information within the office/authority	25	26,6
Other barriers	4	4,3
- Lack of data*	2	-

The data does not sum up to 100% because respondents were able to indicate more than one reason.

\* - excluded from the percentage base.

Source: Report No. 2 (2022).

Most often, representatives of the surveyed offices indicated a lack of funds for building a data portal (51.1%) and a lack of knowledge regarding which data can or should be made available (50.0%). A similar number of responses (45.7%) were obtained for the lack of interest in public data from stakeholders such as residents, businesses, non-governmental organizations, scientists, and journalists. For one-third of respondents (33.0%), a significant barrier is the lack of staff competence in preparing data in open formats, and for one-fourth (26.6%), it is the low or no interest in the topic of data sharing within the office itself.

### **8.3. User opinions about the Dane.gov.pl portal (Report No. 3, 2020-2022)**

According to the research results, users of the Dane.gov.pl platform prefer the PDF format as the most useful for themselves (47.7%). In second place, but with much less popularity, are the XLS and XLSX formats with a result of 38.3%. The next format, which received over one-third of the responses, is CSV (35.4%). The JPEG, PNG, JSON, XML, DOC, and DOCX formats achieved results of about one-fourth of the responses, while the HTML format was

indicated by just over one-tenth of the respondents (12%). RDF and ODS obtained the lowest results, with 5.7% and 3.4% respectively. The remaining formats account for a total of 16.1% of the responses, with the SHP format being the most frequently mentioned, followed by several other formats such as GML, SWDE, TIFF, DXF, WMS, GEOTIFF, KMZ, KML, GEOJSON, and DB3.

Users most commonly expect the publication of public data in the following categories: Health; Economy and Business; Public Transport and Communication; Environment; Geodetic, Cartographic, and Locational Data; Socio-Demographic Data; Science and Education; Security; Culture; Justice and Penitentiary System; Defense and Military.

It turns out that the most common motivation for users to access public data, is the desire to acquire or expand their knowledge. This reason was indicated by over 40% of the respondents (44.7%). Just over one-fifth of the users (19.5%) stated that they use public data out of curiosity and a desire to explore the possibilities hidden in that data. Approximately 10% of portal users utilize public data in their scientific activities, including for research purposes (12.2%), while nearly one-tenth use it for creating applications (7.8%) or building databases (7.5%).

The majority of portal users (58.3%) consider access to data through an API interface to be significant - 39.3% of respondents consider it important, and 19% consider it very important. Only 14.4% of respondents find the API less significant but still use it, while 27.3% do not find it important because they do not use this data retrieval method.

## 9. Results from research reports

Based on the data presented in research reports on urban public administration (regarding the provision of open data in APIs) and local government units (provision in APIs and on the Dane.gov.pl portal, as well as dynamically), it can be concluded that:

- The majority of cities and local government units do not provide their data through APIs: less frequently in cities (around 60%) and more frequently in local government units, with over 80% (when adding 53.1% of responses stating "no" and 29.2% of surveys with no response).
- There is an observed pattern that the larger the unit serving a population, the more likely it is to provide its public data through APIs (e.g., in cities with over 300,000 residents, 100% of units provide data; in cities with 40,000 to 299,999 residents, it ranges from 33.3% to 39%; while in local government units, it is only 17.7%).
- In cities with 40,000 residents or more, data are most frequently provided in categories related to: public transportation, air quality, address points, local spatial development plans, geodesy and cartography, environment, map services, tourism, and recreation.

In local government units, access to geodetic data (Geoportal), address information of companies (BIP), and queue systems (queue machines) are mentioned.

- In light of the new Act on Open Data and Reuse of Public Sector Information from August 2021, 18.4% of surveyed cities state that actions are already being taken to enable the provision of dynamic data through APIs; 30.6% plan to take actions to enable the provision of dynamic data according to Article 24 of the act; 40.8% only express the intention to work towards the goal of providing data through APIs without specifying specific solutions, and 10.2% have no plans for such actions. Among the surveyed local government units that currently do not provide dynamic data, only one in twenty (5%) has taken actions towards enabling the provision of dynamic data, while 10.2% do not plan to take actions to enable the provision of dynamic data through APIs (the reasons were not specified for three cities).
- Among the most commonly mentioned barriers (reasons) for not providing data by local government units (JST), the lack of appropriate tools, knowledge, finances, and demand for data are cited (90% of units use their own data resources, while only about 10% of surveyed units rely on data placed on the Dane.gov.pl portal).
- Users of the Dane.gov.pl platform consider the PDF format as the most useful for them (47.7%), followed by XLS, XLSX (38.3%), CSV (35.4%), JPEG, PNG format (26.6%), JSON (25%), XML (25%), DOC, DOCX (23.4%), HTML (12%), RDF (5.7%), ODS (3.4%), while other formats collectively account for 16.1%.
- 58.3% of users of the Dane.gov.pl portal consider access to data through the API interface to be significant; 14.4% of respondents consider the API to be of little importance but still use it, and 27.3% do not consider it important because they do not use this data retrieval method.

## 10. Discussion

The provision of public data by local government units in Poland is currently a legal obligation. In the year the law was enacted (2022), a significant majority of cities and local government units (JST) do not publicly provide their data in accordance with the law or in any other way.

A concern may arise from the dismissive attitude towards the law exhibited by public administration employees in cities and local government units (10.2%) who casually declare a lack of planned actions towards data sharing through API. "Article 23 - [Criminal liability for failure to provide public information] - Access to public information" clearly indicates the consequences of neglect in this area: "Anyone who, contrary to their obligation, fails to provide public information is subject to a fine, restriction of liberty, or imprisonment for up to one year"

(Journal of Laws 2022.902) - however, upon careful reading of the 2021 Act, it turns out that this refers only to providing information upon request. Therefore, legislation in the discussed scope has its various shortcomings: it does not clearly specify which data should be provided upon request and which should be obligatory for online disclosure. There is a lack of specific indication of a "basket of free public data" available online, to which authorities would be unconditionally obliged. Article 10.1 of the 2021 Act states: "The obligated entity, **if possible**, provides or transmits public sector information as open data for reuse." Consequently, currently, it is sufficient to demonstrate that a public entity obligated to provide data openly has encountered difficulties in doing so in order to be exempt from responsibility. The non-restrictiveness of the law means that open public data are subject to the goodwill of officials rather than being an obligation, and it even encourages authorities to adopt a passive approach.

Based on the responses in Report No. 2 (regarding JST), it can be inferred that in the near future, the number of entities that provide data on the Dane.gov.pl portal should increase from the current level of nearly one-tenth to one-fourth (24.8% - including those that already provide data, are undergoing implementation efforts, or plan to adopt an open data policy). Researchers emphasize that by referring to the near future, they mean within a year, which is confirmed by the survey participants' responses indicating that their offices plan to start sharing data on the portal in 2023.

However, the surveyed representatives of local government units pointed out various ways to increase the efficiency of the data sharing process in their offices. According to them, the most helpful would be workshops, meetings, conferences, and the exchange of best practices in the field of data sharing (75.5% of responses), as well as training, both in-person and online (71.3%). For half of the respondents (52.1%), educational materials would be helpful, and one-fifth (21.3%) suggested appointing a data openness representative in each office. On the other hand, appointing a representative is the least popular among the respondents.

Sharing open data on the Dane.gov.pl portal dynamically through API is not an easy task but requires appropriate tools in the form of electronic hardware and software, such as Appmaster (<https://studio.appmaster.io/>), but above all, a well-prepared workforce to take on such challenges. The logic of the free market suggests that the salary offered in public administration may not be sufficient to attract the most highly qualified IT professionals who opt for the private sector. Therefore, it is necessary to create an internal organizational climate and provide adequate external support (e.g., training) so that the current employees in public administration can cope with the new obligations imposed by the legislator.

It would also be worth considering the possibility of utilizing the experience of opinion research centers, led by the Central Statistical Office, whose ratings in data collection and dissemination are very high (as mentioned earlier in the ODIN ranking).

Data provided through APIs is targeted towards IT professionals, and users with average IT knowledge do not have access to them. Therefore, in line with the preferences of users accessing the Dane.gov.pl portal, it would be advisable to provide data in the most popular formats, such as .pdf, .xlsx, and .docx. To achieve this, a tool like Google Forms could be utilized, allowing for dynamic data extraction into a .csv file (which can easily be converted to .pdf or .xlsx).

As mentioned earlier, in the absence of appropriate (non-fictional) legislation and support infrastructure (financial, tool-based, training, etc.) from the ministry and the cooperation of the government side responsible for the Dane.gov.pl portal with institutions experienced in data collection, processing, and dissemination, it is difficult to expect any revolution in the near future regarding the provision of public data by government offices.

## 11. Summary

The concept of a smart city originally referred to cities that utilize intelligent technology in urban services. This concept has been expanded to include additional dimensions, such as Smart People or Citizens; Smart Governance; Smart Environment and Resource Management; Smart Homes, Buildings, and Living; Smart Education; Smart Transportation, Parking, and Traffic Lights; Smart Healthcare; Smart Grid and Energy; Emergency and Public Safety; and Cybersecurity Management (Sarker, 2022). The implementation of smart products and services necessitates the development of these additional dimensions.

Open data has the potential to support innovative technological solutions and increase citizen engagement in decision-making processes. Examples of smart cities demonstrate that they are characterized by high citizen mobility, the implementation of solutions that contribute to the reduction of carbon dioxide and other pollutant emissions, and the creation of green cities that promote healthier living environments. In other instances, by providing crime maps to the public, the involvement of the community has led to a decrease in crime rates (Haarstad, Wathne, 2019).

The implementation of the smart city concept varies across different cities, influenced by a range of factors, including the provision and utilization of public data. However, it is worth noting that to maximize the benefits for residents in the development of smart cities, it is necessary for authorities to adopt appropriate policies that promote data sharing, enabling data-driven decision-making (Neves, de Castro Neto, Aparicio, 2020).

City managers responsible for selecting and deploying smart products and services must think beyond inclusivity. Restricting access to data for external economic entities and individuals would hinder their involvement in the development and life of these cities. Open data not only allows for responding to the needs of city residents and local businesses but



also provides conditions for coordinating various activities, leading to cost reduction and profit maximization (Sarker, 2022, p. 6).

Even with limited financial resources, especially in smaller cities, local authorities should focus on implementing modern technology in urban products and services, while considering long-term financial forecasts regarding available budgetary funds. An important tool for developing strategic city management for the advancement of smart cities is access to public data. Obtaining information about the city, its population, and the functioning of public systems can support the development of more effective public policies and better organization of transportation and environmental protection (Bibri, 2018, pp. 2-3).

In summary, open data from public administration plays a crucial role in the development of smart cities. However, in order to effectively utilize this data, it is necessary to have wide-ranging sharing by public administration units in accordance with applicable law. Yet, mere data sharing by public administration is not sufficient for smart city development. It also requires broad social engagement and collaboration among the public, private, and academic sectors to ensure the most efficient and beneficial use of this data for the well-being of city residents.

The implementation of an open data policy should be preceded by proper training of residents to help them understand the benefits and significance of data sharing. Additionally, appropriate tools and processes should be provided to ensure the effective and ethical use of this data.

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## DETERMINANTS OF CHOOSING A UNIVERSITY IN THE CONTEXT OF SHAPING ITS IMAGE

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**Purpose:** The aim of the research presented in the article was to indicate what factors determine the choice of higher education in the context of image building within the local environment. The authors tried to determine what peripheral factors may contribute to making technical universities more attractive to women.

**Design/methodology/approach:** The hypotheses concerning the factors determining the choice of higher education were based on previous research results of making an educational offer. The choice of methodology was dictated by local conditions. The study used a diagnostic survey prepared as part of creating a perspective for developing the Czestochowa University of Technology for the period up to 2030. It was conducted among 1039 high school students based in Czestochowa.

**Findings:** The research has shown that prestige, one of the effects of building an organisation's image, may be less important for universities that have less recognition and need to use other assets to attract candidates for studies. Despite various actions organised by technical universities, women continue to focus on education in the fields of social sciences and humanities, at the expense of technical and applied sciences, although peripheral factors are important to them when choosing the appropriate university.

**Research limitations/implications:** The conclusions of the study refer to a specific local system. Further research in this area would require a meta-analysis of research results, taking into consideration the specific nature of the research area and to what extent it is saturated by various types of universities.

**Social implications:** The results of the research work may enable the educational package to be better suited to the relevant category of candidates which, in this case, is women who are less likely to choose a given type of university.

**Originality/value:** A comparison of the results with other studies made it possible to determine the importance of adapting the relevant methodology to local conditions.

**Keywords:** image management, educational preferences, creating of educational offer, higher education.

**Category of the paper:** Research paper.

## 1. Introduction

In modern society, image is becoming an increasingly important attribute of any organisation (Gołata, Sojkin, 2020, p. 41). Until recently, it was perceived as an element of the marketing activities of enterprises. In the case of universities, this action has made it necessary to compete for student acquisition, which has led to a more subjective approach to people studying at universities (Azoury, Daou, El Khoury, 2014). This is because students are not only passive recipients of the offer, but their relationship with the university is transformed into the quality of the teaching and scientific staff of the future. At the same time, relations with the local environment have also become more important. Universities use various strategies to promote their own brand within the local environment, including cooperation with local primary and secondary schools (Mioduchowska-Jaroszewicz, Hawran, Kowalik, 2018, p. 91). Other forms of promoting the university also include various types of events addressed to young people, such as open days, science festivals and a number of other events during which an educational offer is presented.

The issue of subjectivity is also taken into consideration by involving university employees in building and maintaining the quality of their own image. Attention is also paid to shaping relations with other institutions within the local environment. The reputation of the university and possible ways of attracting students depend on relations with external stakeholders (Lafuente-Ruiz-de-Sabando, Forcada, Zorrilla, 2018). On the other hand, presenting one's own potential within the local environment can increase clarity, and thus also prestige (Duarte, Alves, Raposo, 2010). It is worth emphasising that the scope of activities aimed at building the reputation of the university will depend on the scale of its recognition within the local, regional and global environment.

The aim of this article is to indicate the factors of choosing a university in relation to promotional activities undertaken by the university. For this purpose, research was carried out within the local environment of one Polish university, which was the Czestochowa University of Technology. This was part of research performed as part of creating a perspective for developing the Czestochowa University of Technology for the period up to 2030. The research method used was a diagnostic survey addressed to high school students. The discussion in this article presents discrepancies resulting from the methodological approach used in various studies and the consequences for the strategy of image building applied by universities.

## 2. Literature review

In Poland, during the 1990s, the number of people taking up higher education began to increase, which went hand in hand with the development of the educational market and the emergence of new universities, most of which were private. In later decades, however, demographic processes led to universities having to make marketing efforts to effectively compete for university candidates. The educational offer began to be treated as a simple commercial offer, which led to the "trap of marketizing activities". This was accompanied by a focus on short-term effects rather than long-term goals, which include building a network of relations (see Arum, Roksa, 2011; Dziewanowska, 2016). The authors argue that education is increasingly treated as a private good, which is associated with the perception of students as consumers of knowledge, and not as subjects guided by critical thinking (Taylor, Judson, 2014; Dziewanowska, 2016). At the same time, students are treated as clients who are unable to clearly define their own expectations of services provided by universities (Ryńca, Miśko, 2016). Even if we do not regard the process of marketizing activities as a form of privatising knowledge, it can be said that universities are becoming closed institutions, generating not so much private goods as club goods. These goods are divisible, inexhaustible. Nevertheless, access to them is institutionally limited (cf. Kukowska, Skolik, 2016).

The second problem related to university image building or reconstruction is a tendency to commercialise activities, focusing on conducting research while marginalising teaching activity (Del-Castillo-Feito, Blanco-González, González-Vázquez, 2019). This trend is also visible in Poland as a result of the need to reduce the distance between Polish and Western universities in terms of scientific potential. In a parametric assessment, research and publications are important, while from the point of view of students, their relations with academic teachers are more important, not the publications produced by these teachers (Adamska, Dymek, 2018). Dziewanowska (2016) points out that building relations between the university and students is the right approach to creating the university's image.

Some authors also highlight the problems related to how universities are expected to serve society, a duty which universities are moving away, leading to a decline in trust in them (see Khurana, Nohria, 2008). Although a positive image of a university is not enough to consolidate its reputation, this reputation is created on the basis of its image. This requires consistent and long-term action, not short-term media actions (Del-Castillo-Feito et al., 2019). Advertising published in the media is regarded as a weak factor influencing the decision to choose a university (Wasiluk, Markowska, 2015). Candidates first look for information on the Internet on websites not directly related to the university in order to form an opinion. In surveys conducted among students of Poznań high schools, only 6.4% of students declared that they did not look for information about their future university on the Internet (Michalak, Mruk-Tomczak, 2018).

If active promotion in the media, especially traditional media, is not a sufficient activity aimed at increasing recognition among candidates for studies, it becomes necessary to recognise the factors of choosing a university. These factors can change over time, which leads to the need for continuous research in this area. In the case of choosing to study abroad, university rankings are less important than before, and the possibility of receiving scholarships is more important, while the geographical proximity and prestige of the university also remain important factors (Simões, Soares, 2010; Azzone, Soncin, 2020).

Some researchers point out that the impact of university staff is more important than relationships with friends and family (Johnston, 2010; Michalak, Mruk-Tomczak, 2018). Nowacka (2016), citing research conducted among administrators of Polish and English universities, states that the teaching staff and the quality of teaching have the greatest impact on the image of the university. This may mean that these are mainly factors in creating the image and thus the reputation of the university, which in turn translates into the choice of candidates for studies. D'Uggento et al. (2023) pointed out that pride in the university's brand is a key factor in deciding whether to choose a university, which is why the image of a university is an important decision-making factor. In Iran, it has been noted that if students identify with a university, strong ties do not fade even after graduation (Chen, 2016, p. 26). However, it seems that this applies mainly to universities that already have high prestige. In surveys conducted among students of the University of Euroregional Economy in Józefów, only 7% of students claimed that they were guided by prestige when choosing a university, while the most important factor for 48% of them was a convenient location, while the desire to obtain a diploma was the decisive factor for 38% of them (Antczak et al., 2016).

In the study of the selection factors of Polish universities, it was noted that the possibility of finding employment after graduating from a given university, or obtaining better earnings, compliance of the offer with market needs and the quality of education are often taken into consideration (Wroczyńska, 2013; Wasiluk, Markowska, 2015; Michalak, Mruk-Tomczak, 2018). Such utilitarian evaluation of universities may, however, result from the construction of questions in questionnaires. In Western literature, non-economic factors are emphasised more. The influence of such factors as gender, race, and social class is emphasised, while taking into consideration the influence of family, classmates and the reputation of the relevant college (Patlán Pérez, Martínez Torres, 2017). Martin-Gamez et al. (2022) indicate that girls are more likely to choose professions related to social sciences and humanities, which have an impact on society, while boys are more likely to pursue science. Peripheral aspects are also taken into account, such as university facilities used by students, such as canteens and areas where they can find accommodation (Erdoğan, Ergun, 2016).

Different studies have seen different results on factors for choosing colleges. This may result from different methodologies (e.g. the cafeteria for closed questions), socio-cultural conditions of the regions in which the research is conducted as well as the selection of respondents for the survey. When choosing American universities, candidates are guided by



such factors as university rankings, and the problem in this case is the availability of these rankings and what is they take into consideration when grading (Dearden, Grewal, Lilien, 2019). After all, surveys can be conducted among different categories of respondents: students or even graduates, which is easier from the point of view of entities interested in such research, candidates applying for admission to studies (which limits these surveys to people who have already made a choice) or among schoolchildren who make decisions about choosing an institution of higher education. Moreover, results may vary due to different experiences. It has been observed that the image of the university deteriorates in line with the level of studies (Azoury, Daou, El Khoury, 2014).

At Polish universities, research on the needs of candidates for studies began relatively late and there is a lack of nationwide research in this area; the University of Warsaw began conducting such research in 2010 (Wroczyńska, 2013). In 2022, a decision was made to conduct such research among Częstochowa high schools to determine the needs of candidates for studies and the image of local universities, in particular the Czestochowa University of Technology.

### 3. Methods

The quantitative research presented was carried out as part of creating a perspective for developing the Czestochowa University of Technology for the period up to 2030. The chosen research method was a diagnostic survey in the form of an online survey addressed to high school students based in Częstochowa. It was completed in June 2022, and the participants were 1039 students coming mainly from Częstochowa or towns belonging to the Częstochowa subregion. However, 250 students that started the study did not actually answer any of the questions.

The vast majority of candidates for studies at the Czestochowa University of Technology are graduates of Częstochowa high schools who become students immediately after graduating from high school. For this reason, the research was limited to local high school students. Since there has been a lack of research among candidates for universities located in Częstochowa, the survey asked about both the main factors of choosing a university and peripheral factors.

The following research hypotheses were formulated:

*H1. For high school students, the most important factors for choosing a university are: the attractiveness of the chosen field of study, the location of the university and the suggestions of friends.*

An indicator of the main factors taken into consideration when choosing a university were answers to a semi-open question. The three factors indicated in the hypothesis appeared most often in the case of graduates of the Faculty of Management of the Czestochowa University of Technology (Przewoźna-Krzemińska et al., 2020), which is chosen by the largest number of candidates applying for admission to this university.

*H2. There are statistically significant differences between the educational preferences of male and female high school pupils.*

Taking into account the general objectives of the study, it was assumed that, from the point of view of Czestochowa University of Technology, it was important what subjects students intend to take in their Matura examinations, as this may be associated with their subsequent choice of university. Therefore, the indicator of educational preferences were declarations of Matura subjects chosen, and research was conducted among students who in a few months were to make decisions on their choice of subjects for the Matura. Considering previous research results (Martín-Gómez et al., 2022), it was assumed that women would choose subjects related to social sciences and humanities.

*H3. There are statistically significant differences between the choices of peripheral factors by male and female high school pupils.*

The peripheral factor preference indicator was the answers to two questions with lists of factors relating to social security and those related to cultural offer and "student life". These questions took the form of a five-point scale on which each of the elements listed could be evaluated. As indicated in the publications cited above, one of the factors determining the choice of universities is gender. It was assumed that this factor could be important; in Czestochowa, apart from the University of Czestochowa, there is another large university, Jan Długosz University, offering more subjects related to social sciences and humanities. Therefore, it was assumed that if technical courses were less attractive to women, it would be possible to determine other factors that they take into consideration when choosing courses of study.

## **4. Results**

Of the 609 students who completed the birth certificate, there were 386 women and 168 men, while another 55 people indicated that they did not want to specify their gender. 300 students were residents of Czestochowa, while the remaining 309 lived outside the city.

To some extent, H1 was assessed positively. Most people indicated the attractiveness of the chosen field of study (67%), followed by the costs involved in studying (39%), the professionalism of teaching staff (37%), a favourable location (36%) and the attractiveness of the city in which the university is located (36%). Suggestions from friends were only chosen

by only 5%, as were suggestions from family. On the other hand, 20% indicated the reputation of the university. It can be said that, before the start of their Matura classes, high school students are greater individualists with regard to university preferences. Nevertheless, it is worth noting that the main factor is an attractive educational offer. Low indications of the university's reputation may be related to the fact that students have become aware of how difficult it is to be accepted by universities with high prestige.

In the case of H2, significant statistical relationships were noted between gender and the declared choice of some additional subjects for the Matura examination. Women were more likely to choose Polish language, a foreign language, biology and physics, while men were more likely to choose mathematics and computer science (Table 1).

**Table 1.**

*Correlations between gender and the choice of additional subjects for the Matura examination made by students of Częstochowa high schools*

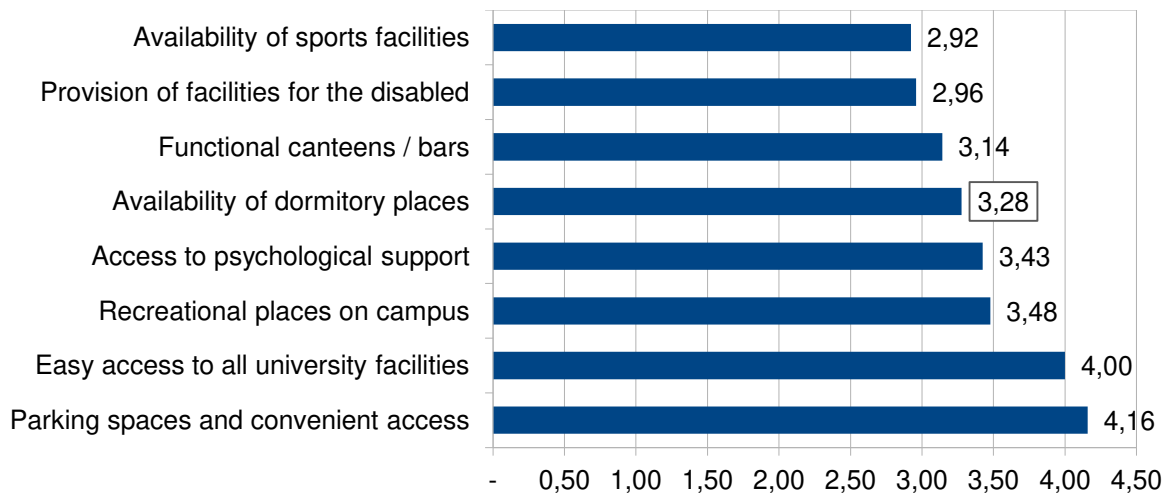
Chosen subject	Proportion		
	$\phi$	$\chi^2$	p
<b>Polish Language</b>	<b>0.261</b>	<b>37.678</b>	<b>0.000</b>
<b>Foreign Language</b>	<b>0.138</b>	<b>10.488</b>	<b>0.001</b>
<b>Mathematics</b>	<b>-0.099</b>	<b>5.395</b>	<b>0.020</b>
Geography	-0.041	0.941	0.332
History	0.055	1.700	0.192
<b>Biology</b>	<b>0.086</b>	<b>4.124</b>	<b>0.042</b>
<b>Physics</b>	<b>0.208</b>	<b>24.047</b>	<b>0.000</b>
Chemistry	-0.021	0.243	0.622
<b>Information Technology</b>	<b>-0.268</b>	<b>39.819</b>	<b>0.000</b>
Social Studies	0.022	0.269	0.604

Note. Results showing significant statistical relationships are marked in bold.

Source: own work.

It can be said that women are more oriented towards humanities, social sciences and natural sciences, while men are more geared towards technical faculties, although physics is also a subject required in most polytechnic faculties. Therefore, despite organised initiatives such as "Girls at Polytechnics", there is still a clear division between subjects that prepare people for "male" and "female" professions.

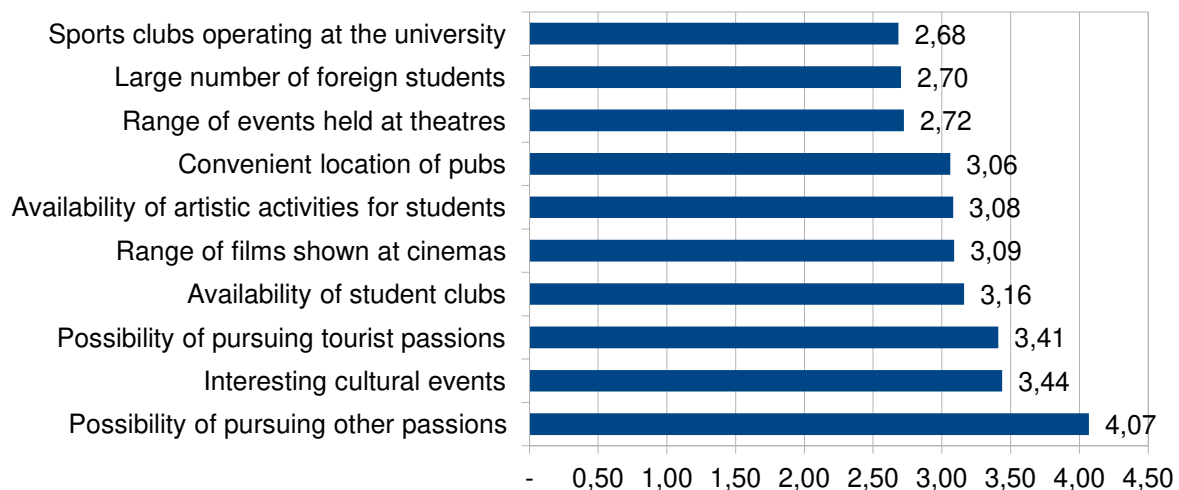
When assessing H3, it was first predetermined how important individual peripheral factors were when choosing a high school for all respondents. In the case of factors related to social security and accessibility of infrastructure, the ratings were quite similar and ranged from 2.92 to 4.16 on a five-point scale, with convenient access and parking spaces indicated as the most important factor, while the least important factor was access to sports facilities and provision of facilities for the disabled. Figure 1 shows detailed data obtained from the survey.



**Figure 1.** Assessment of peripheral factors for high school students when choosing a university. Social security and access to infrastructure. N = 545.

Source: own work.

The situation was similar when assessing factors related to student life and the range of cultural facilities. In this case, the most popular choice was the possibility of pursuing one's own passions. However, these were different from those listed in the cafeteria. At the same time, no one indicated what these passions were, although it was possible to give an additional answer. This may indicate a greater need to protect one's own privacy, especially important for the Z generation. In turn, the least popular choices were sports clubs operating at the university, the range of events held at theatres and a large number of foreign students. Figure 2 shows detailed data obtained from the survey.



**Figure 2.** Assessment of peripheral factors for high school students choosing a university. Cultural offer and student life N = 543.

Source: own work.

Although the differences in the assessment of individual factors were not great, significant statistical relationships were found between gender and the method of assessment. Thus, H3 was positively assessed. Most factors were rated higher by women; men only rated

the availability of sports facilities higher. However, the level of correlation was low, reaching only an average level in the case of access to psychological support and pursuing artistic activities and tourist passions. These three factors may be considered potentially important for making universities more attractive to women. The correlations obtained are shown in Tables 2 and 3.

**Table 2.**

*Correlations between gender and peripheral factors of university choice – social protection and access to infrastructure*

Factor evaluated	Proportion		
	$\varphi$	$\chi^2$	p
Availability of dormitory places	0.063	1.326	0.250
<b>Functional canteens / bars</b>	<b>0.171</b>	<b>9.074</b>	<b>0.003</b>
<b>Recreational places on campus</b>	<b>0.139</b>	<b>5.785</b>	<b>0.016</b>
<b>Availability of sports facilities</b>	<b>-0.146</b>	<b>6.777</b>	<b>0.009</b>
Parking spaces and convenient access	0.060	1.430	0.232
Easy access to all university facilities	0.041	0.623	0.430
<b>Provision of facilities for the disabled</b>	<b>0.160</b>	<b>8.622</b>	<b>0.003</b>
<b>Access to psychological support</b>	<b>0.308</b>	<b>33.815</b>	<b>0.000</b>

Note. Results showing significant statistical relationships are marked in bold.

Source: own work.

**Table 3.**

*Correlations between gender and peripheral factors for choosing a university – cultural facilities and "student life"*

Factor evaluated	Proportion		
	$\varphi$	$\chi^2$	p
<b>Availability of student clubs</b>	<b>0.186</b>	<b>9.991</b>	<b>0.002</b>
Sports clubs operating at the university	-0.055	0.938	0.333
Convenient location of pubs	0.089	2.497	0.114
<b>Interesting cultural events</b>	<b>0.274</b>	<b>23.977</b>	<b>0.000</b>
<b>Range of films shown at cinemas</b>	<b>0.183</b>	<b>10.119</b>	<b>0.001</b>
<b>Range of events held at theatres</b>	<b>0.281</b>	<b>24.555</b>	<b>0.000</b>
<b>Large number of foreign students</b>	<b>0.175</b>	<b>8.288</b>	<b>0.004</b>
<b>Availability of artistic activities for students</b>	<b>0.307</b>	<b>29.896</b>	<b>0.000</b>
<b>Possibility of pursuing tourist passions</b>	<b>0.335</b>	<b>36.257</b>	<b>0.000</b>
Possibility of pursuing other passions	0.054	1.159	0.282

Note. Results showing significant statistical relationships are marked in bold.

Source: own work.

The study presented was a pilot project. The answers obtained in the cafeteria were created on the basis of literature and experience in working with students but without previous interviews with candidates for studies. Therefore, semi-open questions were asked, assuming that it would be possible to modify the questionnaire for a further stage of the research on the basis of additional answers. However, respondents, omitted the possibility of entering their own answer. In the next stages of the study, it will therefore be necessary to obtain information in this area using another research tool.

## 5. Discussion

Previous studies in various countries have indicated that one of the most important factors for choosing a university is its reputation and prestige (Simões, Soares, 2010; Dearden, Grewal, Lilien, 2019; Azzone, Soncin, 2020; D'Uggento et al., 2023). However, the results presented in this article as well as other research conducted at a smaller Polish university (Antczak et al., 2016) indicate that this is not necessarily the norm. Indeed, if students choosing a university are aware of the reduced chance of entering a prestigious university, they may not take this factor into consideration at all. However, it is important for creating the image of the university. In further research, it would be appropriate to ask candidates whether they would choose a university knowing that its prestige is lower than other universities located in the same region or subregion. On the other hand, emphasising the importance of the university's reputation in research primarily serves universities with high prestige as this factor dominates media discourse.

Differences in the choice of matriculation subjects for women and men, which affect the choice of future studies, are an indicator of the global trend. In general, in the European Union, women are less likely to complete their studies in the fields of physical sciences, mathematics and statistics or Information Technology. This is particularly true for the last two categories. The situation is similar in the United States (see Martín-Gámez et al., 2022). In the research presented, it is somewhat surprising that women more often chose physics than men, although it was the least frequently chosen subject (only 31 people declared that they would choose it as a Matura subject). This may possibly be due to local conditions. The Jan Długosz University, which previously functioned as a teacher training university, provides courses in both social sciences and humanities, as well as natural sciences. Although only 6.2% of respondents declared studying in Częstochowa and at the same time specified the choice of university, the Częstochowa University of Technology was chosen by 11 men and four women, while the Jan Długosz University was chosen by one man and 22 women. If stereotypes about "male" and "female" universities persist within the local environment, this may also influence choices.

It is indicated that the ability to identify factors influencing the choice of students enables services to be better adapted to the expectations and needs of students (Azzone, Soncin, 2020). However, if the decision-making process is time-protracted, it is difficult to determine precisely which category of respondents would be most appropriate. Nowadays, the choice of secondary school is often associated with increasing the chance of beginning a specific course of study. Surveys involving the same people at several stages of decision-making would be more beneficial. However, they may discourage respondents from participating in the research at all. Although they may be rather tiring, extensive cafeterias may also enable other conditions to be determined. In our research, it turned out that it was possible to identify a number of peripheral factors that are rated higher by women. Investing in these elements of the educational package may lead to more women being attracted to technical universities.

## 6. Summary

In societies where candidates including university rankings have become the norm, as is the case in the United States, the methodology for their development becomes a problem (Dearden, Grewal, Lilien, 2019). Different methodologies may give different results, which makes it important to choose the right questions in the questionnaire which, due to the type of respondents, should not be too extensive. Finally, the results may also be influenced by whether only candidates for studies who will only make binding decisions about choosing a field of study are examined or whether students already at university are also involved in the research.

For universities that do not have a high position on the prestige scale, it would be important to invest in other elements of the educational package. At the same time, it is important for them not to lose the clarity of their own image. Although this factor is not always chosen by respondents, it may still remain important. Here, there is a risk of losing crucial assets, which is well described by the paradox of the Red Queen, formulated in the context of the evolutionary "arms race". Paraphrasing the original version, organisations that do not improve adaptive features and do not take part in this race on the market are lagging behind and may even go off the market (see Krzanowska et al., 2002, p. 355). Universities lower in the rankings should therefore take a more multifaceted approach to building their own brand and making themselves more attractive to potential future students.

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## EXPLORING THE CHARACTERISTICS, MOTIVATION, CHALLENGES, AND SUPPORT SYSTEM OF FEMALE SOCIAL ENTREPRENEURS IN NIGERIA

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**Purpose:** This study expands on existing literature by exploring characteristics of female social entrepreneurs, their motivational factors, the challenges they face, and the needed support system in the Nigerian context.

**Design/methodology/approach:** A purposive sampling technique was used to select 11 female social entrepreneurs for the qualitative case study design.

The respondents were interviewed, and the data was recorded and transcribed. A thematic analysis was carried out to reduce the responses into themes.

**Findings:** Female social entrepreneurs in Nigeria possess a combination of integrity, transparency, and entrepreneurial traits like knowledge, ambition, and leadership. Their motivations include a primary focus on income and financial stability, coupled with a strong desire to help others, drive societal and community change, and tackle issues like unemployment. Notably, many are motivated by empowering their families and fellow women. Independence plays a significant role in their motivation, manifesting as a desire for flexibility and control over their lives, particularly for mothers. They also draw motivation from societal acceptance, success, appreciation, and respect. Challenges they face include funding limitations, market dynamics, and infrastructure issues common to social entrepreneurs, alongside gender-specific obstacles like inequality and self-confidence issues. Desired support includes funding, improved infrastructure, and gender equality enforcement, with less emphasis on education and training, likely due to their existing entrepreneurial activities.

**Research limitations/implications:** The research has several limitations. Firstly, it is based on a small sample size of only 11 female social entrepreneurs in Nigeria, which may not fully capture the diversity of experiences in this field. Secondly, the findings are specific to the Nigerian context and may not be applicable to other regions or countries with different cultural and economic conditions. Thirdly, the qualitative nature of the research limits its generalizability, as it relies on subjective responses from interviewees. Additionally, the use of purposive sampling may introduce bias, and the cross-sectional data provides only a snapshot, lacking insights into how these entrepreneurs may change over time.

**Practical implications:** The study highlights the need to address gender-specific challenges faced by female social entrepreneurs in Nigeria, such as gender inequality and self-confidence issues. To address these challenges, policymakers, NGOs, and business associations should prioritize initiatives that challenge traditional norms and provide training programs.

**Social implications:** The research emphasizes the importance of addressing gender biases, promoting gender equality, and providing targeted support to empower women in entrepreneurship, which can have far-reaching positive social implications for Nigerian society.

**Originality/value:** This paper enhances our understanding of female social entrepreneurship in the Nigerian context and provides valuable insights into the interplay between entrepreneurship, social leadership, and gender-related obstacles. It also has implications for future research in social entrepreneurship, particularly regarding gender dynamics and socio-cultural influences in developing countries.

**Keywords:** Social Entrepreneur, Woman Social Entrepreneur, Female Entrepreneur, Motivation, Entrepreneurship.

**Category of the paper:** Empirical research paper.

## 1. Introduction

The participation of women in the developing economy is critical, especially in the aspect of entrepreneurship. Women in different countries play a crucial role in the political, social and economic development through social entrepreneurial activities to address socio-economic challenges. Some of the challenges include unemployment, poverty, teenage pregnancy, and gender-based violence (Etim, Iwu, 2018). Social enterprises are gradually becoming the catalyst for transforming society, improving quality of life and increasing human experiences (Zahra et al., 2008).

Lockyer and George (2012) state that women are driven by independence and the desire to contribute to the world's economy. Despite this, there are socio-cultural challenges that women from sub-Saharan Africa face that can deter them from contributing to the economy in a profound way. Literature has revealed that women from developing countries such as Nigeria are affected by poverty, the inability to get paid jobs, and family responsibilities (Ezeibe et al., 2013). Poverty has led female social entrepreneurs to reduce socio-economic differences by the establishment of a social enterprise.

Essentially, people in every country belong to a culture and belief system. These cultures and beliefs of the people decide the ways of living. In line with entrepreneurship, socio-cultural values are those qualities that consist of factors that can positively or negatively affect an entrepreneur. Therefore, the socio-cultural value in Nigeria is gender insensitive or bias. Nigerian culture restricts women from participating in economic activities. This restriction could reduce women's engagement in entrepreneurial activities in the country. Also, subcultural factors exist within the culture, such as region, family attitudes, ethnic groups, social status,

and religion. These factors can shape people's perception of being an entrepreneur (Mathew, Panchanatham, 2009).

Yusuf (2013) refers to gender bias and religious practices as factors within the culture that can affect women social entrepreneurs in Nigeria. This is similar to Hockerts' (2010) view that gender bias and socio-cultural belief could hinder women entrepreneurs' potential by negatively affecting competition, productivity, and economic growth. These problems are embedded in the patriarchal ideology that undermines or devalues women's efforts to grow their businesses (Nguyen, Frederick, Nguyen, 2014).

Besides, women face the challenge of sourcing capital to set up a business and a lack of competence for managing the business. Unlike the male who has the opportunity for promotion, competence to lead, and business participation, women have limited opportunity and power to influence decisions, given the notable socio-cultural challenges facing women in Sub-Saharan Africa. It is necessary to involve some transformation in the labour division and change the primitive mentality about women's roles and responsibilities in society (Martinez, Marlow, 2017)). The intervention of academics, government and other stakeholders is needed to initiate programmes for building women's entrepreneurial skills, growing their network, and providing finance and training for them. These initiatives are to promote women entrepreneurs in Nigeria.

Research on social entrepreneurship has grown over the years and has been recognised as an important field of study (Littlewood, Holt, 2015). Nonetheless, existing research has explored little on the question of female social entrepreneurs' characteristics and motivation in most developing countries (Germak, Robinson, 2014; Omorede, 2014). It is a fact that empirical research on social entrepreneurship is increasing, however, female social entrepreneurs' challenges and desired support have received little attention.

Previous studies in the aspect of personal characteristics and the motivation of social entrepreneurs lacked the challenges and desired support (Cohen, Kaspi-Baruch, Katz, 2019). This current study attempts to bridge that gap to contribute to the development of a more comprehensive profile of the social entrepreneur. Therefore, this study seeks to fill the gap by focusing on the unique characteristics, motivations, challenges and solutions of female social entrepreneurs across different social businesses in Nigeria.

## **2. Literature review**

### **2.1. Social Entrepreneurship in Sub-Saharan Africa and Nigeria**

Africa is a region that can impact social entrepreneurship business (Rivera-Santos et al., 2014) because it has a high level of poverty, while 14 African countries are marked as the most corrupt in the world (International Monetary Fund, 2015). The "doing business index" ranked

most of the Sub-Saharan Africa countries as the worst countries with which to partner in business because of the area's bad regulatory environment, which discourages business owners from running their business smoothly (World Bank, 2018).

Africa is also faced with poor infrastructure, poor governance, corruption lack of management tools and policies (Thorgren, Omorede, 2015; Skubis et al., 2023a), and issues stemming from overpopulation. It is a continent that has seen the fastest growth between 2010 and 2015. The world bank has predicted that Africa's growth will triple in the next 50 years (World Bank, 2018). Due to its level of poverty, Africa possesses an environment of adverse opportunities for the introduction of social enterprises.

Nigeria is a country within Africa with over 180 million people and over 500 different ethnic groups (UN, 2017). Nigeria is fast-growing and becoming overpopulated. The United Nations have predicted that the Nigerian population will surpass the American population before the year 2050. However, Nigeria is naturally endowed with natural resources despite being regarded as a developing country (Kanayo, 2014).

Poverty has taken a toll on Nigerians due to a lack of basic amenities (Kanayo, 2014). In recognition of this high level of poverty, the Nigerian government has given power to NGOs and entrepreneurs to implement policies to reduce poverty. On the verge of eliminating poverty, the Nigerian government has to take note of the overpopulation by creating social entrepreneurs' opportunities to promote their skills amid social and economic constraints (Rivera-Santos et al., 2014; Thorgren, Omorede, 2015).

## **2.2. The Nigerian Social Entrepreneur**

The business entrepreneur has improved over the years, which has resulted in employing the unemployed and making profit for stakeholders (Iwueke, Nwaiwu, 2014). Despite this, challenges in sustainable growth and development pervade the country's existence. If the country has a vibrant economy, it will be easy to solve most of its social problems. The problems are not solved by government or multinational companies alone (Oladejo, Erundu, 2015).

Generally, entrepreneurs are needed for creating value from ideas, opportunities, and driving the economy for the expansion of the social sector (Oghojafor et al., 2011). Unfortunately, the effort of female social entrepreneurs towards sustainable growth and development in Nigeria has been marginalized (Iwueke, Nwaiwu, 2014).

In the context of female social entrepreneurs in Nigeria, responsible leadership plays a crucial role in shaping various aspects of their ventures. A responsible leader within the domain of social entrepreneurship is not only instrumental in motivating employees but also holds the potential to ignite innovation and foster a sense of commitment and job satisfaction among the workforce. This, in turn, has a significant impact on the overall well-being of the business, its employees, and the broader societal context in which these female social entrepreneurs operate (Skubis et al., 2023b).

### **2.3. Social Feminism Theory**

This theory assumes that the male and female gender are notably different (Ahl, 2006). Social feminism recognizes a difference in men's and women's experiences through socialization that has existed since humanity's creation. Female socialization gives a different approach, goal and perspective peculiar to women alone (Brush, 2019). This theory is relevant in focusing on the specific approach that is different from the male perspective.

This approach does not imply that women are weak or ineffective in their position. It rather outlines the unique traits of the female gender. Female entrepreneurs' position is specific as they are complicated with different challenges and motivations (Sarri, Trihopoulou, 2005). Social feminism theory provides socio-cultural reasons for gender differences and the attributes, motivation and challenges they are exposed to (Cliff, 1998).

### **2.4. History and Definition of a Social Entrepreneur and Social Entrepreneurship**

The first usage of the word social entrepreneur was in the 60s and 70s and later gained popularity in the 80s and 90s. Bill Drayton, who founded Ashoka: public innovators, was recognized for using the term social entrepreneurship. There are definitions of a social entrepreneur. In 2007 the Ashoka organization defined a social entrepreneur as someone who has the idealistic solution to societal problems.

The social entrepreneur has the ambition and persistence to address social issues by providing creative ideas for social change. Dees (2001) defined a social entrepreneur as a person who plays a change agent's role by adopting a mission of sustainable social values and recognizing new opportunities to serve a mission by being involved in continuous innovation through learning and acting with the hindrance of limited resources.

Noruzi et al. (2010) define a social entrepreneur as a person, group or organization that seeks out a sustainable wide-scale innovative change by breaking patterned ideas in facing the government, nonprofit or businesses in addressing big social problems.

Social entrepreneurship is at the birth stage, where it consists of a short theory and definition but has a high motivational and passionate spirit. Individual scholars have given their definition of social entrepreneurship in literature (Kickul, Lyons, 2012; Germak, Robinson, 2014) because of the newness of this study field. Social entrepreneurship has a varied definition that ranges from being broad to narrow. These definitions focus on social change and innovative ideas to solve social issues rather than profit-making (Kong, 2010; Dees, Anderson, 2003).

Social entrepreneurship is creating innovation with a social cause, either for profit or not for profit goals (Sullivan Mort et al., 2003). Juneja (2019) defined social entrepreneurship as the identification of societal challenges by using entrepreneurial skills, processes or operations in resolving social challenges for social change. The main ingredient that makes an entrepreneur social is their drive for accomplishing sustainable projects for the empowerment of societies. When social goals are achieved beyond profit, it is known as social entrepreneurship. Social

entrepreneurship is viewed as a process, while an alternative perspective of social entrepreneurship is seen in relation to an individual who is a social entrepreneur.

Social entrepreneurship is a process by which social issues are located and resolved by social entrepreneurs who are social change agents who use innovative techniques to find solutions motivated by altruistic views rather than for profit-making.

## **2.5. The Historical Background Characteristics of a Social Entrepreneur**

There is limited research on a social entrepreneur (Van Ryzin et al., 2009). Levie, Hart (2011) appraised the history of social entrepreneurs in the UK and found out that social entrepreneurs are people who are young and highly educated. In America, a social entrepreneur is a young black woman with a high level of education and an average social and economic status. Yunus (2009) carried out a study on successful social entrepreneurs' biographies and found out that most of them come from minority ethnic and religious groups. Yunus also found out they come from an average socioeconomic status, and their ages are between 20-35, while few of these social entrepreneurs are over 55 years of age (Bosma, Levie, 2010; Gordon, 2005). The main component of social entrepreneurs is their training, experience and ideologies. Becoming a social entrepreneur relates to having social skills and intentions expressed at an entrepreneur's early age (Schoon, Duckworth, 2012).

## **2.6. The Characteristics of a Woman Social Entrepreneur**

The psychological aspect assumes a female social entrepreneur's characteristics that play a crucial role in shaping the behaviour, attitudes, perceptions, beliefs and intentions of these women social entrepreneurs in general (Llewellyn, Wilson, 2003; Frank, Lueger, Korunca, 2007). Costa and McCrea (1992) outlined five personality traits that give an individual the most daunting characteristics: receptivity to new ideas, behaviour, culture, environment and experiences, sociability, pleasantness, awareness and neuroticism.

Receptivity characterizes an individual who is open to investigate new ideas and discover new experiences. Zhao et al. (2005) did a meta-analysis study by comparing these five traits of entrepreneurs. They found a high level of receptivity with entrepreneurs. Shane & Venkataraman (2000) argued that receptivity is required to adopt new methods in dealing with social issues in innovating a social enterprise. A research study of entrepreneurial intention among students in Malaysia positively correlates with other aspects of social entrepreneurship, including social vision, social innovation and financial aspects in social services (Nga, Shamuganathan, 2010). Another study revealed that receptivity is correlated with social vision (Irengun, Arikbuga, 2015); social leadership (Judge, Bono, 2000), self-direction and value creation (Bargsted et al., 2013); and creativity (Ip et al., 2017; Kaspi-Baruch, 2017).



Sociability is expressed in positive emotions, confidence and being extroverted. These traits are usually associated with dominance and being emotionally expressive (Judge, Illies, 2002). Sociableness can create the power of conviction that is perceived as a positive tool to attract investors (McCarthy, 2003). Sociableness is associated with a forward-looking entrepreneurial personality (Rant, 1996; Steege, Stamm, 2014), entrepreneurial success and intentions (Rauch, Frese, 2007).

Social entrepreneurs are required to raise funds, reflecting their extroverted attitude and being seen as a social leader who interacts with policymakers, individuals and volunteers (Nga, Shamuganathan, 2010); social leadership is akin to sociableness (Judge, Bono, 2000). Pleasantness is a beneficial attribute that can contribute to the outcome by solving problems, clarifying issues, having peaceful negotiations, and holding a respectful attitude towards others.

These characteristics are compassion, trustworthiness and humility (Yunis et al., 2018). Awareness expresses persistence, reliability, practicality, motivation, and responsibility in achieving goals. Awareness is composed of 2 elements: reliability and achievement of a motivational goal (Mount, Barrick, 1995). Levander (2010) inferred that the root of awareness lies in responsibility, accountability, obligation, fervour and perseverance. In the spirit of awareness, an entrepreneur must learn to cope with ambiguity, resistance, challenges and issues that arise in business, creating a vision that helps with budgets, managing teams and establishing rules (Bar-Nir, 1999). Being perseverant is relevant to establishing social ventures. Awareness is associated with sustainability and financial consciousness (Nga, Shamuganathan, 2010), goal accomplishment (Yitshaki, Kropp, 2016) and steadfastness (Bussau, 2009).

Neuroticism is the psychological difference in emotional stability. Neurotic individual experiences are damaging trauma such as depression, impulsiveness, hostility, fear, anxiety and self-awareness (Zhao et al., 2005). Neuroticism has shown up in the entrepreneur's background, where he has some traumatic experiences which limit his ability to work productively (Cohen, Katz, 2016).

## **2.7. The Motivational Factor of a Woman Social Entrepreneur**

The motivation for a conventional business entrepreneur is quite similar to a social entrepreneur. However, business entrepreneurs' primary motive is for a financial purpose. (Wadhwa et al., 2009). Other motives of a business entrepreneur include gaining financial independence, breaking the labour market, putting an end to unemployment, and breaking the female gender glass ceiling (Kirkwood, 2009).

Social entrepreneurs are driven by identifying opportunities, exploring ideas and mobilizing resources for solving social problems (Dacin et al., 2010). That is to say that the social entrepreneur's motive is ideological, which means they have the desire to promote and produce social change by solving problems in society (Migliore et al., 2015). Social entrepreneurs work by promoting beneficial outcomes and awareness to change society's value (Stephan, Drencheva, 2017). Having a sense of vision to resolve social and environmental issues (Dees,

1998; Sastre-Castillo et al., 2015) suggests that social entrepreneurs have a long-term ideology of changing society for the better.

What is the driving force for a female social entrepreneur to create a vision and a meaningful and purposeful life? In response to the question, the existential theory of Frankl (1976) and Pines & Yanai (2001) claims that a meaningful life drives social entrepreneurs. Barendsen and Gardner (2004) evaluated social and business entrepreneurs. Barendsen and Gardner discovered that social entrepreneurs are motivated by meaningful actions that deal with healing and resolving difficult life challenges (Cohen, Katz, 2016). Boluk and Mottiar (2014) suggest that both social and business entrepreneurs are innovative, tenacious, resilient & committed.

Another difference between business and social entrepreneurs is that a business entrepreneur is driven by monetary gain while the social entrepreneur is philanthropic or charitable (Mair, Noboa, 2003). The business entrepreneur gains value, while social entrepreneurs create value (Santos, 2012).

## **2.8. Challenges of Women Social Entrepreneurs**

Women are confronted with many challenges when involved in social change. Although women entrepreneurs are sources of growth for a nation's economy, they are faced with serious challenges (Iliya et al., 2017). The lifestyle of the Nigerian social entrepreneur is viewed as domestic. They are generally seen as wives, mothers, and homemakers as prescribed by culture (Tlaiss, 2014). Otekunrin et al. (2013) summarized the challenges Nigerian women face as social entrepreneurs. They are constrained by time management, poor marketing skills, overburdened by family issues and have a lack of sufficient capital. Agboola et al. (2015) endorsed these and also included culture and family issues, lack of training and information about growing the business, etc. Nigeria is viewed as a patriarchal society where women are subjected to men, and men exert dominance and control (Yusuf, 2013). Nigerian women cannot carry out any form of business opportunity without consultation from their husbands (Ekpe et al., 2014). Women in the rural area of Nigeria are more affected than women in urban areas.

Lack of education is a constraint for women social entrepreneurs (Gayathridevi, 2014), while Tanusia et al. (2016) posit a lack of entrepreneurial skills in starting up a business. Women face a lack of family or government support and a lack of confidence, leading to low profit and business failure. Gender discrimination is also a challenge that can lead to women losing control over their properties or assets. This is a serious challenge that has affected women entrepreneurs in Nigeria because they do not enjoy equal opportunity like their male counterparts (Otunaiya et al., 2013). Women are discriminated against in the social, cultural, political, legal and other environments (Otunaiya et al., 2013).

Women are also faced with challenges of lack of support from the government to start businesses, lack of opportunity to receive educational training, and are bombarded with religious beliefs. These women are given away for early marriages due to the cultural ethnocentrism. Personal characteristics are specific to the physiological nature of women and

gender discrimination, cultural and social problems. A typical Nigerian woman's role is to be a wife and mother, but that has changed as numerous women are engaged in different businesses (Emmanuel, 2013). Women are not disposed to engage in businesses without their husbands' knowledge, which is one big challenge that women face.

Ayogu and Agu (2015) summarized other challenges as a lack of access to their property(ies). The Nigerian legal framework forbids women from officially owning land. The issue of inheriting land is biased as women cannot inherit land or property or business from their parents.

Garg and Agarwal (2017) stated that there are social barriers for women (gender discrimination, cultural expectations and family responsibilities). Financial insecurities (lack of funds, difficulty in obtaining a loan from government and banks), personal barriers (lack of confidence, lack of entrepreneurial skills or training and information), market-related barriers such as weak competition, poor marketing network, poor marketing sales strategy, change in technology, lack of available motivational factors, poor location of the business and legal formalities.

Lack of role models, corruption and technology advancement are a big challenge for female social entrepreneurs (Taqi, 2016). While digital technologies offer numerous advantages to female social entrepreneurs in Nigeria, the persistent challenges posed by poor infrastructure significantly impact their operations and the overall landscape of social entrepreneurship in the country. In this context, the limitations of the existing infrastructure have direct implications for the cost of conducting business activities and the broader socio-economic conditions in Nigeria (Skubis, Akahome, 2022). In general, women entrepreneurs face challenges that depend on their present life cycle stages in engaging in businesses (Adim, Tamunomiebi, 2018).

## **2.9. The Needed Support System for Nigerian Women Social Entrepreneurs**

Social entrepreneurship is basically about change or discovering a solution for social challenges. Noruzi et al. (2010) have summarized strategies through which social entrepreneurship can be supported:

- seeking the encouragement of social innovation,
- creating a viable environment where social entrepreneurship can thrive,
- giving accolades or recognition for social entrepreneurial initiatives,
- scaling successful approaches by expanding knowledge and getting people to accept it,
- producing knowledge.

Motilewa et al. (2015) advised that Nigerian women social entrepreneurs are open to available funds such as Coca-Cola women entrepreneurs, Shell Live Wire, Africa development bank, business development Fund for women, etc. With these support funds in place, women entrepreneurs require adequate skills, knowledge, and training to grow the business (Broto, 2014). Islam and Amin (2016) stated that it is relevant to acquire formal education to boost

Nigeria's entrepreneurship. Women social entrepreneurs should view their business as a way to solve social problems rather than profit-making. Empowering women and acting as a good role model to create profitable opportunities and scale-up businesses for societal good (Kraus et al., 2014).

### **3. Methodology**

This study addresses the previous limitations in understanding the personal characteristics and motivation of social entrepreneurs by aiming to create a more comprehensive profile of social entrepreneurs. It specifically focuses on female social entrepreneurs in various social businesses in Nigeria, aiming to uncover their distinctive qualities, motivations, challenges, and potential solutions.

Through the qualitative study, by investigating their characteristics and motivation, we hope to understand the power that female social entrepreneurs have to empower others and enable colleagues to earn and develop some talents and skills and by understanding the challenges and desired support will encourage more women to create social businesses, improving people's lives, supporting communities, helping the environment and fostering women's leadership in the social economy. In developing this research, it will serve as a foundation for further empirical studies.

This research addresses the literature gap by proposing a conceptual model from the empirical findings of female social entrepreneurs in Nigeria. In addition to this contribution, we seek to build a new profile of female social entrepreneurs. This can have a practical and managerial contribution for wealthy businessmen who are willing to invest in seeking innovation and skills in developing social businesses.

The objective of the study is to identify the characteristics, motivational factors, challenges, and solutions to problems for women social entrepreneurs in order to obtain a more comprehensive female social entrepreneur profile.

The objective of this study will expand on existing literature by investigating these research questions:

1. What are the characteristics of female social entrepreneurs?
2. What are the motivational factors of female social entrepreneurs?
3. What challenges do female social entrepreneurs face?
4. What is the needed support system for female social entrepreneurship?

### **3.1. Sampling Technique and Data Collection**

The study adopted a qualitative approach with an exploratory case study design involving eleven social entrepreneurs residing in Nigeria. A semi-structured interview was used to collect data.

A purposive sampling of eleven women social entrepreneurs from Nigeria was used to ensure that the study respondents had a common experience as social entrepreneurs. The goal of purposive sampling is to focus on a particular population of interest, who will answer the research question. The consent from the individual participants was obtained by having a face to face interview with participants. The audio-recorded interview was transcribed into textual format.

We performed member checking by allowing participants to review the transcript's summary to ensure the accuracy in interpretations and the meanings of participants' interview responses. We started by identifying eleven female social entrepreneurs through public directories in Nigeria.

We screened the individuals based on the mission of the organization, what inspired them, how well they demonstrated creativity and leadership in their business, how they were able to collect opportunities to start a social enterprise, and to understand if the social enterprise addresses the community social problems of inequality and poverty. In all these we chose female social entrepreneurs who represent different sectors, namely fashion, business consultants and importation of commodities.

A semi-structured interview was used to collect data and they were presented using themes. Key themes were identified from the data: their traits, driving force, challenges and desired support. Some expert interviewees were chosen based on their knowledge of Nigerian social enterprises.

The study used a face to face interview because of the nature of its authenticity and clarity. For our study, we held a 30 to 60 minutes' semi-structured interview with eleven female social entrepreneurs. The interviews were conducted in October 2020 by the authors. The expert interviews assisted in ensuring their reliability and validity. The interviews were recorded and later transcribed.

### **3.2. Data Coding Analysis and Presentation**

The analysis began by creating elements that led us to answer our research question. Thematic analysis was used on the data collected from the semi-structured interviews to classify, organize, and summarize the data, using Clarke, Braun, and Hayfield's six-step approach (a) Familiarize yourself with your data, (b) Assign preliminary codes to the data to describe the content, (c) Search for patterns or themes in your codes, (d) Review of themes, (e) Define and name themes, and (f) Produce report (Clarke et al., 2015).

A study was presented in the form of narrative themes. The transcribed data were analysed using the open coding procedure and were compared amongst the female social entrepreneurs. This process revealed some similar behaviour among each female social entrepreneur in their characteristics, motivation, challenges and solution.

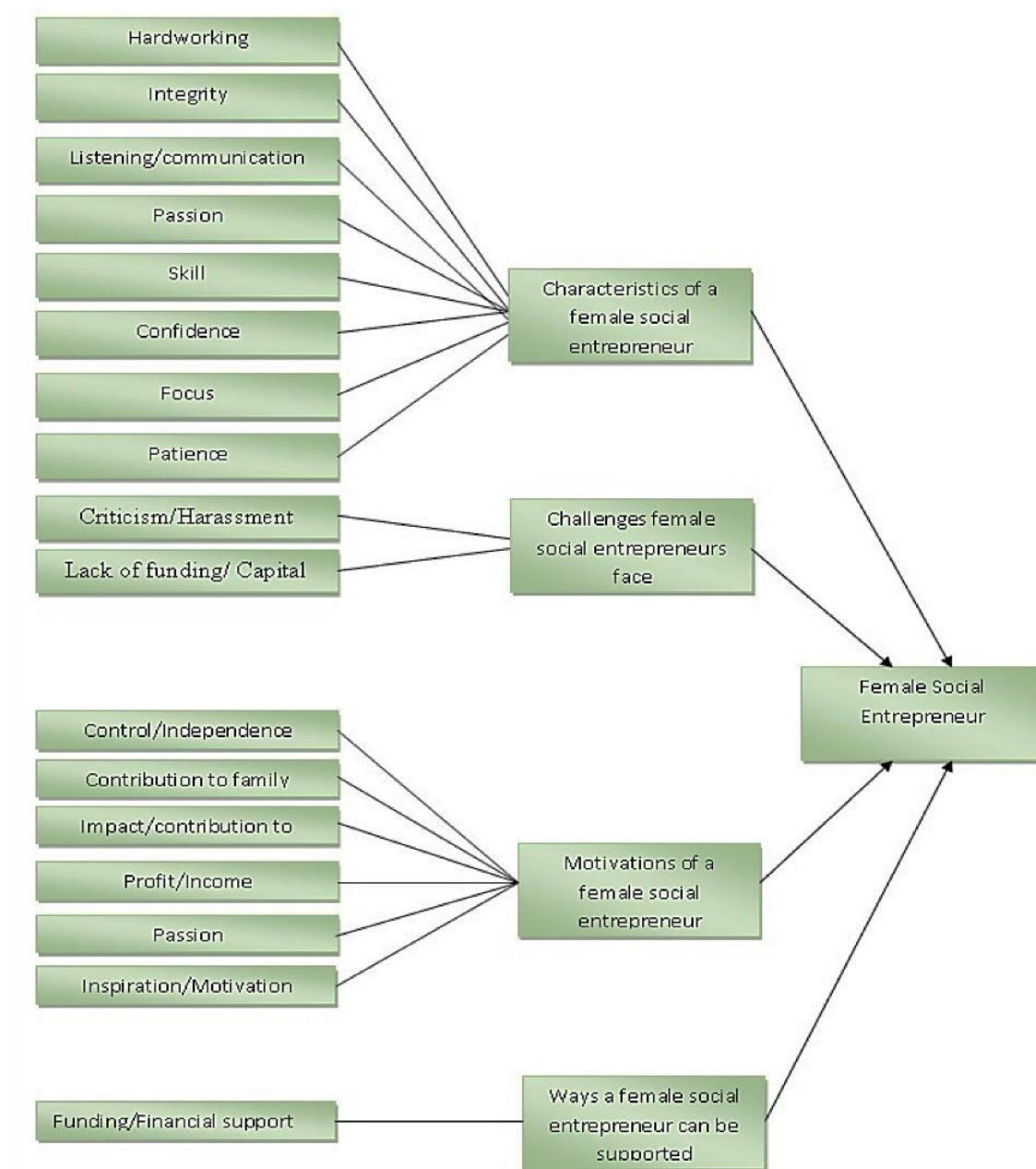
**Table 1.**

*Open-codes for the study*

Open-Ended Questions	Open-Codes	Ref
How long have you worked as a social entrepreneur?	More than 10 years	5
	Less than 10 years	6
What inspired you to become a social entrepreneur?	Employing or helping others	4
	Independence and control	4
	Income and Profit	2
What kind of business are you into?	Business and consulting	3
	Fashion Business	5
	Buying and selling commodities	3
What characteristics do you think a female social entrepreneur should have?	Hardworking	3
	Integrity	3
	Listening and communication	2
	Passion	2
	Skill	3
	Confidence	2
	Focus	2
	Patience	2
What motivates a female social entrepreneur?	Need for control and independence	7
	Contribution to family	2
	Make impact and contribute to society	7
	Profit and income	5
	Passion	2
	Inspiration and motivation	2
What challenges do you face as a female social entrepreneur?	Criticism and harassment	4
	Lack of funding or capital	6
What support system do you need as a female social entrepreneur?	Funding and financial support	9

Table 1 above describes the coding and categorization of the qualitative data based on the emerging and dominant views and ideas expressed. A total of 25 open codes were generated from the analysis and revealed evidence based on the subjective and individualized positions of respondents with regards to the interview questions posed in the research.

Figure 1 below demonstrates the link between concepts drawn from the positions and coded properties at the initial stage and the axial a priori themes (research questions) for the study.



**Figure 1.** Conceptual Model for Female Social Entrepreneurs in Nigeria.

#### 4. Findings

Our final sample contains eleven interviews with female social entrepreneurs. Three can be considered as nascent social entrepreneurs (with 1-5 years of experience). The other eight are mature social entrepreneurs (three with 5-10 years of experience and four with 15-20 years of experience). The social businesses they run are different, including agriculture (agricultural production), consulting (HR, business and management consulting), fashion (design, outlets), department stores, services (estate agency, car rental, event management), etc. Discovering the

characteristics of female social entrepreneurs, their motives, challenges and needed support were the core objectives of our interviews. The findings are presented below.

To find an answer to RQ1, we asked our respondents the following question: "What characteristics do you think a female social entrepreneur should have?"

Some answers were related to knowledge, education and training. Among the answers we also found some traditional characteristics of an entrepreneur as well as characteristics related to their emotional intelligence. Table 2 explains the characteristics of female social entrepreneurs with sample statements. In one particular line you can find expressions or phrases which are synonymous.

**Table 2.**  
*The characteristics of female social entrepreneurs*

Characteristic	Illustrative quote
Traditional characteristics of entrepreneur	"Skillful" (was repeated twice). "She should have basic education." "Education." "Have the basic knowledge." "Knowledgeable." "Teachable (training)"
	"Integrity" (was repeated four times), "honesty", "honest", "transparency"
	"Passion" (for the business) (was repeated four times)
	"Ambitious" (twice)
	"Hardworking" (three times)
	"Confident" (twice) and "know their strength"
	"Innovative." "Resourcefulness"
	"Profit-oriented"
	"Service-oriented"
	"Focused" (twice), "consistent", "persistence"
	"Organized"
	"Endurance" (twice), "stand your ground", "strong", "don't give up", "patient" (twice)
	"Leadership style", "influencer"
	Emotional intelligence
"Empathy", "relational"	
"Good communication skills" (were mentioned twice), "a good listener"	
"Self-motivator", "inspiring"	
"Gratitude"	
"Positivity" and "good attitude"	

RQ2 is related to a female social entrepreneur's motives, so we asked the interviewees about their incentives and motives. Our questions were such as "What inspired you to become a social entrepreneur?" and "What motivates a female social entrepreneur?"

We considered the incentives of female social entrepreneurs. Table 3 expresses the incentives, including the income, independence, passion, and aspiration to help others. We note that these incentives are very interdependent.



**Table 3.**  
*Incentives of female social entrepreneurs*

Incentive	Illustrative quote
Money, income	"Having multiple streams of income." "Profit-making" "I need to make ends meet"
Changing society	"I wanted to give my family a better life" "Solving a need for the masses" "I wanted to create an impact" "The passion I'd always have for fashion and being an employer"
Independence	"Being in control of my time" "To be financially independent and then use some of the money for social activities that will benefit society at large"

Those who became social entrepreneurs also need motives to continue their hardworking. Table 4 shows the groups of factors that motivate female social entrepreneurs. It was also an open question, and the factors are grouped as a result of our analysis.

**Table 4.**  
*Motives of female social entrepreneurs*

Motive	Illustrative quote
Money, income	"To make money." "Money." "I could make and have my own money." "Be in control of your money" "Multiple streams of income" "Contribute to the family" "Profit." "Making profit." "Business expectations"
Changing society	"Passion." "Vision." "Vision of doing something you love." "Changing the world." "Solve a need." "Ability to raise others." "Create job opportunities." "Contribute to society (to help other girls stand too)." "Inspiration to solve social problems"
Independence	"Job flexibility." "Independence." "Freedom and flexibility." "Working according to your time." "To be independent." "More time for a family." "Be in control of your life." "Stability." "Be in control of things around you." "Ownership and responsibility"
Acceptance by society	"Having good customers." "Customers testifying well about the product." "Having the goods customers need." "Keeping good relationships and knowing people too." "Service." "Respect." "Honest feedback." "Acceptance." "Successful outcome on work done pushes one to do more." "Self-fulfilment and social status." "Being appreciated"

To contribute to RQ3, we asked interviewees, "What challenges do you face as a female social entrepreneur?" Table 5 represents four groups of challenges that we have identified.

**Table 5.**  
*Challenges that female social entrepreneurs face*

Challenge	Illustrative quote
Funding	"Money to invest." "Lack of funding." "Accessing funds." "Financial resources." "Lack of capital." "Lack of funds"
Demand and supply	"I'm still struggling to meet up with people's demand." "Oversaturation." "Underpricing of one's products/works." "High cost of production"
Infrastructure and management	"Unfavourable business environment." "Logistics." "Bad road (unable to get to where you can get the materials needed for your job)." "Getting things done on time"
Gender inequality and lack of self-confidence	"People trying to take undue advantage because one is a female in business." "Struggling to be taken seriously." "Defying social expectations." "Leak of power." "Fear of failure." "Destructive criticisms." "Discouragement." "Harassment"

And finally, our last question in the interview was based on RQ4 and related to the support system needed for female social entrepreneurs. We can see that the required support is connected with the challenges they meet. Table 6 shows the desired support for female social entrepreneurs.

**Table 6.**

*Desired support for female social entrepreneurs*

Type of support	Illustrative quote
Funding	"I need money to invest in my business." "Access to funding." "I need financial support or access to credit." "Financial support for business." "Funds to enable me to get bigger equipment." "Finance." "Financial support (grant)". "Sponsorship." "Finds"
Infrastructure and management	"An enabling environment, for example: good and reliable logistic systems, good marketing/ promotion/ referrals." "Good collaboration." "Mobility"
Gender equality and self-confidence	"Respect." "Women economic empowerment." "Husband, children, family, staff, and friends." "Honesty"

## 5. Discussion of Findings

We can start our discussion with the characteristics of a female social entrepreneur. We may note that integrity, honesty and transparency as characteristics of female social entrepreneurs identified by our respondents are very close to the receptivity or openness to new ideas (Zhao et al., 2005; Shane, Venkataraman, 2000). In the case of social enterprise, we would say that receptivity requires integrity and honesty from its leader.

The main characteristics of a female social entrepreneur named by interviewees are related to sociability (Judge, Illies, 2002; McCarthy, 2003). Such characteristics as knowledge, ambitiousness, consistency, focus on success, endurance, hardworking, passion, and leadership are similar to a forward-looking entrepreneurial personality (Rant, 1996; Steege, Stamm, 2014), entrepreneurial success and intentions (Rauch, Frese, 2007). We consider these characteristics as those of an entrepreneur in general. At first glance, the classical entrepreneurial characteristics predominate among the identified characteristics of female social entrepreneurs.

Such characteristics like emotional intelligence, empathy, communicativeness, self-motivation, positivity, good attitude and gratitude correlate with a social entrepreneur's compassion, trustworthiness, and humility (Yunis et al., 2018), sociableness (Judge, Bono, 2000). These two sides of sociability are based on the two sides of social entrepreneurship: the entrepreneurial and the social (Leadbeater, 1997; Dees, 1998; Austin et al., 2006). We may say that if traditional entrepreneurial characteristics form the basis of female social entrepreneur personality, then emotional intelligence makes it specific and really social.

The second part of the interview was devoted to the incentives and motives of a female social entrepreneur. Income and money were mentioned as incentives as well as motives and are regarded as the primary motive of any entrepreneur (Wadhwa et al., 2009).

The next group of incentives as well as strong motives was related to the aspiration to help others and the passion to change society and community, including problem-solving, reducing unemployment and contributing to society. These factors are also well studied and discussed (Dacin et al., 2010; Kirkwood, 2009; Migliore et al., 2015; Pines, Yanai, 2001) and often considered as a response to the need to resolve difficult life challenges (Cohen, Katz, 2016) as many social entrepreneurs had a difficult life background. But what we shall note is that our interviewees repeatedly mentioned their aspiration to help the family or other women stand up for themselves and this is an important feature of female social entrepreneurship.

And the third group of incentives as well as motives can be described as motives of independence and also well known as a feature of female entrepreneurship (Lockyer, George, 2012; Kirkwood, 2009). We shall note that independence was discussed in a very feminine way – as more time for a family, flexible schedule for a mum, control of her own life, etc.

The three groups of incentives were quite the same as the first three groups of motives, but the acceptance by society was identified only as a motive (not as an incentive to start a social enterprise). The fourth group of motives is related to acceptance by society, including success, appreciation and respect. These motives are very close to motives of success (Sharir, Lerner, 2006; Roy et al., 2014).

The third part of the interview was done to answer RQ3: challenges that face female social entrepreneurs. Here we shall note that most of the challenges or barriers identified by our interviewees were typical barriers that face social entrepreneurs in many countries: these were lack of funding, market context (as demand and supply), and infrastructure that has also been well discussed in literature (Sharir, Lerner, 2006; Robinson, 2006). However, one group of challenges was quite specific in terms of entrepreneurship and related to gender inequality and lack of self-confidence (Otunaiya et al., 2013; Garg, Agarwal, 2017; Taqi, 2016).

And the final fourth part of the interview was devoted to RQ4: we asked our respondents about desired support for female social entrepreneurs. The requests for funding and better infrastructure and management were very predictable and can be considered typical for social entrepreneurs (Noruzi et al., 2010). Respondents did not discuss knowledge or training as a needed support, and it could be because they are acting social entrepreneurs. Respondents mentioned education as a key characteristic of a social entrepreneur in the first part of the interview, which indirectly proves the need for support for nascent social entrepreneurs and youth (Broto, 2014).

Finally, one more support for Nigerian female social entrepreneurs is the enforcement of gender equality and self-confidence. This particular need correlates to the challenge of gender inequality that they meet.

## 6. Conclusions

This study analyzes a female social entrepreneur's characteristics, motivating factors, challenges and desired support. In understanding the phenomenon of female social entrepreneurship in Nigeria, we conducted a qualitative research based on a series of interviews.

The answer for RQ1 – "What are the characteristics of female social entrepreneurs?" – is that female social entrepreneurs in Nigeria have the characteristics both of entrepreneur and social leader. We have identified the same characteristics as were described in the existing literature.

The answer for RQ2 – "What are the motivational factors of female social entrepreneurs?" – is that a female social entrepreneur in Nigeria has such incentives to start a social enterprise as 1) money, income, 2) passion to change society, 3) independence, and such motives to continue their social business as 1) money, income, 2) passion to change society, 3) independence, and 4) acceptance by society. From the first view, these are the classical motives of entrepreneurs, social entrepreneurs, or social leaders. Still, if we look in detail, we can see that some motives have a very feminine character. Especially the motives to be independent and to change society were described from a very female point of view (e.g., more time for a family, for children, for herself, and to help other women to stand up for themselves) and can be considered as unique motives of female social entrepreneurs.

The answer for RQ3 – "What challenges do female social entrepreneurs face?" – is that female social entrepreneurs face such challenges as 1) funding; 2) market context (as demand and supply); 3) infrastructure and management; 4) gender inequality and lack of self-confidence. We suppose the first three groups of challenges can be considered as typical challenges for entrepreneurs, including social entrepreneurs. In that case, the fourth challenge has a female face and is a unique challenge for female social entrepreneurs, at least in Nigeria.

The answer for RQ4 – "What is the needed support system for female social entrepreneurship?" - is that female social entrepreneurs desire such support as 1) funding; 2) better infrastructure and management; 3) gender equality and self-confidence. The first two groups of support are classic for all types of entrepreneurs. Still, the third group has feminine characteristics and is related to the challenges of gender inequality and lack of self-confidence.

To conclude, the main contribution of our paper is that we identified that some of the characteristics, motives, challenges and desired support for female social entrepreneurs in Nigeria are quite the same as for entrepreneurs, social entrepreneurs and social leaders. We have also found that independence and changing society are understood in a very feminine way. We also identified the challenge in gender inequality and lack of self-confidence and related request in support of gender equality and self-confidence that are unique features of female social entrepreneurship in Nigeria.

These findings offer a basis for policymakers to develop targeted policies and initiatives, facilitate education and training programs, and promote awareness and advocacy for female participation in social entrepreneurship, ultimately contributing to economic growth and social development in Nigeria.

## **7. Implications of the Study**

The study hopes to contribute to the managerial or entrepreneurial practice and academic research in social entrepreneurship. The characteristics of female social entrepreneurs in the Nigerian context in Africa will provide skills to new social enterprises. Their motivational factors could be discussed to enlighten and motivate other followers in their entrepreneurship footsteps.

The study helped to understand the socio-cultural challenges they face while setting up a social enterprise and the possible solutions that are expected to be actualized to make female social entrepreneurs thrive. Generally, the research will be relevant for present and future academics or scholars in social entrepreneurship. Within the field of social entrepreneurship, it is important to understand the situation of female social entrepreneurship within the emerging context as pointed in literature (Littlewood, Holt, 2015).

This research can assist in exploring and utilizing feminine innovative skills to accomplish social benefit in developing countries. The model will set the stage for potential studies by empirically testing factors that affect the success of social businesses in the context of other countries. It can open doors for cross country studies by supporting the contextualised differences between developed and developing countries and also countries within the developing economy.

It further assists in identifying other characteristics, motivational factors and environmental challenges and support that promote or hinder the successes of social businesses. Research in the theory of social feminism can enrich the examination of other social entrepreneurial activities by investigating socio-cultural reasons for gender differences and identifying the attributes, motivation and challenges they are exposed to.

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## THE RECOGNITION AND IMPORTANCE OF WELLBEING ACTIVITIES FOR EMPLOYEE ENGAGEMENT

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**Purpose:** The objective of the article is to present a partial result of the research aimed at showing the correlation between the performance of the activities carried out in the field of wellbeing and personal engagement.

**Design/methodology/approach:** The research is quantitative and has been conducted continuously since January 2021 using an online questionnaire, on the most vacancies and desired group of employees in the modern labour market - young engineers.

**Findings:** The results allow us to conclude that in some cases, wellbeing solutions and applied activities as they are recognized are loosely related to employees' needs and engagement - more than 50% claimed that they are important. The indicator of the level of engagement and disengagement are almost the same – 0,49 of involvement and 0,36 disengagement. The engagement is stronger related with the recognition of wellbeing activities (especially with recognition and importance of clear and transparent system of access to training, as well as compliance with labour law) and loosely with wellbeing policy, on the other hand, the active disengagement is closer to not recognized wellbeing activities and indifferently with wellbeing policy.

**Research limitations/implications:** The study must be continued, and at this stage the particular indicators of engagement and their relations to wellbeing are not taken into account.

**Practical implications:** The results of the survey can be applied to define the company's wellbeing policy in practice and to focus on the issues that are significant to a particular group of professionals.

**Social implications:** It is essential for contemporary companies to carry out the activities that have the greatest influence on the general wellbeing having regard the balance and effectiveness. The results of the study have been addressed to employers, human resources managers to focus on the most efficient activities and to understand that the only some activities have a real impact on employees' satisfaction.

**Originality/value:** The innovative nature of the research is related to the perspective adopted by the surveyed employees (bottom-up methodology) - focusing on the analysis the importance of wellbeing activities carried out by employers, as well to define if the company's activities in the field of wellbeing are noticed and then how important they are in relation to the employees' engagement.

**Keywords:** wellbeing, employee engagement, communication, human resources management.

**Category of the paper:** research and viewpoint paper.

## 1. Introduction

The concept both well-being and engagement has ambiguous references to organizational practice. While in the theory of positive psychology, focusing on the factors, both individual and social and environmental, that keep a person in good psychophysical shape, allow him to maintain health and mental resilience, feed motivation, allow him to gain wisdom, and increase the level of well-being and happiness (Makowski, 2017), both terms refer to basic and higher-order needs of an individual (sense of happiness, fulfilment, sense of meaning, achieving the state of optimal experience referred to as *flow* or *flourishing* (Csikszentmihalyi, 1996), (Seligmann, 2002). The theory of well-being, as well as the concepts related to employee satisfaction and motivation – defined as *job satisfaction*, *job involvement*, *job engagement* and *organizational commitment* (Bukowski, 2019) in psychological and social sciences take into account the entire spectrum of internal (personal) and external (organizational) factors determining the emergence of specific behavioral and verbal attitudes (Christian, Garza, Slaughter, 2011). Therefore, the postulates that in organizational practice, commitment can become an inexhaustible source, a motivation, and energy resource if only the management provides employees with a sense of autonomy, the possibility of striving for mastery, and a sense of purpose may sound like telling fairy tales to many managers (Makowski, 2017). It seems that the rationality of organizations and managerial functions consciously focuses on tasks and goals, leaving the issues of deciding and searching for an experience of fulfillment and satisfaction at work to the interested parties themselves, which is basically consistent with the concept of Self-Determination Theory by E. Deci (Deci, 1971), as the most desirable state.

## 2. Importance of Wellbeing and Engagement in Survey

Wellbeing can be defined as the state of an individual or group characterized by health, happiness, prosperity and wellness and it is at the heart of an organization's responsibility towards its employees. It is believed and proven that healthy employees have a positive impact on their organizations and societies when they engage in meaningful activities for the greater good (Boschoff, Mels, 1995; Makowski, 2017). Since 2018, the concept of wellbeing has been reported as the most important trend in human resources management. It is declared to be the most powerful factor in employee effectiveness and the most important factor in the engagement and professional experience of employees, 'As the line between work and private life blurs, employees expect companies to expand their benefits offering with a variety of programs for mental health, physical health, spiritual development and financial wellbeing. To meet these expectations, employers invest in employee programs, which are also part of a corporate social responsibility and talent development strategy (Raport Trendy HR, 2018). In 2019, the tendency to focus on the wellbeing of employees was still discussed as the need to

build and improve the quality of employees' experiences based on the sense of the meaning of the work that was done (Raport Trendy HR, 2019). In 2018, 63% of the respondents defined the level of programs to support the construction of wellbeing provided by Polish companies as only basic. If companies seek more advanced solutions, they usually give employees the opportunity to work at a remote location (43%), offer flexible working hours (54%), and often declare reimbursements for fitness costs (65%) (Raport Trendy HR, 2018). Despite the great interest and many statements made by employers and experts in the area that support wellbeing employees, 47.9 percent of respondents said that the approach of employers to health and wellbeing problems has not changed, and 19.3 percent did not in this area. According to 1200 of Polish companies' employees in 2020, attitudes and participation of employers in the wellbeing activities have been considered the most important areas of health and security (more than 40% of respondents), and the lowest participation of employers is in relation to physical activity, personal development, social relationships, and financial security (less than 20% of respondents). However, the most average percent of respondents indicated that employers were neutral or had undertaken only a few individual actions in terms of health protection, physical activities, fine fettle, sense of security, personal development, social relations, financial security, mental state, ergonomics. Finally, the final note was 3,3 points on 5 (maximum) for the employer's approach to employees' health and wellbeing (at the beginning of the new COVID-19 pandemic situation).

Due to experts' conclusion, implementation of wellbeing program results in a 25% lower absence and 2.5 times return on investment of companies investing in employees' health. More important almost 80% of job candidates pay attention whether the employer implemented wellbeing strategy or not (Well HR Report, PWC). The AON report published in cooperation with IPSOS confirms the link between wellbeing and company performance. The 2021 Global Wellbeing Survey found that improving employee wellbeing has an impact on customer satisfaction and retention (Table 1). However, it turns out that single and unrelated initiatives give negligible results - it is crucial to develop a wellbeing strategy that allows for synergy between individual elements.

**Table 1.**  
*Relationship between wellbeing and business outcomes*

<b>Business area</b>	<b>Increase in wellbeing results</b>	<b>Increased business results</b>
Customer satisfaction and retention	3,0%	1,0%
Employee satisfaction	3,5%	1,0%
Customer acquisition	4,0%	1,0%
Company profit	4,0%	1,0%
Commitment to innovation	5,0%	1,0%
Net Promoter Score (NPS)	5,0%	1,0%
Employee engagement	5,0%	1,0%
Decrease in employee turnover	4,0%	1,0%

Source: Raport Global Wellbeing 2021, <https://www.aon.com/poland/risk/publikacje/raport-global-wellbeing-2021.jsp>

Globally, 82% of the companies surveyed said employee wellbeing is important, 87% had at least one initiative, but only 55% had a strategy, and only 24% fully integrated wellbeing into their business and talent strategy (Raport Global Wellbeing, 2021). Another important issue is the effectiveness of the wellbeing solutions implemented, as demonstrated by the research results, ‘What we found is that leaders cannot rely on perks and programs alone, which often come at a high cost. In fact, more than two thirds of the 68% workers surveyed said they did not use the full value of the well-being resources their organizations offered because accessing programs was either too time-consuming, confusing, or cumbersome’ (Bhatt, Fisher, Bordeaux, 2023). Referring to the cost and benefits of workplace wellbeing there is a discrepancy in ratings appear between executives and workers – 80% executives claim the wellbeing is their top priority while in the same time 90% of workers feel their work life is getting worse; and 57% of employees are considering quitting job for one that better supports their wellbeing while 70% executives say they plan to quit for the same reason (Deloitte, 2020 Global Human Capital Trends; Moss, 2021).

Referring to engagement, commitment, or job involvement (Borowski, 2018, pp. 9-10) ‘can manifest itself in the following behaviors: a) willingness to defend the company and its products in situations of crisis and conflict, b) pride in one's work in the given organization, identification expressed through statements such as ‘my company’, ‘we’, etc., c) demonstration of high activity and initiative, d) long-term employment and lack of interest in changing the workplace, e) availability and consent to work overtime when it is required by the situation, f) understanding additional duties, willingness to take responsibility, g) loyalty, h) trust in superiors and co-workers.’

Considering the impact of high engagement, Gallup analysis concludes ‘in short, team members with higher levels of engagement: produce substantially better outcomes; treat customers better and attract new once; are more likely to remain with their organization than those who are less engaged; ... are also healthier and less likely to experience burnout’ (Harter, 2020), at the same time, the productivity of engaged teams is 17% higher than that the workers who ‘do not care’ (Janik, 2019). In the same survey, 5% of Polish respondents claimed their work as ‘great job’ and 37% as ‘good’. Gallup Institute promotes Q12 survey presenting the results of raising engagement:

- Knowing expectations: ‘Employees who strongly agree that their job description aligns with the work they do are 2.5 times more likely than other employees to be engaged’ and ‘by increasing that ratio to eight in 10, organizations could realize a 22% reduction in turnover, a 29% reduction in safety incidents, and a 10% increase in productivity’.
- Having materials and equipment: By doubling that ratio, organizations could realize a 11% increase in profitability, a 35% reduction in safety incidents, and a 28% improvement in quality’.



- Having opportunity to do the best: 'By doubling that ratio, organizations could realize a 6% increase in customer engagement scores, an 11% increase in profitability, a 30% reduction in turnover, and a 36% reduction in safety incident'.
- Receiving recognition or praise: 'By moving that ratio to six in 10, organizations could realize a 28% improvement in quality, a 31% reduction in absenteeism, and a 12% reduction in shrinkage'.
- Having someone who cares: 'By doubling that ratio to eight in 10, organizations could realize an 8% improvement in customer engagement scores, a 46% reduction in safety incidents, and a 41% reduction in absenteeism'.
- Having someone encourages the professional devolvement: 'By moving that ratio to six in 10, organizations could realize a 6% improvement in customer engagement scores, a 11% improvement in profitability, and a 28% reduction in absenteeism'.
- Taking employee opinions to count: 'By doubling that ratio, organizations could realize a 22% reduction in turnover, a 33% reduction in safety incidents, and a 10% increase in productivity'.
- Feeling the job is important: 'By doubling that ratio, organizations could realize a 34% reduction in absenteeism, a 41% drop in patient safety incidents, and a 19% improvement in quality'.
- Having fellow employees committed to doing a quality job: 'By doubling this ratio, organizations could realize a 31% reduction in turnover and absenteeism, a 12% improvement in profit, and a 7% increase in customer engagement scores'.
- Having the best friend at work: 'By moving that ratio to six in 10, organizations could realize 28% fewer safety incidents, 5% higher customer engagement scores, and 10% higher profit'.
- Having someone talking about the progress: 'By doubling that ratio, organizations could realize 38% fewer safety incidents, 28% less absenteeism, and 11% higher profit'.
- Having the opportunities to learn and grow: 'By doubling that ratio, organizations could realize 39% less absenteeism, 36% fewer safety incidents, and 14% higher productivity.' (How to Measure Employee Engagement with the Q<sup>12</sup>).

Even if we assume that the features have more promotional purpose, it can be worth considering them. As well as the common background of the wellbeing, self-determination and engagement as a result of autonomy, competence, bonds.

### 3. Methodology of the Research

As well as the widespread discussion, research and implementation of wellbeing activities and strategies arises the question to the extent to which they are recognized and important for a relatively specific category of employees – 121 young engineers working as Informatics, Programmers, Production, Data Engineers as the most employable and desirable group of employees in the modern labour market. The study was launched in January 2021 and is still underway, but the preliminary results can be discussed. The main research interests focus on three issues:

1. recognition of wellbeing activities performed by employers,
2. recognition of the importance of employee wellbeing activities,
3. recognition of the employee engagement,
4. correlation amongst recognition, importance of wellbeing activities, and personal engagement.

The wellbeing policy and activities have been defined on the basis of the most frequently summoned wellbeing dimensions and factors that compose the general sense of wellbeing of employees. The study was based on an online questionnaire. The presentation describes the results obtained during the research period from January 2021 to April 2023. The wellbeing policy and activities have been defined on the basis of the most frequently summoned wellbeing dimensions and factors that compose the general sense of wellbeing of employees. The study was based on an online questionnaire. The presentation describes the results obtained during the research period from January 2021 to April 2023. The group of respondents was selected deliberately from the graduates and working students of Kielce University of Technology and Lodz University of Technology in the age of 22-36 years old. The description of research sample is presented in a Table 2. As the research data are in process the relations of sex and age with others responses are not determined.

**Table 2.**

*The characteristic of respondents*

Status	Sex	Age				Total
		22-25	26-30	31-35	36 and more	
graduate	female	3	2	0		5
	male	14	19	12		45
working and studing both on daily and external basis	female	4	3	1		8
	male	17	22	19	5	63
Total		38	46	32	5	121

Source: Own Survey.

The innovative nature of the research is related to the perspective adopted by the surveyed employees (bottom-up methodology) and results from a deviation from the traditionally conducted research on the field of wellbeing - focusing on the analysis of the needs of employees or the analysis of wellbeing activities carried out by employers. The result of this

approach is the achievement of results showing to what extent the company's activities in the field of general wellbeing are first noticed (effectiveness of organizational communication, ability to promote the employer's brand and image) and then how important they are in relation to the employee categories studied. This research method allows the assessment of:

- the effectiveness, relevance, appropriateness, and importance of the actions taken,
- in addition, it is possible to define and specify a welfare strategy and the implementation of such measures, which, at least in principle, are considered important and potentially effective.

#### 4. Results of survey

The first part of the survey was about general wellbeing activities defined as clear and fair employment regulations (Table 3).

**Table 3.**

*The recognition of wellbeing activities implemented in the company*

Wellbeing policy implemented in your company	Yes		No		Do not know	
	N = 121	%	N = 121	%	N = 121	%
counteracting discrimination and mobbing in the workplace, particularly in:						
at the stage of recruiting employees	6	4,96	3	2,48	112	92,56
by creating a clear and transparent system of access to training	102	84,30	7	5,79	12	9,92
by creating a clear and transparent system of access to promotions	14	11,57	26	21,49	81	66,94
by creating a clear and transparent employee appraisal system	26	21,49	34	28,10	62	51,24
by creating a clear and transparent system of remuneration and rewards	23	19,01	34	28,10	64	52,89
<b>Total</b>	<b>177</b>		<b>107</b>		<b>443</b>	

Source: Own Survey.

The results presented show that the most recognized activity involves access to the training system (102 responses; 84,30% of respondents), while the other activities are almost invisible to the respondents, or are indifferent. The average recognition of wellbeing policy estimated as percentage of total number of answers (727) is 23,38% of 'yes' answers, of 'no' answers is 14,74% and 'do not know' is 61,02%. The following group of questions refers to employment conditions (Table 4).

**Table 4.**

*The wellbeing activities in the field of health protection and improvement of employee wellbeing are implemented in the company*

Which of the following activities in the field of health protection and improvement of employee wellbeing are implemented in your company	Yes		No		Do not know	
	N = 121	%	N = 121	%	N = 121	%
improvement of physical working conditions and workplace equipment (noise elimination, temperature, etc., ergonomic stations)	19	15,70	58	39,67	54	44,63
proper organization of work - adaptation of duties and work standards to the abilities of employees, precise definition of the scope of duties and working time	67	55,37	12	9,92	42	34,71
participatory management model - employee involvement in creating working conditions in the company	18	55,37	89	9,92	14	34,71
employee training in the field of improving interpersonal competences, e.g., coping with stress, communication, negotiation, conflict resolution, delegation of powers, assertiveness, psychological support	14	11,57	89	73,55	18	14,88
health protection programs (e.g., facilitation for employees returning after longer sick leave, subsidizing active and healthy free time spending, programs facilitating women's return after maternity leave, programs for people in the preretirement age)	0	0,00	114	94,21	7	5,79
employee's integration	83	68,60	8	6,61	30	24,79
creating friendly support groups	5	4,13	79	65,29	37	30,58
compliance with labour law	119	98,35	1	0,83	1	0,83
co-financing for health/medical insurance of a family member or partner of the employee	29	23,97	76	62,81	16	13,22
<b>Total</b>	<b>403</b>		<b>439</b>		<b>247</b>	

Source: Own Survey.

In determining the knowledge on activities aimed at promoting the health and wellbeing of employees, it can be concluded that, in this regard, the most important factor is the regulatory body of labour law (119 'yes' answers; 98,35% of respondents), followed by the integration of employees (83 'yes' answers; 68,60% of respondents) and the proper organization of work (67 'yes' answers; 55,37% of respondents).

The average recognition (Table 5) of activities in the field of health support and employee wellbeing estimated as percentage of the total number of responses (1089) is 30,07% of 'yes' answers, of 'no' answers is 40,01% and 'do not know' is 22,68%, while at the same time the recognition of wellbeing policy (727 total responses) amounts – 24,35% of 'yes' answers, 14,72% of 'no' answers and 60,93% of 'do not know' answers.

**Table 5.**

*The average percentage of recognition of the wellbeing policy and activities in the field of health protection and employee wellbeing*

Area	% of 'yes' answers	% of 'no' answers	% of 'do not know' answers
Wellbeing policy	24,35	14,72	60,93
Activities in the field of health protection and improvement of employees	30,07	40,01	22,68

Source: Own Survey.

Compering average recognition, it is visible that the respondents more easily indicated particular activities than general wellbeing policy, which may us draw to the conclusion that even though policy does not exist as a formal document or statement, some of the activities are implemented.

We can estimate the recognition rate (Table 6.) by dividing the given 'yes' answer in a given area by  $N = 121$ , so its value ranges from 0 (minimum) to 1 (maximum), and the indifference rate by dividing the given 'do not know' answer in a given area by  $N = 121$ , so its value ranges from 0 (maximum) to 1 (maximum).

**Table 6.**

*The Matrix of importance and indifference rates*

Rates	Low recognition (0,00-0,35)	Medium recognition importance (0,36-0,65)	High recognition (0,66-1,00)
Low indifference (0,00-0,35)	<ol style="list-style-type: none"> <li>1. participatory management model - employee involvement in creating working conditions in the company</li> <li>2. employee training in the field of improving interpersonal competences, e.g., coping with stress, communication, negotiation, conflict resolution, delegation of powers, assertiveness, psychological support</li> <li>3. health protection programs (facilitation for employees returning after longer sick leave, subsidizing active and healthy free time spending, programs facilitating women's return after maternity leave, programs for people in the preretirement age)</li> <li>4. cofinancing for health/medical insurance of a family member or partner of the employee</li> </ol>	<ol style="list-style-type: none"> <li>1. proper organization of work - adaptation of duties and work standards to the abilities of employees, precise definition of the scope of duties and working time</li> <li>2. integration of employees</li> </ol>	<ol style="list-style-type: none"> <li>1. compliance with labour law</li> </ol>
Medium indifference (0,36-0,65)	<ol style="list-style-type: none"> <li>1. creating a clear and transparent employee appraisal system</li> <li>2. creating a clear and transparent system of remuneration and rewards</li> <li>3. improvement of physical working conditions and workplace equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. creating friendly support groups,</li> </ol>	-

Cont. table 6.

High Indifference (0,67-1,00)	1. counteracting discrimination and mobbing in the workplace: <ul style="list-style-type: none"> <li>-at the stage of recruiting employees</li> <li>-at the stage of creating a clear and transparent system of access to promotions</li> </ul>	-	1. creating a clear and transparent system of access to training
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Source: Own Survey.

The results let us conclude on the level of communication between employers and employees where the employment and well-being standards are not the priority that the results that most respondents cannot even point to them (let us say that they are not in mind for both parts of employment relations). However, it can also be said that the high level of indifference indicates that the activities are not carried out or that the respondents are not interested in carrying out those activities or not. The last part of the study is to evaluate the importance of employment regulation and conditions – wellbeing policy (Table 7) by indicating on the scale from ‘very important’ (5 points) to ‘not at all important’ (1 point).

**Tabel 7.**

*The structure of importance rate of wellbeing activities in survey*

Employers' wellbeing policy	An average percent of responses
Very important	50,91
Important	24,85
Hard to say	18,51
Unimportant	3,80
Not at all important	1,93

Source: Own Survey.

In general, the structure presented enables to determine that more than 50% of respondents think welfare activities are ‘very important’ whether or not the company implements anything, 24.85% of employees think they are important, 18.52% of employees have no clear view of welfare issues, 3.80% say that implementation of welfare standards is not important, and 1.93% say they are ‘nothing important at all’.

In detailed results this part shows how important certain activities are for young engineers who pay particular attention to the following: - establishment of a clear and transparent system of compensation and rewards - 76.03% - improvement of physical working conditions and workplace equipment (noise removal, temperature, etc., ergonomic facilities) - 73.55% - compliance with labour law - 73.55% - creation of a clear and transparent system of access to training - 71,90% - combating discrimination and violence in the workplace - 61.98% and these activities. Next of importance activities are: clear and transparent system for gaining access to promotions – 61.16%, clear and transparent employee evaluation system – 56.20%, adequate work organization with respect to duties, work standards, working time – 56.68%. Considered the least important, we can indicate activities such as: combating discrimination at the recruitment stage – 43,80%, creating friendly support groups – 42,98%, health co-financing – 35,94%, employee integration – 29,75%, management participation model – 28,10%, employee

training in the field of interpersonal competence – 27,27%, health protection programmes – 23,14% of indicators.

To define the level of personal engagement the Gallup Q12 with the modification of adding the answer category 'I don't know', to make all results comparably and to highlight the areas of lack of orientation resulting from the lack of personal involvement in obtaining adequate knowledge or the lack of clear information from the company (wellbeing activities, Table 2, 3), as well as the difficulty of providing a clear answer (Table 8).

**Table 8.**  
*The respondents' engagement structure*

Indicator	Yes		No		Do not know	
	N = 121	%	N = 121	%	N = 121	%
Do you know what they expect from you at work?	119,00	98,35	1,00	0,83	1,00	0,83
Do you have the necessary materials and equipment to do your job well?	119,00	98,35	1,00	0,83	1,00	0,83
Do you have the opportunity to do what you are best at while working?	97,00	80,17	6,00	4,96	18,00	14,88
Have you been recognized or rewarded for doing a 'good job' in the last 7 days?	6,00	4,96	97,00	80,17	18,00	14,88
Does your supervisor or other person care about you as a person?	47,00	38,84	35,00	28,93	39,00	32,23
Is there someone at your job who encourages you to grow?	29,00	23,97	79,00	65,29	13,00	10,74
Do your opinions count in your work?	96,00	79,34	11,00	9,09	14,00	11,57
Do your company's mission/goals make you feel like you are doing something important?	17,00	14,05	36,00	29,75	68,00	56,20
Are your coworkers committed to doing the job well?	87,00	71,90	12,00	9,92	22,00	18,18
Do you have a best friend at work?	4,00	3,31	115,00	95,04	2,00	1,65
Has anyone from your company spoken to you about your progress in the last 6 months?	9,00	7,44	98,00	80,99	14,00	11,57
Have you had the opportunity to learn new things in the last year?	79,00	65,29	35,00	28,93	7,00	5,79

Source: Own Survey.

The analysis of the distribution of answers allows us to determine that the average level of involvement measured as the number of all 'yes' answers divided by the number of questions is 59.08%, which means that on average almost half of the respondents declare involvement; however, the strength of involvement varies in individual categories, and so the strongest factor involvement is: knowing the expectations and equipping the position (119 responses - 98.35%), a high engagement rate is also associated with the ability to perform the best job (97 responses - 80.17%), taking into account opinions (96 responses - 79.34%), noticing the involvement of others in work (87 indications - 71.90%) and the possibility of acquiring knowledge (79 indications - 65.29%), in other dimensions the number of indications is lower, which correlates with the attitude of disengagement. In such case, the disengagement indicator is 48.83 (calculated as above) and consists mainly of answers 'no' in the category: having a friend at work (115 responses - 95.04%), talk about further development (98 responses - 95.04%) 80.99%), appreciation of doing 'good work' (97 responses - 80.17%) and lack of

a person encouraging development (79 responses - 65.29%). It should also be noted that the lack of a clear answer appears in the category mission and goals of the company give a sense of doing something important (68 responses - 56.20%), caring for a person (39 responses - 32.23%), and noticing the involvement of others in work (22 indications - 18.18%). The respondents build their commitment mainly on the knowledge of expectations regarding their work and duties, the availability of materials and necessary equipment, the feeling that they do (try to) work as best as they can, and the opportunity to express their opinions in the team, which is also perceived as involved in the performance of work as best as possible. Generally, the engagement indicator (measured as an average of a particular group of responses – ‘yes’, ‘no’, ‘do not know’ divided by 100, about the range from 0 to 1) in the survey group amounts to 0,49 for engaged, 0,36 for disengaged and 0,15 for indifferent respondents.

The last phase of the survey was the indication of the correlations between active engagement/active disengagement and wellbeing policy and wellbeing activities referring to health protection and employee wellbeing (Table 8). As individual correlation has not been verified, it is possible at this stage to pull some tendencies regarding the existing relationship between recognition and engagement (Table 9).

**Table 9.**

*The correlation between wellbeing policy, wellbeing activities and employee engagement*

Components of survey	Indirect indicator as the average number of answers from of all participants N = 121		
	Yes	No	Do not know
wellbeing policy implemented in the company	1,46	0,88	3,66
wellbeing activities in the field of health protection and improvement of employee wellbeing	3,33	3,63	2,04
engagement	5,86	4,35	1,79

Source: Own Survey.

The indirect indicator has been calculated as an averaged number of given particular answers in a total number of respondents, its strength varies from 12 – the maximum ‘yes’ answers given by all respondents, to 0 – the none of ‘yes’ answers, and the same for ‘no’ answers and ‘do not know’ responses. As may be observed the engagement is strong related with the recognition of wellbeing activities and loosely with wellbeing policy, on the other hand the active disengagement is closer to not recognized wellbeing activities and indifferently with wellbeing policy. The unsure respondents are both not recognizing wellbeing policy and wellbeing activities, which may be interpreted as a generally an attitude of disinterest that dimension of organizational and work.



## 5. Discussion

Such results (Table 3, 4) mean that companies employing respondents do not know the importance of these activities or that employers do not carry out conscious and integrated communication with employees, provided they recognize whether the company has applied certain standards or not. Interestingly, the results of the study indicate that it is easier for respondents to indicate specific actions taken by employers in the field of promoting the health and well-being of employees than the general policy in the field of wellbeing (Table 5). If we make a comparison between the results presented in Table 4 and Table 6, we can observe that it is important for employees to formalize and communicate the wellbeing policy as well as all activities promoting health and employee wellbeing are worth of implementation.

The evaluation of the level of indifference (Table 6) can be used to indicate to employers how communication procedures and the communication context of accepted standards should be improved or, in some cases, implemented as a social welfare policy. In summary, referring to the wellbeing part, the results can be assumed that the most important elements in the employee survey category are the 'hard' elements of employment – training, promotion, reward, and compliance with law; the least important components group includes most of the 'soft' elements – social relations, participation, integration, and health aspects. The results of the survey are parallel and compatible with the assumptions of the two factors in Herzberg's theory: the external factors with the highest motivation clearly dominate in terms of importance, while the hygiene factors are considered to be the least important (Rymaniak, 2013; Kobyłka, 2016). The results obtained can also be directly related to the age of respondents beginning their professional careers, and only in the long term the factors mentioned in Seligman's theory of the welfare of the PERMA model, positive emotions, commitment, relationships, meaning, achievement/defense, become more important (Seligman, 2011a, 2011b). We can argue that the priority of company wellbeing and communication policies should be strengthened by a clear communication of existing standards, which are more accepted as silent assumptions, not as part of employee branding and the increasing attractiveness of employment. Not only is it the most important indication of improving employee welfare policies, but it should first improve work conditions and employment conditions, focusing on creating motivational compensation and bonus systems, access to professional training and promotion, and then improving working conditions and creating a social working environment through integration, working in groups and the introduction of participatory management model, or combating discrimination. The last of the actions relates to employment solutions in the form of health promotion and soft skills training. Considering the level of engagement or disengagement (Table 8) the respondents build their commitment mainly on the knowledge of expectations regarding their work and duties, the availability of materials and necessary equipment, the feeling that they do (try to) work as best as they can, and the opportunity to express their opinions in the team, which is also

perceived as involved in the performance of work as best as possible. What made it difficult is that giving an unambiguous answer were two mainly ontological aspects - the sense of accomplishment of the company's mission and goals as important and the perception and care for the employee as a complex person. Although the engagement and disengagement are not total (only some aspects have been indicated), however some relation may be observed – especially within personal engagement and recognized wellbeing activities, and within personal disengagement and wellbeing activities.

## 6. Conclusions

Of course, the conducted research has certain limitations, but some regularities can be indicated.

1. Among of all the components of the welfare policy implemented in enterprises, the respondents most often identify the existence of transparent access to training, other aspects, such as preventing discrimination, availability of promotions, functioning of a clear reward and evaluation system, are indicated less frequently.
2. This can be interpreted as a general lack or weakness of the system solutions used in this area.
3. The most recognizable activities contributing to the employee's well-being implemented in the company are indicated by the respondents as observance of labor law, integration, adaptation of duties and work standards to the abilities of employees, precise definition of the scope of duties and working time, less often in the answers there are solutions such as care for physical working conditions, participatory model of management, development of social and personal competencies. On the other hand, solutions such as co-financing health care for the family or partners, creating support groups are indicated less often, and support and application of health promotion and protection programs not at all.
4. That data can be interpreted as an indicator of which activities can be recognized as strengthenings and standards in the organisations and which of them need to be improved to reinforce human resources management.
5. The respondents easily recognized particular wellbeing activities that wellbeing policy: however, they also often indicate the lack of them. More than 50% claimed that they are important.
6. The measured level of engagement reached mean values for both the level of involvement (0,49) and the level of disengagement (0,36).

7. The engagement is stronger related with the recognition of wellbeing activities (especially with recognition and importance of clear and transparent system of access to training, as well as compliance with labour law) and loosely with wellbeing policy, on the other hand, the active disengagement is closer to not recognized wellbeing activities and indifferently with wellbeing policy.

Finally, there are still some questions that rise when discussing the issue of employee wellbeing and engagement: is full involvement really possible and for how long? Are absolute commitment (absorption, enthusiasm, sense of importance and identification, flourishing) really achievable in each enterprise and with regard to each employee? Individual categories of involvement (Gallup method) and wellbeing solutions can be applied to each organization and workplace? Is it really necessary to perform its duties responsibly and reliably on the highest level of engagement or commitment? Is it not a coincidence that some individual inclinations and predispositions allow some people to experience a deep bond with others (coworkers) or a sense of importance? Will the strength and need for wellbeing and engagement be the same after experiencing a loss or change of job? Finally, is it ethical to deliberately and intentionally create and maintain a high level of commitment and engagement, regardless of its consequences (workaholism, burnout, dismissal, changes)?

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## CORPORATE STAKEHOLDER ORIENTATION AND GREEN COMPETENCIES CONCEPTS: UNRAVELING THE NEXUS

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**Purpose:** The purpose of our study is to examine an interrelationship between the construct of corporate stakeholder orientation, which is developed in response to external pressures, and the concept of green competencies.

**Design/methodology/approach:** This study is grounded in an integrative literature review, a valuable approach when the objective is to synthesize diverse concepts or perspectives, facilitating the emergence of novel theoretical frameworks and perspectives. The study contribution arises from the convergence of two different management concepts in order to go deeper into complex phenomena that have not been previously examined.

**Findings:** Based on the conducted literature studies, the paper proposes that there exists a dynamic interrelationship between the green competencies of managers and employees, and the corporate stakeholder orientation of a firm. This implies that the acquisition of green competencies by members of an organization contributes to the development of the firm's corporate stakeholder orientation. On the other hand, the firm's corporate stakeholder orientation has a positive effect on the enhancement of green competencies among its organization members.

**Research limitations/implications:** The study is limited by reinterpreting existing research, so more empirical research is needed to test the three propositions. Furthermore, due to the highly dynamic nature of the research field, a static, one-time analysis appears insufficient. As a result, replication of the study in the future is advised in order to observe changing trends and shifts in the research field over time.

**Practical implications:** The findings of the study have significant implications for managerial practice, highlighting the importance of individuals within organizations having the ability to anticipate and effectively respond to the diverse demands and requirements of stakeholders in contemporary contexts. This in turn suggests that it's vital for both managers and employees to advance their green competence. This is crucial for maintaining the competitive edge of the firm.

**Social implications:** According to the findings, improving managers' and employees' GC leads to environmental benefits that benefit not only the enterprise but also society and the environment by changing social norms, cultural values, and institutional structures. Furthermore, a literature review discovered that an increase in managers' and employees' GC transmits green attitudes and behaviors from work to private land. As a result, social awareness

of contemporary environmental problems is growing, and there is a better chance of preventing the environmental degradation that we are currently facing. This appears significant in terms of the social dimension and societal changes over the long term.

**Originality/value:** The study makes a contribution to the existing literature by examining the concepts of corporate stakeholder orientation and green competencies as well as their potential interrelation that have not been previously examined, in order to improve a firm's ability to effectively respond to external pressures and sustain its competitive edge. The study, in particular, adds value to research practice by formulating three propositions that link green competencies to business focus on managing its relationships with stakeholders in the context of contemporary challenges.

**Keywords:** stakeholders, corporate stakeholder orientation, green competencies.

**Category of the paper:** conceptual paper.

## 1. Introduction

The accelerated pace of industrial and technological development has propelled the Earth beyond its intrinsic limitations, necessitating companies to address environmental obstacles. Concurrently, these enterprises endeavor to generate value for their various stakeholders, including shareholders, employees, business partners, customers, and communities. Currently, companies at a worldwide scale are actively seeking approaches to mitigate and/or prevent environmental harm. This occurs in order to address the inherent tension between environmental conservation and economic progress (Enciso-Alfaro, García-Sánchez, 2023).

Our study examines an interrelation between firms' emphasis on sustaining enduring relationships with their stakeholders and the execution of green upskilling initiatives for managers and employees within these firms. The research's approach is based on the institutional theory, which serves as a conceptual framework for understanding how external factors, social dynamics, community expectations, and environmental influences shape and influence organizational behavior. Taking this perspective, companies should try to ensure that they can adapt to the external or social expectations of their environment in order to survive and gain public legitimacy (DiMaggio, Powell, 1983). According to the institutional theory, multiple external factors affecting the company necessitate its adaptation through various actions, competency development, and so on. One of the strategies employed by nowadays businesses involves the cultivation of enduring relationships with their stakeholders. This strategic approach arises from the underlying assumption aligned with the stakeholder-based view of a company that an organization can be seen as a set of interdependent relationships between its stakeholders, who are jointly committed to its success and contribute specific forms of capital, such as financial, human, and social capital (Kochan, Rubinstein, 2000; Freeman et al., 2010). Nowadays, the aspiration to cultivate stakeholder orientation encourages companies to prioritize elements that facilitate its transition towards widely



understood sustainability. In order to achieve this objective, it is imperative to promote sustainability-problem solving competencies of both managers and employees (Siva, Gremyr, Halldórsson, 2018; Grosseck, Tîru, Bran, 2019; Redman, Wiek, 2021; Gadomska-Lila, Sudolska, Łapińska, 2023). These competencies encompass the gain of knowledge, growth in skills, and cultivation of attitudes that facilitate effective problem-solving in the context of real environmental and social sustainability challenges and opportunities. In our study we claim that organization members (managers and employees) green competencies (GC), which in general refer to individuals' capacities to interact productively and advantageously with their immediate environment (Steele, 1980), stand out among the competencies referred to as sustainability competencies in the relevant literature. We perceive GC as one of the key categories of competencies needed in contemporary businesses due to the fact that they align with the notion of sustainability competencies, including: system-thinking competence, future-thinking competence, values-thinking competence, strategies-thinking competence, implementation competence, interpersonal competence, intrapersonal competence, and integration competence (Redman, Wiek, 2021).

Despite numerous studies on stakeholder orientation and GC in the business context, there is still a scarcity of works that discuss the relationships between the two concepts. A review of the literature on the subject revealed a significant research gap. The Web of Science and Scopus databases both show a clear lack of research on the relations between managers and employees' GC and CSO. Therefore, the aim of our study is to examine an interrelationship between the construct of Corporate Stakeholder Orientation, which is developed in response to external pressures, and the concept of GC. The study is based on the integrative review of the literature, which is said to be advantageous when the aim is to integrate a range of concepts or perspectives, thereby facilitating the emergence of novel theoretical frameworks and avenues (Snyder, 2019). Its contribution arises from the convergence of two different concepts in order to go deeper into complex phenomena that have not been previously examined. This research allows for a better understanding of the relationships and perspectives in the analyzed field as well as an outline of research that poses provocative propositions that provide direction for future studies.

## **2. Stakeholder-based view of the firm**

Nowadays due to growing awareness about business responsibilities towards society and the natural environment, both researchers and business practitioners are increasingly concerned about stakeholder issues. The stakeholder-based view of the firm posits that an organization can be conceptualized as a collection of interconnected relationships among its stakeholders (Freeman et al., 2010) who are mutually dedicated to the organization's prosperity and provide

various types of capital, such as financial, human, and social capital, in pursuit of this objective (Kochan, Rubinstein, 2000).

Multiple definitions of stakeholders have been employed within the existing scholarly literature. Nevertheless, the prevailing interpretation of stakeholders was put forth by Freeman (1984). The author provided a definition of stakeholders as a collective entity that possesses the ability to exert influence over the company, while also being subject to the influence exerted by the company. According to Freeman (1984), a company's stakeholders encompass individuals or groups who have the ability to impact the company's objectives or whose circumstances are affected by the company's pursuit of its goals. These are groups and entities whose interests are related to the operation of the enterprise, such as those who provide resources to it and those who rely on them, as well as groups and entities who bear risk while also influencing the level of risk. Employees, investors, shareholders, buyers, suppliers, governments, regulators, local communities, pressure groups, and businesses as well as social partners are among the most frequently mentioned company stakeholders. Nowadays, due to business obligations towards society and the environment, the latter is also counted among the company's stakeholders and referred to as a silent stakeholder (Herciu, Serban, 2018).

Stakeholder-based perspective argues that stakeholders possess the capacity to exert substantial influence over the attainment of a company's objectives, and may even contribute to its financial prosperity. Additionally, it is presupposed that each stakeholder of the organization possesses distinct sets of expectations. Therefore, it focuses on the decision-making process, wherein the viability of the company is contingent upon fulfilling the expectations of stakeholders in both the economic and social domains (Bridoux, Stoelhorst, 2014). The primary objective of a firm, as stated by Freeman (1984), is to generate superior value for relevant stakeholders over an extended period of time.

The justification for incorporating the stakeholder perspective in management literature is grounded in its descriptive, instrumental, and normative aspects (Donaldson and Preston, 1995). The descriptive aspect investigates which stakeholders are significant when they are significant, and how organizations interact with these stakeholders (Jawahar, McLaughlin, 2001; Austen, Czakon, 2012). The instrumental aspect emphasizes the importance of stakeholders to the firm. Stakeholders, in this approach, are parties that must be managed in order to maximize sales and profits. The ulterior motive of a company adopting stakeholder orientation is to ensure that stakeholders who control critical resources work to promote rather than antagonize the company's commercial success (Pfeffer, Salancik, 1978). In contrast, the normative aspect asserts that a stakeholder orientation ought to be pursued based on inherent, philosophical commitments to the company's interactions with stakeholders. The genesis of this approach can be traced back to the discipline of ethics. A corporation bears specific obligations due to the impact of its actions on external stakeholders, necessitating the fulfillment of these responsibilities as an inherent requirement. According to the normative perspective, companies

that cultivate enduring and authentic relationships with their stakeholders through an inherent dedication may attain a competitive edge over businesses that can only form transient and/or strategic relationships through the instrumental approach (Jamali, 2008).

### **3. The concept of Corporate Stakeholder Orientation (CSO)**

Through the last decades stakeholder orientation has gained considerable attention from scholars. Stakeholder orientation refers to the degree to which a company's management directs its attention towards and incorporates the concerns of various stakeholders in its decision-making processes making (Jones, Harrison, Felps, 2018; Gamache et al., 2020; Bettinazzi, Feldman, 2021). Ferrell et al. (2010) define stakeholder orientation as the organizational culture and behaviors that induce organization members to be continuously aware of and act proactively on, a variety of stakeholders' issues. Previous research has utilized different terms to refer to this concept, such as 'stakeholder engagement', 'stakeholder management' and 'stakeholder integration' (Friedman, Miles, 2002; Heugens, Van Den Bosch, Van Riel, 2002), without making clear distinctions between them. The term 'stakeholder orientation' is commonly utilized in contemporary literature referring to this subject matter. Therefore, we have chosen to adopt this term in our theoretical framework. Moreover, it is worth noting that stakeholder orientation has been found to be influenced by multiple factors (Cennamo et al., 2012; Bridoux, Stoelhorst, 2014). However, for the purpose of this discussion, we assume stakeholder orientation as an established characteristic without further exploring its underlying causes, as suggested by Berman et al. (1999).

According to the relevant literature, it is posited that stakeholder orientation encompasses multiple dimensions (Vaitoonkiat, Charoensukmongkol, 2020; Bettinazzi, Feldman, 2021). Yau et al. (2007) created a scale for measuring an organization's stakeholder orientation, proposing four dimensions of this construct, namely: customer orientation competitor orientation, shareholder orientation, and employee orientation. Drawing upon the literature review, the aforementioned authors argue that these dimensions refer to four fundamental stakeholder groups that are relevant for most companies. Also, Bettinazzi and Zollo (2017) indicate four dimensions of firm's stakeholder orientation. However, their approach, taking into account the context of business acquisitions, is slightly different. The researchers propose such dimensions of stakeholder orientation as: employee orientation, customer orientation, supplier orientation, and local community orientation. Bettinazzi and Zollo (2017) have extended the view of a firm's stakeholder orientation by including the dimension referring to the local community. They allege that the capability to manage the relationships with local communities is so important as it may decrease the probability of protests originating from citizens and local stakeholder activists, which frequently arise in situations where target firms undergo takeovers

or restructuring processes. What is more significant, it may lessen the likelihood of negative spillover effects from local communities to other types of stakeholders.

The importance of community orientation is also highlighted by Jain et al. (2017) who offer a broader view of stakeholder orientation, taking into account seven dimensions, namely: shareholder orientation, customer orientation, employee orientation, partner orientation, environment orientation, community orientation, and corporate governance orientation and proposing the notion of Corporate Stakeholder Orientation (CSO). Jain et al. (2017) define CSO as the top management's viewpoint of their firm's legitimate stakeholders. In other words, they conceptualize CSO as a legitimacy signal that expresses significant information regarding the intentions of organizations' stakeholders.

The first dimension of CSO, which is shareholder orientation, involves the degree to which firms are willing to consider shareholders' interests (Yau et al., 2007). It includes a concern for economic sustainability, economic accomplishments, and future financial strategies, with an emphasis on creating shareholder value as the underlying goal. Mitchell et al. (1997) define shareholder orientation in terms of two types of firm stakes: equity and risk. Shareholders, who own a company through their equity stake, have the right and the incentive to exert control over its management and operations to advance their own financial and other interests. On the other hand, with respect to the risk stake, shareholders can be categorized as investors who seek either short-term or long-term financial gains, express their concerns to the management of the company, or opt to divest their shares (Vaitoonkiat, Charoensukmongkol, 2020). Given the importance of shareholders, firms commit to shareholder interests by maximizing their wealth by making profits and sharing them with shareholders. CSO second dimension - customer orientation - involves the consideration of both current and prospective customers, including the development of product design and customer satisfaction strategies. A key aspect of customer orientation involves prioritizing customers and placing them at the core of an organization (Ang, Buttle, 2006). Furthermore, employee orientation, identified in the literature as the next CSO dimension, encompasses various aspects related to employees, such as their working conditions, compensation, training, and the well-being of their families. Plakoyiannaki et al. (2008) posit that employee orientation entails perceiving employees as partners in the organization's endeavors to attain success in the marketplace. This has been found to effectively mitigate employee stress levels, while concurrently fostering higher levels of job satisfaction and organizational commitment (Lings, Greenley, 2005; Vaitoonkiat, Charoensukmongkol, 2020). The fourth CSO dimension – partner orientation – refers to a strategic approach that emphasizes the establishment and maintenance of enduring relationships with external entities, including suppliers, creditors, lending institutions, and governmental agencies. All initiatives related to developing a firm's partner orientation express its concern for sustaining long-term relationships with suppliers, lenders, governments, and other external partners (Jain, Aguilera, Jamali, 2017). The next dimension, which is environmental orientation, encompasses both current and planned policies and structures

pertaining to the environment, as well as a focus on minimizing the firm's ecological impact. Thus, the company's environmental orientation refers to the expenditures related to the environment encompass various aspects such as the establishment of eco-friendly offices, the conservation of energy and water resources, the implementation of recycling activities, the utilization of green technology, the adoption of alternative production processes, the preservation of biodiversity, the disclosure of environmental policies and regulations, and the recognition of environmental achievements through awards such as ISO 14001 and Eco-Management and Audit Scheme (EMAS) (Jain, Aguilera, Jamali, 2017). The sixth CSO dimension – community orientation – pertains to the extent to which a firm demonstrates a genuine concern for the broader society and future generations, extending beyond the well-being of its employees and their families. This dimension encompasses the genuine and deliberate endeavors made by a company to contribute to societal welfare, such as enhancing educational opportunities, raising awareness about health and environmental issues, and providing related services, fostering inclusive economic development, disclosing information regarding sponsorship activities (e.g., supporting art exhibitions), as well as engaging in charitable donations and initiatives. Additionally, it involves promoting art and culture and advocating for the education and protection of human rights (Bettinazzi, Zollo, 2017; Jain, Aguilera, Jamali, 2017). The final CSO dimension - labeled the orientation of corporate governance - centers around the implementation of ethical, legal, and transparent frameworks and procedures (Jain, Aguilera, Jamali, 2017). A firm's orientation of corporate governance includes various aspects, such as adherence to established standards, implementation of control procedures, conducting audits, having a whistle-blower policy in place, undertaking business repositioning, and major restructuring initiatives (Jain, Aguilera, Jamali, 2017).

Although the adoption of a stakeholder-oriented approach is accompanied by concomitant rises in the firm's costs, it brings about several positive outcomes. In relation to results, a focus on stakeholders has been observed to facilitate the advancement, choice, and implementation of organizational change initiatives (Sharma, Henriques, 2005), the emergence of dynamic capabilities associated with innovation (Aragón-Correa, Sharma, 2003; Vaitoonkiat, Charoensukmongkol, 2020) or the enhancement of legitimacy perceptions and reputation (Bettinazzi, Zollo, 2017). Among the numerous positive effects of adopting CSO by a company, in our study we would like to draw attention to an interrelationship between the concept of CSO and the development of both managers and employees GC, which today are included in the important category of sustainability competencies (Redman, Wiek, 2021).

#### 4. The Concept of Green Competencies (GC)

In scholarly discourse, it is commonly understood that GC refer to individuals' capacities to engage with their immediate environment in a productive and beneficial manner (Steele, 1980). The concept of GC encompasses a range of factors including effective reactions, green motives, perceptions, and attitudes, all of which play a crucial role in promoting environmental conservation. Dlimbetova et al. (2016) define GC as personal traits, skills, knowledge, abilities, and actions that reduce energy consumption, protect ecosystems and biodiversity, or reduce emissions and wastes.

While examining the concept of GC from a management standpoint, it is important to acknowledge the definition put forth by Subramanian et al. (2016). They define GC as the necessary ecological knowledge, skills, and socio-economic behavior that an individual possesses in order to responsibly engage with and contribute to the overall welfare of their immediate environment. Cabral and Dhar (2019) have presented a conceptual framework that identifies six dimensions of GC and offers a measurement instrument for assessing GC from the perspective of firm management. The conclusion drawn by the referred authors, based on an extensive analysis of relevant literature, is that GC can be understood as hierarchical dispositional constructs that encompass various components, including green awareness, green knowledge, green skills, green attitudes, green abilities, and green behavior.

The initial dimension of GC refers to the notion of green awareness. The literature sources analyze this dimension in various contexts, such as understanding the implications of air pollution, customer awareness regarding the manufacturing process and its carbon footprint, awareness of energy consumption during manufacturing, and recognition of environmental risks and cost-benefit analysis (Shrouf, Gong, Ordieres-Meré, 2017; He, Liu, 2018). Green awareness is also defined as an individual's ability to observe and be conscious of various events, objects, ideas, or sensory patterns related to the challenges faced by the natural environment (Zareie, Navimipour, 2016). According to Kollmuss and Agyeman (2002), the concept of green awareness refers to an individual's understanding of the environmental consequences resulting from human actions. From an organizational perspective, the awareness of employees regarding environmental issues is of great importance, as it fosters a sense of concern and responsibility toward mitigating their negative impact on the natural environment. Consequently, they are more inclined to implement strategies to alleviate the situation. The following dimension of GC is green knowledge, which is considered to be of the greatest significance in the acquisition of GC (Subramanian et al., 2016). Green knowledge refers to a comprehensive understanding of factual information, conceptual frameworks, and interconnections related to the natural environment and the broader ecosystem. It can also be defined as the comprehension of the natural surroundings, the deterioration of the environment, and actions that promote ecological sustainability (Fryxell, Lo, 2003; Dlimbetova

et al., 2016). This dimension pertains to the understanding of environmental matters and the capacity to propose resolutions for these matters by cultivating green attitudes and engaging in green behavior (Kollmuss, Agyeman, 2002). What is worth noting, green knowledge is important for businesses because it enables organization members to recognize specific problems and then implement actions associated with environmental preservation. The third dimension of the GC is known as green skills. It is argued that possessing a theoretical comprehension of environmental challenges alone is inadequate for actively participating in the protection of the environment. In order to address this issue, it is imperative that both managers and employees possess the necessary green skills, which encompass the practical implementation of theoretical knowledge (Cabral, Dhar, 2021). Green skills are defined as the professional and vocational skills, as well as the generic skills, required for new green jobs and the greening of existing jobs across all industries. They are known as 'vivid skills,' and are required to develop products/services/operations that take into account environmental challenges (Cabral, Dhar, 2019). The next dimension of GC, as identified in scholarly literature, is referred to as green abilities (Rajiani, Musa, Hardjono, 2016; Cabral, Dhar, 2021). According to Cabral and Dhar (2021), green abilities denote an individual's capacity to effectively combine theoretical knowledge and practical expertise in the field of natural environment in order to address tangible environmental issues. As several authors point out, the implementation of green abilities aids organization members in their personal development and enhances their performance, enabling them to achieve business objectives associated with broad notions of corporate sustainability (Gerhart, 2005; Rajiani, Musa, Hardjono, 2016). The subsequent dimension of GC is the green attitude, which pertains to an individual's cognitive evaluation of the value of environmental protection. Zareie and Navimipour (2016) posit that the dimension of green attitude encompasses both a cognitive orientation towards environmental issues and a dedication to addressing ecological challenges. As proved by various studies, green attitude is a key variable that motivates organization members to engage in pro-environmental behavior (Dlimbetova et al., 2016; Zareie, Navimipour, 2016; Cabral, Dhar, 2019). The final GC dimension relates to green behavior. In current scholarly literature, the term 'green behavior' is alternatively referred to as 'eco-friendly behavior', 'environmentally sustainable behavior' or 'responsible environmental behavior' (Wang, 2016; Cabral, Dhar, 2019). In a broad sense, this dimension pertains to the adaptive actions of employees that positively impact environmental sustainability. Essentially, the adoption of green behavior by managers and employees entails engaging in sustainable work practices, such as resource conservation, discouraging others from participating in activities that harm the environment, actively taking measures to safeguard the environment, and working towards reversing environmental degradation (Ones, Dilchert, 2012; Alvarez-García, Sureda-Negre, Comas-Forgas, 2018; Cabral, Dhar, 2019). The classification of green behavior in the literature distinguishes between two categories: required green behavior, which is directly related to one's role and tasks, and voluntary green behavior, which goes beyond one's role and is characterized by proactive

actions (Islam et al., 2020). Organization members demonstrate task-related green behavior when they perform their job duties and fulfill obligations in the workplace. On the contrary, voluntary green behavior refers to environmentally conscious actions undertaken by individuals beyond the purview of their organizational duties. This behavior promotes the involvement of organizations in activities related to environmental protection (Cabral, Dhar, 2021).

The six dimensions of the GC concept presented represent a very detailed approach. However, multiple scholarly sources in the field suggest that there are three primary dimensions of individuals' environmental consciousness. These dimensions include green knowledge, which relates to cognitive aspects, green skills and abilities, which concern psychomotor aspects, and attitude and behavior, which encompass affective aspects (Sern, Zaime, Foong, 2018; Ibrahim et al., 2020).

To sum up, the adoption of GC is imperative for contemporary firms as they confront environmental challenges, develop responsible products, and transition towards a sustainable and circular economy. These endeavors align with the current market expectations.

## **5. Interrelationship between CSO and GC**

Theoretically, being green as a result of having GC and implementing green practices enables a company to satisfy the needs and requirements of its various stakeholders. To meet the demands of customers for products, as well as those of suppliers and other business partners for green technologies, and to meet the environmental protection expectations of local communities, it is necessary to develop or adopt new technologies, employ sustainable materials, and carefully consider waste and hazardous waste management. According to this line of reasoning, and drawing upon an extensive literature review, we propose that there exists a dynamic interrelationship between the GC of managers and employees and the CSO of a firm. This implies that the acquisition of GC by members of an organization contributes to the development of the firm's CSO. Additionally, the firm's CSO has a positive effect on the enhancement of GC among its organization members. The pertinent academic sources provide numerous instances that exemplify this relationship.

Examining the relationship between meeting the expectations of modern customers and advancing the GC of an organization's members is an intriguing research avenue in this field. In accordance with institutional theory, customer pressure is a manifestation of institutional pressure (DiMaggio, Powell, 1983; Alziady, Enayah, 2019). Certain businesses are experiencing a shift in customer attitudes as contemporary customers consider whether the product, they buy has a positive or negative impact on the environment, value sustainability, and actively avoid products they perceive as detrimental (Xie, Huo, Zou, 2019; Lestari et al., 2021). Multiple studies have indicated that providing organization members with GC has



a noteworthy influence on the process of enhancing a firm's products or services to align with ecological principles. Moreover, several researchers have found that the result of advancing GC within a company positively impacts the perception of its offerings by customers (Ambec, Lanoie, 2008; Cai et al., 2020; Cabral, Dhar, 2021). It is essential to keep in mind that when making purchases, modern consumers consider not only the quality of a product or service but also its production context. Also, the afterlife and future environmental impact of a product are becoming increasingly important to consumers (Zhang, Wang, You, 2015). Incorporating explicit consideration of environmental concerns during the process of product development has the potential to generate a distinctive marketing proposition that resonates with particular consumer demographics or even extends into previously untapped customer segments (Smerichevskiy et al., 2018). However, engaging in activities related to the prioritization of customer expectations with regards to ecological aspects necessitates the development or adoption of new technologies, using sustainable materials, considering waste and hazardous waste management, etc. This in turn implies the urgent need to educate both managers and employees (Pace, 2016; Dzhengiz, Niesten, 2020). The acquisition of knowledge about environmentally sustainable practices, followed by the development of associated skills and abilities, is imperative in order to effectively provide products and services in the market that are rooted in advanced technologies requiring less energy and resources (Lestari et al., 2021). Organizations are required to adapt to escalating normative pressures, which arise from various sources such as their engagements with customers or trade organizations (Deng, Ji, 2015). Normative pressures can be distinguished from coercive pressures based on the absence of direct enforcement authority and the lack of penalties for noncompliance by institutions exerting normative pressures (Chen, 2011). Hence, it can be argued that normative pressures exert no coercive force on firms, as firms willingly adhere to specific norms. In today's world, an increasing number of managers hold the belief that adhering to prescribed norms established by various entities, including customers and industry institutions, can facilitate the acquisition of additional customers and demonstrate a commitment to environmental preservation. Prior studies have substantiated the existence of this phenomenon (Alziady, Enayah, 2019). The above insights from the literature justify a proposition that argues a positive relationship between the CSO dimension which is customer orientation and the development of both managers' and employees' GC.

**Proposition 1.** High corporate customer orientation promotes the development of organization members' green competencies.

Another attractive avenue of scientific considerations relates to the correlation between enhancing the CSO dimension, which is environmental orientation, and enhancing the level of organizational members' GC. Environmental orientation refers to a firm's recognition of its detrimental impact on the environment and its commitment to mitigating this impact. The environmental orientation of a company can be categorized into two dimensions: internal and external environmental orientation. The concept of internal environmental orientation

refers to a company's internal values, ethical behavior standards, and commitment to environmental protection (Shrivastava, 1995; Zehir, Ozgul, 2020). This is manifested through the inclusion of environmental mission statements in the firm's annual reports. In contrast, an external environmental orientation relates to the managerial recognition of the necessity to address stakeholders' apprehensions regarding environmental matters (Banerjee, 2001). The ability of a firm to meet its environmental obligations and adapt to institutional pressures is associated with its degree of external environmental orientation (Gupta, Kumar, 2013). It is said that firms with a low level of external environmental orientation are less likely to exhibit proactive responsiveness towards external environmental factors, such as customer requirements (Bowen, Aragon-Correa, 2014). Moreover, we believe that the development of a firm's environmental orientation is also associated with a normative approach to the company's stakeholders, according to which it is essential for a company to address moral stakeholder expectations, even if they are not directly related to or advantageous to its strategic objectives. Our assumption is based on the fact that the natural environment is already treated as a (silent) stakeholder, as well as the fact that environmental protection benefits both present and future generations.

Given the above, in order to enhance a firm's environmental orientation, it is imperative to equip both managers and employees with green knowledge, green skills, and abilities as well as green attitudes and behaviors. It is noteworthy that environmentally conscious employees frequently provide valuable insights into company energy and resource efficiency improvements. Therefore, it appears crucial to foster increased awareness among employees regarding the necessity and potential avenues for transformation in this domain. It has been already recognized that the incorporation of green values, knowledge, skills, and abilities among organization members can greatly enhance the overall performance of an organization (Chiou et al., 2011; Das, Singh, 2016; Dey et al., 2020; Yang et al., 2021). This can be accomplished in a number of ways, including updating the company's knowledge base and technology, reducing resource consumption, minimizing hazardous emissions, promoting resource conservation, and enhancing product design (Bansal, 2005; Chiou et al., 2011; Gürlek, Tuna, 2018; Dey et al., 2020; Yong, Yusliza, Fawehinmi, 2020; Gadomska-Lila, Sudolska, Łapińska, 2023). Moreover, the advantages derived from the advancement of GC contribute to the company's gaining a competitive edge as well as bringing about several benefits for the society (Yusoff, Nejati, 2017; Gadomska-Lila, Sudolska, Łapińska, 2023). Based on the above reasoning, the following proposition was formulated:

**Proposition 2.** Advancing environmental orientation favors the development of organization members' GC.

Another appealing research avenue refers to the relationship between corporate governance issues and developing GC within an organization. Management scholars are increasingly acknowledging that corporate governance plays a critical role in shaping decisions related to the transformation of a company's activities toward environmental sustainability (Walls,

Berrone, 2017). The decision to shift business focus towards environmental sustainability is influenced by corporate governance, as environmental initiatives typically necessitate coordination among multiple corporate actors who compete for firm resources and significant investments that have long-term strategic implications (Aguilera et al., 2021). As the members of corporate governance (i.e., institutional investors, top management teams and CEOs, members of the board of directors) are those who make the majority of company decisions, their values, beliefs, behaviors, and attitudes can help or hurt the adoption of organizational policies and strategies that are meant to develop environmentally friendly projects (Zaman et al., 2022; Enciso-Alfaro, García-Sánchez, 2023). This assumption is derived from the upper echelons theory, proposed by Hambrick and Mason (1984), which suggests that organizational outcomes and decisions can be anticipated by examining the attributes, like individual preferences, experiences, and values, of the top-level management team (Chin, Hambrick, Trevino, 2013). Numerous scholars have examined the topic of incorporating sustainability elements into corporate governance practices to foster value generation for the organization and beneficial outcomes for all stakeholders, including the natural environment, over a long period of time (Walls, Berrone, Phan, 2012; Tashman, Marano, Kostova, 2019; Aguilera et al., 2021). Based on their research, the inclusion of environmental aspects into the firm's corporate governance system necessitates a greater degree of pro-environmental awareness and knowledge, particularly among managers.

Corporate governance orientation refers to management policies concerning transparent, lawful, and ethical firm's operations, such as compliance with standards, code of conduct implementation, various control procedures, audits, etc. (Jain, Aguilera, Jamali, 2017). Thus in order to develop a firm's corporate governance orientation, its strategy, and operational activities, need to be based on the priorities related to environmental and social sustainability. We assume that this in turn implies the need to advance organization members', particularly top and operational managers', green awareness, knowledge as well as attitudes and behaviors. Our assumption is grounded in above-mentioned the upper echelons theory (Hambrick, Mason, 1984) which has already been used in the literature on sustainability (Chin, Hambrick, Trevino, 2013; Sancha et al., 2022) and assists in linking firm's governance with environmental and social operational management practices. Following the logic of the upper echelons theory, we anticipate that governance boards with a strong commitment to environmental values will encourage the development of GC among organization members, resulting in an increase in the field of pro-environmental business practices.

Furthermore, it is important to highlight that corporate governance largely concentrates on the company's adherence to environmental regulations and its control of environmental disclosure. The fulfillment of these responsibilities by corporate governance members necessitates the enhancement of GC (Katmon et al., 2017). Based on the above considerations we propose the relationship between the corporate governance orientation of a company and managers as well as employees GC:

**Proposition 3.** Enhancing corporate governance orientation requires the development of organization members' GC.

In light of the aforementioned considerations, it can be assumed that the provision of GC to both managers and employees within enterprises plays a crucial role for fostering CSO. Based on the aforementioned considerations, it can be proposed that the provision of GC to both managers and employees within enterprises plays a pivotal role in fostering CSO. Proactivity refers to the capacity for thinking to anticipate potential issues in advance and implement preventive actions to mitigate their occurrence (Fay et al., 2022). In essence, it can be characterized as a behavioral approach that encompasses proactive anticipation and intervention to assume control over a given circumstance and bring about transformative outcomes within said circumstance. Therefore, we claim that in today's environment, it is imperative for members of organizations to possess the capacity to anticipate and address the various demands and needs of stakeholders. This is crucial for maintaining the competitive edge of the firm.

## 6. Conclusions

The study explicates an interrelationship between CSO and organization members' GC, specifically within the present-day environmental context. CSO acts as an intentional legitimacy signal employed by organizations to demonstrate their commitment to the interests of shareholders and other stakeholders, while navigating various external pressures. In turn, the development of organizational members' GC represents a proactive strategy for fostering a company's stakeholder orientation. This refers to the endeavor of recognizing and satisfying the unexpressed requirements of stakeholders. Therefore, business entities should engage in the integration of forward-looking trends, technologies, and economic advancements within their strategic framework. In turn, it is imperative for them to make an effort to equip both managers and employees with GC which facilitate addressing the above-mentioned challenges.

This study makes a contribution to the existing literature by examining the concepts of CSO and GC and their potential interrelation to improve a firm's ability to effectively respond to external pressures and sustain its competitive edge. By examining the nature of the relationship between CSO and GC, this article sheds light on the factors that confirm the value of GC development. The study, in particular, adds value to research practice by formulating three propositions that link GC to business focus on managing its relationships with stakeholders in the context of contemporary challenges.

However, it is important to mention the existing constraints of the study. First, GC and CSO are broadly defined and explained in the literature in numerous ways. This makes them rigorously describe and evaluate. The study is limited by reinterpreting existing research, so more empirical research is needed to test the three propositions. Several models can be built to analyze the impact of organization members' GC on a firm's orientation towards its multiple stakeholders based on the propositions regarding the relationships between CSO and GC concepts. Furthermore, due to the highly dynamic nature of the research field, a static, one-time analysis appears insufficient. As a result, replication of the study in the future is advised in order to observe changing trends and shifts in the research field over time.

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## CONDITIONS OF THE QUALITY OF RELATIONSHIPS WITH REGARD TO PARTICIPANTS OF THE QUADRUPLE HELIXE

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**Purpose:** The purpose of the article is to compare the attitudes of representatives of innovative enterprises toward the strength and importance of relationships in relation to different groups of participants in the quadruple helix (groups of enterprises, local government organizations, scientific organizations and business environment institutions).

**Design/methodology/approach:** The presented analyses are concerned with the determinants of the quality of relationships of innovative enterprises in the quadruple helix. The research was conducted on a sample of 200 innovative enterprises using the CATI method. Four relationship constructs were studied – trust, commitment, satisfaction and communication.

**Findings:** The results indicate that the most significant, both within strength and importance, are relationships with other enterprises, followed in turn by those with institutions of the business environment, local government and the scientific sphere. With respect to all participants in the quadruple relationship, the validity of the constructs is as follows: trust, satisfaction, commitment, communication (with commitment and communication being equally important in the case of business environment institutions). Analysis of the discrepancies in the responses indicated that the most statistically significant differences exist for the relationship with local government units.

**Research limitations/implications:** The main limitation is the research sample and the limitations of the relationships established, especially with regard to scientific/research institutions and business environment institutions.

**Practical implications:** The article indicates which constructs of relationship quality should be paid attention to by representatives of the various helix in managing relationships with innovative enterprises, and identifies which characteristics generate differences in their perception.

**Originality/value:** The article undertakes to analyse the quality of inter-organizational relations through the prism of its constructs. The article is addressed to both representatives of enterprises and other participants in the quadruple helix.

**Keywords:** quadruple helix, relations, relationship quality.

**Category of the paper:** research paper.

## 1. Introduction

Cooperation, due to the enormous turbulence of the environment, is an essential action taken for development. It facilitates access to information and knowledge by constantly offering new opportunities. Combining the potentials of partners is the key to successful development. Despite the awareness of the role and importance of cooperation, the relationships taking place between entities are often weak and unsustainable, and there are often attempts to exploit the partner (Nowak, 2015).

The quadruple helix (QH) model explains the essence and principles of cooperation using knowledge, mutual learning and synergy of resources in innovation processes. Relationships between the entities of each of the mentioned spheres have a slightly different nature and significance. An attempt is made in the article to analyse them.

The main goal of the article was to compare the attitudes of representatives of innovative enterprises toward the strength and importance of relationships with regard to the various groups of participants in the quadruple helix. Accordingly, the following research questions were posed:

- Pb1. What is the importance of relationships, as measured by their strength and importance, in relation to the various addressees of the quadruple helix?
- Pb2. Are there differences in the perceived importance of individual relationship quality constructs depending on their addressees?
- Pb3. Do company characteristics differentiate perceptions of the components of individual relationship quality constructs depending on their addressees?

## 2. The importance of cooperation in the quadruple helix

The QH model is a significant concept in the development of cross-sector cooperation. The foundation of QH was the Triple Helix (TH) model, from 1995 (Mendel, Matzko, 2013; Etzkowitz, 1993; Etzkowitz, Leydesdorff, 1995; Leydesdorff, 2000) depicting different network behaviors. TH involves an arrangement of links between representatives of three sectors – scientific, private and public (Łącka, 2018) – at a certain level with a condition of mutual learning (Etzkowitz, Leydesdorff, 2000; Hilarowicz, 2017). Relationships occurring between spheres can take different forms, as illustrated by popular models (Etzkowitz, Leydesdorff, 2000, Etzkowitz, Zhou, 2007; Bednarzewska, 2016; Tomaszuk, Wasiluk, 2021):

- 1) an etatistic model of university-industry-government relations model, in which the public power sector embraces the scientific and business communities and directs their interactions;

- 2) a “laissez-faire” model of university-industry-government, consisting of three separate sectors, in which there are clear boundaries between them and relations are limited;
- 3) the Triple Helix Model of University-Industry-Government Relations, in which the three sectors maintain a relatively independent status, but there are advanced interactions between them.

In addition, a considerable number of concepts have been proposed in the literature for modeling the processes that take place in the three-sector system (Bednarzewska, 2016).

Thus, in the TH model, there can be both interpenetration of institutions from the three sectors (interchangeable playing of roles originally assigned to another sector) and the emergence of intermediate organizations located in the functional space between sectors (Hilarowicz, 2017). The concept of the QH (Carayannis et al., 2012) is linked to the concept of the knowledge economy, in which the structure of society is undergoing a continuous transformation derived from technoscience (Leydesdorff, 2012; Etzkowitz, Leydesdorff, 2000; Bojar, Machnik-Słomka, 2014).

An extension of the TH spiral is the concept of the quadruple helix (QH), whose model incorporates the media and civil society into the innovation system, which allows the formation of relationships based on the knowledge of society and democracy (Carayannis et al., 2012; Sick, 2016; Carayannis, Campbell, 2011; Bojar, Machnik-Słomka, 2014; Carayannis, Campbell, 2009; Colapinto, 2011), and creates a framework for innovation (Kopeć, 2020; Park, 2014).

The QH model, describing the new economic environment, allows analysis of the interaction of all actors, and indicates the involvement of the whole society in continuous innovation, which is the result of co-creation between all helixes connected by a network of partnerships, cooperation and relationships (Afonso et al., 2012; Bojar, Machnik-Słomka, 2014).

As in the case of TH, different concepts of helixes can also be found in QH (Macełko, Mendel, 2011; Lindberg et al., 2010):

- 1) the triple helix model with an additional element – the social sector, whereby civil society is not an equal partner in innovation development processes;
- 2) the quadruple helix model, in which the business sector plays the most important role, being responsible for commercializing products and services, utilizing expert and user knowledge, and systematically collecting information on user needs and experiences;
- 3) the quadruple helix model, in which the most important role is played by the public sector responsible for developing public services, stimulating and supporting citizen involvement, and systematically collecting information about the needs of innovation recipients;
- 4) the quadruple helix model, in which the most important role is played by the social sector responsible for creating innovations and deciding which innovations are priorities and should be developed.

Cooperation in QH is a source of many important benefits for the individual parties – both to increase the efficiency of operations and improve competitive position (Sudolska, 2011). The main objectives of business cooperation can be considered (Doz, Hamel, 2006; Yu, Lee, 2017):

- 1) joining forces to build a coalition to achieve mutual goals or turn potential rivals into allies in a common cause;
- 2) combining complementary elements to achieve synergistic effects;
- 3) jointly acquiring hard-to-reach knowledge and learning both with and from the partner.

By intensifying knowledge flows, inter-organizational cooperation reduces uncertainty and provides better adaptation to changes in a turbulent environment (Wściubiak, 2019). An important motive for cooperating partners is also the desire to share between them the costs and risks of ongoing activities, especially R&D work, which is characterized by both soaring costs and a significant percentage of projects ending in failure. Increasing pressure from competitors and the shortening of the life cycle of most products are also important impulses for cooperation. These are forcing companies to accelerate the pace of development of new solutions, resulting in the need to innovate ever faster. Achieving this goal is possible through cooperation with other entities (Gorbatyuk et al., 2016).

### 3. Methodology

The strength and importance of the relationship from the point of view of representatives of innovative enterprises with business partners, which were classified according to the concept of the quadruple helix, were examined. An innovative organization was considered to be one that integrates employees around shared innovation-oriented values and creates conditions for reporting and implementing innovations, based on trust (Krot, Lewicka, 2016) and nurturing an organizational climate that provides employees with a framework for making important decisions.

Due to the lack of an explicit quality of relationships (Skarmeas, Robson, 2008; Kumar et al., 1995; Ahamed, Skallerud, 2013; Lages et al., 2005), for the purposes of the study the concept was treated as a metaconstruct (Holmlud, 2008; Tomaszuk, 2022). Being aware of the fact that there are different sets of components of relationship quality in the literature, three constructs considered key – trust, satisfaction and commitment – were used to create the research tool (Hennig-Thurau et al., 2002; Ulaga, Eggert, 2006; Barry, Doney, 2011; Tung, Carlson, 2013; Leszczynski, 2014; Walter, 2003; Ahamed, Skallerud, 2013; Hajli, 2014; Vieira et al., 2008; De Wulf et al., 2001; Skarmeas, Robson 2008; Liang et al., 2011; Chu, Wang, 2012) and communication (Jiang et al., 2016; Heroux, Hammoutene, 2012; Whipple et al., 2010, Athanasopoulou, 2009; Fynes et al., 2005; Mohaghar, Ghasemi, 2011; De Bürca et al., 2011).



Regardless of the addressee of the relationship, given the complex nature of the constructs under study (Blunsdon, Reed, 2003; Sankowska, 2011; Lewicka et al., 2016), the list of items examining the quality of the relationship was optimized and formulated universally. It ranged from 3 (for satisfaction) to 5 (for the other constructs) (Table 1).

**Table 1.**  
*Identified dimensions of relationship quality*

Construct	Items
Trust	T1) We are convinced that organizations we work with are fair.
	T2) We believe that organizations we work with know what they do.
	T3) We trust organizations we work with because they have trusted us.
	T4) We believe that cooperation with organizations will be beneficial for us.
	T5) Organizations usually keep their promises to our company.
Commitment	C1) We believe that organizations treat cooperation with us as an element of long-term relationships.
	C2) We believe that organizations prefer long-term cooperation with us over short-term profits.
	C3) We believe that organizations we work with would not do business with others at our expense.
	C4) We believe that organizations we work with are ready to invest time and resources in developing relationships with us.
	C5) From time to time we are ready to make sacrifices to help organizations.
Satisfaction	S1) Taking into account all aspects of cooperation, our experience with organizations is very Satisfactory.
	S2) Our relations with organizations have positively surprised us.
	S3) We are very pleased with the cooperation with organizations.
Communication	CM1) The contents of messages from organizations are clear to us.
	CM2) Organizations communicate with us in an open manner.
	CM3) Our contacts with organizations are very frequent.
	CM4) Our contacts with organizations are very often direct.
	CM5) Organizations make efforts to better understand us and our needs.

Note. As organization can be meant: 1. other enterprises, 2. local/government units, 3. scientific/research institutions, 4. non-government organizations.

Source: own study based on Lages et al., 2005; Walter, Ritter, 2003; Ryciuk, 2013; Stach, 2013; Woo, Ennew, 2004; Roberst et al., 2003.

For each statement in the questionnaire, the respondent was asked to indicate his or her position by marking the category on a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The reliability of the created scale was checked using Cronbach's alpha coefficient. The calculated statistics (Table 2) indicate a high consistency of the items included in the created scale.

**Table 2.**  
*Cronbach's alpha coefficient for the tested constructs*

		Alfa Cronbach			
		trust	commitment	satisfaction	communication
Relations with:	Enterprises	0.7617	0.7971	0.7137	0.7935
	Scientific institutions	0.8751	0.8949	0.9225	0.8504
	Local government units	0.8806	0.8900	0.9242	0.8000
	Non-government organization	0.8669	0.8816	0.8821	0.7831

Source: own study.

The survey was conducted with a sample of 200 innovative companies in the last quarter of 2021 using the CATI method. This made it possible to achieve a high level of standardization, to reach respondents in high positions, and to be anonymous (Malhotra, 2010). The characteristics of the companies are illustrated in Table 3.

**Table 3.**  
*Research sample characteristic*

	Characteristic	%
Industry	trade	29%
	production	26%
	service	19.5%
	construction	16.5%
	transport	9%
Enterprise size	10-49	57%
	50-249	34.5%
	>249	8.5%
Activity on the market	up to 1 year	0%
	1-3 years	0.5%
	4-9 years	5.5%
	more than 9 years	94%
Operations range	local	21%
	regional	18%
	domestic	31.5%
	international	29.5%
Established relationships	with other enterprises	98%
	with administration units	38%
	with research and development units	22.5%
	with business environment units	33%
Implemented innovations	product	64,5%
	service	39,5%
	process	34,5%

Source: own study.

#### 4. Analysis of research results

Questions about relationship constructs preceded those about the strength and importance of relationships with individual participants (Table 4).

**Table 4.**  
*The power and validity of relationships with QH participant*

Relations with:	Enterprises			Local government units			Scientific institutions			Non-government organization		
	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$
Power	4.12	4	4	3.49	4	4	3.38	3	3	3.52	4	4
Validity	4.23	5	5	3.73	4	5	3.71	4	4	3.74	4	4

Source: own study.

The analysis of respondents' indications allows us to clearly state that the strongest relationships are those established with other companies, they also have the most significant importance, with a low coefficient of variation maintained. Next, rank the strength and importance of relationships with NGOs and with local government units. The least important are relationships with representatives of science (this is also confirmed by the number of established relationships – Table 3).

Respondents, when asked directly about the relevance of a given construct of the relationships formation (Table 5) for all partners of the QH, considered the following in order: trust, satisfaction, commitment (only in the case of NGOs commitment and satisfaction have received the same score) and communication.

**Table 5.**

*Importance of individual constructs in shaping relationships with individual members of the QH*

Meaning of the construct in relation with:	Enterprises			Local government units			Scientific institutions			Non-government organization		
	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$
Trust	4.37	5	5	4.04	4	W	4.27	4	4	4.02	4	4
Commitment	4.17	4	4	3.95	4	4	3.93	4	4	3.95	4	4
Satisfaction	4.24	4	4	3.97	4	4	3.95	4	4	3.95	4	4
Communication	4.08	4	4	3.89	4	4	3.87	4	4	3.92	4	4

Source: own study.

Representatives of the surveyed companies were asked to respond to individual statements reflecting the characteristics of the constructs (Table 6).

**Table 6.**

*Assessment of respondents' agreement with statements reflecting particular constructs of relationship quality*

Statement	Enterprises			Local government units			Scientific institutions			Non-government organizations		
	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$	$\bar{x}$	$M_e$	$D$
T1	4.16	4	4	4.01	4	5	4.33	4	5	4.06	4	4
T2	4.43	5	5	3.78	4	4	4.33	4	5	4.20	4	4
T3	4.34	4	5	3.93	4	4	4.24	4	4	4.02	4	4
T4	4.60	5	5	4.20	4	5	4.44	5	5	4.11	4	4
T5	4.03	4	4	4.13	4	5	4.13	4	4	3.85	4	4
C1	4.31	4	5	3.66	4	4	3.84	4	W	3.70	4	4
C2	3.90	4	4	3.32	3	3	3.62	4	3	3.65	4	4
C3	3.57	4	4	3.23	3	3	3.42	4	4	3.38	3	3
C4	3.78	4	4	3.33	3	3	3.44	3	3	3.61	4	4
C5	4.00	4	4	4.03	4	4	3.84	4	4	3.76	4	4
S1	4.10	4	4	3.77	4	4	4.04	4	4	3.85	4	4
S2	3.78	4	4	3.41	4	4	3.60	4	4	3.64	4	W
S3	4.03	4	4	3.70	4	4	3.93	4	4	3.77	4	4
CM1	4.16	4	4	3.79	4	4	3.93	4	4	3.94	4	4
CM2	4.02	4	4	3.75	4	4	3.98	4	4	3.95	4	4
CM3	4.28	4	5	3.36	3	3	3.20	3	3	3.43	4	4
CM4	4.16	4	5	3.71	4	4	3.58	4	4	3.61	4	4
CM5	3.53	4	4	3.09	3	3	3.20	3	3	3.40	3	4

Source: own study.

As in the case of the importance and relevance of relationships overall, the highest agreement with the statements occurred with regard to relationships with other companies, followed (which does not coincide with respondents' answers regarding the strength and importance of relationships) with the scientific sphere, business environment institutions and local government units. Respondents' answers according to the arithmetic mean range from 3.09 for CM5 with regard to government units to 4.60 for T1 with regard to other companies. The largest difference according to the arithmetic mean occurred for statement CM3 (1.08 – 4.28 for companies and 3.20 for academic units); the smallest for T5 (0.18 – 4.13 for local government and academic units and 3.85 for NGO's). The median indicated differences for seven constructs (two for trust – T2 and T4; three for commitment – C2, C3 and C4; and two for communication – CM3 and CM5); while the dominant indicated differences for twelve (differences did not occur for the satisfaction constructs, and partially for commitment (C5) and communication (CM 1 and CM2)).

The Kruskal-Wallis test (Table 7) was used to test whether the parameters of companies (industry, size, scope of operations and period of operation in the market) differentiate perceptions of relationship components.

**Table 7.**

*Differences in ratings of relationship constructs according to the characteristics of the analysed entities*

		Industry	Enterprise size	Activity on the market	Operations range
Relations with:	Enterprises	-	-	-	-
	Local government units	x	x	-	x
	Scientific entities	-	-	-	x
	NGOs	-	-	-	x
p < 0.05					

Source: own study.

The most statistically significant differences are found in the case of perceptions of the constructs of the quality of relationships with local government units, and relate to the following, respectively:

- in the case of the industry represented – perceptions of commitment (for the statement "We believe that the local government institutions we work with would not do business with others at our expense" and "We believe that our local government partners are willing to invest time and expense in developing relationships with us") and communication ("Our contacts with local government institutions are very frequent");
- in the case of company size – perceptions of commitment (for the statement "We believe that local government institutions view cooperation with us as part of a long-term relationship");
- for operations range – perceptions of trust ("We believe that the local government units we work with know what they are doing") and commitment ("The commitment of local government institutions significantly influences the formation of relationships with them").

For scientific institutions, statistically significant differences in relationship perceptions were noted by:

- company size – perception of trust ("We believe that the scientific/research institutions we work with are honest"; "We believe that the scientific/research institutions we work with know what they are doing" and "We believe that working with scientific/research institutions will be beneficial to us");
- range – perception of satisfaction ("Considering all aspects of cooperation, our experience with scientific/research institutions is very satisfactory"; "We are very satisfied with cooperation with scientific/research institutions").

In the case of business environment institutions, there were statistically significant differences in perceptions of the relationship due to the range for trust ("We believe that cooperation with NGOs will be beneficial to us"; "NGOs usually keep their promises to our company") and communication ("NGOs communicate with us in an open manner").

## 5. Conclusion

The results of the study clearly indicate that innovative companies in Poland shape their relationships based on the QH model, in which the business sector plays the most important role. The role of the public sector is to support and finance development, the scientific sector is responsible for creating new knowledge and intellectual capital, and the social sector is responsible for participating in idea generation and development (Lindberg et al., 2010). This is indicated both by the strength and importance of the relationships, which are significantly higher than those with the other three groups of participants, and by the sheer number of relationships established (only 22.5% of units declared cooperation with the scientific and research sphere, 33% with the business environment sphere, 38% with the administrative sphere). This shows that the importance of both cooperation and relationship management is far underestimated, which is covered in the research of other authors (Tomaszuk, Wasiluk, 2021).

Deepening the analysis to the level of relationship quality constructs, it can be seen that they are treated in a similar way regardless of the addressee of the relationship. The most important component of them is trust, the least important is communication.

However, slight differences were noted in the perception of the components of the various constructs depending on the parameters of the enterprise – especially with regard to local government units. In the author's opinion, this may be due to the fact that, unlike the other participants in the QH, these are relationships whose establishment was due to coercion. Differences were noted with regard to the industry represented, the size of the company and the

scope of operations. They did not occur with regard to the length of operation in the market, which may mean that the opinions of company representatives do not change.

The analysis and conclusions presented here can inspire further research, but it is important to point out the limitations of the research sample. Despite the fact that 200 innovative companies were surveyed, a significant number of them, due to the lack of established relationships with scientific and research institutions, the public and the administrative sector, did not comment on them.

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## THE USAGE OF SMARTPHONE APPLICATIONS IN SMART CITY DEVELOPMENT – PUBLIC SAFETY AND EMERGENCY SERVICES

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**Purpose:** The purpose of this publication is to present the usage of smartphone application in Smart Cities in public safety and emergency services.

**Design/methodology/approach:** Critical literature analysis. Analysis of international literature from main databases and polish literature and legal acts connecting with researched topic.

**Findings:** The integration of smartphone applications into smart city development for public safety and emergency services is a pivotal step toward creating safer, more efficient, and resilient urban environments. These apps empower citizens and authorities to collaborate effectively, enhancing response times and resource allocation during emergencies. Smartphone applications also provide timely alerts, navigation tools, and educational resources for disaster preparedness. However, challenges like limited access, privacy concerns, and digital literacy gaps must be addressed to fully harness their potential. Embracing these challenges through technology enhancements and user education can lead to safer and smarter urban environments.

**Originality/value:** Detailed analysis of all subjects related to the problems connected with the usage of smartphone applications in public safety and emergency services.

**Keywords:** Smart City, urban mobility, public safety, smartphone applications, smart mobility.

**Category of the paper:** literature review.

### 1. Introduction

The usage of smartphone applications in smart city development for public safety and emergency services is vital for creating safer, more efficient, and resilient urban environments. These apps empower both citizens and authorities to collaborate, respond effectively to crises, and make data-driven decisions, ultimately contributing to the overall well-being and quality of life in modern cities. Smart cities are a growing trend globally, and their development relies heavily on harnessing technology to enhance various aspects of urban life, including public safety and emergency response.

Smartphone applications play a pivotal role in improving the response times of emergency services. Citizens can use these apps to quickly report emergencies, such as accidents, fires, or medical incidents, by providing real-time location data and essential information. This enables emergency responders to reach the scene faster, potentially saving lives and minimizing property damage (Rahman, Dura, 2022).

Smart city applications can help allocate emergency resources more efficiently. By analyzing data from smartphones and other sources, city authorities can identify areas with higher accident rates, crime hotspots, or health emergencies. This data-driven approach allows for a more precise deployment of police, firefighters (Rachmawati et al., 2021; Dutta et al., 2021; Ivanyi, Biro-Szigeti, 2019).

The purpose of this publication is to present the usage of smartphone application in Smart Cities in the case of public safety and emergency services.

## **2. The usage of smartphone applications in public safety and emergency services**

Smartphone applications are powerful tools for enhancing public safety and emergency management. They facilitate timely communication, provide vital information, and empower both authorities and the public to respond effectively to emergencies, ultimately saving lives and minimizing damage during crises (Herdiansayah, 2023; Rose et al., 2021). Many government agencies and local authorities have developed apps that can send emergency alerts and notifications directly to users' smartphones. These alerts can include weather warnings, natural disasters, Amber Alerts for missing children, and other critical information to keep the public informed and safe (Prajeesh, Pillai, 2022; Kuntska et al., 2023).

Citizens can use smartphone apps to report emergencies or suspicious activities to the authorities. These apps often allow users to provide details about the situation, attach photos or videos, and share their real-time location data. This reporting feature can significantly speed up emergency response times (Wolniak, Sułkowski, 2015, 2016; Wolniak, Grebski, 2018; Wolniak et al., 2019, 2020; Wolniak, Habek, 2015, 2016; Wolniak, Skotnicka, 2011; Wolniak, Jonek-Kowalska, 2021; 2022). During emergencies like natural disasters or large-scale events, smartphone apps can provide real-time navigation and evacuation route information. This helps people find the safest and quickest way to leave an affected area, reducing congestion and improving overall safety. Apps can provide information about nearby emergency shelters, their availability, and what amenities they offer (Wolniak, 2016; Czerwińska-Lubszczyk et al., 2022; Drozd, Wolniak, 2021; Gajdzik, Wolniak, 2021, 2022; Gębczyńska, Wolniak, 2018, 2023; Grabowska et al., 2019, 2020, 2021). This is especially useful during events like hurricanes, wildfires, or prolonged power outages (Benevolo et al., 2016; Kalasova et al., 2021).

Many apps include a list of important emergency contacts, including local police, fire departments, hospitals, and non-emergency services (Kalasova et al., 2021). Users can quickly access these numbers if needed. Some apps offer basic first-aid information and instructions for common medical emergencies. They can guide users through CPR, offer advice on handling burns or bleeding, and provide other essential medical information (Boichuk, 2020).

Apps can serve as educational tools to help citizens prepare for emergencies. They may include checklists for emergency kits, guidelines for creating family emergency plans, and information on disaster preparedness. During ongoing emergencies, smartphone apps can provide real-time updates on the situation. This includes weather updates, traffic conditions, and updates from local authorities. Citizens can stay informed about the evolving situation, helping them make informed decisions (Simonofski et al., 2023; Chmielarz et al., 2021).

Apps can collect and aggregate crowdsourced data from users, including reports of damage, power outages, or road closures. This information can be valuable for emergency responders to prioritize their efforts. Many apps offer features to support individuals with disabilities or those who speak languages other than the official language of the area (Sułkowski, Wolniak, 2015, 2016, 2018; Wolniak, Skotnicka-Zasadzień, 2008, 2010, 2014, 2018, 2019, 2022; Wolniak, 2011, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022; Gajdzik, Wolniak, 2023). This ensures that emergency information is accessible to a broader range of citizens (Chmielarz et al., 2021).

Some emergency management apps integrate with social media platforms to share critical information and updates with a wider audience (Jonek-Kowalska, Wolniak, 2021, 2022, 2023; Rosak-Szyrocka et al., 2023; Gajdzik et al., 2023; Jonek-Kowalska et al., 2022; Kordel, Wolniak, 2021; Orzeł, Wolniak, 2021, 2022; Ponomarenko et al., 2016; Stawiarska et al., 2020, 2021; Stecuła, Wolniak, 2022; Olkiewicz et al., 2021). This can help reach individuals who may not have the app installed. For emergency management professionals, apps can be used to track the location and deployment of resources such as emergency vehicles, personnel, and supplies. This improves the efficiency of emergency response efforts (Rose et al., 2021). After an emergency, apps can provide resources and information on recovery efforts, including assistance programs, insurance claims, and community rebuilding initiatives (Dutta et al., 2019).

Table 1 contains descriptions of how smartphone applications are used in public safety and emergency services.

**Table 1.***How smartphone applications are used in public safety and emergency services*

Aspect	Description
<b>Communication</b>	- <b>Emergency Alerts:</b> Apps provide real-time alerts for disasters, weather, and other emergencies.
	- <b>Two-way Communication:</b> Allows users to report incidents, send photos, and request assistance.
<b>Mapping and Navigation</b>	- <b>GPS &amp; Location Services:</b> Apps offer real-time tracking, mapping, and navigation during emergencies.
	- <b>Evacuation Routes:</b> Provides evacuation route information and updates during crises.
<b>Information Sharing</b>	- <b>Incident Updates:</b> Delivers updates on emergency situations, road closures, and safety instructions.
	- <b>Social Media Integration:</b> Facilitates sharing of information on social media platforms.
<b>Resource Management</b>	- <b>Resource Allocation:</b> Helps authorities allocate resources like ambulances and firetrucks efficiently.
	- <b>Inventory Management:</b> Tracks equipment and supply levels in real-time.
<b>Emergency Services</b>	- <b>Request Services:</b> Allows users to request police, fire, or medical assistance.
	- <b>Emergency Contacts:</b> Provides quick access to local emergency numbers.
<b>Crowdsourced Data</b>	- <b>User-Generated Reports:</b> Encourages citizens to report incidents, road conditions, and hazards.
	- <b>Crowdsourced Damage Assessment:</b> Helps authorities assess damage quickly.
<b>Situational Awareness</b>	- <b>Live Video Feeds:</b> Offers live video streaming to assess situations remotely.
	- <b>Weather Updates:</b> Provides real-time weather information and forecasts.
<b>Community Engagement</b>	- <b>Community Alerts:</b> Sends alerts and updates to residents based on their location.
	- <b>Community Forums:</b> Allows users to connect, share information, and support each other.
<b>Training and Preparedness</b>	- <b>Training Modules:</b> Offers preparedness and safety training modules.
	- <b>Checklists &amp; Guides:</b> Provides emergency response guides and checklists.
<b>Data Analytics</b>	- <b>Data Collection:</b> Collects data on incidents, responses, and user interactions.
	- <b>Predictive Analytics:</b> Uses data to predict future incidents and allocate resources.
<b>Accessibility and Inclusivity</b>	- <b>Multilingual Support:</b> Offers content in multiple languages.
	- <b>Accessibility Features:</b> Ensures access for individuals with disabilities.
<b>Privacy and Security</b>	- <b>Data Protection:</b> Ensures user data is secure and used only for emergency purposes.
	- <b>Authentication:</b> Secures access for authorized personnel only.
<b>Integration with Other Systems</b>	- <b>Integration with First Responder Systems:</b> Connects with CAD and RMS systems.
	- <b>Interagency Coordination:</b> Facilitates communication between different agencies.
<b>Feedback and Reporting</b>	- <b>User Feedback:</b> Allows users to provide feedback on app performance.
	- <b>Incident Reporting:</b> Enables users to report issues with the app.
<b>Training and Support</b>	- <b>User Training:</b> Provides training materials for app usage.
	- <b>24/7 Support:</b> Offers support for technical issues and emergencies.

Source: (Kalasova et al., 2021; Chmielarz et al., 2021; Rose et al., 2021; Dutta et al., 2019; Ivani, Biro-Szigeti, 2019; Leal et al., 2023; Chowdhury et al., 2023; Sanchez et al., 2018; Aguilera, Boutueil, 2018).

Table 2 highlighting the advantages of using smartphone applications in in public safety and emergency services within smart cities. These advantages underscore the crucial role that smartphone applications play in enhancing public safety and emergency services within smart cities, ultimately contributing to the well-being and resilience of urban communities.

**Table 2.***Advantages of using smartphone applications in public safety and emergency services*

<b>Advantage</b>	<b>Description</b>
<b>Rapid Communication</b>	- Instant notifications and alerts to residents during emergencies.
	- Two-way communication between authorities and citizens for real-time updates.
<b>Enhanced Situational Awareness</b>	- Real-time mapping and geolocation for improved incident response.
	- Access to live video feeds and sensor data for better decision-making.
<b>Efficient Resource Allocation</b>	- Smart apps help allocate resources like emergency vehicles and personnel optimally.
	- Data-driven insights lead to quicker response times and resource management.
<b>Timely Emergency Alerts</b>	- Residents receive timely alerts about natural disasters, accidents, or security threats.
	- Personalized alerts based on location, ensuring relevance.
<b>Crowdsourced Data</b>	- Citizens can report incidents, hazards, and provide valuable situational data.
	- Authorities gain a broader perspective of ongoing events.
<b>Improved Community Engagement</b>	- Apps foster community cohesion and trust by involving residents in safety efforts.
	- Enables community-driven initiatives for disaster preparedness.
<b>Efficient Evacuation and Navigation</b>	- Provides evacuation routes and real-time traffic updates during crises.
	- GPS navigation helps residents find safe zones quickly.
<b>Data Analytics for Predictive Insights</b>	- Collects and analyzes data to predict future emergencies and plan accordingly.
	- Supports data-driven policymaking and urban planning.
<b>Access to Critical Information</b>	- Access to emergency contact information, medical records, and medication lists.
	- Enables first responders to make informed decisions.
<b>Accessibility and Inclusivity</b>	- Ensures accessibility features for individuals with disabilities.
	- Multilingual support for diverse populations.
<b>Reduction in Response Times</b>	- Faster incident reporting and response through mobile apps.
	- Reduced manual data entry and paperwork.
<b>Integration with IoT and Sensors</b>	- Integrates with smart city sensors and IoT devices for real-time data.
	- Monitors environmental conditions and detects anomalies.
<b>Enhanced First Responder Safety</b>	- Real-time updates on hazards and threats to first responders.
	- Improved coordination among emergency services.
<b>Privacy and Security Measures</b>	- Ensures data security and privacy compliance.
	- Authentication mechanisms to prevent unauthorized access.
<b>Cost Savings</b>	- Efficient resource utilization leads to cost savings.
	- Reduced infrastructure costs compared to traditional alert systems.

Source: (Kalasova et al., 2021; Chmielarz et al., 2021; Rose et al., 2021; Dutta et al., 2019; Ivani, Biro-Szigeti, 2019; Leal et al., 2023; Chowdhury et al., 2023; Sanchez et al., 2018; Aguilera, Boutueil, 2018).

Table 4 highlighting some of the common problems and challenges associated with the usage of smartphone applications in *in public safety and emergency services* within smart cities. These problems and challenges highlight the complexity of implementing smartphone applications for public safety and emergency services in smart cities. Addressing these issues requires a multi-faceted approach, including technology infrastructure development, user education, and robust data governance.

**Table 3.**

*Problems of using smartphone applications in in public safety and emergency services within smart cities*

<b>Problem</b>	<b>Description</b>
<b>Limited Access to Technology</b>	- Not all residents may have smartphones or access to mobile networks.
	- Vulnerable populations may be disproportionately affected.
<b>Reliance on Connectivity</b>	- Dependence on mobile data and internet connectivity may lead to service interruptions during disasters.
	- Offline functionality may be limited.
<b>Privacy Concerns</b>	- Collecting and sharing personal data for emergency response can raise privacy concerns.
	- Ensuring secure data storage and transmission is crucial.
<b>Digital Literacy</b>	- Some residents, particularly older adults, may struggle to use smartphone apps effectively.
	- Requires education and training efforts.
<b>App Compatibility and Updates</b>	- Compatibility issues with different smartphone models and operating systems.
	- Frequent updates may lead to app instability or require user action.
<b>False Alerts and Overload</b>	- Misuse or false reporting through apps can overwhelm emergency services.
	- Distinguishing between genuine and false alarms can be challenging.
<b>Cybersecurity Threats</b>	- Apps and data are vulnerable to hacking and cyberattacks.
	- Ensuring robust cybersecurity measures is critical.
<b>Language and Cultural Barriers</b>	- Multilingual cities may struggle to provide information in all relevant languages.
	- Addressing cultural sensitivities and communication barriers is essential.
<b>Resource Allocation Challenges</b>	- Allocating resources based on app-generated data may lead to disparities.
	- Data quality and accuracy must be ensured.
<b>Data Overload and Analysis</b>	- Managing and analyzing the vast amount of data generated by apps can be overwhelming.
	- Requires advanced analytics tools and expertise.
<b>Dependence on Smartphone Battery Life</b>	- In prolonged emergencies, smartphone battery life may become a concern.
	- Power banks and charging stations may be needed.
<b>Resistance to Adoption</b>	- Some residents may resist using new technology for emergency communication.
	- Building trust and promoting adoption is challenging.
<b>Network Congestion</b>	- During large-scale emergencies, network congestion can hinder app functionality.
	- Dedicated emergency network infrastructure is needed.
<b>Interoperability and Integration</b>	- Ensuring apps can seamlessly integrate with existing emergency systems and technologies.
	- Compatibility between different agencies' apps is vital.
<b>Cost of Development and Maintenance</b>	- Developing and maintaining robust emergency apps can be expensive.
	- Funding challenges may arise.
<b>User Error and Misuse</b>	- Users may unintentionally cause errors or misuse the app during emergencies.
	- Clear user interfaces and training can mitigate this.
<b>Dependence on Electricity</b>	- Smartphones require electricity to function; power outages can disrupt communication.
	- Backup power solutions are needed.

Source: (Kalasova et al., 2021; Chmielarz et al., 2021; Rose et al., 2021; Dutta et al., 2019; Ivani, Biro-Szigeti, 2019; Leal et al., 2023; Chowdhury et al., 2023; Sanchez et al., 2018; Aguilera, Boutueil, 2018).

One of the primary challenges lies in ensuring equitable access to smartphone technology. Not all residents may possess smartphones or have reliable access to mobile networks. To address this issue, local governments can step in by providing subsidized smartphones or mobile hotspots to underserved communities. Additionally, the establishment of public spaces



equipped with free Wi-Fi can bridge the digital divide. Public safety apps heavily rely on mobile data and internet connectivity, making them susceptible to service interruptions during disasters. A solution to this is the development of backup communication systems, such as radio-based networks, to ensure continuous communication even when traditional networks fail. Furthermore, optimizing apps for offline functionality can prove invaluable during emergencies.

As these apps collect and share sensitive personal data for emergency response purposes, privacy concerns inevitably arise. Striking the right balance between collecting necessary data for emergency management and safeguarding individual privacy is crucial. Strict data protection policies and adherence to privacy regulations are a must. Transparent communication regarding data usage and storage policies helps build trust among users. Digital literacy is another challenge, particularly among older adults and those less familiar with smartphone technology. To address this, cities can launch digital literacy training programs tailored to different age groups and skill levels. Furthermore, designing user-friendly interfaces and providing in-app tutorials and guides can make these apps more accessible to all.

The diverse landscape of smartphone models and operating systems can pose compatibility challenges. Regular testing across various devices and operating systems is essential to ensure broad accessibility. Clear instructions for users on updating apps, along with automated update mechanisms, can simplify maintenance. Misuse or false reporting through apps can overwhelm emergency services. Implementing user authentication and verification mechanisms can reduce false reporting. Educational campaigns can educate the public on responsible app usage and the potential consequences of misuse.

Apps and the data they handle are susceptible to hacking and cyberattacks. Robust cybersecurity measures, including encryption, intrusion detection, and frequent security audits, are necessary to safeguard sensitive information. Developing incident response plans to mitigate cyberattacks swiftly is equally vital. Cities with diverse populations may struggle to provide information in multiple languages and navigate cultural sensitivities. Translating app content into relevant languages and consulting with community leaders and cultural experts can help overcome these challenges.

Efficiently allocating resources based on app-generated data can be challenging. Advanced data analytics tools and protocols for validating and prioritizing incoming data can streamline this process. Clear procedures for responding to app-generated reports and incidents are essential. The vast amount of data generated by these apps can be overwhelming. Investing in big data analytics tools and expertise to manage and extract insights from these datasets is critical. Automated algorithms can assist in analyzing and interpreting data in real-time.

In prolonged emergencies, smartphone battery life may become a concern. Providing access to charging stations in public spaces and emergency shelters is a practical solution. Encouraging residents to maintain backup power sources, such as power banks, can also mitigate this challenge. Some residents may resist using new technology for emergency communication due

to unfamiliarity or distrust. Public awareness campaigns that highlight the benefits of emergency apps, along with endorsements from community leaders and local influencers, can promote adoption.

During large-scale emergencies, network congestion can hinder app functionality. Investment in robust network infrastructure with priority access for emergency services and protocols for load balancing during peak usage can alleviate this issue. Ensuring seamless integration of apps across various emergency agencies and with existing systems is crucial. Establishing standards and protocols for app integration, along with fostering collaboration between agencies, can enhance information sharing and coordination.

Developing and maintaining robust emergency apps can be expensive. Seeking public-private partnerships for funding and resource sharing can alleviate budget constraints. Prioritizing budget allocations for these critical applications is essential. Users may inadvertently cause errors or misuse the app during emergencies. Designing intuitive user interfaces, providing clear instructions, and offering ongoing user support and education can minimize these challenges.

Smartphones require electricity to function, making them vulnerable during power outages. Installing backup power systems in critical locations, such as emergency operations centers and communication hubs, and creating awareness about power outage preparedness can mitigate this concern.

Addressing these challenges requires a collaborative effort involving government agencies, technology developers, community organizations, and the public. By proactively tackling these issues, cities can harness the full potential of smartphone applications to enhance public safety and emergency services, ultimately creating smarter and more resilient urban environments.

### **3. Conclusion**

In the ever-evolving landscape of smart city development, the integration of smartphone applications for public safety and emergency services stands as a vital pillar in creating urban environments that are safer, more efficient, and ultimately, more resilient. These applications empower both citizens and authorities to collaborate effectively, respond swiftly to crises, and make data-driven decisions that enhance the overall well-being and quality of life in modern cities.

Smart cities are rapidly gaining traction worldwide, and their evolution hinges on harnessing technology to improve various facets of urban life, including public safety and emergency response. Smartphone applications play a pivotal role in this transformation, revolutionizing the speed and efficiency of emergency services.

By allowing citizens to report emergencies in real-time, provide critical information, and share their precise locations, smartphone applications enable emergency responders to reach incidents faster, potentially saving lives and reducing property damage. These applications also contribute to more efficient resource allocation by analyzing data from various sources, ensuring that emergency personnel and equipment are deployed precisely where they are needed most.

Moreover, the advantages of smartphone applications extend beyond rapid response times. They facilitate timely emergency alerts, equip citizens with navigation tools during crises, provide information on evacuation routes and shelter locations, and maintain up-to-date contact lists for essential services. These apps also serve as educational platforms for disaster preparedness, offering training modules, checklists, and guidelines to help citizens plan and respond effectively to emergencies.

Crowdsourced data collection is another significant feature, allowing users to report incidents, road conditions, and hazards. This invaluable information aids emergency responders in prioritizing their efforts during critical situations. Smartphone applications are designed with inclusivity in mind, offering support for individuals with disabilities and multilingual capabilities to cater to diverse populations.

These applications even transcend individual utility by integrating with social media platforms, facilitating the dissemination of crucial information to a wider audience. For emergency management professionals, these apps enable the tracking and deployment of resources, enhancing the overall efficiency of emergency response efforts. Furthermore, post-emergency phases benefit from these applications by offering resources and information on recovery efforts, insurance claims, and community rebuilding initiatives.

Despite their undeniable advantages, the implementation of smartphone applications for public safety and emergency services within smart cities is not without its challenges. Limited access to technology, reliance on connectivity, privacy concerns, digital literacy gaps, compatibility issues, and cybersecurity threats are among the hurdles to overcome. Additionally, challenges related to language and culture, resource allocation, data overload, user errors, and resistance to adoption require careful consideration and strategic solutions.

Addressing these challenges necessitates a holistic approach that encompasses technological enhancements, user education, and robust data governance. By embracing these challenges head-on and working collaboratively with government agencies, technology developers, community organizations, and the public, smart cities can fully harness the potential of smartphone applications to enhance public safety and emergency services. In doing so, they pave the way for urban environments that are not only smarter but also safer and more resilient for all their residents.

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## THE APPLICATIONS OF USAGE OF BUSINESS ANALYTICS IN ENERGY MANAGEMENT IN INDUSTRY 4.0 CONDITIONS

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**Purpose:** The purpose of this publication is to present the applications of usage of business analytics in energy management.

**Design/methodology/approach:** Critical literature analysis. Analysis of international literature from main databases and polish literature and legal acts connecting with researched topic.

**Findings:** The advantages of using business analytics in energy management are substantial, including cost reduction, enhanced energy efficiency, and sustainability alignment. This approach also provides real-time monitoring and control capabilities, predictive maintenance, and compliance with regulatory requirements. However, it comes with challenges such as data integration complexity, data quality, and security issues, as well as the need to address high implementation costs and talent gaps. Business analytics is a game-changer in energy management within Industry 4.0, offering numerous benefits but also requiring organizations to overcome significant challenges. Embracing these complexities will enable organizations to thrive in this dynamic landscape while contributing to a sustainable and efficient future.

**Keywords:** business analytics, Industry 4.0, digitalization, artificial intelligence, real-time monitoring; energy management.

**Category of the paper:** literature review.

### 1. Introduction

In the era of Industry 4.0, characterized by the integration of digital technologies into industrial processes, businesses across various sectors are harnessing the power of data analytics to optimize their operations. One critical area where data analytics is making a significant impact is energy management (Scappini, 2016). With the increasing emphasis on sustainability and cost-efficiency, organizations are turning to advanced business analytics to not only monitor but also enhance their energy consumption and resource utilization.

This article explores the pivotal role of business analytics in energy management within Industry 4.0 conditions.

The purpose of this publication is to present the applications of usage of business analytics in energy management.

## **2. The selected aspects of business analytics usage in energy management processes**

In Industry 4.0, data is abundant and easily accessible, thanks to the proliferation of sensors, IoT devices, and interconnected systems. These technological advancements enable real-time data collection, allowing businesses to gain deep insights into their energy usage patterns (Wolniak, 2016; Czerwińska-Lubszczyk et al., 2022; Drozd, Wolniak, 2021; Gajdzik, Wolniak, 2021, 2022; Gębczyńska, Wolniak, 2018, 2023; Grabowska et al., 2019, 2020, 2021; Wolniak et al., 2023; Wolniak, Grebski, 2023; Wolniak, Skotnicka-Zasadzień, 2023; Jonek-Kowalska, Wolniak, 2023). Data on electricity, gas, water, and other resources can be continuously monitored and analyzed to identify areas of inefficiency or opportunities for improvement. Predictive analytics tools play a vital role in forecasting energy consumption. By analyzing historical data, weather patterns, production schedules, and other relevant factors, businesses can create predictive models that help anticipate energy demands. This proactive approach allows for better planning and allocation of resources, reducing energy waste and costs (Jonek-Kowalska, Wolniak, 2021, 2022; Jonek-Kowalska et al., 2022; Kordel, Wolniak, 2021, Orzeł, Wolniak, 2021, 2022, 2023; Rosak-Szyrocka et al., 2023; Gajdzik et al., 2023; Ponomarenko et al., 2016; Stawiarska et al., 2020, 2021; Stecuła, Wolniak, 2022; Olkiewicz et al., 2021).

Business analytics tools can pinpoint specific areas within an industrial facility where energy efficiency can be improved. For instance, by analyzing equipment performance data, organizations can identify machines that consume excessive energy or require maintenance. Continuous monitoring enables businesses to fine-tune processes for maximum efficiency. Energy management in Industry 4.0 goes beyond day-to-day operations. Predictive analytics can help businesses participate in demand response programs, where they adjust energy consumption during peak periods to reduce costs. Peak shaving strategies can be implemented to flatten energy demand curves, ensuring efficient use of resources and minimizing expensive peak-time charges. Sustainability is a top priority in Industry 4.0, and business analytics plays a crucial role in achieving sustainability goals. By analyzing energy consumption data and emissions data, organizations can identify opportunities to reduce their carbon footprint. These insights enable the implementation of energy-efficient technologies and renewable energy sources, contributing to a greener and more eco-friendly operation (Greasley, 2019).

Efficient energy management not only reduces costs but also enhances a company's competitiveness (Nourani, 2021). By using data analytics to optimize energy usage, businesses can lower operational expenses, increase profit margins, and offer more competitive pricing to consumers. Additionally, a commitment to sustainable energy practices can enhance a company's reputation and appeal to environmentally conscious customers. Industry 4.0 brings with it a host of new regulations and standards related to energy and environmental management (Wolniak, Skotnicka-Zasadzień, 2008, 2010, 2014, 2018, 2019, 2022; Wolniak, 2011, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022; Gajdzik, Wolniak, 2023; Wolniak, 2013, 2016; Hys, Wolniak, 2018). Business analytics can help organizations ensure compliance by providing accurate data and performance metrics. This reduces the risk of fines and legal issues while demonstrating a commitment to corporate responsibility (Charles et al., 2023).

In Industry 4.0 conditions, businesses cannot afford to overlook the critical role of business analytics in energy management. Leveraging data-driven insights to optimize energy consumption not only reduces costs but also aligns with sustainability objectives. By continuously monitoring, analyzing, and acting upon energy-related data, organizations can thrive in an increasingly competitive and eco-conscious world while making significant strides towards a sustainable future (Peter et al., 2023).

Table 1 contains descriptions of how business analytics is used in energy management. These examples demonstrate the versatile applications of business analytics in energy management, ranging from real-time monitoring to long-term sustainability planning. Organizations can leverage these analytics-driven strategies to optimize energy usage, reduce costs, and achieve their environmental and business objectives.

**Table 1.**

*The usage of business analytics in energy management*

<b>Application of Business Analytics</b>	<b>Description</b>
<b>Real-time Energy Monitoring</b>	Continuous monitoring of energy consumption and production in real-time to identify anomalies and optimize usage.
<b>Predictive Maintenance</b>	Using predictive analytics to forecast equipment failures and schedule maintenance to prevent energy waste.
<b>Energy Demand Forecasting</b>	Analyzing historical data and external factors to predict energy demands and optimize resource allocation.
<b>Peak Demand Management</b>	Implementing strategies to reduce energy consumption during peak demand periods to lower costs and avoid penalties.
<b>Energy Efficiency Analysis</b>	Identifying inefficiencies in equipment and processes through data analytics and making adjustments for optimal efficiency.
<b>Renewable Energy Integration</b>	Analyzing data to determine the optimal integration of renewable energy sources like solar and wind into the grid.
<b>Carbon Emissions Tracking</b>	Using analytics to monitor and report on carbon emissions, ensuring compliance with environmental regulations.
<b>Demand Response Optimization</b>	Utilizing analytics to participate in demand response programs, adjusting energy consumption during peak times for cost savings.
<b>Energy Procurement Strategy</b>	Analyzing market data and consumption patterns to optimize energy procurement, considering factors like contract negotiations and tariffs.

Cont. table 1.

<b>Sustainability Reporting</b>	Compiling data on energy usage and emissions for sustainability reports, demonstrating corporate responsibility.
<b>Energy Cost Reduction</b>	Identifying cost-saving opportunities through analytics, such as negotiating better energy contracts or optimizing energy use.
<b>Energy Benchmarking</b>	Comparing energy consumption and efficiency against industry benchmarks to identify areas for improvement.
<b>Energy Performance Dashboards</b>	Creating interactive dashboards that display key energy metrics and performance indicators for easy monitoring.
<b>Energy Portfolio Optimization</b>	Managing a diverse portfolio of energy sources (e.g., gas, electricity, renewables) to balance costs and reliability.
<b>Energy Data Visualization</b>	Visualizing energy data through graphs and charts to make complex information more accessible for decision-makers.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz et al., 2015; Nourani, 2021; Peter et al., 2023).

### 3. Software used in energy management in Industry 4.0 conditions

Many types of software has emerged as a crucial tool for optimizing energy management within industrial settings. Leveraging sophisticated software solutions, organizations can monitor, analyze, and control their energy consumption more effectively than ever before. This article explores how software is utilized in energy management within the Industry 4.0 landscape (Cillo et al., 2022).

One of the cornerstones of Industry 4.0 is real-time data. Specialized software, often integrated with sensors and IoT devices, allows industries to continuously monitor energy consumption across their operations. Real-time data enables immediate responses to anomalies, optimizing energy usage and minimizing wastage. Operators can also remotely control equipment and processes to achieve peak energy efficiency. Industry 4.0 software employs predictive analytics algorithms to forecast energy demand and consumption patterns. These predictive models consider factors such as historical usage, production schedules, and external variables like weather conditions. By anticipating energy needs, organizations can proactively adjust operations to minimize costs and avoid disruptions. Software solutions are adept at identifying inefficiencies in industrial processes. They analyze data from various sources, including equipment sensors and production logs, to pinpoint areas where energy consumption can be optimized. Adjustments can then be made to machinery settings, production schedules, and logistics to achieve greater energy efficiency (Adel, 2022).

Energy management software supports demand response strategies, enabling industries to participate in demand-side management programs. When demand on the grid is high, these programs allow companies to reduce their energy usage or shift it to off-peak hours, reducing energy costs and supporting grid stability. Many organizations are adopting renewable energy sources as part of their sustainability efforts (Javaid, Haleem, 2020). Energy management



software helps integrate renewable energy, such as solar panels or wind turbines, into the energy mix. These systems optimize the generation, storage, and distribution of renewable energy, ensuring its effective use. Software solutions analyze energy procurement options, track energy prices, and manage contracts to minimize energy costs. They provide insights into the most cost-effective energy sources, suppliers, and tariff structures, helping companies make informed decisions (Di Marino et al., 2023).

In the complex regulatory landscape of Industry 4.0, energy management software helps organizations stay compliant with environmental and energy efficiency regulations. It automates the collection and reporting of energy data, reducing the risk of non-compliance and associated penalties. Software platforms offer interactive dashboards and reporting tools that transform complex energy data into actionable insights. Visualization simplifies the communication of key energy performance indicators to decision-makers, facilitating informed choices (Bakir, Dahlan, 2022).

As industries continue to evolve in this digital age, software-driven energy management will play a pivotal role in reducing costs, enhancing competitiveness, and meeting environmental objectives. By embracing advanced software solutions, companies can navigate the complexities of Industry 4.0 while creating a more sustainable and efficient future (Olsen, 2023).

Table 2 highlighting examples of software and applications used in energy management, along with descriptions of their usage. These software and applications play an important role in energy management, enabling organizations to monitor, analyze, and optimize their energy usage, reduce costs, and meet sustainability objectives in an increasingly data-driven and interconnected world.

**Table 2.**

*The usage of business analytics in energy management*

<b>Software/Application</b>	<b>Description of Usage</b>
<b>Energy Management Systems (EMS)</b>	EMS software is used for real-time monitoring, control, and optimization of energy consumption within facilities. It provides insights into energy usage patterns, manages equipment, and automates responses to reduce energy costs and wastage.
<b>Building Energy Management Systems (BEMS)</b>	BEMS software focuses on energy management within commercial and residential buildings. It monitors HVAC systems, lighting, and other building services to optimize energy usage for comfort and efficiency while reducing costs.
<b>SCADA (Supervisory Control and Data Acquisition)</b>	SCADA systems are used in industrial settings to monitor and control processes, including energy-related operations. They provide real-time data visualization and control capabilities for energy-intensive industries like manufacturing and utilities.
<b>Demand Response (DR) Platforms</b>	DR platforms help organizations participate in demand response programs. They allow users to adjust energy usage during peak periods or in response to grid conditions, helping reduce energy costs and support grid stability.

Cont. table 2.

<b>Energy Analytics Software</b>	Energy analytics tools analyze historical and real-time data to identify energy inefficiencies, forecast consumption, and suggest optimization strategies. These tools provide actionable insights for decision-makers.
<b>Renewable Energy Management Software</b>	This software is designed to monitor and manage renewable energy sources like solar panels and wind turbines. It tracks energy production, forecasts generation, and optimizes storage and distribution.
<b>Carbon Emissions Tracking Software</b>	Carbon tracking software helps organizations monitor and report greenhouse gas emissions, ensuring compliance with environmental regulations and facilitating sustainability reporting.
<b>Smart Grid Management Software</b>	Smart grid software enables utilities to manage and optimize the distribution of electricity in real-time, incorporating renewable energy sources and improving grid reliability. It also supports demand-side management.
<b>Energy Procurement and Contract Management Software</b>	This software assists organizations in optimizing their energy procurement strategies by analyzing market data, tracking contracts, and managing suppliers. It aims to reduce energy costs and risks.
<b>Energy Simulation and Modeling Software</b>	These tools create virtual models of buildings or industrial processes to simulate and optimize energy usage under different conditions. They are used in design and planning phases to maximize efficiency.
<b>Energy Data Visualization Platforms</b>	Visualization tools display energy data through interactive dashboards, graphs, and charts, making it easier for users to understand and act upon complex energy-related information.
<b>Energy Auditing Software</b>	Energy auditing software facilitates energy assessments of buildings and industrial sites. It helps identify energy-saving opportunities, track improvements, and calculate potential cost savings.
<b>IoT (Internet of Things) Energy Monitoring Devices</b>	IoT devices and sensors collect real-time data on energy consumption and equipment performance, which can be integrated with various energy management software systems for analysis and control.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz et al., 2015; Nourani, 2021; Peter et al., 2023).

#### 4. Advantages and problems with business analytics usage in energy management

By harnessing data analytics, organizations can unlock a plethora of advantages that not only enhance efficiency but also align with sustainability goals. One of the primary benefits of business analytics in energy management is cost reduction. Organizations can identify energy inefficiencies, optimize consumption, and streamline procurement strategies. This leads to substantial savings in operational expenses, a critical advantage in the competitive environment of Industry 4.0 results (Wolniak, Grebski, 2018; Wolniak et al., 2019, 2020; Wolniak, Habek, 2015, 2016; Wolniak, Skotnicka, 2011; Wolniak, Jonek-Kowalska, 2021; 2022).

Analytics-driven insights enable organizations to fine-tune their equipment, processes, and operations for maximum energy efficiency. This translates to reduced energy waste and a reduced environmental footprint. Improved efficiency also enhances overall productivity and competitiveness (Ghibakholl et al., 2022).

Sustainability is a cornerstone of Industry 4.0, and business analytics plays a pivotal role in achieving eco-friendly objectives. By effectively monitoring and managing energy usage, organizations can significantly reduce carbon emissions, aligning with global sustainability initiatives and demonstrating a commitment to environmental responsibility (Aslam et al., 2020). Business analytics provides real-time visibility into energy consumption and performance. This enables organizations to make immediate adjustments and respond swiftly to anomalies. Proactive management enhances operational reliability, reduces costly disruptions, and ensures continuous production and uptime (Akundi et al, 2022).

Table 3 contains the advantages of using business analytics in energy management within Industry 4.0 conditions, along with descriptions for each advantage. These advantages underscore the pivotal role of business analytics in energy management within Industry 4.0 conditions. They not only contribute to cost savings and operational efficiency but also enable organizations to thrive in an era focused on sustainability, innovation, and competitiveness.

**Table 3.**

*The advantages of using business analytics in energy management*

Advantage	Description
<b>Cost Reduction</b>	Business analytics enable organizations to identify and eliminate energy inefficiencies, resulting in substantial cost savings. By optimizing energy consumption and procurement strategies, businesses can lower operational expenses, which is especially critical in the competitive landscape of Industry 4.0.
<b>Energy Efficiency Improvement</b>	Analytics-driven insights allow for the fine-tuning of equipment, processes, and operations to maximize energy efficiency. This leads to reduced energy waste and a smaller environmental footprint. Improved efficiency also enhances the overall productivity and competitiveness of organizations in Industry 4.0.
<b>Enhanced Sustainability</b>	Industry 4.0 emphasizes sustainability, and business analytics play a crucial role in achieving eco-friendly goals. By monitoring and managing energy usage effectively, organizations can reduce their carbon emissions and demonstrate a commitment to environmental responsibility, aligning with global sustainability initiatives.
<b>Real-Time Monitoring and Control</b>	Analytics provide real-time visibility into energy consumption and performance, allowing organizations to make immediate adjustments and respond to anomalies promptly. This proactive approach enhances operational reliability and helps avoid costly disruptions, ensuring continuous production and uptime.
<b>Predictive Maintenance</b>	Predictive analytics predict equipment failures based on historical and real-time data, allowing for preventive maintenance. By addressing potential issues before they escalate, organizations reduce downtime, extend equipment lifespans, and avoid energy waste associated with inefficient or failing machinery.
<b>Optimized Resource Allocation</b>	Energy demand forecasting through analytics helps organizations allocate resources more effectively. By accurately predicting energy requirements, businesses can allocate resources, including labor and materials, to match production needs. This ensures resource optimization and reduces waste, contributing to cost-efficiency in Industry 4.0 conditions.
<b>Competitive Advantage</b>	Leveraging business analytics in energy management provides organizations with a competitive edge. Companies that can lower their energy costs, enhance sustainability, and meet regulatory requirements more efficiently are better positioned to compete effectively in the dynamic landscape of Industry 4.0, attracting environmentally conscious customers and investors.

Cont. table 3.

<b>Regulatory Compliance</b>	In Industry 4.0, regulations and standards governing energy and environmental management are complex and stringent. Business analytics simplify compliance by providing accurate data and automated reporting, reducing the risk of fines and legal issues associated with non-compliance. Ensuring regulatory adherence is essential for avoiding costly penalties and reputation damage.
<b>Data-Driven Decision-Making</b>	Analytics transform vast amounts of energy-related data into actionable insights. This data-driven decision-making empowers organizations to make informed choices about energy procurement, efficiency projects, and sustainability initiatives, resulting in more effective strategies and resource allocation. In Industry 4.0, data-driven decision-making is a key driver of success.
<b>Operational Resilience</b>	Real-time monitoring and predictive analytics bolster operational resilience. By quickly identifying and responding to energy-related issues, organizations can maintain consistent production and minimize disruptions. This resilience is critical in Industry 4.0, where downtime can have far-reaching consequences on production schedules and customer commitments.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz et al., 2015; Nourani, 2021; Peter et al., 2023).

Table 4 contains the problems of using business analytics in energy management within Industry 4.0 conditions, along with descriptions for each advantage. These problems and challenges underscore the complexity and multifaceted nature of implementing business analytics in energy management within Industry 4.0 conditions. Addressing these issues requires careful planning, investment, and ongoing commitment to ensure that organizations can harness the full potential of analytics for efficient energy management.

**Table 4.**

*The problems of using business analytics in energy management*

<b>Problem/Challenge</b>	<b>Description</b>
<b>Data Integration Complexity</b>	In Industry 4.0, data is generated from numerous sources, including IoT devices, sensors, and legacy systems. Integrating this diverse data into a coherent analytics platform can be challenging. Data integration complexity can hinder the seamless flow of information required for accurate energy management, potentially leading to incomplete or inaccurate analyses.
<b>Data Quality and Accuracy</b>	The quality and accuracy of data are paramount for effective analytics. Inaccurate or incomplete data can lead to faulty conclusions and suboptimal energy management decisions. Maintaining data quality, cleaning and preprocessing data, and addressing data gaps are ongoing challenges in Industry 4.0, where data volumes are massive and diverse.
<b>Data Privacy and Security</b>	With the increased reliance on data analytics comes the concern of data privacy and security. Energy consumption data and related information are sensitive and must be protected from unauthorized access and breaches. Balancing the need for data accessibility with robust security measures is a challenge, especially in interconnected Industry 4.0 environments where cyber threats are prevalent.
<b>Complexity of Analytical Models</b>	Developing and deploying sophisticated analytical models for energy management can be complex and resource-intensive. Many organizations lack the in-house expertise to create and maintain these models effectively. The complexity of models can lead to delays in decision-making, making it challenging to respond promptly to changing energy conditions.
<b>High Initial Implementation Costs</b>	Implementing advanced analytics systems for energy management in Industry 4.0 conditions often requires significant upfront investments in hardware, software, and talent. These costs can be prohibitive for smaller organizations or those with limited budgets, posing a barrier to entry for advanced energy analytics.

Cont. table 4.

<b>Scalability and Infrastructure</b>	As organizations grow and expand their operations, the scalability of energy analytics solutions becomes critical. Scaling up analytics infrastructure and processes to accommodate larger data volumes and more complex operations can be challenging. Ensuring that the analytics infrastructure remains efficient and effective while scaling is an ongoing concern in Industry 4.0 conditions.
<b>Talent and Skill Gap</b>	Leveraging business analytics in energy management requires a skilled workforce capable of understanding data analytics tools and techniques. The shortage of data scientists, analysts, and engineers with domain expertise in both energy management and Industry 4.0 technologies can hinder the effective implementation of analytics initiatives. Bridging this skill gap is essential for realizing the full potential of analytics.
<b>Interoperability of Systems</b>	Industry 4.0 environments often consist of heterogeneous systems and technologies from different vendors. Ensuring the interoperability of these systems with energy analytics platforms can be challenging. A lack of standardization and compatibility issues can result in data silos, limiting the comprehensive analysis needed for efficient energy management.
<b>Regulatory and Compliance Complexities</b>	Industry 4.0 is subject to evolving regulations and standards in the realms of energy management and environmental compliance. Navigating these complexities while integrating analytics solutions can be daunting. Organizations must remain up-to-date with changing regulations and ensure that their analytics systems align with compliance requirements, which can be resource-intensive and time-consuming.
<b>Change Management and Adoption</b>	The adoption of analytics-driven energy management often necessitates a cultural shift within organizations. Employees must embrace data-driven decision-making, which can be met with resistance. Implementing change management strategies and fostering a culture of data literacy and analytics adoption is a challenge, as it requires buy-in from all levels of the organization to ensure successful integration and utilization of analytics solutions.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz at al., 2015; Nourani, 2021; Peter et al., 2023).

## 5. Conclusion

In the era of Industry 4.0, businesses are undergoing a transformative journey by integrating digital technologies into their industrial processes. Data analytics has emerged as a critical tool in this evolution, and its impact on energy management is particularly noteworthy. This article has explored the significant role of business analytics in optimizing energy consumption and resource utilization within the context of Industry 4.0.

The advantages of using business analytics in energy management are substantial. Firstly, it leads to cost reduction by identifying and addressing energy inefficiencies, thus lowering operational expenses in a highly competitive landscape. Secondly, it enhances energy efficiency by fine-tuning equipment, processes, and operations, resulting in reduced energy waste and a smaller environmental footprint. Thirdly, it contributes to enhanced sustainability by monitoring and managing energy usage effectively, aligning with global sustainability initiatives and demonstrating environmental responsibility.

Additionally, business analytics provides real-time monitoring and control capabilities, ensuring prompt responses to anomalies and minimizing costly disruptions. Predictive maintenance forecasts equipment failures, allowing for preventive maintenance and reduced downtime. It also enables participation in demand response programs, peak demand management, and regulatory compliance, all crucial aspects of Industry 4.0.

However, there are challenges and complexities to navigate in the application of business analytics in energy management within Industry 4.0. These include the complexity of integrating diverse data sources, ensuring data quality and security, developing and maintaining complex analytical models, managing high initial implementation costs, and addressing scalability concerns as organizations expand. Furthermore, bridging the talent and skill gap, ensuring interoperability of systems, navigating regulatory complexities, and managing the cultural shift toward data-driven decision-making pose additional hurdles.

In summary, business analytics is a game-changer in energy management within Industry 4.0 conditions. It offers a multitude of benefits, including cost reduction, enhanced efficiency, sustainability, and regulatory compliance. However, organizations must be prepared to address the challenges associated with data integration, quality, security, complexity, and talent to fully realize the potential of analytics in energy management. Embracing these challenges will empower organizations to thrive in the dynamic landscape of Industry 4.0 while contributing to a sustainable and efficient future.

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## THE APPLICATION OF BUSINESS ANALYTICS IN PRODUCT CUSTOMIZATION AND PERSONALIZATION

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**Purpose:** The purpose of this publication is to present the applications of usage of business analytics in energy management.

**Design/methodology/approach:** Critical literature analysis. Analysis of international literature from main databases and polish literature and legal acts connecting with researched topic.

**Findings:** The advantages of using business analytics in energy management are substantial, including cost reduction, enhanced energy efficiency, and sustainability alignment. This approach also provides real-time monitoring and control capabilities, predictive maintenance, and compliance with regulatory requirements. However, it comes with challenges such as data integration complexity, data quality, and security issues, as well as the need to address high implementation costs and talent gaps. Business analytics is a game-changer in energy management within Industry 4.0, offering numerous benefits but also requiring organizations to overcome significant challenges. Embracing these complexities will enable organizations to thrive in this dynamic landscape while contributing to a sustainable and efficient future.

**Keywords:** business analytics, Industry 4.0, digitalization, artificial intelligence, real-time monitoring; customization, personalization.

**Category of the paper:** literature review.

### 1. Introduction

Business analytics plays a pivotal role in the era of modern business, particularly when it comes to product customization and personalization. In an increasingly competitive marketplace where consumers are inundated with choices, tailoring products and services to individual preferences has become a strategic imperative for companies seeking to thrive and grow. In this paper, we delve into how business analytics is leveraged to drive product

customization and personalization, delivering enhanced customer experiences and bolstering bottom lines.

The purpose of this publication is to present the applications of usage of business analytics in energy management.

## **2. Customization and personalization of product – the usage of business analytics**

The role of personalization and customization of products in Industry 4.0 is pivotal and transformative. Industry 4.0, also known as the Fourth Industrial Revolution, represents a paradigm shift in manufacturing and production, characterized by the integration of digital technologies, automation, data analytics, and the Internet of Things (IoT) into industrial processes. Industry 4.0 enables companies to create highly personalized products that cater to individual customer preferences. Customers today expect products that align with their unique needs and tastes. By leveraging advanced technologies, companies can deliver products that resonate with each customer on a personal level, thereby enhancing the overall customer experience (Wolniak, 2016; Czerwińska-Lubszczyk et al., 2022; Drozd, Wolniak, 2021; Gajdzik, Wolniak, 2021, 2022; Gębczyńska, Wolniak, 2018, 2023; Grabowska et al., 2019, 2020, 2021; Wolniak et al., 2023; Wolniak, Grebski, 2023; Wolniak, Skotnicka-Zasadzień, 2023; Jonek-Kowalska, Wolniak, 2023).

Personalization in Industry 4.0 goes beyond simple customization; it involves mass customization, where products can be tailored to suit individual preferences on a large scale. This is achieved by combining automation and digital technologies to efficiently produce customized products at a scale and cost that was previously unattainable. Personalization and customization allow for demand-driven manufacturing (Wolniak, Grebski, 2018; Wolniak et al., 2019, 2020; Wolniak, Habek, 2015, 2016; Wolniak, Skotnicka, 2011; Wolniak, Jonek-Kowalska, 2021; 2022).. Instead of producing items in large quantities and hoping they sell, businesses can produce goods based on actual customer demand. This reduces inventory costs, waste, and the risk of overproduction (Jonek-Kowalska, Wolniak, 2021, 2022; Jonek-Kowalska et al., 2022; Kordel, Wolniak, 2021, Orzeł, Wolniak, 2021, 2022, 2023; Rosak-Szyrocka et al., 2023; Gajdzik et al., 2023; Ponomarenko et al., 2016; Stawiarska et al., 2020, 2021; Stecuła, Wolniak, 2022; Olkiewicz et al., 2021).

Industry 4.0 relies heavily on data collection and analysis. Personalization and customization generate valuable data about customer preferences and behavior. This data can be used not only to tailor products but also to gain insights into market trends, enabling companies to make informed decisions about product development and marketing strategies (Wolniak, Skotnicka-



Zasadzień, 2008, 2010, 2014, 2018, 2019, 2022; Wolniak, 2011, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022; Gajdzik, Wolniak, 2023; Wolniak, 2013, 2016; Hys, Wolniak, 2018).

Customized products often require stringent quality control measures to ensure they meet the unique specifications of each customer. Industry 4.0 technologies, including sensors and data analytics, enable real-time quality monitoring and rapid adjustments in production to maintain high-quality standards. Personalization can contribute to sustainability efforts by reducing waste. When products are made to order, there is less excess inventory that may go unsold and end up as waste. This aligns with the growing demand for eco-friendly and sustainable practices.

Business analytics starts with data collection and analysis. By mining customer data from various sources such as online behavior, purchase history, and demographic information, companies gain valuable insights into customer preferences, behavior patterns, and desires. These insights serve as the foundation for effective product customization and personalization strategies. Analytics helps in segmenting customers into distinct groups based on shared characteristics or behaviors (Ghibakholl et al., 2022). These segments can range from broad categories to highly specific niches. Once segments are defined, companies can target each group with customized products or offerings that are tailored to their unique needs and preferences. This approach is far more effective than one-size-fits-all marketing strategies (Scappini, 2016).

Product recommendations are one of the most visible forms of personalization. Businesses employ recommendation engines that use complex algorithms, often driven by machine learning, to suggest products or content to customers (Nourani, 2021). These recommendations are based on the customer's past interactions, as well as the behavior of similar customers. Amazon's product recommendation system is a prime example of this in action. Analytics also facilitates dynamic pricing, where prices are adjusted in real-time based on various factors, including demand, competitor pricing, and customer behavior (Charles et al., 2023). Airlines and ride-sharing services like Uber employ this strategy to optimize revenue. It allows businesses to offer personalized pricing to different customer segments, increasing the likelihood of purchase (Bakir, Dahlan, 2022). Analytics is instrumental in conducting A/B tests, where different versions of a product or website are shown to different groups of users, and their interactions are analyzed. This helps in fine-tuning product features or website layouts to maximize user engagement and conversion rates, making the user experience more personal and effective. In manufacturing and e-commerce, analytics plays a crucial role in optimizing supply chains to meet the demands of custom or personalized products efficiently. Predictive analytics can help forecast demand for specific variations of a product, reducing waste and improving inventory management (Greasley, 2019).

Listening to customer feedback through surveys, reviews, and social media is vital for product improvement and personalization. Advanced sentiment analysis tools can help businesses extract actionable insights from unstructured textual data, enabling them to make

data-driven decisions to enhance their products. With the advancement of technology, real-time personalization is becoming more prevalent (Javaid, Haleem, 2020). Websites and mobile apps can adapt their content and user interfaces on the fly based on a user's behavior and preferences. This level of personalization enhances the user experience and increases engagement (Peter et al., 2023).

Businesses can use predictive analytics to anticipate what features or customizations customers will desire in the future (Di Marino et al., 2023). This foresight informs product development efforts, ensuring that new offerings align with evolving customer needs and preferences. Ultimately, effective product customization and personalization driven by business analytics can provide a significant competitive advantage. Companies that can consistently deliver tailored experiences are more likely to build customer loyalty, increase customer lifetime value, and outperform competitors (Cillo et al., 2022).

The integration of business analytics into product customization and personalization strategies has revolutionized the way companies interact with their customers. By leveraging data-driven insights, businesses can create highly tailored experiences that resonate with individual preferences, resulting in increased customer satisfaction, loyalty, and profitability (Akundi et al., 2022). As technology and analytics continue to advance, the potential for even more sophisticated personalization and customization is bound to grow, reshaping the landscape of business in the process (Adel, 2022).

Table 1 contains descriptions of how business analytics is used in product customization and personalization. This comprehensive table highlights the diverse applications of business analytics in customizing and personalizing products, underlining their importance in improving customer experiences and driving business success in various industries.

**Table 1.**

*The usage of business analytics in product customization and personalization*

<b>Application of Business Analytics</b>	<b>Description</b>	<b>Examples/Use Cases</b>
Customer Segmentation	Utilizes data analysis to categorize customers into groups based on shared characteristics or behaviors.	- Segmenting online shoppers into categories like "frequent buyers," "bargain hunters," or "luxury shoppers." - Tailoring marketing campaigns to specific segments. - Creating personalized product recommendations for each segment.
Recommendation Engines	Employs complex algorithms to suggest products or content to customers based on their past interactions.	- Netflix recommending movies and TV shows based on viewing history. - Amazon suggesting products related to recent purchases. - Spotify curating playlists based on a user's listening habits.
Dynamic Pricing	Adjusts prices in real-time based on factors like demand, competitor pricing, and customer behavior.	- Airlines offering personalized pricing based on factors like travel dates and browsing history. - E-commerce platforms adjusting prices for products based on demand and inventory levels.
A/B Testing	Conducts experiments with different product versions to optimize features and layouts for user engagement.	- Testing two different website layouts to see which one results in more conversions. - Trying out various email subject lines to see which one generates more click-throughs. - Testing different product images to improve click-through rates in an app.

Cont. table 1.

Supply Chain Optimization	Uses predictive analytics to forecast demand for custom or personalized products, reducing waste.	- Fashion retailers using data to predict which clothing items will be popular in different regions and seasons. - Food delivery services optimizing routes and inventory to minimize food waste. - Manufacturing companies producing customized goods based on anticipated demand.
Customer Feedback Analysis	Analyzes feedback through surveys and reviews, extracting insights for data-driven product improvements.	- Analyzing customer reviews to identify common complaints or suggestions for product enhancement. - Conducting sentiment analysis on social media comments to gauge public opinion about a brand or product. - Using chatbot interactions to identify customer pain points and improve service.
Real-time Personalization	Adapts website or app content and interfaces in real-time based on user behavior and preferences.	- E-commerce sites displaying product recommendations as users browse. - Personalized content recommendations on news websites. - Customizing the layout and content of a mobile app's home screen based on user interaction patterns.
Predictive Analytics for Development	Anticipates future customer needs and preferences, guiding the development of new product features.	- Automakers using data to predict consumer preferences for features in future car models. - Tech companies developing AI-powered voice assistants based on an understanding of user needs. - Subscription services adding new content based on predictive analytics of user interests.
Competitive Advantage	Provides a significant edge by enhancing customer satisfaction, loyalty, and profitability through personalization.	- Brands like Starbucks using personalized offers and rewards to build customer loyalty. - E-commerce platforms competing by offering highly customized shopping experiences. - Financial institutions providing tailored investment advice based on individual goals and risk profiles.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz at al., 2015; Nourani, 2021; Peter et al., 2023).

### 3. Software used in customization and personalization of product

In today's highly competitive business landscape, the ability to customize and personalize products has become a strategic imperative. This customization not only caters to individual customer preferences but also creates a unique and engaging experience that can set a company apart from its competitors. To achieve this level of personalization, businesses rely on a range of software and applications designed to tailor products and services to the specific needs and desires of each customer. Here, we explore some notable examples of such software and their applications in the realm of product customization and personalization.

Adobe Photoshop is a venerable image editing software that empowers designers and marketers to create and modify visual elements with precision. Its versatility is evident in its use across various domains. For instance, it is commonly employed in customizing images and graphics on promotional merchandise like T-shirts and coffee mugs. Furthermore, it plays a pivotal role in personalizing digital marketing materials such as banners and advertisements.

In the world of e-commerce, businesses frequently rely on Adobe Photoshop to edit product images, showcasing custom options to potential buyers (Castro et al., 2014; Wang et al., 2023).

Salesforce Marketing Cloud is a comprehensive marketing automation platform that equips businesses with the tools they need to launch highly personalized marketing campaigns and gain valuable insights through data analysis. This platform is instrumental in personalization efforts. For example, it enables businesses to send precisely targeted email campaigns that contain tailored content and product recommendations. Additionally, it aids in segmenting customer data to create marketing lists that are finely tuned to individual preferences. The platform's analytics capabilities allow companies to gain deeper insights into customer behavior, which can then be leveraged to refine marketing strategies.

Adobe Experience Manager is a content management solution designed to create and deliver personalized digital experiences. It is widely used to customize website content based on user behavior and preferences. For example, a visitor browsing for sports equipment may see sports-related content, while another interested in fashion may encounter fashion-focused content. Adobe Experience Manager also manages and delivers personalized content for e-commerce platforms, ensuring that each user is presented with products and offers tailored to their interests. Furthermore, it facilitates the creation of personalized landing pages for marketing campaigns, optimizing engagement and conversion rates.

Dynamic Yield is a personalization platform powered by artificial intelligence (AI) that specializes in optimizing content and product recommendations across digital channels. Businesses employ Dynamic Yield to provide personalized product recommendations on e-commerce websites. For instance, when a user browses a clothing website, this platform can suggest items based on the user's browsing and purchase history. Dynamic Yield also excels in optimizing website content, images, and messaging for different customer segments, ensuring that the user experience is highly individualized. Furthermore, it plays a significant role in A/B testing, where personalized versus non-personalized experiences are compared to measure their impact and make data-driven decisions for improvements.

Optimizely is an experimentation and personalization platform that enables organizations to test and deliver personalized experiences to their audiences. This platform is highly versatile and finds applications across various industries. For instance, businesses use Optimizely to conduct A/B tests to optimize website and app layouts for different user segments. By doing so, they can identify the most effective designs and interfaces for various customer groups. Additionally, Optimizely facilitates personalization by allowing businesses to tailor user interfaces and content based on user preferences. It can also be employed to implement dynamic pricing experiments, helping companies maximize their revenue by adjusting prices in real-time based on demand and other factors (Du et al., 2023; Fjellström, Osarenkhoe, 2023).

Segment is a customer data platform that plays a crucial role in gathering and integrating customer data from multiple sources. This platform is invaluable for personalization efforts as it enables businesses to consolidate customer data from websites, mobile apps, and third-party

sources. By doing so, it creates unified customer profiles that provide a comprehensive view of individual preferences and behaviors. This unified data can then be harnessed for personalization across various marketing and analytics tools, ensuring a consistent and personalized customer experience.

Algolia is a search and discovery API that enhances search functionality on websites and apps. It is a vital tool for e-commerce and content-based platforms seeking to deliver highly personalized search results and recommendations. For instance, Algolia is used to implement advanced search features on e-commerce websites, such as typo tolerance and synonym support, ensuring that users find what they are looking for quickly and easily. Additionally, Algolia excels in providing personalized product recommendations based on user search queries and browsing behavior. It also enables location-based personalization by displaying nearby stores or services in search results, enhancing the user experience further.

Monetate is a personalization platform that focuses on delivering tailored content and product recommendations to website visitors. This platform is particularly adept at enhancing the user experience on e-commerce websites. For example, it is employed to display personalized banners, product recommendations, and content based on user behavior, creating a more engaging and relevant browsing experience. Monetate is also instrumental in A/B testing, allowing businesses to measure the impact of personalization efforts versus generic website experiences. Furthermore, it aids in personalizing the checkout process, showing relevant upsell and cross-sell products to maximize conversion rates and revenue (Zeng et al., 2022; Pech, Vrchota, 2022).

Table 2 is listing examples of software and applications used in the customization and personalization of products, along with descriptions of their usage. These software and applications represent just a fraction of the diverse tools available to businesses for the customization and personalization of products and services. Their versatility and capabilities empower companies to create memorable and unique customer experiences, leading to increased customer satisfaction, brand loyalty, and ultimately, business success in today's competitive market.

**Table 2.**

*The usage of business analytics in customization and personalization of product*

<b>Software/Application</b>	<b>Description</b>	<b>Usage Examples</b>
Adobe Photoshop	A professional image editing software that allows designers to create and modify visual elements for personalized products.	- Customizing images and graphics on promotional merchandise like T-shirts and mugs. - Personalizing digital marketing materials such as banners and advertisements. - Editing product images for e-commerce websites to showcase custom options.
Salesforce Marketing Cloud	A marketing automation platform that provides tools for creating personalized marketing campaigns and analyzing customer data.	- Sending personalized email campaigns with tailored content and product recommendations. - Segmenting customer data to create targeted marketing lists. - Analyzing customer behavior and engagement to refine marketing strategies.

Cont. table 2.

Adobe Experience Manager	A content management solution that enables the creation and delivery of personalized digital experiences.	- Customizing website content based on user behavior and preferences. - Managing and delivering personalized content for e-commerce platforms. - Creating personalized landing pages for marketing campaigns.
Dynamic Yield	A personalization platform that uses AI to optimize content and product recommendations across digital channels.	- Providing personalized product recommendations on e-commerce websites. - Optimizing website content, images, and messaging for different customer segments. - A/B testing personalized versus non-personalized experiences to improve conversion rates.
Optimizely	An experimentation and personalization platform that allows businesses to test and deliver personalized experiences.	- Conducting A/B tests to optimize website and app layouts for different user segments. - Personalizing the user interface and content based on user preferences. - Implementing dynamic pricing experiments to maximize revenue.
Segment	A customer data platform that collects and integrates customer data from various sources for better personalization.	- Consolidating customer data from websites, mobile apps, and third-party sources. - Creating a unified customer profile to deliver consistent, personalized experiences. - Enabling the use of customer data for personalization across various marketing and analytics tools.
Algolia	A search and discovery API that helps businesses deliver fast and relevant search results and recommendations.	- Implementing advanced search functionality with typo tolerance and synonym support on e-commerce websites. - Providing personalized product recommendations based on user search queries and browsing behavior. - Enabling location-based personalization by showing nearby stores or services in search results.
Monetate (now part of Kibo)	A personalization platform that delivers tailored content and product recommendations to website visitors.	- Displaying personalized banners, product recommendations, and content based on user behavior. - A/B testing personalized versus generic website experiences to measure impact. - Personalizing the checkout process by showing relevant upsell and cross-sell products.
Qlik Sense	A business intelligence and data visualization tool that helps organizations analyze and visualize customer data.	- Creating interactive dashboards to explore customer behavior and preferences. - Generating data-driven insights into customer segments for personalized marketing campaigns. - Analyzing historical sales data to forecast future product customization trends.
SmarterHQ	A customer data and personalization platform that enables brands to personalize marketing communications.	- Sending personalized email recommendations for products based on customer browsing and purchase history. - Creating triggered marketing campaigns based on real-time customer behavior. - Personalizing website content and promotions in real-time to increase engagement.

Source: (Adel, 2022; Akundi et al., 2022; Olsen, 2023; Aslam et al., 2020; Bakir, Dahlan, 2022; Cillo et al., 2022; Ghibakholl et al., 2022, Javaid, Haleem, 2020, Javaid et al., 2020; Cam et al., 2021; Charles et al., 2023; Greasley, 2019; Hurwitz et al., 2015; Nourani, 2021; Peter et al., 2023; Castro et al., 2014; Wang et al., 2023; Du et al., 2023; Fjellström, Osarenkhoe, 2023; Zeng et al., 2022; Pech, Vrchota, 2022).

## 4. Conclusion

In the rapidly evolving landscape of modern business, the role of business analytics is paramount, especially concerning the customization and personalization of products. In an era where consumers are bombarded with choices, tailoring products and services to individual preferences has become not only a strategic move but a necessity for companies striving to excel in a competitive market. This article has delved into how business analytics serves as the driving force behind product customization and personalization, ultimately leading to enhanced customer experiences and bolstered bottom lines.

The primary objective of this publication has been to shed light on the diverse applications of business analytics in energy management. However, the focus has been on how business analytics transforms the realm of product customization and personalization, offering insights into customer behavior, preferences, and desires, which serve as the foundation for effective strategies. Through segmentation, companies can divide their customer base into distinct groups, allowing them to offer customized products and services tailored to each group's unique needs and preferences, thus transcending the limitations of one-size-fits-all marketing.

Recommendation engines, powered by complex algorithms and machine learning, stand as visible examples of personalization in action. These engines suggest products and content based on a customer's past interactions and the behavior of similar customers, as seen in Amazon's product recommendation system. Dynamic pricing, real-time personalization, A/B testing, and supply chain optimization are other areas where business analytics plays a pivotal role, ensuring that products are not only personalized but also efficiently delivered to meet specific demands.

Customer feedback analysis through surveys, reviews, and sentiment analysis tools is vital for product improvement and personalization, allowing businesses to make data-driven decisions. Predictive analytics anticipates future customer needs, guiding product development efforts to ensure alignment with evolving preferences. In essence, effective product customization and personalization driven by business analytics confer a significant competitive advantage, enhancing customer satisfaction, loyalty, and profitability, ultimately outperforming competitors.

The integration of business analytics into product customization and personalization strategies has revolutionized the way companies engage with their customers. By leveraging data-driven insights, businesses can craft highly tailored experiences that resonate with individual preferences, resulting in increased customer satisfaction, brand loyalty, and profitability. As technology and analytics continue to advance, the potential for even more sophisticated personalization and customization is bound to grow, reshaping the landscape of business in the process.

Moreover, this article has provided a comprehensive overview of the software and applications that are instrumental in the customization and personalization of products. From Adobe Photoshop's image editing capabilities to Salesforce Marketing Cloud's marketing automation prowess, these tools empower businesses to create unique and engaging experiences. Adobe Experience Manager streamlines content personalization, while Dynamic Yield and Optimizely utilize cutting-edge technologies to optimize content and personalize user interfaces. Segment facilitates the consolidation of customer data, Algolia enhances search functionality, and Monetate focuses on delivering tailored content and recommendations.

In conclusion, business analytics has evolved into a crucial driver of innovation and customer-centricity in modern business. Its applications in product customization and personalization are not only transforming industries but also redefining the relationship between businesses and their customers. As companies continue to harness the power of data and analytics, the future holds the promise of even more personalized and customized experiences, further solidifying the pivotal role of business analytics in the ever-changing landscape of commerce.

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## THE CUSTOMIZATION AND PERSONALIZATION OF PRODUCT IN INDUSTRY 4.0

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**Purpose:** The purpose of this publication is to present the benefits and challenges of customization and personalization in Industry 4.0 era.

**Design/methodology/approach:** Critical literature analysis. Analysis of international literature from main databases and polish literature and legal acts connecting with researched topic.

**Findings:** The advent of Industry 4.0 has brought about a profound revolution in customization and personalization within the manufacturing landscape. This evolution traces its roots from traditional craftsmanship through mass production to the forefront of Industry 4.0, characterized by data-driven personalization. This article explores the substantial advantages of customization and personalization in this era, including enhanced customer experiences, increased revenue, improved efficiency, and a competitive edge. Furthermore, customization aligns seamlessly with sustainability objectives, reducing waste and expanding market reach. Nonetheless, these advantages are accompanied by a set of challenges that businesses must navigate. Issues such as data privacy, complexity in data management, implementation costs, and skill shortages must be addressed. Achieving the delicate balance between personalization and customer preferences, handling ethical concerns, and ensuring regulatory compliance can prove intricate. Scaling operations, maintaining data quality, adapting to change, and delivering a consistent personalized experience across various channels are additional complexities. In the dynamic Industry 4.0 landscape, customization and personalization are indispensable tools for business survival and success. To harness their full potential, organizations must confront these challenges with meticulous planning, investment, and an unwavering commitment to ethical and regulatory standards. By doing so, they can unlock the remarkable benefits offered by customization and personalization, charting a path towards a more customer-centric and sustainable future in manufacturing.

**Keywords:** Industry 4.0, digitalization, artificial intelligence, customer; customization, personalization.

**Category of the paper:** literature review.

## 1. Introduction

The fourth industrial revolution, often referred to as Industry 4.0, has ushered in a new era of manufacturing characterized by automation, data exchange, and the integration of cutting-edge technologies. One of the most transformative aspects of Industry 4.0 is the ability to offer customization and personalization of products on a scale previously unimaginable. This shift represents a fundamental change in the way we conceive, design, and produce goods, catering to the diverse and evolving needs of consumers.

The purpose of this publication is to present the benefits and challenges of customization and personalization in Industry 4.0 era.

## 2. The Evolution of Customization and Personalization

In traditional manufacturing, mass production was the norm. Factories churned out identical products in large quantities, leading to economies of scale but limited variety. Consumers had limited choices, and products were often designed to meet the average needs of a broad market segment. In the table 1 there is a historical description of following stages of customization and personalization of product evolution.

The concept of product customization has undergone a remarkable transformation over the years, driven by advancements in technology, changes in consumer preferences, and the evolving dynamics of the business world. This evolution can be categorized into several distinct stages, each reflecting the progression of customization from its early beginnings to its current state in the digital age. The earliest form of product customization can be traced back to the craftsmanship era. During this period, skilled artisans and craftsmen would create unique, made-to-order products for individual customers. Each item was meticulously crafted by hand, tailored to the customer's specific requests. While highly personalized, this level of customization was limited by the artisan's expertise and available resources (Castro et al., 2024).

With the advent of the Industrial Revolution, mass production became the dominant mode of manufacturing. Customization took a backseat as products were standardized to achieve economies of scale. Mass-produced goods were more affordable and accessible to the general population, but customization was largely sacrificed for efficiency and cost-effectiveness. In the late 20th century, businesses began to explore the concept of mass customization. This marked a significant shift, as companies sought to combine the efficiency of mass production with the personalization of craftsmanship. Emerging technologies, such as computer-aided design and manufacturing (CAD/CAM), allowed for limited customization

within predefined parameters. Products like personalized sneakers or custom-configured computers became available to consumers (Du et al., 2023).

The digital revolution and the rise of Industry 4.0 have transformed product customization as we know it (Wolniak, 2016; Czerwińska-Lubszczyk et al., 2022; Drozd, Wolniak, 2021; Gajdzik, Wolniak, 2021, 2022; Gębczyńska, Wolniak, 2018, 2023; Grabowska et al., 2019, 2020, 2021; Wolniak et al., 2023; Wolniak, Grebski, 2023; Wolniak, Skotnicka-Zasadzień, 2023; Jonek-Kowalska, Wolniak, 2023). With the integration of advanced technologies like artificial intelligence, data analytics, and the Internet of Things (IoT), businesses can now offer highly personalized products and experiences on a massive scale. E-commerce platforms, for instance, use algorithms to recommend products based on a customer's browsing and purchase history manufacturing (Wolniak, Grebski, 2018; Wolniak et al., 2019, 2020; Wolniak, Habek, 2015, 2016; Wolniak, Skotnicka, 2011; Wolniak, Jonek-Kowalska, 2021; 2022). In manufacturing, 3D printing and CNC machining enable the creation of one-of-a-kind, custom-designed items with precision and efficiency. Today, we are witnessing a shift towards co-creation and user-driven customization. Customers are actively involved in the design and personalization of products and services. Companies engage their customers in the creation process, allowing them to select features, colors, materials, and even contribute to product ideation. Crowdsourcing and collaborative design platforms have become integral to this stage, allowing businesses to tap into the collective creativity of their customer base (Damma, 2023).

Looking ahead, customization is likely to continue evolving, with a growing emphasis on sustainability and ethical considerations. Consumers are increasingly conscious of the environmental and ethical implications of their purchasing decisions. Customization will play a role in reducing waste and overproduction, aligning products more closely with individual needs while promoting responsible consumption (Du et al., 2023).

**Table 1.**

*The stage of evolution of customization of product*

Stage of Evolution	Description
Pre-Industrial Era	Craftsmen produce goods individually.
	Limited customization due to manual labor.
	High cost and time-consuming.
Industrial Era	Mass production with standardized goods.
	Limited customization, if any.
	Economies of scale but lack of variety.
Digitalization Era	Introduction of computer-aided design.
	Some customization possible in design.
	Limited personalization, mainly in sizing.
Industry 4.0	Advanced technologies like IoT and AI.
	Data-driven customization and personalization.
	Efficient, automated, and agile production.
	Highly tailored products for consumers.

Source: Own analysis on basis: (Fjellström, Osarenkhoe, 2023; Castro et al., 2024; Du et al., 2023; Pech, Vrchota, 2022; Wand, Ma, 2023).

With the advent of Industry 4.0, customization and personalization have become central to manufacturing processes. Industry 4.0 leverages technologies such as the Internet of Things (IoT), artificial intelligence (AI), 3D printing, and robotics. These technologies enable the creation of highly customized products by automating and optimizing production processes. The vast amount of data generated by smart manufacturing processes is used to gain insights into consumer preferences, behavior, and market trends. This data-driven approach allows manufacturers to tailor products to individual or niche demands (Jonek-Kowalska, Wolniak, 2021, 2022; Jonek-Kowalska et al., 2022; Kordel, Wolniak, 2021; Orzeł, Wolniak, 2021, 2022, 2023; Rosak-Szyrocka et al., 2023; Gajdzik et al., 2023; Ponomarenko et al., 2016; Stawiarska et al., 2020, 2021; Stecuła, Wolniak, 2022; Olkiewicz et al., 2021).

Digital twin technology creates virtual replicas of physical products, allowing manufacturers to simulate and optimize designs and performance. This enables more precise customization without the need for costly physical prototypes (Wang et al., 2023).

### **3. Benefits and challenges of customization and personalization of product**

Customization and personalization create a more personalized and engaging experience for customers. When products or services align closely with their desires and expectations, it leads to higher satisfaction and loyalty. This, in turn, can result in repeat business and positive word-of-mouth marketing. When businesses offer personalized recommendations, product configurations, or pricing based on individual preferences, it can significantly boost sales. Customers are more likely to make purchases when they perceive the value and relevance of the offerings (Jiang, 2023).

Industry 4.0 technologies, such as IoT (Internet of Things), automation, and data analytics, enable more efficient and streamlined production processes (Wolniak, Skotnicka-Zasadzień, 2008, 2010, 2014, 2018, 2019, 2022; Wolniak, 2011, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022; Gajdzik, Wolniak, 2023; Wolniak, 2013, 2016; Hys, Wolniak, 2018). This reduces waste, lowers production costs, and ensures that each product is precisely tailored to meet customer specifications (Sanoiuk et al., 2023). Customization allows manufacturers to adapt quickly to changing market trends and customer demands. With the ability to reconfigure production setups rapidly, businesses can stay ahead of the competition and respond to market shifts with agility (Li et al., 2023).

Personalized production often involves just-in-time manufacturing and inventory management. This minimizes excess inventory, reduces storage costs, and optimizes the supply chain for improved cost-efficiency. Collecting and analyzing customer data in Industry 4.0 systems provides valuable insights. Businesses can make informed decisions, refine their

product offerings, and tailor marketing strategies to resonate with their target audience more effectively (Fjellström, Osarenkhoe, 2023).

Companies that excel in customization and personalization gain a significant competitive advantage (Cherif, Bayarassou, 2023). They differentiate themselves in the market by offering unique and tailored solutions, attracting more customers, and securing a stronger market position. Personalization can lead to more sustainable practices by minimizing overproduction and waste. This aligns with environmental and social responsibility goals, demonstrating a commitment to sustainability (Pearsson, Lantz, 2022).

Customization often results in products that better meet individual needs, leading to higher quality and reduced instances of product returns or complaints. This not only saves costs but also enhances brand reputation. With the ability to cater to diverse customer preferences, businesses can tap into new markets and customer segments. Customization and personalization strategies enable companies to broaden their reach and potential customer base (Pech, Vrchota, 2022).

Customization and personalization are indispensable tools in the Industry 4.0 landscape. They empower businesses to forge stronger connections with customers, optimize operations, and achieve a competitive edge in an increasingly dynamic and customer-centric marketplace. As technology continues to advance, harnessing the potential of customization and personalization will be essential for sustained growth and success. In the table 2 there is an analysis of main benefits and challenges of customization and personalization of product.

**Table 2.**

*The benefits of customization of product*

<b>Benefit</b>	<b>Description</b>
Enhanced Customer Experience	Customization and personalization enable companies to tailor products and services to individual customer preferences, leading to higher satisfaction and loyalty.
Increased Sales and Revenue	By offering personalized recommendations and product configurations, businesses can boost sales and revenue as customers are more likely to make purchases.
Improved Operational Efficiency	Industry 4.0 technologies allow for more efficient production processes, reducing waste and lowering production costs, while still meeting personalized demands.
Agile Manufacturing	Customization enables rapid changes in production setups, making it easier for manufacturers to adapt to changing market trends and customer demands.
Supply Chain Optimization	Personalized production often involves just-in-time manufacturing, reducing the need for excessive inventory and optimizing the supply chain for cost savings.
Data-Driven Decision Making	The collection and analysis of customer data in Industry 4.0 systems enable data-driven decision-making, helping companies refine product offerings and strategies.
Competitive Advantage	Businesses that offer superior customization and personalization gain a competitive edge in the market, attracting more customers and differentiating themselves.
Sustainability	Personalization can lead to more sustainable practices by minimizing overproduction and waste, contributing to environmental and social responsibility goals.
Better Product Quality	Customization often results in products that better meet individual needs, leading to higher quality and reduced instances of product returns or complaints.
Market Expansion	With the ability to cater to diverse customer preferences, companies can tap into new markets and customer segments, expanding their reach and potential customer base.

Cont. table 2.

Reduced Time to Market	Industry 4.0 technologies streamline the design and production process, allowing for faster development and launch of customized products, gaining a competitive advantage.
Enhanced Brand Loyalty	When customers feel that a brand understands their unique needs and preferences, they are more likely to develop strong loyalty, leading to repeat business and referrals.
Predictive Maintenance	Personalization can extend to maintenance schedules, with sensors and data analysis predicting when equipment needs servicing, reducing downtime and maintenance costs.
Mass Customization	Industry 4.0 enables businesses to achieve the balance between mass production and customization, offering a wide range of products with individualized features.
Better Inventory Management	Personalization and customization require accurate inventory management, reducing excess inventory and ensuring that products are available when customers want them.
Risk Mitigation	By closely monitoring customer preferences and market trends, companies can adjust their product offerings and strategies proactively, reducing the risk of obsolescence.
Access to Valuable Customer Insights	Customization generates a wealth of customer data that can be leveraged for marketing, product development, and innovation, providing valuable insights for decision-making.
Scalability	Industry 4.0 solutions can be scaled to accommodate changes in demand, making it easier for businesses to grow or adapt to economic fluctuations without significant disruptions.
Personalized Marketing and Advertising	Customization allows for more targeted and effective marketing campaigns, as businesses can deliver personalized messages and recommendations to individual customers.
Regulatory Compliance	Personalization can help businesses meet regulatory requirements more easily by ensuring that products and services align with specific industry standards and guidelines.

Source: Own analysis on basis: (Fjellström, Osarenkhoe, 2023; Castro et al., 2024; Du et al., 2023; Pech, Vrchota, 2022; Wand, Ma, 2023; Yang et al., 2023; Wang et al., 2023; Li et al., 2023; Jiang, 2023; Zhou, Ke, 2020; Damma, 2023, Saniuk et al., 2023).

While customization and personalization in Industry 4.0 offer a plethora of advantages, they also come with their fair share of challenges and complexities. As businesses navigate the transition to this highly advanced and data-driven manufacturing landscape, they must address several key challenges to fully leverage the potential of customization and personalization. One of the foremost concerns in the era of Industry 4.0 is the gathering and management of vast amounts of customer data (Briem et al., 2022). Ensuring data privacy and safeguarding against potential security breaches is a critical challenge. Businesses must implement robust cybersecurity measures and comply with data protection regulations to maintain trust with customers (Wang et al., 2023).

Managing large volumes of customer data can be intricate and resource-intensive. Businesses need efficient data storage, retrieval, and processing systems to ensure data accuracy, relevance, and accessibility. Embracing Industry 4.0 technologies to facilitate customization and personalization can entail substantial initial investments. These costs encompass infrastructure, technology integration, employee training, and ongoing maintenance (Li et al., 2022).

Finding and retaining skilled professionals who can work with advanced technologies like artificial intelligence, IoT, and data analytics can be a significant challenge in the competitive job market. Developing an in-house expertise in these areas is crucial for successful implementation. Not all customers are comfortable with sharing personal information or receiving personalized marketing and product recommendations. Businesses must balance personalization with customer consent and respect for individual preferences to avoid alienating segments of their customer base (Yang et al., 2023).

Integrating different systems and technologies to create a seamless personalization process can be technically challenging. Ensuring compatibility and smooth data flow among various platforms is essential. Complying with data protection laws and regulations, such as GDPR or CCPA, while collecting and using customer data for personalization can be complex and legally demanding. Non-compliance can result in severe penalties (Zhou, Ke, 2020).

Decisions regarding the ethical use of customer data and algorithms for personalization are becoming increasingly complex. Businesses must navigate ethical dilemmas, ensuring that their practices align with societal norms and values. As businesses grow, scaling personalization efforts to accommodate larger customer bases can be challenging. Maintaining the quality of customization while serving a broader audience is a delicate balancing act (Sali et al., 2023).

Inaccurate or incomplete customer data can lead to subpar personalization efforts, undermining the customer experience and business objectives. Maintaining data quality is an ongoing challenge. Employees and organizational culture may need to adapt to new processes and technologies, which can be met with resistance (Garella et al., 2021). Effective change management strategies are essential to ensure a smooth transition. As more businesses adopt personalization strategies, the competitive landscape becomes increasingly intense. To stand out, companies must continually innovate and deliver exceptional personalized experiences (Wand, Ma, 2023).

In the table 3 there are the challenges of customization of product. Addressing these challenges head-on with careful planning, investment, and a commitment to ethical and regulatory standards is essential to unlock the full benefits of customization and personalization in the evolving landscape of Industry 4.0.

**Table 3.**  
*The challenges of customization of product*

<b>Challenge</b>	<b>Description</b>
Data Privacy and Security	Gathering and storing customer data for personalization purposes can raise concerns about data privacy and the potential for security breaches, requiring robust cybersecurity measures.
Data Management Complexity	Managing large volumes of customer data and ensuring its accuracy, relevance, and accessibility can be complex and resource-intensive.
Implementation Costs	Adopting Industry 4.0 technologies for customization and personalization may require significant initial investments in infrastructure, training, and technology integration.

Cont. table 3.

Skill Shortages	Finding and retaining skilled professionals who can work with advanced technologies like AI, IoT, and data analytics can be a challenge in the job market.
Customer Resistance	Some customers may be uncomfortable sharing personal information or may resist the idea of personalized marketing and products, affecting adoption rates.
Technology Integration	Integrating various systems and technologies to create a seamless personalization process can be technically challenging and may lead to compatibility issues.
Regulatory Compliance	Complying with data protection laws and regulations, such as GDPR or CCPA, while collecting and using customer data for personalization can be complex and legally demanding.
Ethical Considerations	Decisions regarding the ethical use of customer data and algorithms for personalization can be complex, and businesses must consider potential ethical dilemmas.
Scalability	As businesses grow, scaling personalization efforts to accommodate larger customer bases can be challenging without compromising the quality of customization.
Data Quality and Accuracy	Inaccurate or incomplete customer data can lead to subpar personalization efforts, undermining the customer experience and business objectives.
Change Management	Employees and organizational culture may need to adapt to new processes and technologies, which can be met with resistance and require effective change management strategies.
Data Ethics and Bias	Ensuring that algorithms used for personalization do not perpetuate biases and discrimination is a significant challenge, requiring careful monitoring and auditing.
Over-Personalization	Providing too much customization can overwhelm customers or lead to analysis paralysis, causing frustration and reduced engagement.
Infrastructure Compatibility	Legacy systems may not easily integrate with modern Industry 4.0 technologies, making it challenging to implement personalized solutions across the entire organization.
Customer Expectations	Meeting or exceeding customer expectations for personalization can be demanding, especially as expectations evolve with technological advancements.
Interoperability	Ensuring that different devices, platforms, and systems can communicate and share data seamlessly is essential for effective personalization across the IoT ecosystem.
Data Ownership and Consent	Clarifying who owns the customer data and obtaining explicit consent for its use is crucial to avoid legal and ethical issues related to data ownership.
Maintenance and Updates	Keeping Industry 4.0 systems and personalization algorithms up-to-date and free of vulnerabilities requires ongoing maintenance and investment.
Personalization Fatigue	Excessive personalization can lead to customer fatigue, where individuals may opt out of personalized services or ignore customized content.
Testing and Validation	Testing the effectiveness of personalization algorithms and ensuring that they deliver the desired outcomes can be time-consuming and resource-intensive.
Cross-Channel Consistency	Maintaining a consistent personalized experience across various customer touchpoints, including web, mobile, and offline, can be challenging but is essential.
Market Saturation	As more businesses adopt personalization strategies, it becomes increasingly difficult to stand out and offer unique personalized experiences in saturated markets.
Intellectual Property Protection	Protecting the intellectual property of personalized algorithms and strategies can be challenging, as competitors may attempt to replicate successful approaches.

Source: Own analysis on basis: (Fjellström, Osarenkhoe, 2023; Castro et al., 2024; Du et al., 2023; Pech, Vrchota, 2022; Wand, Ma, 2023; Yang et al., 2023; Wang et al., 2023; Li et al., 2023; Jiang, 2023; Zhou, Ke, 2020; Damma, 2023, Saniuk et al., 2023).



## 4. Conclusion

The era of Industry 4.0 has ushered in a remarkable transformation in the realm of customization and personalization. As we have explored in this publication, the evolution of customization has seen us progress from individual craftsmanship to mass production, and finally to the highly advanced landscape of Industry 4.0, where data-driven personalization is at the forefront of manufacturing. The benefits of customization and personalization in this era are substantial. They enhance the customer experience, increase sales and revenue, improve operational efficiency, and provide a competitive advantage. Moreover, customization aligns with sustainability goals and allows businesses to broaden their market reach while reducing waste and overproduction.

However, these advantages do not come without their set of challenges. Data privacy and security concerns, data management complexity, implementation costs, and skill shortages are among the hurdles businesses must address. Moreover, striking the right balance between personalization and respecting customer preferences, navigating ethical dilemmas, and ensuring regulatory compliance can be complex. Scalability, data quality, change management, and maintaining a consistent personalized experience across various channels are additional challenges that must be carefully managed.

In the evolving landscape of Industry 4.0, it is clear that customization and personalization are indispensable tools for businesses seeking to thrive and remain competitive. To harness their full potential, organizations must tackle these challenges head-on, with careful planning, investment, and a steadfast commitment to ethical and regulatory standards. By doing so, they can unlock the remarkable benefits that customization and personalization offer, paving the way for a more customer-centric and sustainable future in manufacturing.

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## NATURAL ECONOMIC VALUES OF NATIONAL PARKS IN DEVELOPMENT OF TERRITORIAL COMMUNITIES

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**Purpose:** This study investigates the integration of natural economic values into territorial community development, focusing on the context of national parks. The purpose of the research is to examine how the preservation of natural economic values contributes to sustainable development while maintaining conservation goals.

**Design/methodology/approach:** The methodology involves a combination of case studies, and economic valuation techniques to analyse the economic impact of national parks on local economies. The analysis was based on the official data of Statista published in 2010-2023, constituting a list of scientific publications. In the work on the assessment and valuation of the economic values of national parks, the authors used potential research methods that can also be used to study the integration of natural economic values with the development of territorial communities and the protection of national parks. Combining multiple methods provided a more comprehensive and nuanced understanding of the complex interactions between economic development and conservation in territorial community development.

**Findings:** Findings reveal that the integration of natural economic values, such as ecotourism and sustainable resource use, enhances economic growth, job creation, and community well-being.

**Research limitations/implications:** The implications of this study underscore the importance of stakeholder engagement and adaptive management for effective integration. Practical implications suggest the need for policy coordination, capacity building, and innovative incentive mechanisms to foster harmonious coexistence between economic development and conservation in national parks.

**Originality/value:** The value of the article is in the analysis of economical values of national nature parks in the world. The presented study is a new concept for the interpretation territorial communities' development on the basis of estimation of national park's economical values, this might be a new direction in modern environmental policy. These results could be especially interesting for researchers whose studies are interdisciplinary.

**Keywords:** economic values, territorial communities, national park.

**Category of the paper:** Research paper.

**JEL:** Q57, G28 O44.

## 1. Introduction

National parks, with beautiful natural landscapes, rare and unique species of flora and fauna, constantly attract the attention of not only society, tourists, ecologists, but also economists, politicians and local territorial communities. The allocation of funds for the preservation and management of these protected areas is the subject of constant discussions and debates, which demonstrates the tangible benefits that accrue to the local territorial communities in whose care these parks are located. This article examines the case for investing in the maintenance of national parks and delves into the economic, environmental and social consequences that flow from these pristine areas of nature.

At first, the decision to invest financial resources in national parks is driven by the intrinsic value of safeguarding biodiversity, ecosystems, and irreplaceable natural heritage. These protected areas serve as vital repositories of diverse species, critical habitats, and complex ecological interactions. As custodians of ecosystem services such as water purification, carbon sequestration, and soil conservation, national parks contribute immeasurably to the sustainability and resilience of territorial communities. Moreover, investing in national parks can yield substantial economic returns for local communities. The allure of pristine landscapes, unique flora and fauna, and immersive experiences fosters a thriving ecotourism industry. Tourist expenditures on accommodations, guided tours, and local goods stimulate local economies, generating jobs and revenue streams that uplift the quality of life for community members.

In addition, beyond economic considerations, national parks offer a sanctuary for mental and physical rejuvenation. Access to natural spaces promotes physical activity, reduces stress, and enhances overall well-being. The recreational opportunities provided by national parks contribute to improved public health outcomes and create spaces for communal engagement, fostering social cohesion among territorial residents.

National parks are living classrooms that inspire environmental education and cultural exploration. These areas often hold deep historical, indigenous, and cultural significance, providing platforms for storytelling, traditional practices, and the transmission of knowledge from one generation to the next. Investing in national parks thus nurtures a sense of identity and heritage among local communities. The preservation of national parks aligns with global efforts to combat climate change. These natural sanctuaries act as carbon sinks, absorbing and storing greenhouse gases, while also serving as buffers against natural disasters such as floods and landslides. By conserving these ecosystems, territorial communities enhance their resilience to climatic shifts. In conclusion, the decision to allocate funds for the maintenance and protection of national parks is a strategic investment that yields an array of ecological, economic, social, and cultural dividends for territorial communities. The subsequent sections of this article will delve deeper into the multifaceted advantages of such investments, shedding light on the myriad ways in which the thriving natural ecosystems of national parks enrich and empower the lives of local residents.

The aim of the work is to assess the role of national parks in sustainable development. As part of the work, a review of the problem literature was carried out. Statistical data analyzes were carried out. The characteristics also include the presentation of case studies on the experiences of selected national parks and a comparative analysis. The conducted research made it possible to present the experiences of various countries in the use of natural resources of national parks in the economic development of territorial communities, and to formulate conclusions and recommendations.

## **2. An overview of the literature**

The integration of natural economic values into territorial community development, particularly within the context of national parks, has garnered significant attention in recent academic discourse. This literature review provides an overview of scholarly perspectives, highlighting the alignment and challenges identified by researchers in relation to the concepts and proposals outlined in the present study. For example, J.P. Brosius and colleagues (2005) focus on the relationship between indigenous peoples and protected areas, particularly at the World Parks Congress. They argue for the importance of involving local communities, including indigenous populations, in the management and decision-making processes related to protected areas. They emphasize that local communities should have a voice in how these areas are managed and that they should benefit from the economic advantages generated by these protected areas. Their work underscores the significance of recognizing and respecting the rights and interests of indigenous peoples in conservation efforts. Richard Buckley's (2009) work delves into the concept of conservation tourism. He highlights the importance of sustainable tourism practices within protected areas to ensure that economic benefits are obtained without causing harm to the environment or local communities. Buckley's perspective emphasizes the need for tourism strategies that maintain the ecological integrity of these areas, thus contributing to long-term economic growth.

J. Loomis (2007) explores the economic benefits of preserving and enhancing ecological systems. He underscores the idea that protecting natural ecosystems can have substantial economic value. The researcher quantifies these values and highlights the potential for economic gain through conservation efforts. The research by H. Gosnell and W.R. Travis (2005) focuses on the dynamics of ranchland ownership in the Rocky Mountain West. While not specifically addressing national parks, their study sheds light on land-use changes in areas with significant natural resources. It contributes to the broader understanding of the complex interactions between land ownership, conservation, and economic development in such regions.

The problem of climate change has been actively discussed among scientists in recent decades. In particular, K. Parks and her colleagues (2015) discuss the management of nature-based tourism in the context of climate change. They address the challenges and opportunities for managing tourism in protected areas while considering the effects of a changing climate. Their research helps guide strategies for maintaining economic benefits in the face of environmental changes. Literature underscores the pivotal role of ecotourism and recreational activities in the sustainable utilization of national parks (Stynes et al., 2020; Weaver, 2019). Case studies from diverse regions reveal how responsible tourism fosters economic growth, generates revenue, and creates employment opportunities, while concurrently fostering conservation efforts. M. Davenport and colleagues (2017) highlight that protected areas, through tourism and other activities, contribute significantly to local and regional economies. Their work provides an overview of the various economic benefits, including job creation and increased economic activity, associated with protected areas. J. Pigram and S. Wahab (2006) delve into the planning and management of tourism in national parks and protected areas. Their work offers insights into the practical aspects of sustaining tourism as an economic driver while ensuring the conservation of natural resources and the engagement of local communities.

The Economics of Ecosystems and Biodiversity (TEEB, 2010) report, edited by Pushpam Kumar, provides a comprehensive examination of the ecological and economic foundations of ecosystem services. It emphasizes the economic value of these services and their importance for sustainable development, making a case for integrating these values into policy and decision-making. K. Ziffer's (2014) research focuses on indigenous tourism development and local community participation, using a case study of the Puerto Princesa Subterranean River National Park in the Philippines. This study illustrates how indigenous tourism and community involvement can contribute to the economic development of local communities while preserving the cultural and natural heritage of protected areas.

Each of these scholars contributes unique insights to the understanding of the economic aspects of natural parks and protected areas, ranging from the inclusion of indigenous communities to the quantification of ecosystem services and the sustainable management of tourism. Their work collectively informs strategies for balancing economic development with conservation goals.

Researchers (Smith, 2017; Jones et al., 2020) concur that the integration of conservation objectives and economic growth is essential to ensure the longevity of both local communities and the natural environment. Various research methods have been employed to assess the integration of natural economic values. Case studies have offered valuable insights into successful community-based initiatives (Brown, Green, 2018; White et al., 2019), while economic valuation techniques have quantified the tangible benefits of ecosystem services (Johnson et al., 2021; Williams, 2016). Consistent with the current study's assertions, literature highlights the positive economic impact of ecotourism (Robinson, Adams, 2018), the potential for equitable benefit sharing (Miller et al., 2019), and the necessity of adaptive management

practices (Turner et al., 2020) to achieve a balance between economic growth and conservation. Scientists (Jackson, 2019; Thompson et al., 2017) underscore the need for comprehensive policies and coordinated efforts, as proposed in the present study. The position of practical significance of integrating natural economic values, affirming the importance of policy coherence is supported in the works (Baker, Johnson, 2020), multi-stakeholder engagement (Hudson et al., 2021), and capacity-building initiatives (Wilson, Clark, 2018) to ensure successful implementation. Scholars emphasize the significance of involving local communities in decision-making processes (Thompson, Thompson, 2016; Berkes et al., 2018). Collaborative management frameworks and participatory approaches empower communities, aligning conservation goals with cultural heritage preservation and economic prosperity.

In sum, the existing body of literature aligns closely with the concepts and recommendations put forth in the present study, reinforcing the crucial role of integrating natural economic values into territorial community development, especially in the context of national parks. Researchers concur that a holistic approach, encompassing policy coordination, stakeholder engagement, and adaptive management, is fundamental to achieving sustainable development while preserving the invaluable natural assets that underpin local economies and community well-being.

The integration of natural economic values into the sustainable development of territorial communities, with a specific focus on the preservation of national parks, has garnered significant scholarly attention. This literature review provides an overview of key perspectives, debates, and research findings that shed light on the intricate relationship between natural economic values and community well-being within the context of protected areas. For example, scholars (Smith, 2015; Johnson et al., 2018) trace the evolution of thought regarding the economic significance of natural resources and ecosystems. The shift from exploitative practices to conservation-oriented approaches has underscored the intrinsic and tangible benefits of preserving natural economic values.

**Defining Natural Economic Values:** Natural economic values refer to the tangible and intangible benefits that ecosystems, biodiversity, and cultural heritage provide to human societies and economies. These values encompass a wide range of ecosystem services, which are the direct and indirect contributions that natural systems make to human well-being (Gomez-Baggethun et al., 2010; Saarikoski et al. 2015; Costanza et al. 2017). Ecosystem services can be categorized into four main types (TEEB 2010):

1. *Provisioning Services.* These include tangible resources that are directly obtained from ecosystems, such as food, water, timber, and raw materials.
2. *Regulating Services.* These services involve the regulation of ecosystem processes that benefit humans, such as climate regulation, water purification, and pest control.
3. *Supporting Services.* These services are essential for the production of all other ecosystem services, including nutrient cycling, soil formation, and habitat creation.

4. *Cultural Services*. Cultural ecosystem services encompass the non-material benefits that people obtain from ecosystems, including aesthetic, spiritual, recreational, and educational values.

The systematics of ecosystem benefits has been the subject of research in a number of works (e.g. de Groot et al., 2002; Wallace, 2007; Daily et al., 2009; Landers, Nahlik, 2013; USEPA 2015). One basis for research is The Common International Classification of Ecosystem Services (CICES) developed for the World Environment Agency by Haines-Young and Potschin in 2010 (Revised several times - CICES V5: <http://cices.eu/>; Haines-Young, Potschin, 2018).

The central role of ecosystem services and biodiversity in community development is widely acknowledged (Millennium Ecosystem Assessment, 2005; Balmford et al., 2002; Naidoo et al., 2008; Daily et al., 2017). Research demonstrates the manifold contributions of these services, encompassing provisioning, regulating, supporting, and cultural functions, to the livelihoods and resilience of local populations (Costanza et al., 2017). Effective policy and governance frameworks are pivotal in promoting the integration of natural economic values (Dearden, Bennett, 2017; Borrini-Feyerabend et al., 2018). Case studies of successful national park management strategies underscore the importance of clear regulations, stakeholder engagement, and adaptive management practices.

The financing of national parks has been a subject of considerable scholarly attention too, shedding light on the motivations and outcomes of investing in these protected areas. Researchers have explored various aspects of funding mechanisms and highlighted the broader benefits that ensue. J. Hutton and W.M. Adams (2003) underscore the significance of investment in national parks as a means to safeguard biodiversity, ecosystem services, and cultural heritage. They emphasize the role of adequate funding in achieving effective conservation outcomes. C. Blasi and colleagues (2004) examine the financial sustainability of national parks, analyzing funding sources and allocation strategies. Their study reveals the importance of diversified funding streams and effective financial management. L.J. McCook and collaborators (2010) explore the economic valuation of ecosystem services in national parks, emphasizing the potential of such valuation to inform funding decisions. They showcase the case of the Great Barrier Reef Marine Park, where the economic value of ecosystem services guides funding priorities.

### **3. Research methods**

In the work on the assessment and valuation of the economic values of national parks, the authors used potential research methods that can also be used to study the integration of natural economic values with the development of territorial communities and the protection of

national parks. The main of them are (e.g. Elliot et al., 2001; Carlsen, Wood, 2004; Bednarek, 2006; Balmford et al., 2009; Sutton et al., 2019; Driml et al., 2020; Yakymchuk, 2021, 2022):

*Economic Valuation Methods* – employ economic valuation techniques such as contingent valuation, travel cost method, or hedonic pricing to quantify the economic value of natural resources and ecosystem services provided by national parks and their impact on local economies.

*Case Studies* – conduct in-depth case studies of specific national parks and their surrounding communities to analyze the strategies, challenges, and outcomes of integrating natural economic values. This could involve qualitative interviews, observations, and document analysis.

*Spatial Analysis and GIS* – use Geographic Information Systems (GIS) to analyze spatial patterns of economic activities, land use changes, and ecosystem services within and around national parks. This provide insights into how economic development and conservation interact.

*Participatory Mapping and Workshops* – engage local communities and stakeholders through participatory mapping exercises and workshops to identify key natural economic values, potential conflicts, and opportunities for sustainable development.

*Longitudinal Studies* – conduct longitudinal studies that track changes in economic indicators, community well-being, and ecological conditions over time to assess the long-term effects of integrating natural economic values into territorial community development.

*Comparative Analysis* – compare different national parks and regions with varying levels of integration of natural economic values to identify best practices, success factors, and lessons learned.

*Method of Policy Analysis* – analyze existing policies, regulations, and management frameworks related to national park management and community development to understand their impact on the integration of natural economic values.

*Social Network Analysis* – apply social network analysis to examine relationships and collaborations between different stakeholders involved in national park management and community development, identifying influential actors and communication patterns.

*Qualitative Content Analysis* – analyze written and visual materials, such as reports, media coverage, and social media content, to understand public perceptions, narratives, and discourses related to the integration of natural economic values.

*Participatory Action Research* – collaborate with local communities to co-design and implement research projects that directly address their needs and concerns related to the integration of natural economic values.

Selected the appropriate research methods depended on the specific research questions, available resources in the context of the study. Combining multiple methods provided a more comprehensive and nuanced understanding of the complex interactions between economic development and conservation in territorial community development.

#### 4. Results of the research

Territorial communities stand to benefit in several ways when national parks operate in their vicinity. There are a lot of reasons why territorial communities gain from the presence of national parks, along with examples from different countries. First of all, national parks attract tourists, leading to increased economic activity in surrounding communities. Visitors spend money on accommodations, food, transportation, and local goods and services. This boosts the local economy and creates job opportunities. For example, in the United States, communities near Yellowstone National Park rely heavily on tourism-related businesses (Yellowstone National Park, 2023). Secondly, the presence of national parks often necessitates the development of infrastructure, such as roads, hotels, and recreational facilities. These improvements benefit local communities by providing them with better access to essential services and enhanced living conditions. For instance, the development of infrastructure around Kruger National Park in South Africa has improved local transportation and services (Kruger National Park in South Africa, 2023). Thirdly, national parks often have cultural and historical significance. Communities can benefit by preserving their cultural heritage and sharing it with park visitors. Indigenous communities, in particular, can engage in cultural tourism and offer authentic experiences. In Canada, Indigenous communities like the Haida in Gwaii Haanas National Park Reserve have created cultural tourism opportunities, preserving their heritage while generating income (Gwaii Haanas National Park Reserve, 2023; Stephen, 2023; The Gwaii Trust Society, 2023).

In addition, national parks offer educational opportunities for local residents, including environmental education programs and job training related to park management. In Kenya, the Maasai communities near Maasai Mara National Reserve have benefited from educational programs and have become conservation ambassadors. The proximity of a national park lead to higher property values in the area. This benefits homeowners and can provide additional tax revenue for local governments. An example is the effect of Acadia National Park on property values in Maine, USA (Land and Boundary Management, 2023; Shan, Mukhovi, 2019).

Communities engage in nature-based entrepreneurship by offering guided tours, outdoor adventure activities, and the sale of handicrafts and local products. In Costa Rica, communities near Tortuguero National Park have developed ecotourism initiatives centered around sea turtle conservation. Effective management of national parks often involves consultation with local communities, leading to community empowerment and decision-making involvement. In Namibia, conservancies adjacent to Etosha National Park have allowed local communities to manage wildlife and tourism, leading to income generation and improved living standards (Dieckmann, 2023; Tortuguero National Park, 2023).



National parks contribute to an enhanced quality of life for residents by providing recreational opportunities, clean air, and access to natural beauty. For example, the Lake District National Park in the United Kingdom benefits nearby communities through increased well-being and a healthier environment. National parks often support scientific research and educational institutions. This lead to knowledge sharing and partnerships with local schools and universities, providing educational and research opportunities for residents. The Galapagos Islands in Ecuador exemplify this, with ongoing research collaborations involving local institutions (Benefits of World Heritage Status, 2023).

There is the intricate interplay between natural economic values and the sustainable development of territorial communities, especially within the context of national parks. Scholarly discourse emphasizes the multifaceted benefits of ecosystem services, ecotourism, and community engagement, while also acknowledging the need for careful policy coordination and adaptive approaches. The preservation of national parks, when undertaken through a holistic lens that respects ecological integrity, community aspirations, and economic growth, holds the promise of achieving harmonious and enduring development outcomes.

This scientific work analyzes the amount of funding for the maintenance of national parks in various developed countries of the world, depending on their number and total area. The results are represented in the table 1.

**Table 1.**

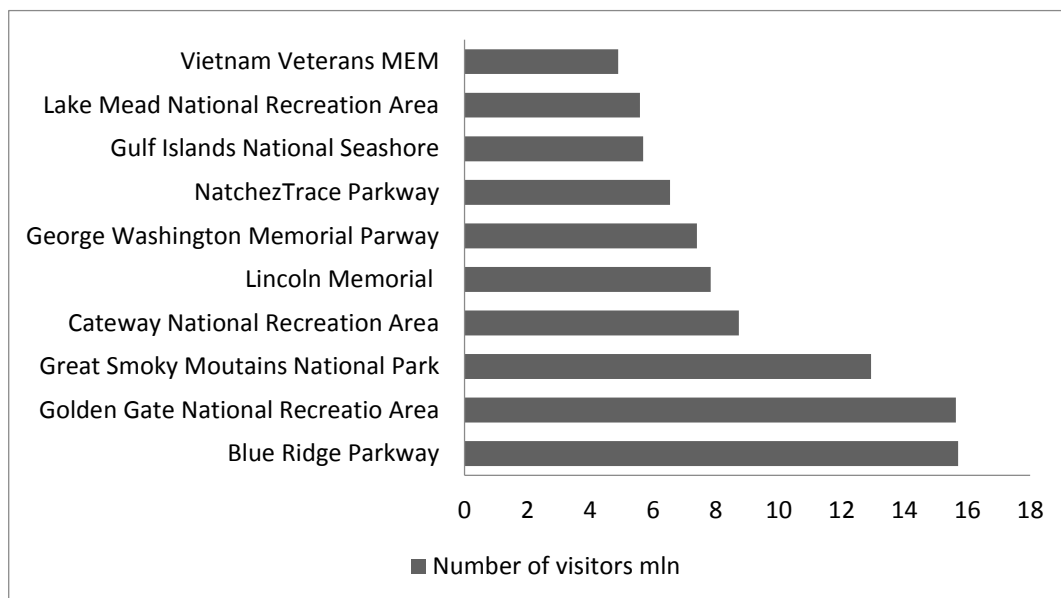
*The amount of funding for the maintenance of national parks in various developed countries of the world*

Country	Budget for National Parks, million \$	Number of National Parks	Total Area of National Parks, square kilometres	Visitors to National Parks, million
United States	4 000	63	343982,8	237
Canada	375	48	328000	20
Australia	179	500	344000	50
India	330	104	63000	1250
South Africa	80	21	38000	6

Source: author's work based on Benefits of World Heritage Status, 2023; Dieckmann, 2023; Most visited U.S. national parks, 2022; Dearden, Bennett, 2017; Borrini-Feyerabend et al., 2018.

The budget, number of parks, and visitor numbers (Table 1) vary significantly from country to country, reflecting differences in size, population, and natural landscapes. The United States has the highest budget for national parks, with \$4,000 million, followed by India with \$330 million. South Africa has the lowest budget at \$80 million. Australia has the highest number of national parks, with 500, followed by the United States with 63 and this country has the largest total area of national parks, with 344,000 square kilometers. India has the smallest total area of national parks, with 63,000 square kilometers but has the highest number of visitors to its national parks, with 1,250 million visitors. These statistics provide insights into the allocation of funds and the popularity of national parks in these developed countries.

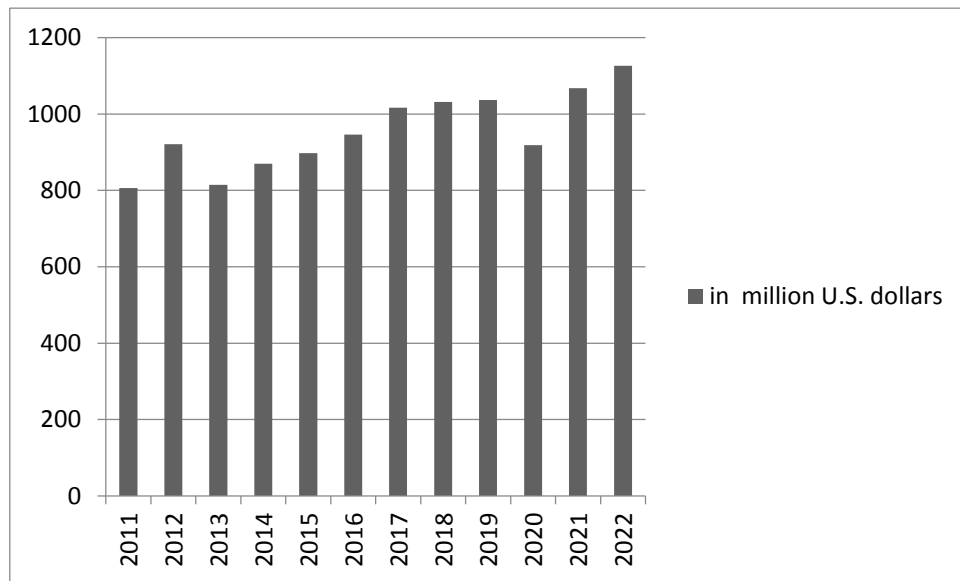
With approximately 15.7 million recreational visits in 2022, the Blue Ridge Parkway in North Carolina and Virginia was the most visited National Park Service park in the United States (Figure 2). Meanwhile, the Golden Gate National Recreation Area in California was the second most visited park in the country (Most visited U.S. national parks, 2022; Statista).



**Figure 1.** The most visited National Park Service park in the United States.

Source: author's work based on (Most visited U.S. national parks, 2022; Statista).

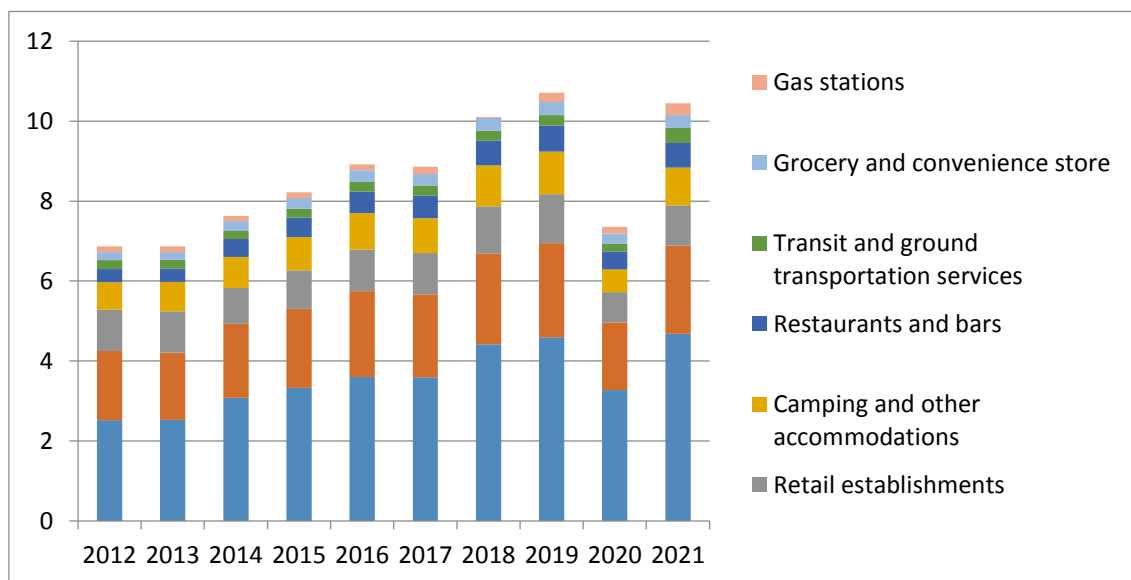
Market size of the national and state park sector in the United States from 2011 to 2022 has been presented in Fig. 2. It was estimated at 1.13 billion U.S. dollars in 2022. This reflects a 5.5 percent increase over the previous year's size of 1.07 billion U.S. dollars. National parks are areas protected by government and local authorities to preserve their natural environment and wildlife for public recreation and entertainment or because of their historical or scientific value. In particular, efforts are made to keep their landscapes, fauna and flora intact (Benefits of World Heritage Status, 2023; Economic impact of U.S. national park visitors, 2021; Dieckmann, 2023; Most visited U.S. national parks, 2022; Dearden, Bennett, 2017; Hutton, Adams, 2003).



**Figure 2.** The market size of the national and state park sector in the United States in million dollars, 2011-2022.

Source: author’s work based on (Most visited U.S. national parks, 2022; Statista).

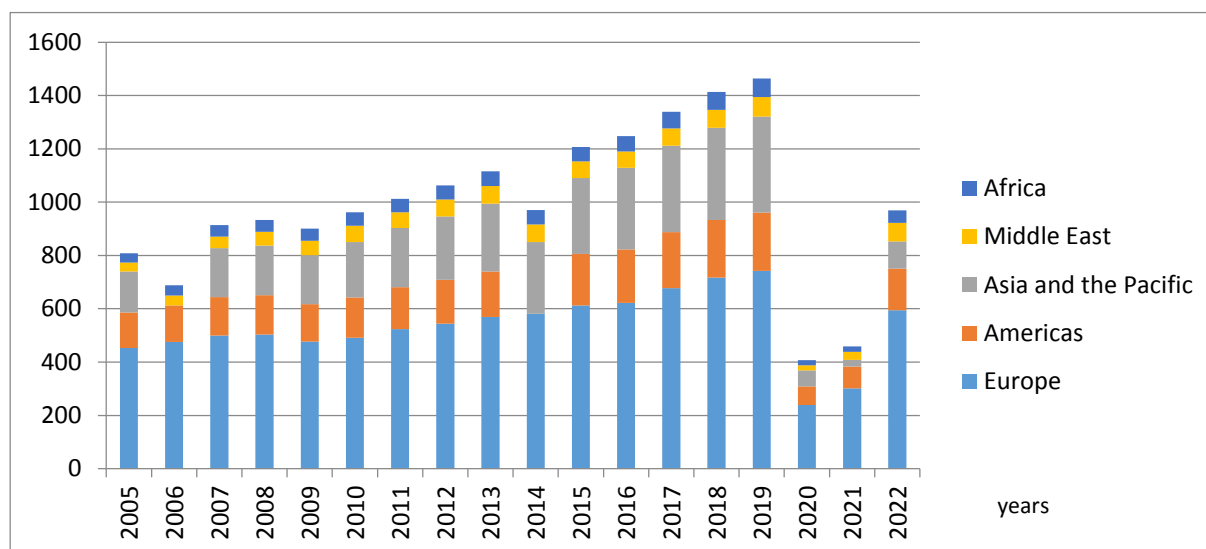
The size of the national nature parks market in the United States was estimated to be approximately USD 940 million by 2022. It is worth noting that as of the beginning of 2022, this sector included slightly more than 1,080 enterprises and had more than 7,500 employees. Thanks to visitors, US national parks received \$4.68 billion in 2021, the largest contribution of any major economic activity (Figure 3). The restaurant business, by comparison, had a second position at \$1.43 billion over the same period.



**Figure 3.** Value added of national park visitor spending to the economy in the United States from 2012 to 2021, by economic activity, billion U.S. dollars.

Source: author’s work based on (Economic impact of U.S. national park visitors, 2021; Statista).

The number of international tourist arrivals worldwide roughly doubled in 2022 over the previous year, after falling dramatically with the onset of the coronavirus (COVID-19) pandemic (Figure 4).



**Figure 4.** Number of international tourist arrivals worldwide from 2005 to 2022, by region, in millions.

Source: author's work based on Number of international tourist, 2023.

The largest number of tourists in 2022 was estimated in Europe - approximately 595 million. While this figure represents a significant year-over-year increase, the number of international arrivals in the region remained below pre-pandemic levels. The COVID-19 pandemic nearly wiped out the tourism industry, posing unprecedented challenges in 2020 and 2021 as countries around the world imposed quarantine measures and travel bans. In 2020, 62 million travel and tourism jobs were lost worldwide due to the impact of COVID-19. Meanwhile, the share of total gross domestic product generated by the global travel and tourism industry nearly halved in 2020. According to a report published by the European Tourism Commission, global visitor numbers are expected to increase dramatically in 2023 and continue to increase in the following periods. (Number of international tourist arrivals worldwide from 2005 to 2022, by regions, 2023).

Leading national parks in Europe during 2021 were such as: the Pembrokeshire Coast Natural Park (index score 95), Snowdonia (94) (UK), Foreste Casentinesi, Monte Falterona, Campigna – 92 (Italy), Cairngorms – 91, Northumberland – 91 (UK), El Teide – 89 (Spain), Mercantour – 89 (France), Gran Paradiso – 89 (Italy), South Downs – 88 (UK), Sarek – 88 (Sweden) (<https://www.statista.com/ststatistics/1058601/leading-national-parks-europe/>). For example, the Pembrokeshire Coast Natural Park, located in Wales (UK), was most popular European national park in 2021, with an index score of 95. Snowdonia, also in Wales, had the second highest score. Out of the top ten national parks in Europe that year, five were located in the United Kingdom.

The integration of natural economic values into territorial community development requires a comprehensive and well-coordinated approach facilitated by effective policies and management frameworks. The main instruments of funding for the maintenance of national parks in various developed countries have been presented in table 2. This table provides an overview of various financial instruments used for funding and managing national parks and protected areas, along with the characteristics and types of these instruments and the countries where they are commonly employed.

**Table 2.**

*The instruments of funding for the maintenance of national parks in various developed countries*

Financial Instruments	Characteristics and types	Countries using	Sources of funding
Government Appropriations	Direct funding from the government's budget for park operations and maintenance.	United States, Canada, Australia, India, South Africa, and many others	Government budgets
Entrance and User Fees	Fees charged to visitors for park entry or specific activities like camping and boating.	United States, Canada, Australia, India, South Africa, and many others	Visitor fees
Concession Contracts	Agreements with private companies to provide services like food, lodging, and retail.	United States, Canada, Australia, India, South Africa, and many others	Private sector revenue
Grants and Donations	Funding received from grants, philanthropic organizations, individuals, and corporations.	United States, Canada, Australia, India, South Africa, and many others	Grants, donations
Tourism and Recreation	Revenue generated from tourism-related activities such as guided tours and adventure sports.	United States, Canada, Australia, India, South Africa, and many others	Tourism-related income
Corporate Partnerships	Partnerships with corporations for sponsorship and promotional agreements.	United States, Canada, Australia, India, South Africa, and many others	Corporate sponsorships
Resource Use Fees	Income from resource use permits and royalties, especially in parks with natural resources.	Canada, Australia, India, South Africa, and others	Resource use fees
Conservation Trust Funds	Trust funds supported by endowments and investment returns for protected areas.	United States, India, and others	Endowments and investments
Volunteer Programs	Utilizing volunteers for park tasks, reducing labor costs.	United States, Canada, Australia, India, South Africa, and many others	Volunteer contributions
Public-Private Partnerships (PPPs)	Collaboration between government and private entities for park management and development.	United States, Canada, Australia, India, South Africa, and many others	Public-private agreements
International Funding	Funding from international organizations and governments for transboundary parks or projects.	Various countries, especially in the case of transboundary parks	International grants and aid
Carbon Credits and Eco-Tourism	Income from selling carbon credits or eco-tourism initiatives highlighting conservation.	Australia, India, and others	Carbon credit sales, eco-tourism

Cont. table 2.

Community-Based Tourism	Projects that generate income for local communities and parks while promoting responsible tourism.	India, South Africa, and others	Community-based initiatives
Special Events and Filming Permits	Permit fees for hosting special events or filming within park boundaries.	United States, Canada, Australia, India, South Africa, and others	Permit fees

Source: author's work based on Economic impact of U.S. national park visitors, 2021; Benefits of World Heritage Status, 2023; Hutton, Adams, 2003; Dieckmann, 2023; Most visited U.S. national parks, 2022; Dearden, Bennett, 2017; Borrini-Feyerabend et al., 2018.

These financial instruments demonstrate the diverse ways in which national parks and protected areas can secure funding and support their conservation efforts and operations.

Additionally, natural economic values encompass biodiversity, which represents the variety and variability of life forms within ecosystems. Biodiversity contributes to ecosystem resilience, genetic resources, and potential for scientific discovery. Cultural heritage refers to the cultural aspects of ecosystems, including traditional knowledge, historical sites, and practices that have social and cultural significance. The sustainable development of territorial communities relies on the careful management and preservation of natural economic values. Many national parks hold deep cultural and historical significance. They protect indigenous knowledge, sacred sites, and traditional practices. Uluru-Kata Tjuta National Park in Australia is not only ecologically important but also culturally revered by the Anangu people, preserving their heritage for generations (Uluru-Kata Tjuta National Park, 2023). The Galápagos Islands are a living laboratory of evolution and are highly protected due to their unique biodiversity. Tourism to the park generates significant revenue for Ecuador, contributing to both national and local economies. Another example – Khao Sok National Park (Thailand), that showcases the value of ecotourism. Sustainable tourism practices have not only bolstered the local economy but also funded conservation efforts, resulting in a win-win situation for both the environment and the community. Bwindi Impenetrable National Park (Uganda), known for its population of endangered mountain gorillas, Bwindi Impenetrable National Park draws tourists from around the world. Revenue from gorilla trekking permits directly benefits local communities and supports conservation initiatives. Jasper National Park in Canada demonstrates how protected areas can stimulate the economy through recreational activities like hiking, skiing, and wildlife viewing. These activities create jobs and boost local businesses (Khao Sok National Park, 2023; Krozer et al., 2019).

National parks are not only ecological and cultural treasures but also significant contributors to the economic well-being of local communities. This article delves into the diverse ways in which national parks play a pivotal role in fostering economic growth, job creation, and sustainable development. By exploring the avenues of ecotourism, recreation, and research, as well as presenting compelling data, this article underscores the immense economic potential that national parks hold for territorial communities. According to a study conducted by the National Park Service in the United States, national parks contributed \$40 billion to the U.S.

economy and supported more than 340,000 jobs in 2020. A report by the World Travel & Tourism Council indicated that natural and cultural heritage sites, including national parks, accounted for over 10% of global tourism spending in 2019.

## 5. Conclusions

In this study, the authors summarized the main points presented in the article, proved the essential importance of natural economic values in the sustainable development of territorial communities through the preservation of national parks. The main results are:

1. The need to continue research, cooperation and making informed decisions to ensure a harmonious balance between economic progress and environmental protection is emphasized. Territorial communities benefit from the presence of national parks through economic opportunities, infrastructure development, cultural preservation, education, property value increases, nature-based entrepreneurship, community empowerment, improved quality of life, and access to scientific research and education. These benefits can vary from one country to another depending on the specific context and management practices in place.
2. National parks are indispensable in the preservation of natural economic values. By conserving biodiversity, upholding ecosystem services, and safeguarding cultural heritage, they contribute to the sustainable development of both local communities and the planet at large. The examples outlined above underscore the tangible benefits that national parks bring to economies and well-being, demonstrating that their role extends far beyond conservation alone. Also national parks are dynamic engines of economic prosperity for territorial communities. Their contributions extend from ecotourism and recreation to research and education, fostering economic growth and job creation. As evidenced by data from various regions, the economic potential of national parks is substantial, underlining the critical role they play in advancing sustainable development and enhancing the quality of life for communities fortunate to coexist with these invaluable natural assets.
3. While conflicts between economic development and conservation in national parks are inevitable, strategic planning and collaborative efforts can mitigate these tensions. By adopting a holistic approach that considers ecological, social, and economic factors, territorial communities can navigate these challenges and achieve a harmonious balance between sustainable economic activities and the preservation of natural economic values within their cherished national parks.

4. The importance of involving local communities in national park management and economic activities cannot be overstated. Community engagement not only enhances conservation efforts but also empowers communities to prosper in ways that are ecologically sustainable and culturally respectful. The success stories of community-based initiatives highlighted in this article underscore the transformative potential of collaborative approaches, reinforcing the notion that the harmonious coexistence of people and nature is not only feasible but also beneficial for the preservation of natural economic values within national parks.
5. Effective integration of natural economic values into territorial community development necessitates a cohesive framework of policies and practices. By enhancing policy coordination, engaging stakeholders, practicing adaptive management, and implementing incentive mechanisms, territorial communities can embrace sustainable development that not only bolsters their economies but also preserves the invaluable natural assets that underpin their prosperity.
6. The decision to allocate funds for the maintenance and protection of national parks is a strategic investment that yields an array of ecological, economic, social, and cultural dividends for territorial communities. Such investments in the form of grants and budget funding, carbon credit sales, corporate sponsorships have multifaceted advantages, ensuring the effective preservation and prosperity of the natural ecosystems of national parks, which significantly enriches and improves the lives of local residents.
7. Scholars have highlighted the critical role of funding in sustaining national parks, with studies focusing on financial sustainability, economic valuation, and innovative funding models. Country examples such as the United States, Costa Rica, South Africa, and Australia showcase diverse approaches to financing, underscoring the global recognition of the importance of investing in national parks for their ecological, economic, and cultural value. Effective funding strategies are essential to ensure the long-term viability of these invaluable natural assets.

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## STUDY OF LEARNERS' EDUCATIONAL PREFERENCES AS A FACTOR IN SHAPING THE UNIVERSITY'S IMAGE

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**Purpose:** The aim of the article is to present the results of a study on the opinions of high school students in Czestochowa regarding the factors that shape their decisions related to university choice and to explore the possibilities of using these findings in shaping the image of the university, using Czestochowa University of Technology as a case study.

**Design/methodology/approach:** For the purposes of the article, a literature review on the subject was conducted, and empirical research was carried out using a diagnostic survey method. The analysis of the data obtained during the survey was performed using the Yule's phi coefficient.

**Findings:** The study allowed for diagnosing the expectations and educational preferences of high school students regarding higher education and the factors influencing their choice of a study location. When making decisions, the most crucial factor is the availability of a desirable field of study, followed by the university's image and the attractiveness of the city where the university is located.

**Research limitations/implications:** The study had a limited scope as it was a one-time survey. It is advisable to continue and expand the sample size for future studies to allow for comparative analyses.

**Practical implications:** The article presents excerpts from a study conducted for the purposes of the development strategy of Czestochowa University of Technology. The results of this study have provided insights into the actions that should be taken to build the university's image and strengthen its brand within the local community.

**Social implications:** The utilization of the research results will enable the university to better align its activities with the needs of its stakeholders, particularly the students. This will have a positive impact on the university's image and demonstrate its commitment to social responsibility.

**Originality/value:** This study is one of the few that presents research results conducted among high school students rather than among university applicants or current students.

**Keywords:** educational preferences, image management, students' expectations, university, university brand.

**Category of the paper:** research paper.

## 1. Introduction

Polish universities are increasingly taking action aimed at strengthening their image and attractiveness to attract an optimal number of students. They employ diverse strategies and methods focused on initiatives such as cooperation with local and regional schools, creating educational services offers, including "universities for children and youth" (Mioduchowska-Jaroszewicz et al., 2018). Other forms of promoting the university's brand and shaping its image like open days, campaigns highlighting the academic achievements of staff and students, science festivals, e.t.c. The image effects of these activities are assessed through opinion surveys conducted among candidates or students (Mont, Bélanger, 2004; Ryńca, Radomska, 2018; Ramdan et al., 2021; Pacholarz, 2022; and others).

Reports on research examining the impact of such initiatives on how learners perceive higher education institutions as places for future academic education are rare. At the same time, researchers recognize the necessity of conducting such studies (Royo, 2017). The limited number of such studies makes it challenging to assess whether the initiatives undertaken by universities serve to attract participating learners or are merely a supplementary form of school activities that do not influence decisions regarding the choice of future study place and field. A similar approach was observed at Częstochowa University of Technology (PCz). The university undertook such actions without assessing their actual promotional impact.

It was only during the preparation of the development strategy for Częstochowa University of Technology (PCz) that the institution was prompted to conduct research to determine whether the campaigns conducted among pupils were perceived by them as factors enhancing its attractiveness as a potential place for further education. These studies also allowed for the identification of factors that students consider when making decisions regarding their choice of a higher education institution. Based on this, it is possible to determine which of the expectations of high school students PCz meets and which ones need to be adjusted.

The article will present the results of these studies, and their potential utility in managing the university's image in the long term will be indicated. The authors of the article will complement the presentation of these results with an analysis of the literature containing research findings and recommendations from other national and international authors.

## 2. Literature Review

The necessity for higher education institutions to engage in marketing activities began to be recognized in highly developed countries in the 1970s (Mount, Bélanger, 2004). In the following decade, incorporating promotional activities and building the university's

image into the management process became a reality. Initially, actions aimed at building a positive image were taken by private universities, which were competing for students as customers (Chen, 2016; Ramdan et al., 2021; and others). Later on, the need for promotional and branding efforts also became evident to administrators of public universities (Azoury et al., 2014; Lafuente-Ruiz-de-Sabando et al., 2018).

The image of a higher education institution reflects what people think about it. It is also a kind of perception that forms in the minds of individuals who come into direct or indirect contact with it (Sławiński, 2011) and is disseminated in the form of public opinion (Wilkins, Huisman, 2015). In the case of a higher education institution, it determines its uniqueness resulting from the utilization of material and non-material resources to distinguish it from other higher education entities (Palacios-Marqués et al., 2019). Therefore, in contemporary societies, the image and brand of a university become increasingly important attributes for every higher education institution (Golata, Sojkin, 2020).

Managing the image of Polish universities, like other non-profit institutions, was considered unnecessary for decades (Oleksy, 2022). It was only the need to compete through the quality of education as a factor in building a strong brand for the purpose of attracting and retaining key customers, who are students (Pacholarz, 2022), and the approach to students as the primary stakeholders without whom universities would cease to exist, that changed the perspective of those in charge of these institutions regarding such efforts (Witczak, Mitręga, 2015).

D'Uggento et al (2022) indicated that pride associated with the brand of the university is a crucial factor for students while making a decision to choose a university, therefore the image of the university is an important decisive factor. Students with a high reputation of their university develop higher brand experience, which then strengthens the pride to belong to the institution and identify with it pride seemed to be a most evident factor in the multidimensional aspect of emotional engagement of students. The study revealed a positive association between the high brand experience of the university and the pride of the students.

This change in the approach to management is the result of higher education authorities recognizing that the popularity of a university and its ability to attract students increasingly depend on actively building relationships with stakeholders, including children, youth, and their parents (Nowacka, 2016; Lafuente-Ruiz-de-Sabando et al., 2018; Adamska, 2018).

Factors such as credibility, the quality of educational services offered, and the past and current perception by communities interacting with the university also play a significant role (Ramdan et al., 2021). Chen (2016) found that at public universities in Iran, students' identification was positively related to the university brand. Students who identify with the university's brand through word of mouth and buzz marketing convey positive information about its image. For these reasons, universities, in order to survive and thrive in the market, should continuously shape their image professionally, undertaking long-term, deliberate, planned, and systematic efforts to disseminate positive information about themselves (Pawlak-Wolanin, Gudowski, 2016).

Particularly important are actions related to showcasing the intellectual potential of the university and its achievements, which contribute to building its prestige and visibility in the social environment (Duarte et al., 2010; Załona, 2019; Kowalska-Musiał, 2023). Building the university's image and positive relationships with the community are also facilitated by the university's openness to current and anticipated changes in its environment (Golata, Sojkin, 2020). Managing its image also requires that the actions related to it are known to and accepted by the staff. This allows employees to identify with the university, participate in shaping its image, and manifest through their own attitudes the values that are crucial for the university (Wæraas, Solbakk, 2009).

As can be seen, incorporating image-related activities into management practices arising from the implementation of a strategy requires university authorities to base their actions on a classical approach that includes four groups of activities: planning, organizing, leading, and controlling. Key to this is proper planning, which necessitates the examination and analysis of the expectations and perception of the higher education institution by its stakeholders (Załona, 2019), including students who are part of the local community.

In the literature, it is emphasized that the smaller the university, the greater the importance of its image and its relationships with the local community for its current and future functioning. A significant portion of its future students is likely to come from this local community, making it essential to continually monitor this image (Ryńca, Radomska, 2018). An effective way to diagnose this is through conducting systematic marketing research among external stakeholders, which can include online surveys. In 2022, PCz initiated such research, and the results pertaining to the needs and expectations of high school students deciding on their choice of university are presented in the later part of the article.

### **3. Materials and methods**

The results presented later in the article are based on a quantitative study conducted as part of the preparation of the Development Strategy for Częstochowa University of Technology until 2030. The research method employed was a diagnostic survey, utilizing an online questionnaire as the data collection tool. The study was conducted in June 2022 among 1,039 pupils from Częstochowa's upper-secondary schools in their final year. Some of the surveyed pupils were residents of the city, while the other portion consisted of individuals who were studying in Częstochowa but lived outside the city. Among the 1,039 pupils who opened the questionnaire, 250 did not respond to any of the questions, meaning that the sample size for the study comprised 789 respondents.



The research aimed to identify whether there were differences in the needs and expectations regarding future universities between students residing in Częstochowa and those living outside the city. If such differences existed, the study sought to determine the specific areas where these distinctions occurred. As a result, it would be possible to pinpoint the areas of action that PCz should undertake to enhance its attractiveness as a potential university choice for the surveyed students. The following research hypotheses were formulated for the study:

- H1. High school learners do not have specific plans regarding the locality in which they want to study.
- H2. Respondents based their choice of the city where they planned to study on the image of the university and the reputation of the city in which it is located.
- H3. Learners, regardless of their place of residence, select the academic field they are interested in first and then choose the university offering that field.
- H4. Statistically significant differences in educational preferences exist between individuals residing in Częstochowa and those living outside the city.

The indicators for planning future studies were the declarations of the choice of the study location and the factors influencing the choice of a higher education institution respondents intended to apply to. The indicators for knowledge about the factors shaping the attractiveness of a university were the responses to questions about expectations regarding the educational offerings and social facilities provided by the university. The indicators for differences in the educational preferences and expectations of high school students were the pieces of information about their place of residence.

In the statistical analysis of the research results, the focus was on identifying correlations between the respondents' place of residence (Częstochowa vs. another locality) and their responses to specific questions, as well as the type of school they attended (general high school vs. other secondary school) and their responses. The statistical analysis was conducted following the procedure adopted for calculating the  $\phi$ -Youla correlation coefficient, which was determined using PQStat Software 1.8.6. This allowed for the assessment of the strength of the identified correlations.

## 4. Results

Among the surveyed high school learner, there were 465 females, 268 males, and 56 individuals who did not specify their gender. In the entire sample, the distribution of responses regarding the place of residence of the respondents was similar - 346 individuals indicated Częstochowa, 344 stated that they live outside Częstochowa, and 184 did not provide an answer to this question. Since information about the place of residence was essential for the analysis of the research results, the surveys of those who did not respond to this question were

not considered in the subsequent analysis. Therefore, the research sample was limited to 690 individuals.

Among the final-year high school pupils, only 48 individuals (7%) indicated that they want to study in Częstochowa, 188 (28%) plan to pursue studies elsewhere, 343 respondents (50%) were indifferent about where they would study, and 111 (16%) do not plan to pursue higher education (Table 1). The table presents the distribution of responses regarding of learners' preferences regarding the location where they would like to pursue their higher education.

Among the learners who decided to study in Częstochowa, 18 individuals (2.6% of the sample) chose Częstochowa University of Technology and 25 individuals (3.7% of the sample) selected Jan Długosz University. The remaining 5 individuals (0.7% of the sample) did not specify a particular university. This suggests that, in general, the respondents did not have specific plans regarding the university they wanted to attend, what leads to a positive verification of this hypothesis. To unambiguously verify the first hypothesis, the value and significance of the relationship between the place of residence and the reasons for choosing a university were further examined by calculating the  $\phi$ -Youla correlation coefficient (Table 2).

For all statistically significant importance is attached to the universities offering an interesting study program ( $\phi = 0.246$  for residents of Częstochowa and 0.362 for those residing outside the city), the university's reputation/prestige ( $\phi = 0.116$  for residents of Częstochowa and 0.236 for those residing outside the city), and the attractiveness of the city where the university is located ( $\phi = 0.209$  for residents of Częstochowa and 0.193 for those residing outside the city). Additionally, for residents from outside Częstochowa, the costs associated with studying are statistically significant ( $\phi = 0.123$  for those residing outside the city). According to the obtained data, there were no significant correlations found between the place of residence and the approach to choosing the university where the respondents planned to study. Therefore, the first hypothesis has been positively verified. These responses were more frequently indicated by students from general high schools.

To verify the second hypothesis, data obtained from responses to questions about expectations regarding the university's educational offerings and social facilities were utilized. These responses were correlated with demographic data regarding the place of residence and the type of high school attended by the respondents. In Table 3, the distribution of responses from study participants regarding their expectations concerning the educational offerings of the university is presented, taking into account their place of residence and the type of high school they attended. The values of the  $\phi$ -Youla correlation coefficient and  $\chi^2$  allowed us to determine the existence of significant relationships between the place of residence and the type of high school where the respondents studied, and their expectations regarding the educational offerings of the university. All participants attached significant importance to the professionalism of the teaching staff ( $\phi = 0.172$  for residents of Częstochowa and 0.209 for those residing outside the city), practical preparation for future professional work ( $\phi = 0.134$  for residents of Częstochowa and 0.195 for those residing outside the city), and the possibility

of finding satisfying employment after completing their studies ( $\varphi = 0.235$  for residents of Częstochowa and 0.277 for those residing outside the city).

The results presented in Tables 2 and 3 positively confirm the second hypothesis. Respondents, when deciding to pursue their studies, take into account the prestige of the university and the attractiveness of the city where it is located. Similarly, the third hypothesis has been verified. The most important factor in deciding where to pursue their studies is the availability of the desired field of study for the respondents.

For residents of Częstochowa, statistically significant importance was also attached to: high-quality foreign language education ( $\varphi = 0.126$ ) and the corresponding opportunity for studying abroad ( $\varphi = 0.201$ ), as well as the possibility of collaboration with companies cooperating with the university ( $\varphi = 0.120$ ) and the opportunity to connect with professionals ( $\varphi = 0.145$ ). Learners living outside Częstochowa statistically more often emphasized the importance of a close relationship with the teaching staff ( $\varphi = 0.175$ ), an interesting study program ( $\varphi = 0.238$ ), the opportunity to pursue their own academic interests ( $\varphi = 0.168$ ), and student internships allowing them to acquire professional skills ( $\varphi = 0.199$ ). When comparing the responses of students from general high schools and other types of schools, it was found that the former more frequently provided statistically significant answers.

The last issue subjected to statistical verification concerned the expectations of the respondents regarding the social facilities that the university should offer to attract them as potential candidates (Table 4). It turns out that there were few indications for which a statistically significant relationship was found. For residents of Częstochowa, it was only the availability of dormitory spaces ( $\varphi = 0.115$ ), and for those residing outside Częstochowa, it was the availability of functioning on-campus bars and cafeterias ( $\varphi = 0.115$ ). Therefore, it can be inferred that students from Częstochowa were planning to move to another city, while those living outside Częstochowa were less likely to consider this option.

In summary, we can also verify the fourth hypothesis, which assumed that there were statistically significant differences in educational preferences between individuals residing in Częstochowa and those living outside the city. The hypothesis was partially confirmed. Residents of Częstochowa paid more attention to whether the university would enable them to acquire language skills for studying abroad. On the other hand, individuals from outside Częstochowa placed greater importance on the opportunity to develop their own scientific interests and collaborate with the teaching staff. In other areas, the differences were not statistically significant.

## 5. Discussion and summary

The study presented in the article shows that despite the wide range of educational offerings at the Częstochowa University of Technology for high school students, their interest in it as a potential place to pursue their studies is proportionally low. It is also impossible to determine how the respondents perceive its image, but it is clear that the university's image and the city in which it is located are significant factors in making decisions about the place of education. This means that the results of the study presented by the authors confirm those of other studies presented in scientific reports (Chen, 2017; Ramdan et al., 2021; Pacholarz 2022; and others).

While conducting a literature review, the authors noticed that both domestic and foreign studies most commonly involve groups such as students, business representatives, parents (Ramdan et al., 2021; Azoury et al., 2014; Golata, Sojkin, 2020; and others). This approach by researchers may suggest that high school students are not the optimal target group for such research. However, considering the number of students residing in Częstochowa and its surroundings pursuing studies in all faculties and fields at the university, it seems that the local community positively evaluates the quality of its educational offerings and services. Therefore, it can be assumed that its image is also positive. The results of research presented by other authors support the validity of such reasoning. In these studies, the quality of education and the attractiveness of the educational offerings are indicated as key factors positively influencing the university's image (Zaclona, 2021; Adamska, 2018; Kowalska-Musiał, 2023; and others).

In summary, the management of a university's image has been an interesting topic for both Polish and international researchers for many years. In their studies, they often focus on external stakeholders, examining local communities, business representatives, alumni, and other social groups involved in direct and indirect relationships with universities (Lafuente-Ruiz-de-Sabando et al., 2018). However, there has been a lack of research on potential students, i.e., high school students. The results presented in the article, obtained from this group of individuals, indicate that valuable knowledge about students' educational preferences and their academic plans can be built based on their responses. Conducting such research allows universities to gather information that enhances the accuracy of designing new educational programs or estimating the level of interest in studying at the institution. Knowledge in this area facilitates rational planning of actions to increase the university's appeal among the local population of high school students.

On the other hand, conducting and utilizing survey research as a source of information about the image of a university located in the same city where the students go to school and express their opinions about it may seem to have limited significance. A significant portion of these students may be interested in studying locally, while others may prefer universities in different cities, making the image or prestige of the local university less relevant to them. However, such research can serve as source material for developing a long-term strategy to increase

interest in the university's offerings by enhancing its attractiveness and providing young people with information about its programs that have been tailored to the diagnosed needs and expectations of the students.

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## Appendix

**Table 1.**

*Place Where Students Would Like to Pursue Higher Education*

Częstochowa	Another Location	Indifferent About Location	Not Planning to Pursue Higher Education
48 (7%)	188 (28%)	343 (50%)	111 (16%)

Source: own work.

**Table 2.**

*The values of the correlation coefficients  $\phi$ -Youla,  $\chi^2$ , and their significance for the place of residence and reasons for choosing a university*

Element of university characteristics	Measure					
	$\phi$	$\chi^2$	p	$\phi$	$\chi^2$	p
	Residing in Częstochowa			Residing outside of Częstochowa		
Offers a program of study that interests me	<b>0,246</b>	<b>17,783</b>	<b>0,000</b>	<b>0,362</b>	<b>38,965</b>	<b>0,000</b>
Has a favorable location for me	0,013	0,052	0,820	0,066	1,290	0,256
Costs associated with studying	0,078	1,773	0,183	<b>0,123</b>	<b>4,495</b>	<b>0,034</b>
University reputation/prestige	<b>0,116</b>	<b>3,935</b>	<b>0,047</b>	<b>0,236</b>	<b>16,626</b>	<b>0,000</b>
Family traditions	- 0,089	2,330	0,127	0,091	2,444	0,118
Family suggestion	0,112	3,689	0,055	0,033	0,319	0,572
Suggestion from friends/colleagues	- 0,102	3,029	0,082	- 0,011	0,037	0,848
Attractiveness of the city where the university is located	<b>0,209</b>	<b>12,811</b>	<b>0,000</b>	<b>0,193</b>	<b>11,157</b>	<b>0,001</b>

statistically significant values are bolded

Source: own work.

**Table 3.**

*The values of the  $\phi$ -Youla correlation coefficient,  $\chi^2$ , and their significance for the place of residence and expectations regarding the educational offerings of the university*

Assessed element of the educational offer	Measure					
	$\phi$	$\chi^2$	p	$\phi$	$\chi^2$	p
	Residing in Częstochowa			Residing outside of Częstochowa		
Professionalism of the teaching staff	<b>0,172</b>	<b>8,742</b>	<b>0,003</b>	<b>0,209</b>	<b>13,009</b>	<b>0,000</b>
High-quality foreign language education	<b>0,126</b>	<b>4,679</b>	<b>0,031</b>	0,113	3,779	0,052
Collaborative relationships with the teaching staff	0,092	2,495	0,114	<b>0,175</b>	<b>9,117</b>	<b>0,003</b>
Interaction with instructors through virtual media (social media)	- 0,023	0,154	0,695	0,078	1,819	0,177
An engaging curriculum	0,102	3,039	0,081	<b>0,238</b>	<b>16,924</b>	<b>0,000</b>
Modern equipment in classrooms/laboratories	- 0,019	0,101	0,751	0,104	3,224	0,073
Access to the latest technologies	- 0,011	0,035	0,853	0,020	0,117	0,733
Opportunities for pursuing personal research interests	0,022	0,146	0,702	<b>0,168</b>	<b>8,404</b>	<b>0,004</b>
Collaboration with the academic faculty in research	- 0,055	0,886	0,347	0,097	2,813	0,094
Participation in academic circles/academic organizations	0,083	2,025	0,155	0,036	0,396	0,529
Opportunities for studying abroad	<b>0,201</b>	<b>11,914</b>	<b>0,001</b>	0,006	0,010	0,918
Student internships that provide professional competencies	0,064	1,191	0,275	<b>0,199</b>	<b>11,756</b>	<b>0,001</b>
Practical preparation for future professional work	<b>0,134</b>	<b>5,297</b>	<b>0,021</b>	<b>0,195</b>	<b>11,363</b>	<b>0,001</b>
Opportunities to collaborate with companies cooperating with the university	<b>0,120</b>	<b>4,233</b>	<b>0,040</b>	0,084	2,108	0,146
Direct contact with industry professional	<b>0,145</b>	<b>6,193</b>	<b>0,013</b>	0,102	3,081	0,079
The possibility of finding satisfying employment after graduation or during the course of studies	<b>0,235</b>	<b>16,205</b>	<b>0,000</b>	<b>0,277</b>	<b>22,911</b>	<b>0,000</b>

statistically significant values are bolded.

Source: own work.

**Table 4.**

*The values of the  $\phi$ -Youla correlation coefficient,  $\chi^2$ , and their significance for the type of completed school and expectations regarding the social support infrastructure of university students residing in Częstochowa and outside it*

Assessed element of social support	Measure					
	$\phi$	$\chi^2$	p	$\phi$	$\chi^2$	p
	Residing in Częstochowa			Residing outside of Częstochowa		
Availability of dormitory spaces	<b>0,115</b>	<b>3,875</b>	<b>0,049</b>	- 0,099	2,910	0,088
Operating cafeterias / bars	- 0,042	0,513	0,474	<b>- 0,115</b>	<b>3,918</b>	<b>0,048</b>
Recreational areas on the university campus	- 0,042	0,510	0,475	- 0,008	0,017	0,895
Availability of sports facilities	0,111	3,612	0,057	0,080	1,922	0,166
Parking spaces and convenient access	- 0,080	1,887	0,170	- 0,034	0,334	0,563
Easy access to all university facilities/clustering of buildings in the campus	- 0,072	1,514	0,219	0,033	0,319	0,572
Facility adaptation for people with disabilities	0,076	1,717	0,190	0,010	0,032	0,858
Availability of psychological support services	- 0,038	0,421	0,516	- 0,100	2,966	0,085

statistically significant values are bolded.

Source: own work.



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