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COMPETITIVENESS AND DEVELOPMENT
OF REGIONS IN THE CONDITIONS
OF EUROPEAN INTEGRATION
AND GLOBALIZATION

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FOREWORD

Presented number of Silesian University of Technology. Scientific Papers. Organization and Management Series. Contemporary management. The number consists of 39 papers published by international authors.

The papers presented in the number concentrate on many topics connected with organization and management. The authors of paper in their research focus on following topics: innovation management, human resource management, marketing, environmental management, public management, sustainable economy, information management, Industry 4.0, Smart City, quality management, production management, organizational culture, logistics and finance.

Radosław Wolniak

Bożena Skotnicka-Zasadzień

INNOVATION IN INDUSTRIAL ENTERPRISES IN POLAND IN 2017-2019

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Purpose: The main purpose of the article is to present, based on the literature on the subject, the essence of the innovative potential and innovative activity of a company as generators of innovative processes.

Design/methodology/approach: The study used the methodology developed by Eurostat and OECD, as presented in the Oslo Manual.

Findings: The empirical part presents, using statistical data, the innovative activity of Polish industrial enterprises in the years 2017-2019.

Originality/value: The survey of industrial and service enterprises was conducted between 2017 and 2019, and its results were published in 2020. The results of the study can be used in strategic decisions of enterprises in the field of innovative activities of Polish industrial enterprises.

Keywords: innovative potential of the enterprise, innovative activity of industrial enterprises.

Category of the paper: research paper.

1. The innovative potential of an enterprise as a generator of innovative processes

In Polish and foreign-language literature on the subject, the concept of the innovative potential of an enterprise has been given many different definitions. Thus, one can notice the development of this concept over the last several decades, especially in the Polish literature on the subject in the period after the systemic transformation of the country's economy.

The concept of the innovative potential of an enterprise is always associated with its internal conditions and, increasingly, with many external conditions in which these companies operate.

According to K. Poznański, there is a direct and close relationship between the innovative potential of an enterprise and the phenomenon of resistance to innovation posed by the company's staff and the environment (Poznań, 1998). Internal resistance in an enterprise is proportional to the level of risk related to the implementation of innovations and resulting changes, such as job security or the current position and the associated comfort of employees. External risk related to innovation may result, for example, from the lack of acceptance of the innovation by the market or negative actions on the part of competitors. Therefore, it must be assumed that the implementation of innovations by an enterprise may disturb its internal balance.

According to K. Poznański, the specific innovative potential of an enterprise translates into its ability to effectively introduce innovations, for example in the form of new products, new technologies, better organizational methods and innovations in the sphere of strategies, activities and marketing tools. The author defines the innovative potential through four basic and key elements of the company's operation (Poznański, 1998):

- material potential (including, in particular, the quality level of the production apparatus),
- financial potential (own funds and the ability to obtain funds from external sources),
- human potential (the number of employees, their structure and their competence level, qualifications, skills and professional experience),
- knowledge (especially technical, technological and market information).

In the era of developing globalization and digitization of economy, the influence of the environment on individual elements of the innovative potential of the enterprise, both further (macro-environment) and closer (micro-environment) of the enterprise, is rapidly increasing. Based on this assumption, one can differentiate the internal and external innovative potential of the enterprise (Poznański, 1998). The latter is created by such factors as: the labour market, resources of technical knowledge and scientific innovation, or the system of financial institutions ready to support innovative undertakings.

A similar approach to the concept of the innovative potential of an enterprise can be observed in the works of A. Żoźnierski. The author argues that it is determined by internal elements and access to external sources of information (Żoźnierski, 2005). He lists the following internal components of the innovative potential: staff, research and development, technology. In turn, the basic external sources of innovation are: universities, R&D units, competitive enterprises, final consumers and intermediaries.

R. Sitkowska (Sitkowska, 2006) presents a more extensive concept of the elements of the company's innovative potential. The author, however, like her predecessors, is of the opinion that the company's innovative potential is determined by two spheres of the enterprise, namely the internal and external ones.

When analyzing the proposed theories and models of innovative activity of an enterprise appearing in the literature on the subject, it is apparent that the recommended development of an enterprise should be based on both the internal and external elements of innovations. For example, the theory of the absorption capacity of an organization emphasizes the importance of the company's environment (external environment) in addition to the elements of the internal environment of the organization (Cohen, Lewinthal, 1990). In turn, in the interactive model of R. Rothwell and W. Zegveld, it is indicated that the innovative potential of an enterprise should be based on three key cells such as: R&D, production and marketing, which guarantee an effective innovation creation process (Rothwell, Zegveld, 1985).

2. Innovative activity of Polish industrial enterprises in 2017-2019

2.1. Methodology of empirical research

Innovations introduced in the enterprise help to achieve a competitive advantage and success on the market. They are the basis of economic growth. The implementation of innovations requires effective action spread over time and incurring considerable investment. The results of the study presented in the article were taken from the Statistical analysis of the Central Statistical Office entitled: "Innovative activity of enterprises in the years 2017-2019", GUS, Warsaw-Szczecin, 2020. The study of industrial and service enterprises was carried out in 2017-2019, and its results showed in 2020. The study used the methodology developed by Eurostat and OECD, presented in the Oslo Manual (Oslo Manual, 2008).

According to the definition adopted in the European Union and OECD presented in the Oslo Manual, innovation is the implementation of a new or improved product, service or business process in economic practice, workplace organization or in business relations with the surroundings. A new or improved product is implemented when it is introduced to the market. New business processes are implemented when they are actually used in the company's operations.

Product and business processes do not have to be new to the market in which the company operates, but they must be new at least for the company itself. They do not have to be developed by the enterprise itself, they may be developed by another enterprise or by an entity of a different nature (e.g. a research institute, research and development centre, university, etc.).

Innovative activities include all development, financial and commercial activities undertaken by the enterprise, the intended goal of which is innovation. Some of these activities are innovative, while others are not new, but are necessary for the implementation of innovation. Innovation activities also include research and development (R&D) activities that

are not directly related with the creation of a specific innovation. The innovative activity of an enterprise may be:

- successfully completed with the implementation of innovation (but it does not necessarily have to be associated with commercial success),
- ongoing in progress, which has not led to the implementation of innovations so far,
- abandoned prior to the implementation of innovations.

Industrial enterprises are the subject of research on innovative activities and service. The units for the research were selected using the Polish Classification of Activities (PKD) 2007, consistent with the Statistical Classification of Economic Activity of the European Union (NACE Rev. 2). The research covered industrial enterprises operating in the PKD sections listed below. Industrial enterprises: Section B (mining and quarrying), Section C (manufacturing), Section D (generation and supply of electricity, gas, steam, hot water and air-conditioning systems), Section E (water supply, waste water management) and waste and remediation activities).

The research on innovative activity carried out using the PNT-02 form covered enterprises employing more than 9 people. In 2019, this study in industry was carried out on the full population of enterprises employing 50 people and more and a representative sample of enterprises employing 10-49 persons, amounting to approx. 25% of the frame. The survey is prepared on the basis of the above-described subjective scope. Units in a small number of sections may be included in the sample as a whole, due to the later ensuring that the results are representative for these sections. The remaining part of the sample is allocated according to PKD divisions and provinces. The allocation of the sample uses the results of the previous study to estimate the variance of the most important examined characteristics in the defined sections. Estimation of the variance for the most important features determined is performed using standard statistical procedures, i.e. with the data from the previous year from the conducted study, it is possible to estimate the variance of a given feature in the studied population (taking into account the weights). Quantities determined in this way are used for optimal sample allocation to a new study; Thanks to this, in the resulting cross-sections with greater variability of the examined feature, a correspondingly larger sample will be allocated, which will allow for better precision in the next year of the study. Such an approach gives results with the natural assumption that the distributions of the examined features are similar in the following years. On the basis of the determined allocation, a part of the sample is drawn according to the simple drawing scheme, without return, independently in the sections considered.

2.2. The structure of the surveyed group of industrial enterprises

As in previous years, in 2019 the vast majority of the analyzed industrial and service enterprises were companies employing 10-49 people. Over the year, their share in the total number of enterprises increased (industrial – by 0.6 percent, service – by 1.7 percent). Compared to 2018, the percentage of enterprises employing 50-249 people (industrial –

by 0.6 percentage points, services – by 1.5 percentage points) has decreased. The share of enterprises employing 250 people and more remained at a similar level as in the previous year and amounted to 5.5% in the industrial sector and 2.8% - in the service sector.

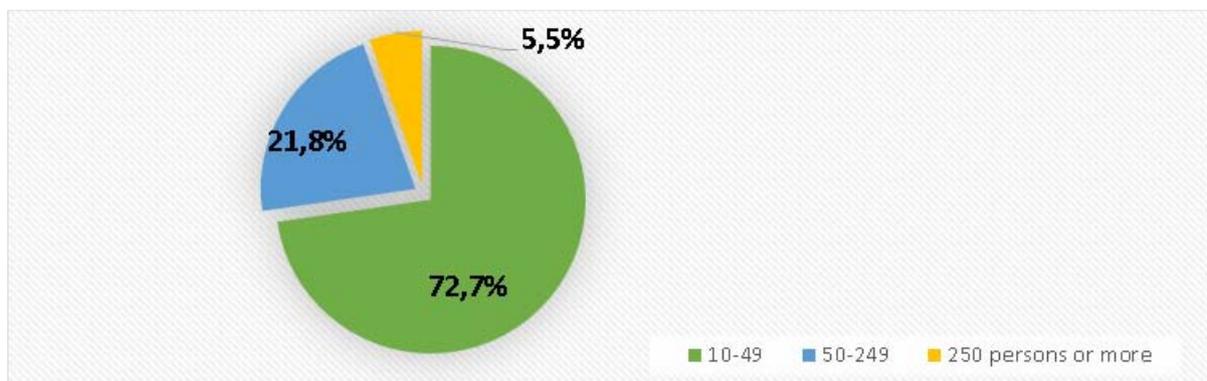


Figure 1. Structure of industrial enterprises by the number of employees in 2019 (%). Source: Innovative activity of enterprises in 2017-2019, GUS, Warsaw-Szczecin, 2020.

In 2019, every sixth industrial enterprise was active in the production of metal products (16.4% of the respondents). Among all the surveyed enterprises in industrial processing, the smallest number of entities were operating related to the mining of crude oil and natural gas (0.0% of the respondents), the mining of metal ores (0.0% of the respondents) and the production of tobacco products (0.0% of the respondents).

Taking into account the territorial division of the country, the following provinces were characterized by the highest number of surveyed industrial enterprises in 2019, as in the previous year: Śląskie (13.0%), Wielkopolskie (13.0%) and Mazowieckie (12.6%), while the smallest – Podlaskie (2.4%), Świętokrzyskie (2.6%), Lubuskie (2.8%) and Opolskie (2.8%). (figure 2).

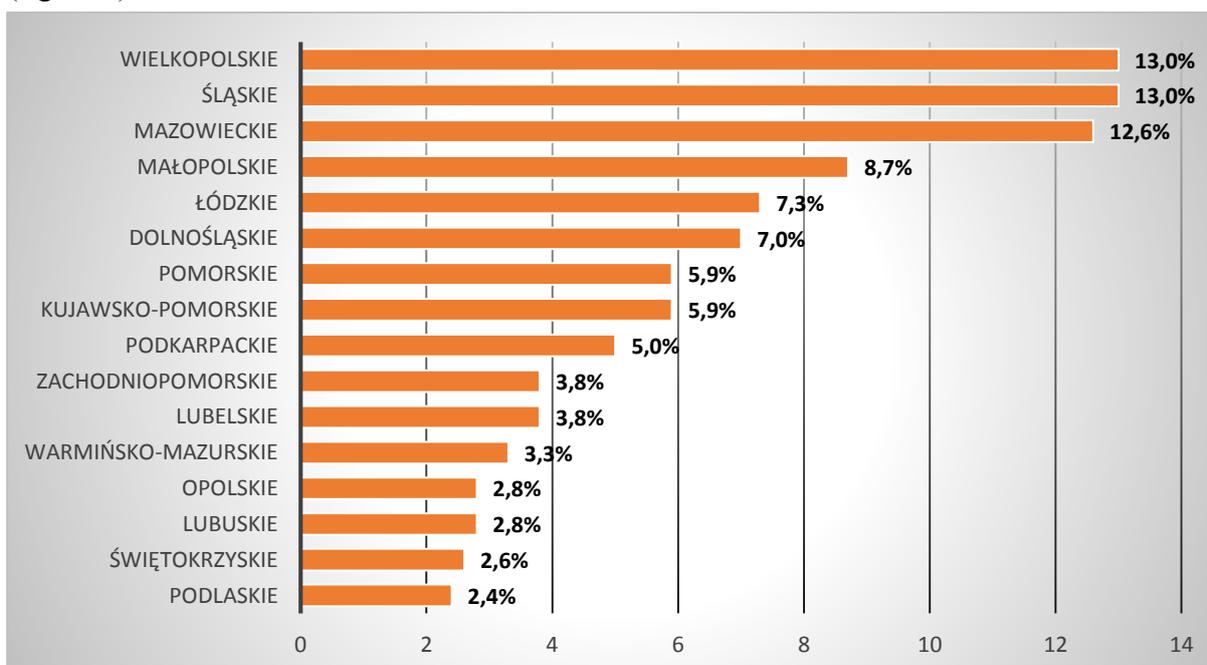


Figure 2. Structure of the surveyed industrial enterprises by voivodships in 2019 (%). Source: as above.

2.3. Innovative activity of industrial enterprises

In the research conducted by the Central Statistical Office, it was assumed that an innovatively active enterprise is one that: in the analyzed period, introduced at least one product or business process innovation or implemented at least one innovative project during this period, which was interrupted or abandoned during the period under examination (not successfully completed) or was not completed by the end of this period (i.e. it is continued).

An innovative enterprise in the field of product innovations and business processes is an enterprise that in the analyzed period introduced to the market at least one product or business process innovation (a new or improved product or a new or improved business process).

a) Innovatively active industrial enterprises

In the years 2017-2019, the share of innovatively active enterprises in the industrial enterprise sector was 21.7%. Taking into account the size classes of industrial enterprises, the highest percentage of innovation active entities, as in the previous years, was recorded among units employing 250 people and more (figure 3).

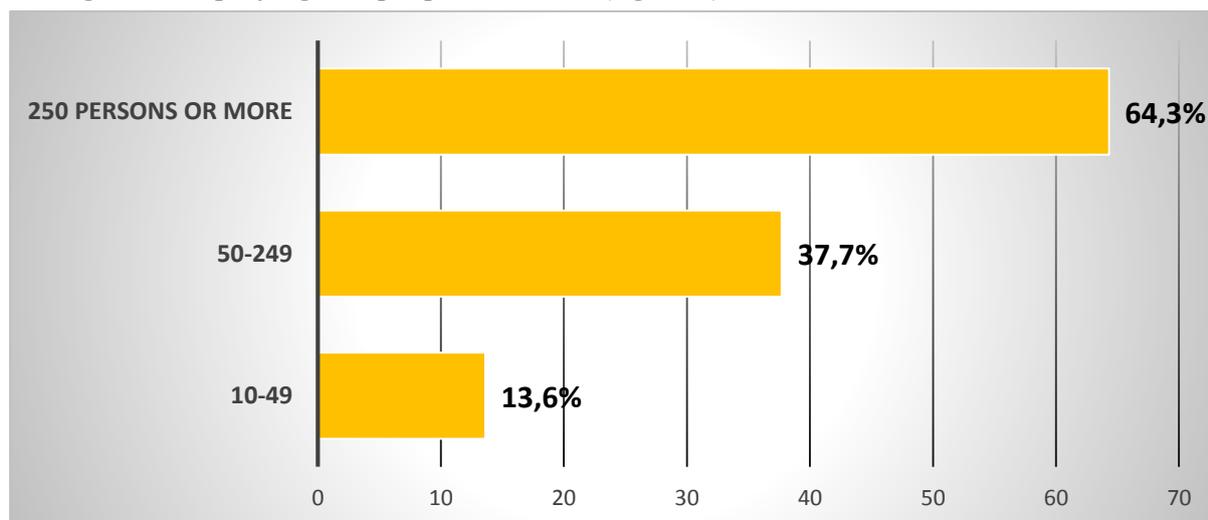


Figure 3. Innovatively active industrial enterprises in 2017-2019 by the number of employees (%). Source: as above.

In Industrial processing, the highest percentage of innovatively active enterprises was recorded in the section Production of coke and refined petroleum products (55.1%). The lowest innovative activity in Industrial processing was shown by companies producing clothing (8.2%).

Taking into account the territorial division of the country, the largest concentration of innovatively active industrial enterprises occurred in Podlaskie (30.7%) and Podkarpackie (28.4%) provinces. The lowest values of the percentage of innovation active entities in industry it was recorded in the Zachodniopomorskie (15.6%) and Lubuskie (17.2%) provinces (figure 4).

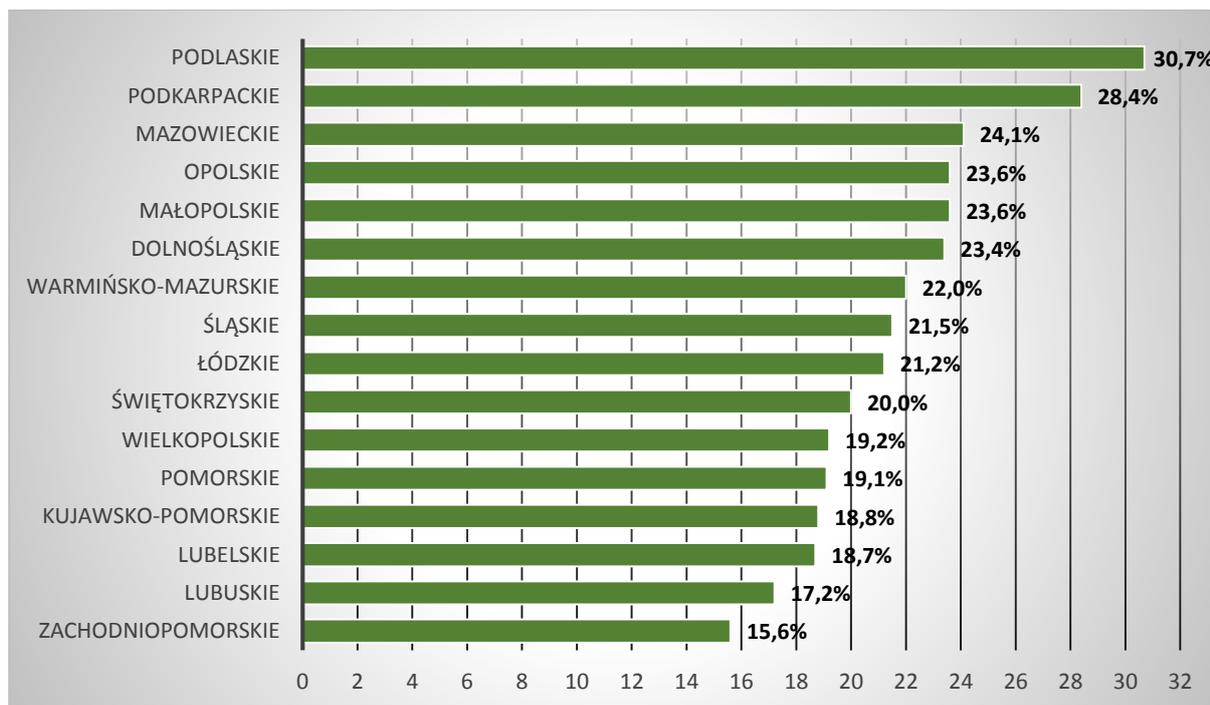


Figure 4. Innovatively active industrial enterprises in 2017-2019 by province (%). Source: as above.

b) Innovative industrial enterprises

The share of innovative industrial enterprises in the years 2017-2019 in the total number of these enterprises was 18.9%. Most often, product or business process innovations were introduced by entities employing 250 people or more (60.6% of industrial enterprises) (figure 5).

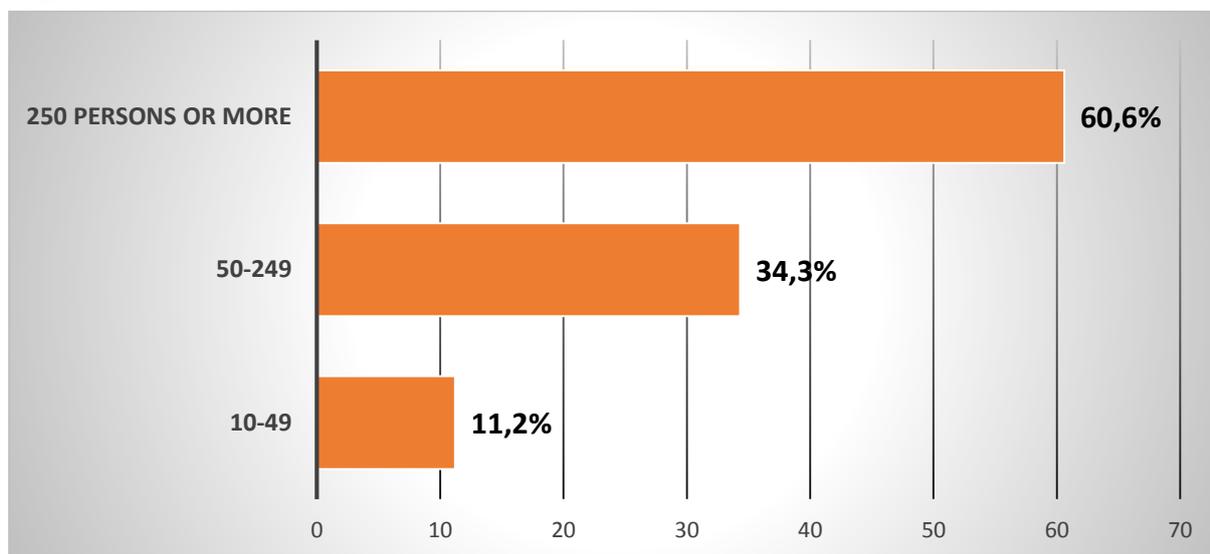


Figure 5. Innovative industrial enterprises in 2017-2019 by the number of employees (%). Source: as above.

In the analyzed period, the relatively largest number of innovative enterprises in industry was in the section Production of coke and refined petroleum products – 55.1%, while the smallest – in the section Production of clothing – 8.0%.

When analyzing innovation in territorial terms, it can be noticed that among industrial enterprises, the highest percentage of entities that introduced innovations in 2017-2019 occurred in the Podkarpackie (23.8%) and Podlaskie (22.1%) provinces, and the lowest – in Zachodniopomorskie (14.5%) (figure 6).

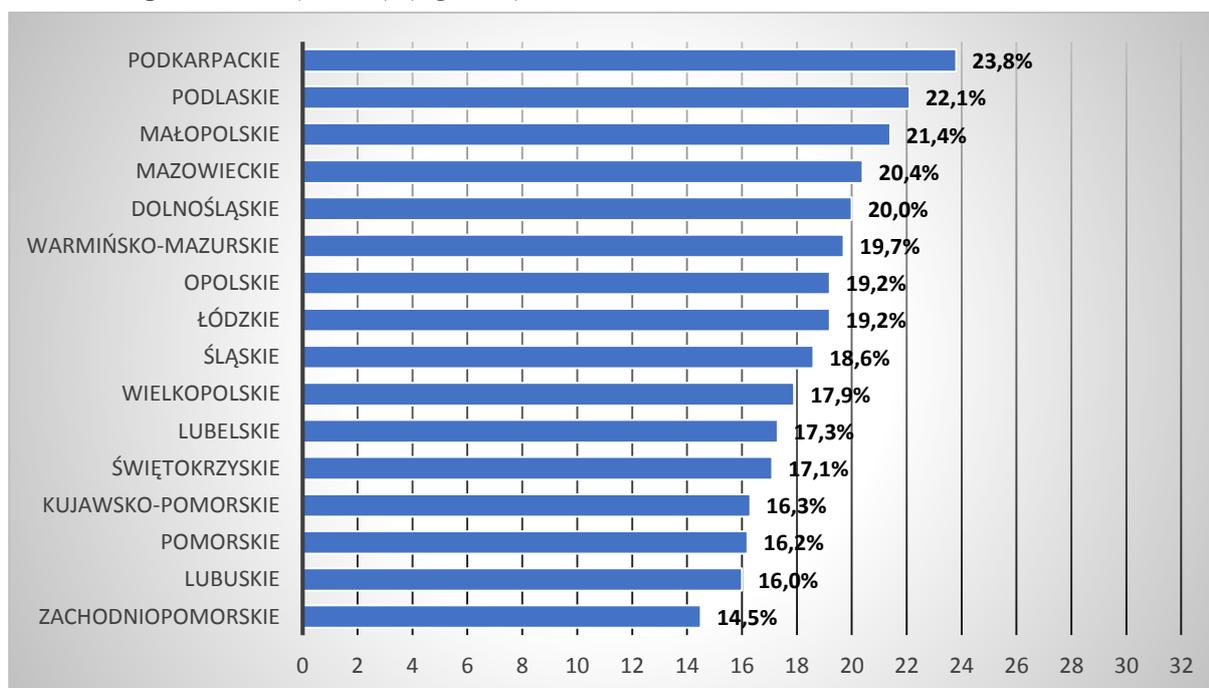


Figure 6. Innovative industrial enterprises in 2017-2019 by province (%). Source: as above.

The higher the technology advancement level, the greater the percentage of enterprises implementing innovations. The share of enterprises from the innovative industrial processing section in 2017-2019 classified as high technology was three times higher than that of low technology enterprises. In the analyzed period, the percentage of entities in the Industrial processing section which were innovatively active was higher than the innovative ones, especially in the case of high technology (by 6.0 percentage points) and medium-high technology (by 4.9 percentage points). The smallest difference was in low-tech enterprises (by 1.4 percentage point).

c) Innovative industrial enterprises by type of innovation

Product innovation is the introduction to the market of a product or service that is new or improved in terms of its features or applications. This includes significant changes in terms of technical specifications, components and materials, embedded software, ease of use, or other functional characteristics. Product innovation may result from the application of new knowledge or technology, or from new applications or a combination of existing knowledge and technology.

A new product is a product or service that significantly differs in terms of its features or purpose from the products previously manufactured by the enterprise.

Improvements to existing products consist of changes to materials, components and other features that make these products work better.

Business process innovation is the introduction of new or improvement of business processes in an enterprise as part of one or more business functions that significantly change the business processes used so far.

Production methods are technologies, devices and software used to produce (manufacture) products or services.

Enterprise logistics, supply, or distribution methods include equipment, software, and techniques used to acquire inputs, allocate resources within an enterprise, or deliver end products.

Business process innovations also include new or improved techniques, devices and software in ancillary activities such as accounting, IT support, procurement or maintenance. Business process innovations also include new organizational methods, such as: principles of operation within the company or in relation to the environment, division of tasks, decision-making powers and human resources management, as well as marketing methods in the field of packaging visualization, price shaping, promotion techniques, product placement or after-sales services.

The results of the research on innovative activity indicate that in industrial enterprises the share of enterprises that introduced business process innovations (new or improved business processes) in 2017-2019 was higher than product innovations (new or improved products).

Business process innovations introduced in 2017-2019 by industrial enterprises most often concerned new or improved methods of manufacturing (producing) products (including the development of products or services) – 9.9% of enterprises (figure 7).

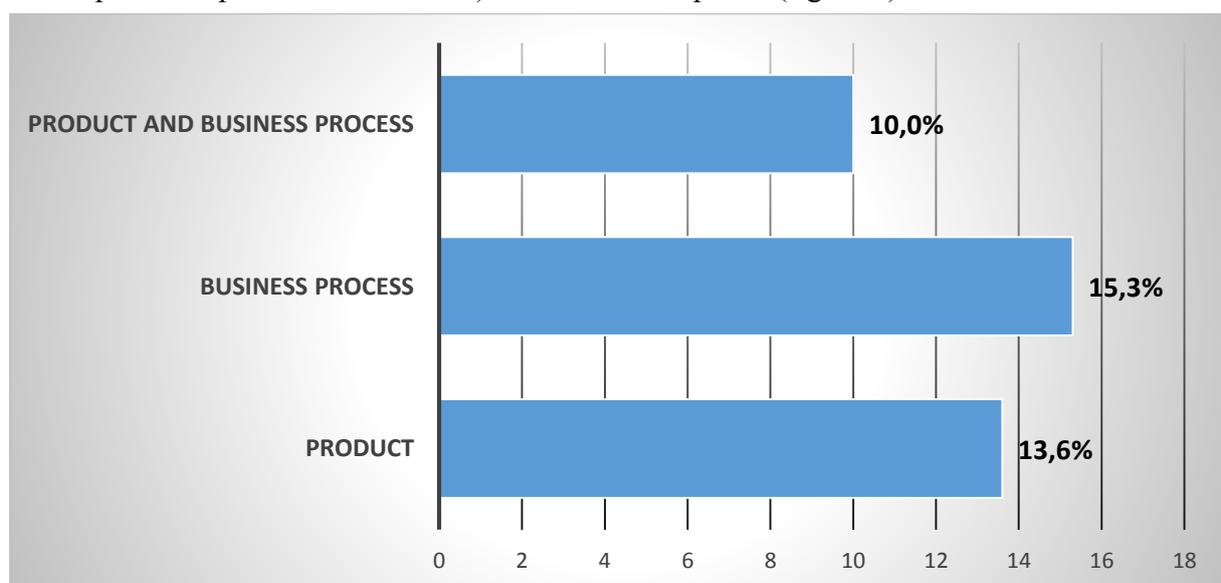


Figure 7. Innovative industrial enterprises in 2017-2019 by type of innovation (%). Source: as above.

Among industrial enterprises that introduced product innovations in 2017-2019, the largest percentage was recorded in the section Production of coke and refined petroleum products (49.0%). Business process innovations were also most often implemented by entities from the Production of coke and refined petroleum products division – 51.0%. The smallest share in industrial enterprises introducing new or improved products was in the section Water collection, treatment and supply (2.8%), while business process innovations were least frequently implemented in enterprises in the section Manufacture of wood, cork, straw and wicker products (7.1 %).

In enterprises from the Industrial processing section, analyzed according to the technology levels, it can be noticed that enterprises classified as high technology most often introduced product innovations (36.1%), while enterprises classified as other levels of technology – new or improved business processes.

In 2017-2019, product innovations were implemented by 13.6% of industrial enterprises. The highest percentage of industrial enterprises that introduced product innovations in 2017-2019 was recorded in units with 250 employees and more (47.0% of entities) (figure 8).

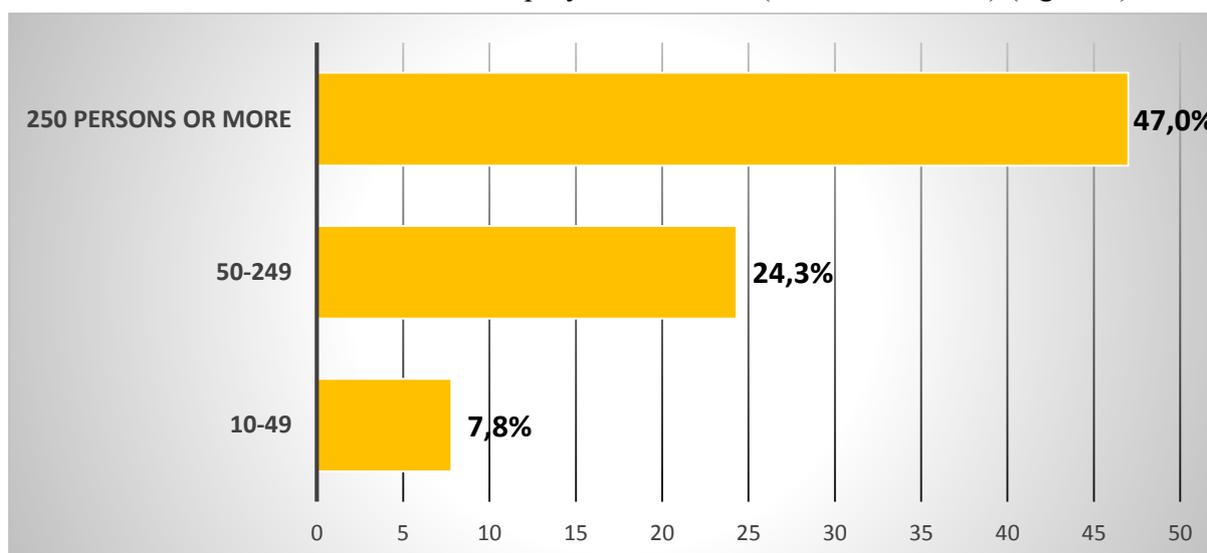


Figure 8. Industrial enterprises that introduced product innovations in 2017-2019 by number of employees (%). Source: as above.

In 2017-2019, business process innovations were implemented by 15.3% of industrial enterprises. The largest percentage of industrial enterprises that introduced business process innovations in 2017-2019 was recorded in units employing 250 people and more (55.5%) (figure 9).

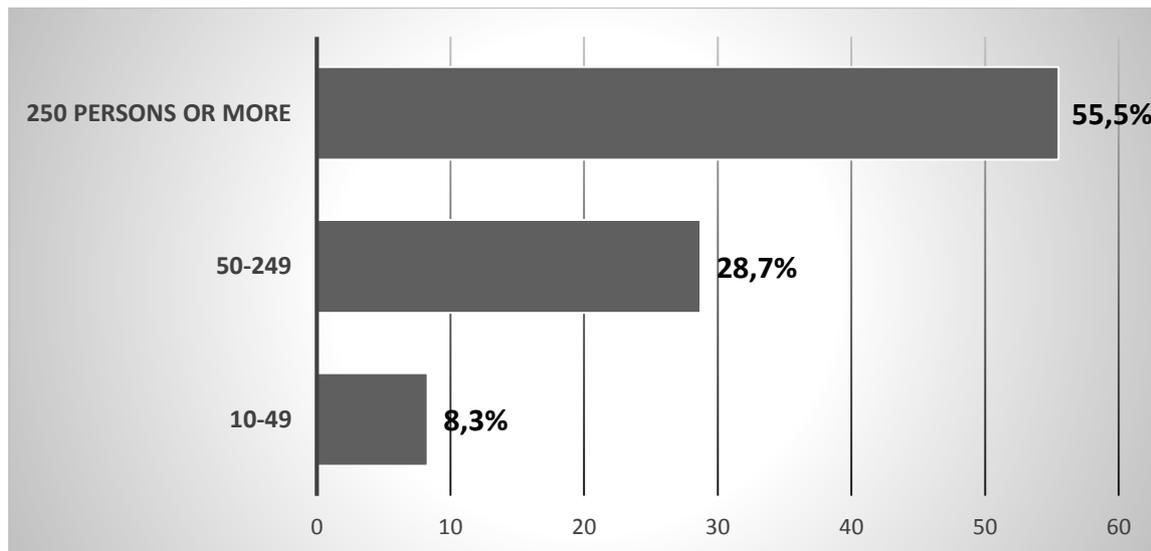


Figure 9. Industrial enterprises that introduced business process innovations in 2017-2019 by number of employees (%). Source: as above.

Taking into account the territorial division of the country, the highest percentage of industrial enterprises that introduced product innovations in 2017-2019 was recorded in the Podkarpackie (20.0% of enterprises) and Mazowieckie (15.6%) provinces, and the smallest – in Zachodniopomorskie (9.5%) and Pomorskie (10.5%).

Taking into account the territorial differentiation, the highest percentage of industrial enterprises that introduced business process innovations in 2017-2019 was recorded in the Podkarpackie (18.6%) and Małopolskie (18.3%) provinces, and the lowest – in Zachodniopomorskie (11.3%) and the Kujawsko-Pomorskie province (11.8%).

The comparison of the implementation of product innovations in Poland with other countries showed that in 2016-2018, in selected European countries, the highest percentage of industrial enterprises that introduced product innovations occurred in Estonia (50.8%), and the lowest – in Romania (12.5%). In Poland, the percentage of industrial enterprises that introduced product innovations was 16.8%.

3. Summary and main conclusions

The following conclusions can be drawn in the summary of this article, whose main purpose was to present the essence of the innovative potential and innovative activity of an enterprise as generators of innovative processes:

- When analysing the literature on the subject, it can be concluded that the proposed theories and models of innovative activity of an enterprise most often recommend basing the development strategy through the implementation of innovation on its key internal and external elements (resources).

- In 2017-2019, innovation-active industrial enterprises were 21.7% of the total number of these entities. The highest percentage of innovatively active entities occurred among units employing 250 people and more. In 2017-2019, the share of innovative industrial enterprises was 18.9%.
- Product or business process innovations were most often introduced by entities employing 250 people or more (60.6% of industrial enterprises).
- In the analyzed period, the relatively largest number of innovative enterprises in industry was in the section Production of coke and refined petroleum products – 55.1% and Extraction of hard coal and lignite – 52.9%, while the smallest – in the section Clothing production – 8.0%.
- Taking into account the territorial division, the highest percentage of innovatively active industrial enterprises was recorded in the Podlaskie province (30.7%), and the innovative ones – in the Podkarpackie province (23.8%).
- The presentation of the results confirms the differentiation in the voivodeship level of innovation among enterprises. The distance between the highest and the lowest value of the percentage of innovative industrial enterprises in provinces was 9.3 percentage points.
- The results of the research on innovative activity indicate that in industrial enterprises the share of entities that introduced business process innovations (new or improved business processes) in 2017-2019 was higher than product innovations (new or improved products).

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CO-OPERATION BETWEEN POLISH ENTERPRISES WITHIN THE SCOPE OF INNOVATION-FOCUSED ACTIVITIES IN 2017-2019

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Objective: the authors' main objective was to analyse, on the basis of other publications on the subject, the merits, the stages and the reasons for which enterprises establish innovation-driven relationships, as well as to present the results of an empirical study showing the condition and scope of co-operation between Polish enterprises within the scope of innovation-related activities in the years 2017-2019.

Project/methodology/approach: The results of the empirical study presented in the paper have been taken from a statistical analysis by the Central Statistical Office titled: "Innovative activities of enterprises in the years 2017-2019", GUS (Central Statistical Office), Warsaw-Szczecin 2020. The study covering industrial and service enterprises was carried out in the years 2017-2019, and its results were published in 2020. The study applied the methodology developed by Eurostat and OECD described in the Oslo Manual (Oslo Manual, 2008).

Findings: the paper and its summary discuss the main findings from the and the results of the empirical study conducted.

Originality/value: the paper presents the latest data published by the Central Statistical Office, which are the results of studies innovation-focused activities of Polish enterprises as part of innovation-driven co-operation (relationships). The paper is addressed chiefly to industrial and service enterprises.

Keywords: innovation-driven relationships between enterprises, innovation-focused co-operation and activities, clusters.

Category of text: research paper.

1. Merit and features of innovation-driven relationships

Academic papers usually claim that “innovativeness”, understood as the ability to create, implement and absorb innovations, which involves active engagement in actions enhancing this ability, should be a fundamental characteristic of every enterprise that wants to effectively compete in the market. According to R. A. D’Aveni, the ability to continuously develop new products and processes, and to improve the way of functioning in the market is the critical success factor for an enterprise (D’Aveni, 1994, pp. 217-218).

Analysis of economic phenomena shows that the critical feature of enterprises capable of creating innovative solutions is establishing contacts within their market that allow them to fill in their resource gaps, which favours the development of innovative ideas (Sudolska, 2011, p. 79). In situations where the purpose of a specific co-operative arrangement is to improve the innovative skills of these enterprises, the relationship established between the partners can be described as an innovation-driven relationship. Thus, interorganisational innovation-driven relationships are such relationships that, by definition, should increase the innovativeness of the co-operating enterprises (Sudolska, 2011, p. 79). It means that the main reason for establishing such relationships is the fact that such enterprises strive to create innovations.

Interorganisational innovation-driven relationships are highly complex co-operative arrangements. They can be established even between market rivals as well as between enterprises that do not compete with each other. They can also assume various organisational forms.

Sustainable and successful co-operative arrangements between enterprises are characterised by certain features:

- They are strategic by nature. This means that established, well-fostered relationships and their potential benefits play a significant role in the strategy adopted by a given enterprise.
- By definition, such relationships are long-term, which results from the strategic nature of the co-operation. These co-operative relationships may often turn out to be profitable only in the long-term perspective. What is more, the awareness that the relationship is designed to be long-term strengthens the co-operation between partners.
- Another feature of innovation-driven relationships resulting from their strategic and long-term nature is the interdependence between parties, which strengthens their involvement in the pursuit of common goals. The interdependence between enterprises is related to their commitment to maintain the relationship in order to meet desired goals that otherwise would be unachievable. The crucial feature of innovation-driven relationships, focused on exchanging or jointly generating new know-how by partnering enterprises, is their pursuit to stimulate their capability for creating innovations within this relationship.

- Another feature of innovation-driven relationships is their dynamic nature resulting from continuous development of new technologies, ever shorter product lifecycles and growing market competition.

It must be therefore stated, after A. Sudolska, that innovation-driven relationships oriented towards the creation of innovations are the response to today's market imperative for fast action (Sudolska, 2011, p. 82).

2. The process and stages of building innovation-driven relationships

Building innovation-driven relationships can often be a lengthy process. The process of building a co-operative relationship between two enterprises can be divided into two phases. The phase of establishing a relationship and the phase of its development. The first phase includes actions such as: potential partners getting to know each other, entering into negotiations before establishing co-operation, implementing the relationship, i.e. commencing and undertaking joint activities. The second phase starts when partners, having implemented their relationship, are satisfied with its effects and want to maintain it.

The related publications present different models describing the process of shaping and developing trust in relationships between enterprises (e.g. Doney, 1997; Cannon, pp. 36-39; Ganesan, 1994, pp. 4-7; Morgan, Hunt, 1994, pp. 20-24; Światowiec, 2006, p. 141). These models often involve a number of stages. A detailed description of stages comprising such a complex model is presented in A. Sudolska's publication (Sudolska, 2011, pp. 90-98).

An example of a less complex model is the model developed by P.R. Ring and A.H. Van de Ven (Ring, Van de Ven, 1994, p. 97), presenting the process of evaluating a relationship as a repetitive sequence of three main stages: negotiations, the stage of determining the obligations of partners, adopting a method for coordinating and controlling activities as part of a specific relationship, and the stage of the execution of these activities. Throughout the relationship, the parties carry out a subjective assessment of these stages. This process has been presented in Figure 1.

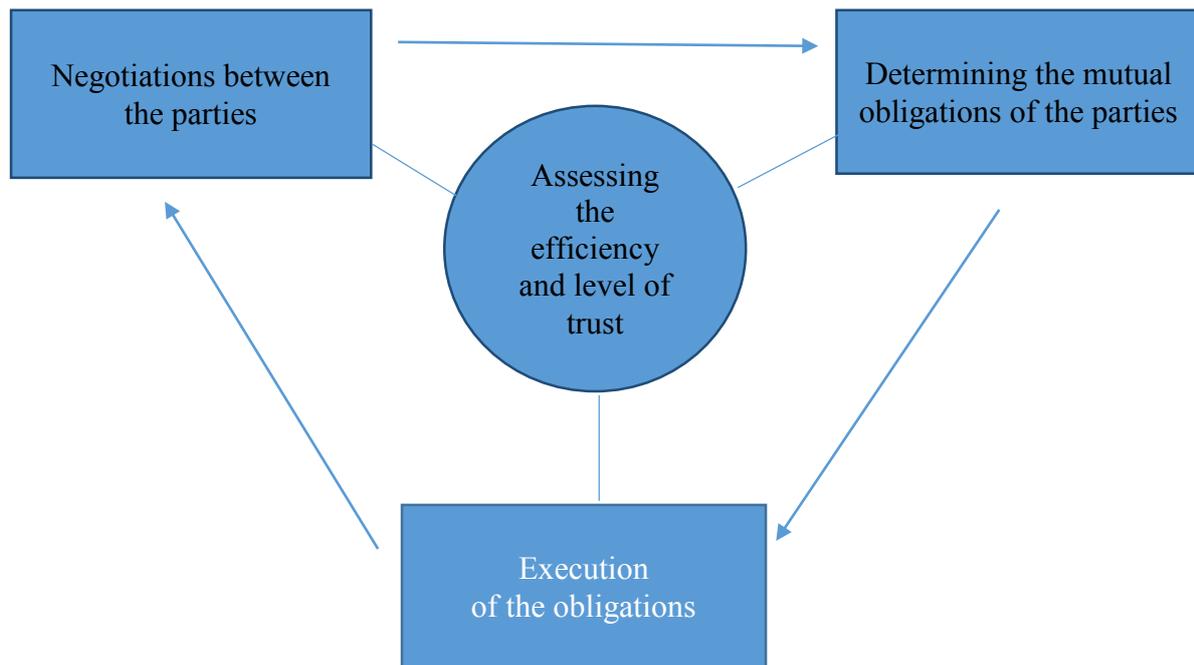


Figure 1. Relationship as a cycle of repetitive stages. Source: Own study based on: Child, Faulkner, Tallman, 2005, p. 404, as cited in A. Sudolska, 2011, p. 99.

- The first stage of this process are negotiations between the co-operating parties, which includes: developing joint goals and expectations, assessment of risks resulting from joint activities and specifying the level of mutual trust.
- The stage for defining mutual obligations. Establishing clear guidelines in the form of operating procedures for actions, controls and standards of conduct.
- The obligations execution stage. This stage includes actions aimed at the completion of jointly agreed tasks.

These stages are frequently repeated over time. The final stage of a relationship can assume various forms (Murray, Mahon, 1993, pp. 102-111). Three variants may be possible:

- the co-operation is successful, co-operating parties are satisfied, the partners are willing to sign another agreement on joint activities,
- the parties to the relationship end their co-operation and part ways amicably,
- the co-operating parties are hostile to each other, which prevents any further co-operation.

It should always be borne in mind that the fundamental purpose of establishing a relationship is the partners' intention to achieve more than they would achieve on their own, i.e. to achieve synergies.

3. Reasons why enterprises establish innovation-driven relationships

There are several reasons why enterprises establish innovation-driven relationships. The first and the most important one is the aim to **make the enterprise more innovative**. High innovativeness is considered a pre-condition for making the enterprise highly competitive. As worldwide studies carried out by the A.D. Little consulting firm show, innovative enterprises grow by several per cent faster and achieve 6-times higher operating profit than the average for their industry (Little, 2007). That is why fast-growing enterprises make it their priority to increase efficiency and effectiveness in the area of innovative activities.

Another factor that motivates enterprises to build interorganisational relationships in the market is their **commitment to learn and continuously improve their market offers** as a consequence of growth (Olivier, 1990, p. 242; Osborn, Hagedoorn, 1997, p. 266). Studies show that the enterprises' ability to generate and absorb know-how has a positive effect on other competences, and it contributes in particular to the development of their innovativeness (Hagedoorn, 1993, p. 373). For many enterprises, building market relationships with other organisations is a way to obtain and develop their know-how and skills resources. Yet another reason that prompts enterprises to establish and develop relationships for the purpose of learning is the cost that the enterprise would have to incur if it wanted to obtain this know-how or skills on its own.

Another important reason to start innovation-driven relationships is the enterprise's **willingness to eliminate the resource gap**. Enterprises that compete with each other may have different resources at their disposal, which may cause significant differences in the economic benefits they achieve. The consequence of this phenomenon is the differentiation between enterprises in terms of opportunities related to competitive advantage. In most cases, an enterprise is not perfect and does not possess all the resources necessary to meet its goals. The most common way to fill in a resource gap and acquire resources is to purchase them. However, it is not always possible, for instance in the case of intangible resources. Another way to fill in a resource gap is to undertake creative activities in the environment where specific relationships with other entities exist.

Willingness to improve efficiency of operations is instrumental for the process of establishing innovation-driven relationships between enterprises. In this significant decision-making area, enterprises also take efficiency-related goals into account. In accordance with this rule, the effect of joint activities anticipated by the parties should be related to a reduction of costs associated with these joint activities and/or an increase in value generated as a result of the relationship (Sudolska, 2011, p. 141). In instances where co-operation is established by entities, this results in synergies. It is a consequence of the fact that a large portion of the costs related to the performance of a specific task are borne jointly by both parties to the relationship. The reduction of costs is the result of economies of scale and scope (Czakon, 2007, p. 94).

Finally, the last factor stimulating the establishment of innovation-driven relationships is **the growing uncertainty and unpredictability with regard to changes in the business environment**. Globalisation processes which impact the economy for many years now have profoundly affected the business environment. The environment of today is plagued by increasing and multifaceted uncertainty which results from the tempo, scope and swiftness of the changes taking place in the global economy. As a result of these changes, patterns, strategies and operating methods developed by enterprises previously do not work anymore (Kozłowski, 2004, p. 7). Establishing and developing an arrangement of co-operative relationships between enterprises in the market is an expression of their willingness to mitigate risks resulting from uncertain business environment. A developed arrangement of relationships with other entities gives enterprises new strategic possibilities. It is also their way of increasing their anticipatory capabilities and competitiveness (Sudolska, 2011, p. 155).

4. Methodology of the empirical study

Innovations implemented in an enterprise help them gain a competitive advantage and thereby achieve potential market success. They are the foundation of economic growth. Implementing innovations requires enterprises to undertake efficient activities over a certain period of time and considerable financial outlays. The results of the empirical study presented in the paper have been taken from a statistical analysis by the Central Statistical Office entitled: “Innovative activities of enterprises in the years 2017-2019”, GUS (Central Statistical Office), Warsaw-Szczecin 2020. The study covering industrial and service enterprises was carried out in the years 2017-2019, and its results were published in 2020. The study used methodology developed by Eurostat and OECD (*Organisation for Economic Co-operation and Development*), presented in the Oslo Manual (Oslo Manual, 2008).

As mentioned previously, co-operation with other entities in the area of innovation-focused activities is a significant element of any enterprise’s operations. It provides broader access to know-how and new technologies. It allows enterprises to reduce the cost and risk of business operations and promotes the exchange of experience and know-how.

Co-operation in innovation-focused activities involves engagement in joint projects developed with other enterprises or non-commercial institutions. Such a co-operation can be prospective and long-term, and does not have generate direct, measurable economic benefits for the partners involved.

Commissioning works with third-party contractors without taking an active role in their execution should not be considered co-operation in innovation-focused activities.

In the research on innovation-focused activities, the Oslo Manual lists the following types of partner institutions:

- enterprises from the same group of enterprises,
- enterprises from outside the same group of enterprises, including: consulting companies (consultants), commercial laboratories, private research institutes and academic institutions, suppliers of equipment, materials, components or software, customers, competitors, other enterprises,
- academic institutions,
- public research institutes (including research institutes of the Polish Academy of Sciences),
- public sector entities (government and local administration bodies – such as government bodies, organisations and agencies – public schools, educational institutions, academic institutions, healthcare centres and other units providing public services),
- non-profit organisations.

The study of innovation-focused activities covered industrial and service enterprises. The entities covered by the study were selected on the basis of the Polish Classification of Activities (PCA) 2007, compliant with the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2).

The study of innovation-focused activities, carried out using the PNT-02 form, covered enterprises with more than 9 employees. In 2019, the study was carried out in the industry sector on a full population of enterprises with 50 employees or more, and on a representative sample of enterprises with 10-49 employees, representing approx. 25% of the sampling frame. The sampling frame was prepared on the basis of the personal scope defined above. The sample might include enterprises representing narrow ranges, as this later ensures that the results will be representative for these ranges as well. The remaining part of the sample was allocated within ranges by sections of the Polish Classification of Activities and by provinces. The sample was allocated using of the results of the previous study, which allows for estimating variances of the most important features in the defined ranges. Estimation of variances for the most important features is carried out using standard statistical procedures, i.e. data from a study completed the previous year makes it possible to estimate variances of a specific feature in the studied population (taking weights into account). The volumes so determined are used to perform an optimum allocation of the sample for the purpose of a new study; as a result, a larger sample will be allocated within ranges with higher variability of the feature, which allows the consecutive year's study to be more precise. Such an approach is effective provided that the distributions of studied features are similar in successive years. On the basis of a selected allocation, a drawing of a sample part is carried out according to a simple random sampling scheme, without replacement, in each studied range independently.

5. Co-operation in innovation-focused activities – selected results of the study

In the years 2017-2019, 23.4% of innovation-active industrial enterprises and 18.5% of service enterprises co-operated as part of innovation-focused activities (2.0 percentage points and 1.1 percentage point less than in the years 2016-2018 respectively). The share of large industrial or service enterprises (with at least 250 employees) that co-operated in innovation-focused activities was higher than in the case of enterprises of other sizes.

Table 1.

Innovation-active enterprises which co-operated in innovation-focused activities in the years 2017-2019 by number of persons employed

Specification	Industrial enterprises	Service enterprises
	In % of innovation active enterprises	
TOTAL	23.4	18.5
10-49 persons	15.4	16.3
50-249 persons	24.3	21.7
250 persons and more	43.4	25.8

Source: Innovative activity of enterprises in the years 2017-2019, GUS (Central Statistical Office), Warsaw-Szczecin, 2020.

Taking the sections of the Polish Classification of Activities into account, co-operation in innovation-focused activities in 2017–2019 among innovation-active enterprises was most frequently pursued, within the Processing industry sector, by enterprises representing the *Manufacture of coke and refined petroleum products* category (44.4%) and, within the services sector, by entities from the *Research and experimental development* category (59.7%).

Taking the territorial division of the country into account, the highest share of innovation-active industrial enterprises that co-operated in innovation-focused activities in 2017-2019 was in the Lubelskie (29.2%) and the Śląskie Province (28.2%), whereas the lowest share was in the Warmińsko-Mazurskie (13.7%) and the Zachodniopomorskie Province (18.9%). In the service sector, the largest number of such enterprises was in the Podkarpackie (39.7%) and the Łódzkie Province (31.8%), while the lowest number was in the Zachodniopomorskie (2.7%) and the Wielkopolskie Province (7.4%).

In the Processing industry sector, co-operation in innovation-focused activities in 2017-2019 among innovation-active enterprises classified according to technology level was most frequently pursued by high-tech enterprises (33.9%) and least frequently by low-tech enterprises (14.6%).

Innovation-active enterprises that co-operated in terms of innovation-focused activities in 2017–2019 most frequently partnered with enterprises from outside their own groups of enterprises from Poland and with Polish academic institutions. In the industry sector, 67.6% and 55.6% of enterprises respectively declared their co-operation with these partners, whereas in the services sector the relevant figures were 70.5% and 43.1%. In the industry sector,

taking partner institutions from all of the countries into account, enterprises least frequently co-operated with non-profit organisations. In the service sector, non-profit organisations were also least frequently indicated as partners in innovation-focused activities, but only with reference to partners from Poland and EU/EFTA member countries. Among other countries, units representing the public sector were least frequently selected for co-operation.

One of the forms of co-operation between enterprises is *cluster initiative*. According to a definition by M.E. Porter, a cluster is a geographical concentration of mutually connected enterprises, specialised suppliers, service-providing units, enterprises operating in related sectors and related institutions (e.g. universities, standardisation bodies, trade associations and financial institutions) in individual areas, competing and co-operating with each other. For the purposes of the study of innovativeness, a cluster initiative is understood as co-operative connections established formally in the form of a letter of intent, an association agreement, a consortium agreement etc.

In the years 2017-2019, the share of enterprises co-operating as part of a cluster initiative in the total number of entities was 3.2% for industrial enterprises and 2.5% for service enterprises. Among the entities that co-operated as part of a cluster initiative in 2017-2019, the highest share of industrial and service enterprises was among entities with at least 250 employees (figure 2).

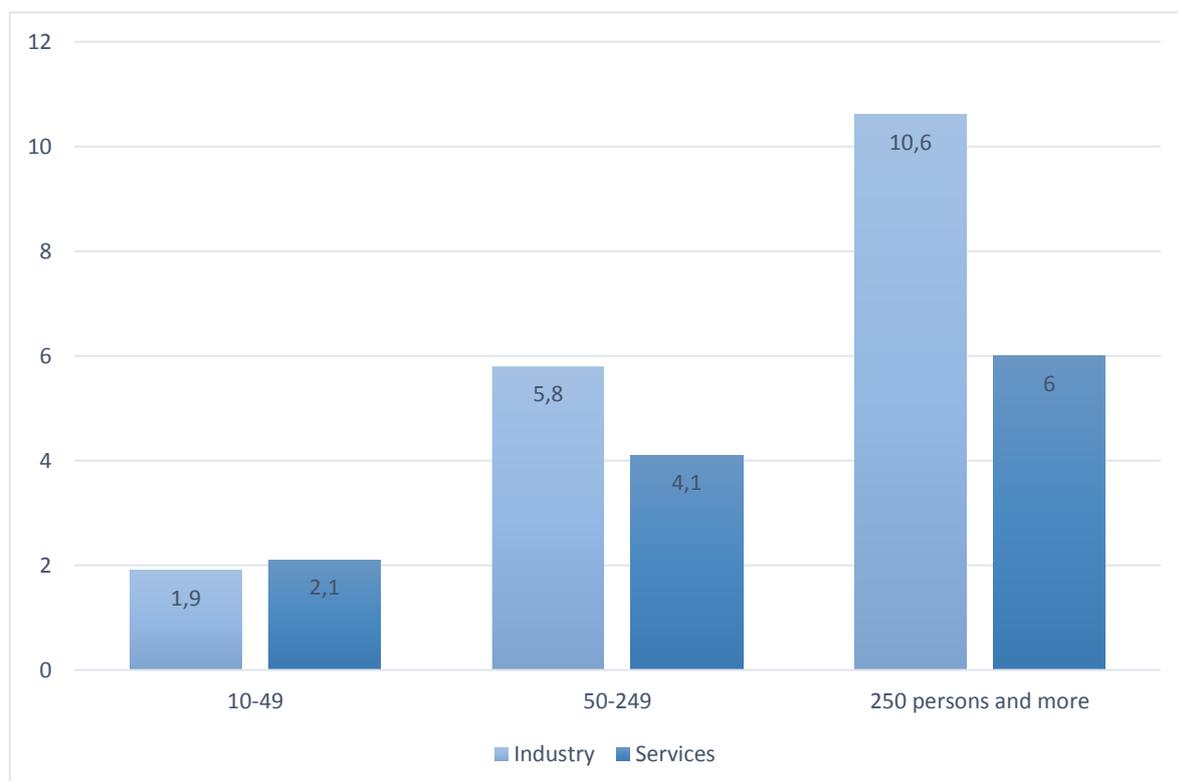


Figure 2. Enterprises which participated in cluster co-operation in the years 2017-2019 by number of persons employed [%]. Source: Innovative activity of enterprises in 2017-2019, GUS (Central Statistical Office), Warsaw-Szczecin, 2020.

Taking the territorial division of the country into account, the highest share of industrial enterprises participating in cluster initiatives was in the Podkarpackie Province (7.7%) and the Podlaskie Province (5.8%), while the lowest share was in the Lubuskie Province (1.7%) and the Opolskie Province (1.8%). In the services sector, the highest share was in the Dolnośląskie Province (5.4%) and the Podkarpackie Province (3.9%), whereas no such co-operation occurred in the Opolskie Province.

In 2017-2019, enterprises from the Processing industry section which were most active in cluster initiatives were the enterprises representing the *Manufacture of coke and refined petroleum products* category (16.3% of enterprises had such relationships). In the service sector, enterprises representing the *Research and experimental development* section most frequently co-operated as part of clusters (21.2%).

Taking the technology level into account, the highest share of entities co-operating as part of clusters in the Processing industry section was among high-tech enterprises (8.6%), and the lowest share was among low-tech enterprises (1.2%).

In conclusion, the share of innovation-active enterprises that co-operated in innovation-focused activities in the years 2016-2018 **ranked Poland in one of the lowest positions in Europe**. In the industry sector, only one in four Polish innovation-active enterprises co-operated in innovation-focused activities in the studied period, and in the service sector only one in six enterprises undertook such co-operation.

Summary and conclusions

The following conclusions can be drawn as part of the summary of this paper, where the main objective was to analyse, on the basis of the relevant publications, the merit, the stages and the reasons why enterprises establish innovation-driven relationships, and to present the results of an empirical study showing the co-operation between Polish enterprises in the context of innovation-related activities in the years 2017-2019.

- Innovation-driven relationships oriented towards co-operation and creation of innovations are a response to today's imperative for fast action.
- Industrial enterprises are more active in co-operating in the area of innovation-focused activities than service enterprises. Over the analysed period, 23.4% of innovation-active industrial enterprises and 18.5% of service enterprises were maintaining co-operative relationships.
- The share of innovation-active enterprises that co-operated in innovation-focused activities in the years 2016–2018 has ranked Poland in one of the lowest positions in Europe.

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OCCUPATIONAL BURNOUT SYNDROME IN THE CONTEXT OF ORGANIZATION MANAGEMENT

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Purpose: The aim of the paper is to present the burnout syndrome as one of the many threats and determinants of the organizational management policy. The study also assessed the occupational burnout syndrome in the context of maintaining occupational health and safety and the relationship between these categories, which is a feedback.

Design/methodology/approach: This paper provides a theoretical analysis of the burnout syndrome in the context of organizational management. Burnout is analyzed through the prism of both its causes and the mechanism of its formation and the expected health, social and economic effects. The paper uses secondary data taken from public statistics, thematic reports and scientific research. To illustrate the phenomenon, the available domestic data was used, and for comparative purposes, foreign data were also referenced.

Findings: Burnout syndrome, posing a great threat to the effectiveness and efficiency of undertaken actions, should be one of the main determinants of the policy of broadly understood management in organizations.

Practical implications: Psychosocial risks and work-related stress are among the key challenges in terms of occupational health and safety. The conditions and the growing phenomenon of burnout imply the need to take into account remedial measures at the organizational management level. The factors determining the development of organizations and economies, ie innovation, competitiveness, etc., indicated so far in the literature on the subject, are based on the quality of human capital and lose their effectiveness in the face of occupational burnout. The COVID-19 pandemic has exacerbated this phenomenon by weakening ties, trust contributing to the progressive corrosion of social capital. And even the best management and business development strategy will not be effective based on burned-out employees.

Social implications: It is to raise awareness of the growing threat of professional burnout phenomenon and to indicate the necessity of undertaking specific preventive tasks by the management.

Originality/value: This paper evaluates the professional burnout syndrome in the context of maintaining occupational health and safety and the feedback relationship between these categories. The article is addressed to employees in order to raise awareness of the threat of professional burnout, but also to managers in order to improve the work environment to protect the organization from the effects, including the costs of burnout.

Keywords: burnout syndrome, psychosocial risks, organizational management, occupational health and safety.

Category of the paper: viewpoint, conceptual paper.

1. Introduction

The pace of life in the 21st century and the constantly growing demands placed on employees generate stress and civilization diseases. Burnout is already widely considered a disease of the 21st century, although according to the Classification of Diseases and Health Problems it has the category of a syndrome, not a disease. According to the World Health Organization (WHO), burnout is the result of prolonged, excessive stress that the employee is unable to cope with. Considering the frequency of its occurrence and its consequences, this is a problem that was noticed by WHO a few years earlier. Then, in the Classification of Diseases and Health Problems, it was added to the category of "problems in coping with the difficulties of life". Burnout was therefore recognized as a factor influencing health or re-quiring contact with medical care. However, this is a phenomenon that concerns an increasing number of employees, so in 2019 the WHO clarified the definition of occupational burn-out by classifying it into the subcategory of problems arising from professional work. This means that currently occupational burnout is analyzed only through the professional prism and does not apply to non-professional spheres of life.

Burnout is characterized in three aspects:

1. exhaustion or lack of energy,
2. cynicism, negativity and distancing from work,
3. decreased self-efficacy.

It is the body's response to long-term stress caused by excess work, high responsibility, general overload or intense social contacts. As a result, there are a number of undesirable psychological, emotional and physical symptoms. The scope of the phenomenon and its severity, consequences difficult to reverse, and even symptoms that are weak to grasp in the early stages of development have become the reason for interest in the subject of burnout in this paper.

Burnout syndrome, posing a great threat to the effectiveness and efficiency of undertaken actions, should be one of the main determinants of the policy of broadly understood management in organizations.

2. Methods

The subject of the paper is the burnout syndrome in the context of organization management. Burnout is analyzed through the prism of both its causes and the mechanism of its formation, stages and phases in which it takes place, and the expected health, social and economic effects. Due to the lack of statistical data relating directly to occupational burnout, statistics on stress were presented, as it is a direct and inherent cause of occupational burnout.

The social and economic effects of stress in the work environment were described and the relationship between occupational burnout and the level of occupational health and safety was assessed. The paper uses secondary data taken from public statistics, thematic reports and scientific research. To illustrate the phenomenon, the available domestic data was used, and for comparative purposes, foreign data were also referenced.

3. Occupational burnout in theory

Although the phenomenon of occupational burnout has accompanied people for a long time, research on it was initiated in the 1970s. In the literature on the subject, the interest in the burnout syndrome is ascribed to Herbert Freudenberger (1974), who noticed that volunteers dealing with adolescent drug addicts were exhausted and discouraged from further charity work. He called it burnout, and he continued his research as part of his psychiatric practice. Regardless of Freudenberger, social psychologist Christina Maslach (1976) conducted an analysis of similar symptoms in social workers with a team at Berkeley University. People who professionally help others, i.e. doctors, nurses, teachers, educators, policemen or social workers, while describing their own experiences, indicated emotional exhaustion, loss of emotionality, negative perception of themselves and others, which Maslach called burnout. It should be noted, however, that the very phenomenon of exhaustion, loss of internal energy and motivation to work has been noticed and described earlier (Anczewska et al., 2005). For example, Schwartz and Wil (1953), as early as 1953, pointed to a syndrome observed in a nurse in a psychiatric hospital, described as fatigue, physical and mental helplessness, skepticism towards patients and lack of joy from work. The very term burnout also appeared in a short story by Graham Greene, author of psychological novels, entitled *A Burn-Out Case*. The protagonist of the 1961 short story was an architect of world renown, who, tired of work, showing symptoms attributed today to the burnout syndrome, leaves his job and his previous life and lives in the African bush (Schaufeli, Enzmann, 1998).

Despite the fact that occupational burnout is currently quite a large social problem, there is no unambiguous and universal definition in the literature on the subject. The reasons for this lie in the complexity of the phenomenon, in the difficulty of constructing measurement tools, in the lack of a precise definition of the scope of symptoms of occupational burnout and, consequently, the smooth boundary between burnout and stress, fatigue, alienation, de-pression and existential crisis (Wilczek-Rużyczka, 2014). According to Pines (2007), burnout is always the final stage of a gradual loss of delusions, i.e. disappointment in finding meaning in working life. In addition, what identifies burnout is durability, as it is a process that is permanent, complex and specific, as opposed to stress or fatigue that happens to everyone as a result of conflict, job loss, or various problems. Most often, however, it is defined through the prism of its symptoms. A list of selected definitions of the burnout syndrome is presented in Table 1. Freudenberger (1974), who "introduced" the term "burnout" to the scientific literature, defined this process by accumulating several symptoms, i.e. long-term emotional exhaustion, demoralization, dissatisfaction with work, weakened temperament and creativity and finally chronic physical fatigue. He considered them to be a characteristic of professions, the essence of which is working with people.

Table 1.

List of selected definitions of occupational burnout

Author	Year	Definition
H.J. Freudenberger	1974	introducing the term "burnout" into the scientific literature – exhaustion, a decrease in the energy level of an employee, occurring as a result of being overwhelmed with problems by others
Ch. Maslach	1976	a multidimensional syndrome manifested by emotional exhaustion, depersonalization, lowering the quality of work performed
C. Cherniss	1980b	a consequence of excessive requirements of the work environment, a process in which the behavior and attitudes of an individual become more and more negative, and avoidance strategies of coping with stress intensify its effects
J. Edelwich, A. Brodsky	1980	gradual loss of illusions, goals, energy and ideals when confronted with the conditions in which people practice their profession
C. Cherniss	1980a	a process in which negative changes in attitudes and behavior occur under the influence of work-induced tension, when the requirements of the workplace exhaust and exceed the capabilities of individual resources
B. Perlman, A. Hartman	1982	burnout as a response to chronic emotional stress, manifested by emotional and physical exhaustion, depersonalization and decreased productivity
W.G. Emener, R.S. Luck, F.X. Gohs	1982	a state of physical and mental exhaustion that arises as a result of the action of long-term negative feelings, developing both at work and in the person's own image
E. Aronson	1983	"the mental state of people working with others". Characteristics of well-being: the person generally feels quite poorly, is emotionally, physically and mentally exhausted, is aware of helplessness and hopelessness, is dissatisfied with work and dissatisfied with life
P.L. Brill	1984	work-related, dysphoric and dysfunctional, non-pathological state experienced by an individual under unfavorable working conditions; the individual is unable to return to functioning in the optimal, previous state without external help or transformation of the external environment
M. Burisch	1984	burnout is a global name for certain confusingly defined types of crisis, is an ambiguous pool of symptoms, or an obscure group of people exhibiting these symptoms

Cont. table 1

D. Etzion	1987	the process of slow and hidden mental erosion, which is the basis of the so-called slight stressors, undetectable but devastating
A. Pines, E. Aronson	1988	a state of physical, emotional and mental exhaustion resulting from prolonged exposure to situations requiring emotional involvement
W. Schaufeli, D. Enzmann	1998	a long-term, disruptive work-related state that manifests itself in relatively healthy people
H. Şek	2004	burnout as a set of symptoms appearing in people performing professions in which close, full of commitment interpersonal contact and personality traits of a professional are the basic instruments of professional activities, decisive for the level of performance of the profession, about professional successes and failures

Source: own study based on the literature on the subject.

The variety of definitions of occupational burnout results from the complexity of the phenomenon and the difficulty of its measurement, however, as Perlman and Hartman (1982) indicate after analyzing nearly 50 definitions formulated by various authors, all of them emphasize the consequences of chronic emotional stress resulting from emotional and physical exhaustion and lower work efficiency.

Despite the multitude of definitions describing burnout, they all have a common denominator describing this phenomenon as a state of emotional exhaustion and fatigue, which is the end result of a gradual process of loss of delusions (disappointment).

3.1. Causes of occupational burnout

Burnout is becoming a growing social problem of the 21st century. However, due to the fact that it is a long process and its progress is slow, it is often unnoticeable.

According to Schuman and Kaslow (Janczewska, Roszczyńska, 2004), the warning symptoms preceding the occurrence of burnout syndrome are: reluctance to work, constant complaints about overwork, feeling of social exclusion, loss of enthusiasm, escalation of inappropriate mutual transfers in relations with clients, oversensitivity, lack of self-control in relations with household members, common illnesses for no apparent reason and thoughts of escape.

Figure 1 presents the relationships between burnout and other mental states and disorders, which are sometimes identified interchangeably due to the similarity of symptoms. And although there is a peculiar dispute in the literature about the separateness of syndrome occupational burnout, depression, chronic fatigue and reduced satisfaction in working life (Maslach et al., 2001; Maslach, 1998; Bakker et al., 2000; Iacovides et al., 2003), the results of the research conducted so far are still not unequivocal (Maslach, 2000). A strong relationship with depression is characterized by emotional exhaustion, and the symptoms of burnout occurring with greater intensity are similar to the symptomatology of depression (Falba, 2015), which may be caused by the conditioning of both states by personality factors (Iacovides et al., 2003). A differentiating symptom may be the "range of action", i.e. depression penetrates into all areas of life, while burn-out occurs only at the professional level (Bakker et al., 2000).

Chronic fatigue is dominated by physical complaints accompanied by psychological complaints, while in burnout syndrome, emotional exhaustion predominates.

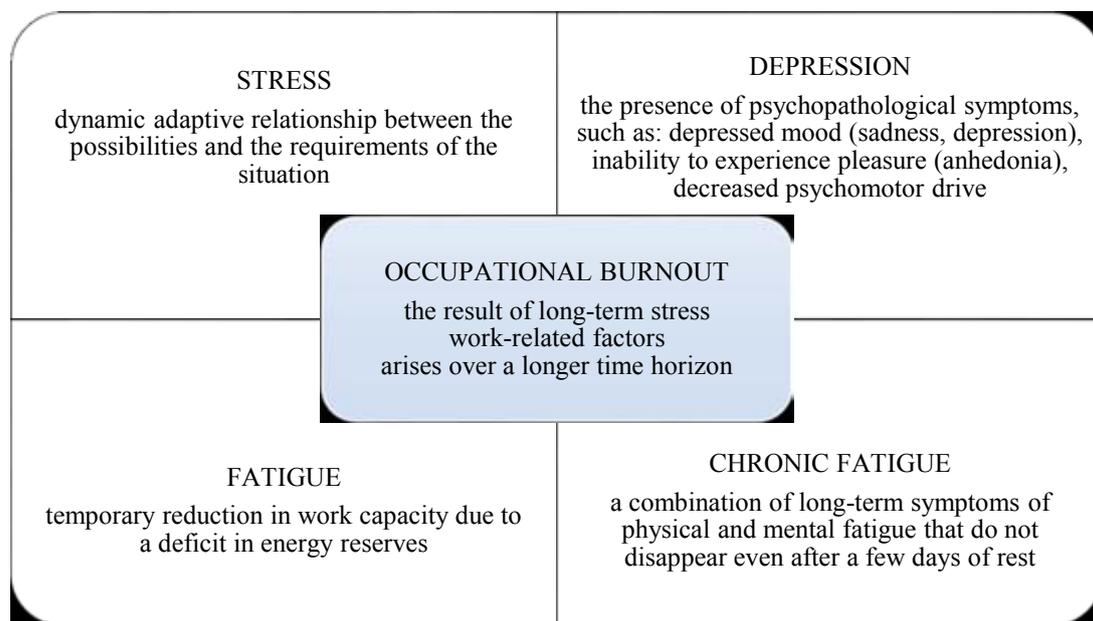


Figure 1. Relationships between burnout and other negative emotional states. Adapted from: *Zespół wypalenia zawodowego wśród personelu medycznego oddziałów chirurgicznych* by A. Falba, (2015) Doctoral dissertation, Gdańsk: Medical University of Gdańsk, p. 44.

The researchers analyze the causes of burnout in three dimensions: individual, interpersonal and organizational, while Schaufeli and Enzemann (1998) point to the social dimension. They recognized that "burnout is a chronic, work-related, negative mental state that occurs in "typical" ("normal") people who are initially exhausted, followed by discouragement, decreased effectiveness, decreased motivation, negative attitudes. and behaviors that make it difficult to adapt at work. These symptoms develop gradually and may go unnoticed by the individual for a long time. This situation results from the discrepancy between professional aspirations and actual working conditions. Additionally, burnout is often a self-reinforcing process, which is the result of a mismatch in coping strategies.

Factors on an individual level are divided into groups A and B, while factors from group A are related to the mental structure of the individual. Wilczek-Rużyczka (2014, pp. 74-75) lists the following among them:

- low self-esteem,
- hypersensitivity, high reactivity,
- uncertainty, instability, poor sense of identity,
- stiffness, low tolerance to dissimilarity,
- defensive attitude,
- dependence, insufficient autonomy,
- passivity, low activity,

- perfectionism,
- external localization of a sense of control,
- low stress coping skills,
- avoiding difficult situations.

Individual factors from group B result from the competences and skills of the individual.

These are:

- insufficient professional preparation, low professional competences;
- low self-efficacy, i.e. the belief that "I am unable", that I "can't do it";
- idealistic approach to work - professional mysticism;
- low interpersonal competences.

In the interpersonal plane that is responsible for incorrect contacts with superiors and associates, Wilczek-Rużyczka (2014) mentions:

- interpersonal conflicts,
- hostile rivalry,
- claims,
- lack of mutual trust,
- impaired communication,
- verbal aggression,
- mobbing.

In turn, organizational factors are stressors related:

- with occupational role (occupational burden and ambiguity of tasks),
- with the physical environment (difficult working conditions),
- with the way the work is done (haste, over-control and insufficient help),
- with the functioning of the employee as a member of the organization (experiencing marginalization, omission, disregard and experiencing an autocratic manner of management),
- with professional development (no possibility of promotion and career prospects),
- with simultaneous functioning in the organization and outside it (conflict of professional and family roles).

After many years of research, Maslach and Leiter concluded that a poorly functioning organization increases the risk of burnout. They mention six critical areas of professional work, the dysfunctions of which lead to the appearance of key symptoms of occupational burnout, i.e. emotional exhaustion, cynicism and a sense of the lack of sense in professional activities. These, in their opinion, are: duties, control, remuneration, community, justice and values (Wilczek-Rużyczka, 2014).

Shaufeli and Enzman, analyzing the most important factors determining burnout, considered strong motivation, difficult working conditions and ineffective coping strategies as key and mutually reinforcing (Wilczek-Rużyczka, 2014).

According to the above-mentioned researchers, strong motivation is one of the three key factors of occupational burnout, as it most often affects ambitious people, with high aspirations and great determination, characterized by enthusiasm and commitment, which Pines (1993, p. 41) summed up vividly – "to burn out, you have to burn first".

Difficult working conditions in professional life may have a negative impact on an ambitious, highly motivated employee, causing frustration, fatigue, exhaustion and discouragement.

Ineffective countermeasures, e.g. physical and/or mental withdrawal, inappropriate attributions, etc. generate negative consequences both for the individual and the organization. The first lead to loss of health, depression and low evaluation, which results in absenteeism and a reduction in the efficiency and quality of professional tasks performed. It should be noted that the negative effects of ineffective coping strategies were also included in their concepts of occupational burnout by other researchers, such as Freudenberg (1983), Fischer (1983), Hobfoll and Schiro (1993) and Harrison (1983).

3.2. Consequences of occupational burnout

The consequences of the burnout syndrome are very wide, however, limiting ourselves to the most important ones, they can be listed as follows:

- the risk of chronic somatic diseases increases,
- the risk of serious mental disorders, requiring long-term treatment, and often hospitalization, e.g. depressive, anxiety, psychosomatic disorders, sleep disorders, addictions,
- absenteeism from work increases,
- the risk of the necessity to change or to resign from work increases, which leads to high (and costly for the employer) employee turnover,
- in the case of depression, there is a risk of coexistence of somatic diseases, the course of which is negatively influenced by depression, and sometimes leads to death (increased risk of suicide).

The above-mentioned consequences are important from the point of view of the individual and are directly felt by him, while the remaining ones considered in a broader context are indicated in the subsection on the effects of occupational burnout.

Unfortunately, in Poland there is still no research on occupational burnout, as is the case, for example, in Slovenia. Accordingly, the estimates for the scale may be derived either from commercial pooled surveys or from related national, European or worldwide surveys. And the scale of the phenomenon is large. The results of the STADA study "The Future of Your Health" (2019) presented in Figure 2 show that Poles are the third nation in Europe with the largest number of people (62%) who have experienced burnout, with the European average of 55%. The lowest share of people affected by burnout syndrome in the STADA re-search was

shown by France (44%), slightly higher than Poland – Serbia 66%, while Russia – 72%. Only in Spain, Italy, Germany (49% each) and France (44%) the share of those affected by burnout remains below 50%. The cited analyzes show that the inhabitants of Eastern Europe are particularly prone to burnout. It should also be noted that 7% of the respondents completely exclude the possibility of developing burnout at any time in the future.

The growing number of burnout cases is a wake-up call for nearly 70% of Europeans surveyed, and 41% believe that, as this phenomenon continues to worsen, it may be assumed that the world of work is dysfunctional. This opinion was especially often expressed by Serbs (57%) and French (54%). On average, 27% believe that the growing numbers are due to gaps in education and prevention. It may also result from the low level of knowledge about burnout, as evidenced by only 8% of correct answers to typical symptoms of burnout, i.e. "lack of motivation" and "insomnia", while 54% of respondents attribute almost every mental overload to burnout.

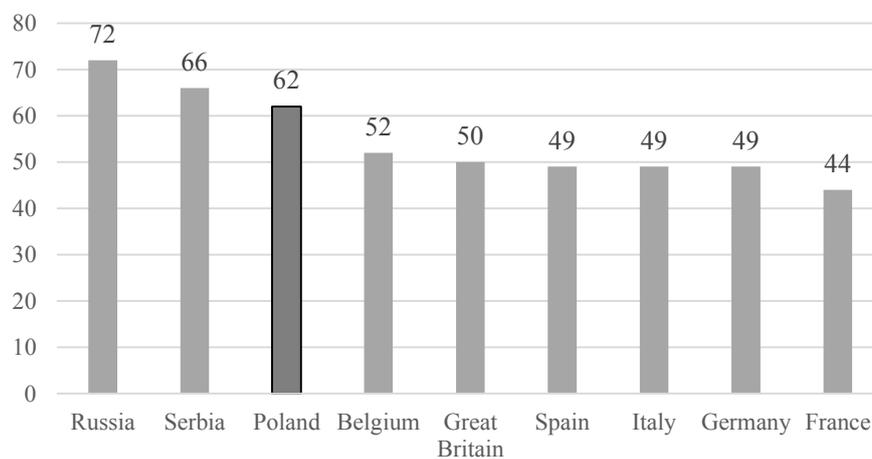


Figure 2. Share of respondents who experienced burnout in selected countries. Source: Own study based on data from the report *The Future of Your Health 2019*, www.yourhealth.stada.com/media/stada-group-health-report-2019 (10.06.2021).

The cited report shows that 55% of respondents have already experienced burnout (14%), were on the verge of burnout (15%) or knew the feelings and symptoms from their own experience (26%). In addition, seven out of ten respondents believe that the current number of burnout cases should be a wake-up call, while 92% of Europeans interviewed do not even know the exact (medical) definition of burnout and often attribute the disorder to inappropriate symptoms. The conclusion, which was formulated on the basis of the research, “shows that burnout in the common understanding is often equated with the majority of mental ailments and diseases. On the other hand, the attitude towards psychologists and psychiatrists improves, for whom the visit does not arouse resistance for 62% of respondents, but with great variation. For 82% of Serbian respondents a visit to a psychologist is something normal, followed by Polish respondents, 70% of whom were of the same opinion. At the same time, the fear of being stigmatized by visiting a psychologist is the highest in Germany (10%) with the European average of 6%.

From the beginning of research on burnout syndrome, medical workers have been at the center of researchers' interest. And although the analyzes currently concern also other professional groups, due to the easement characteristic of work in medical professions, it is still the most frequently analyzed professional group.

Burnout most often occurs in the so-called service professions, that is, work with people and for people. "Currently, researchers of the problem notice that civilization changes and increasing requirements for social service professions caused psychological costs in such professions as teachers, nurses, doctors, social workers, emergency service workers, policemen and others. Functioning in these professions is characterized by increasing work-related stress. Strategies for coping with stress turn out to be ineffective, resulting in exhaustion, chronic fatigue and loss of satisfaction with the professional tasks performed. This leads to exclusion, loss of involvement, and even a change of profession or complete resignation from professional activity (Sęk, 2004, p. 7).

4. Assessment of the occupational burnout in the context of the organization's safety

4.1. Social and economic effects of occupational burnout

Social costs generated by the burnout syndrome include sickness absenteeism of employees, early retirement, frequent changes of employment, and even leaving the profession (Anczewska, 2010).

People who, despite the perceived symptoms of burnout, i.e. discomfort at work, have lower efficiency, reduced concentration, which extends the performance of tasks.

In the case of organizations, burnout translates into poor overall performance, increased absenteeism, unproductive presence at work (presenteeism – the arrival of sick or incapable employees to work), shirking, and an increase in accidents and injuries. Absences due to burnout tend to be longer than those caused by other causes, and work-related stress can stimulate early retirement. It is estimated that such costs for enterprises and society amount to billions of euros nationwide (Zagrożenia..., 16.06.2021).

Until now, burnout was associated only with work-related factors, while the development of depression, according to researchers, was mainly determined by personal problems. However, a study by Guille and Rotenstein (2020) on medical interns from 68 different institutions found that the circumstances leading to burnout were much more linked to the causes of de-pression than previously thought, and that factors largely coincide with the causes of depression.

The difference between burnout and depression regards' the emotions you experience – in depression it is guilt, and in burnout it is anger (...). Additionally, a burned-out worker may feel happiness in other areas of his life, while a depressed person may feel depressed in all areas and spheres of life. However, the lack of interventions in the situation of experiencing occupational burnout, as a consequence, may lead to the occurrence of a depressive state.” (Godlewska-Werner, 2019).

According to the estimates of the Institute for Health Metrics and Evaluation, in 2019 (NFZ..., 2020), depressive disorders were the second most common mental disorders (after anxiety disorders). And although depression is not the same as occupational burnout, due to the fact that both states have a common ground, it is worth quoting data on depressive disorders. According to the National Health Fund (NFZ), 22 million Europeans and 1 million Poles were ill in 2019. Poland was the country with the lowest percentage of people suffering from depression in the European Union, which, according to the OECD, may result from the level of understanding of the problem of mental disorders, stigmatization of patients, or access to psychiatric care. Compared to the data for 2013, there has been an increase in the number of patients in each age group. The highest dynamics was observed in the age group 0-17 (145%), 65+ (60%), the smallest increase was observed in the 18-44 and 45-64 age groups (50 and 19%, respectively). The costs of financing services and drugs (reimbursed by the National Health Fund) amounted to PLN 251.2 million and PLN 143.5 million, respectively. In the economic context, this translated into 318 thousand sick leaves, 3 thousand of repeated statements of incapacity for work due to depression (89% are statements of partial incapacity for work), which, with the calculated average length of the sick leave of 19 days, was graphically presented the National Health Fund as 16,000 years of the total duration of sick leave. Similar calculations, although slightly lower, are certainly due to the fact that they concern 2014, published by the Institute of Healthcare Management (Depresja – Analiza kosztów ekonomicznych i społecznych, Raport, 2014) (for example, PLN 169 million from benefits, and PLN 108 million from expenses on drugs). The ZUS expenditure on this account in the report was indicated at the level of PLN 762 million. As you can see, it generates huge losses resulting, apart from direct expenses, also from the loss of potential GDP.

Król (Ile nieudane rekrutacje kosztują twoją firmę? 16.06.2021) presented estimated data on the costs of unsuccessful recruitment, which gives an overview of the costs of hiring employees, also as a consequence of resignation from work due to burnout. The total cost of replacing an outgoing employee is the equivalent of his annual salary. If you want to calculate the cost of recruitment, which does not end with the achievement of the desired effect, you should take into account:

- the employer's gross remuneration costs in a given position multiplied by the number of months worked in this position by the employee,
- the value of intellectual capital lost with the departure of an employee,
- administrative costs of leaving the employee's job,

- costs of recruiting both a departing employee and a new employee for the position of a departing employee,
- costs of medical examinations,
- internal and external training costs,
- costs of the implementation time of the departing employee,
- costs of introducing a new employee,
- costs of employees' incomplete productivity during the implementation period,
- overtime costs of employees replacing the outgoing employee, at least during the transitional period,
- costs of lost business benefits while the position is vacant,
- costs of possible clearance.

After adding up the above categories, for an employee who has worked three months, with a gross salary of PLN 5,943 (the employer's expense) and PLN 3,500 net, it is PLN 91,896 (Ile nieudane..., 16.06.2021).

A study conducted in July 2020 by the ARC Rynek and Opinia institute, in cooperation with Randstad, on behalf of Gumtree, shows that as many as 31% of white-collar workers are considered burned out. More than half of the respondents (54%) believe that the reasons for burnout are high responsibility and, at the same time, low remuneration, 43% believed that the source is the need for professional development with little chance for promotion. The respondents also indicated routine and weariness (28%). All these burnout generators are also specific to the medical profession. Therefore, it can be assumed that the structure would look similar.

Apart from the health, emotional and efficiency effects mentioned above, the serious consequences of burnout are also the financial losses of employers. Thomas and Lankau (2009) write that, according to a US study, corporations lose around \$ 300 trillion a year due to the consequences of work-related stress and burnout.

4.2. Burnout in the context of occupational health and safety

As reported by the European Agency for Safety and Health at Work (<https://osha.europa.eu/>..., 16.06.2021), almost half of European workers believe that stress is a widespread problem in their workplace. It should be noted that about 50% of "lost" working days are related to stress, and mental problems are misunderstood and often stigmatized in the work environment. However, it is important that psychosocial risks and stress are treated more broadly as an organizational problem, not an individual problem, then they can be dealt with as with any other threat in the organization.

Chronic and unreduced stress at work, as previously mentioned, is the cause of losses and the source of higher costs, e.g. due to wrong decisions of the company's management, lower quality and efficiency of employees, unfinished orders, etc. (Gólczyk, 2016). The costs of

accidents at work, damaged equipment, replacement of employees are equally high, and in the case of medical workers, it is worth emphasizing the non-measurable consequences related to the effects of wrong decisions, negligence, etc. (Gólcz, 2016).

The link between occupational burnout and occupational health and safety is a feedback loop. The workplace, understood as a set of requirements and resources influencing the wellbeing of an employee and his mental health, is a determinant of occupational burnout. Difficult working conditions including ambiguities, increased physical and emotional effort, chronic stress, conflicts, poor technological equipment limiting the possibilities of cooperation with contractors or clients, etc. increase the risk of burnout. Therefore, psychological, physical, social and organizational resources, certain freedom and autonomy at work, support in achieving goals and professional development, a friendly and motivating atmosphere and a safety culture at work are important. The latter manifests itself in the awareness of the great importance attached by superiors to the safety and health of employees. On the other hand, an unfavorable work environment leading to burnout entails, apart from measurable financial losses, also a reduced level of safety at work due to less concentration on the tasks performed, and in the case of absenteeism, burdening other employees with the tasks of the absent employee. In addition, burnout by reducing the concentration, perception and physical and mental abilities of an employee directly affects the risk of an accident and the financial results of the entire organization (Grunt-Mejer, 2012). Research among nurses indicates that psychological exhaustion is associated with accidents, injuries and unsafe activities at work (Spence-Laschinger, Leiter, 2006). In Poland, health care and social assistance is the third most important section with the highest accident rate. This indicator is higher than in manufacturing, and lower only in comparison with mining and sewage management (Wypadki przy pracy..., 2021). At the same time, more than 60% of all accidents in Poland are caused by inappropriate behavior of an employee, and several percent result from an inappropriate psychophysical condition (Wypadki przy pracy..., 2021). Every 7th accident was the result of physical or mental strain. These figures are similar each year. Thus, there is a clear influence of work culture, personality traits and other factors mentioned above on the probability of burnout syndrome, but also the influence of burnout symptoms on occupational health and safety.

In the Eurofound report (2018) examples of actions to prevent burnout in the workplace and good practice were indicated paying attention also to activities in the field of broadly understood organization management (e.g. in Sweden, Austria, Belgium). This is also evident in the research by Smulders et al. (2013), in which the lack of management support translated into a 2.3 times higher risk of burnout in the Netherlands. Lipowska's research (2016) among employees of orphanages in Poland also led to conclusions about the positive impact of mentoring, appreciation and trust on the part of superiors on reducing symptoms of occupational burnout and maintaining or restoring motivation to work. Thus, in this context, the management policy of the company is significant, because the emergence of occupational burnout syndrome is highly influenced by the work environment, the safer, hygienic and employee-friendly it is, the lower the risk of occupational burnout (Gembalska-Kwiecień, Zając, 2005; Găureanu et al.,

2019). “The fight against occupational burnout is beneficial and necessary not only from the perspective of the burned-out person and his/her family and friends. Organisations and companies that prevent the occupational burnout of employees and fight against its also gain.” (Gembalska-Kwiecień, 2019, p. 42). Management prevention should include for example (Lafuente et al., 2018; Stoffregen et al., 2019): stress management (and especially its causes), unloading stress (integration trips, trainings), seeking sources of stress and neutralising or limiting it by the employees themselves, changing the perception and assessment of stressful situations by employees, social support (the atmosphere and organisational culture of the company have a huge impact on the frequency of burnout)” (Gembalska-Kwiecień, 2019, p. 42).

In Evangelista et al. (2021, p. 178) opinion, psychosocial risks are present in all work environments, it is the duty of organizations to make risk reduction plans to preserve the health of their workers and avoid production risks.

Occupational burnout is a multifaceted phenomenon that is subject to dynamic changes along with the evolution of societies and lifestyles. It is difficult to measure and identify due to its correlation with the individual characteristics of the individual. Additionally, due to the slow process of proceeding, it is often overlooked in the initial stages of development. Equally important is the fact that the sources and symptoms are the same also for other conditions, such as fatigue, stress or depression. The specificity of occupational burnout and its intensification in recent years necessitate the broadest possible analysis of the phenomenon and reaching as many employees as possible in order to effectively prevent its negative effects (Mierzwa et al., 2019). The conditions and the growing phenomenon of burnout imply the need to take into account remedial measures at the organizational management level. The factors determining the development of organizations and economies, i.e. innovation, competitiveness, etc., indicated so far in the literature on the subject, are based on the quality of human capital and lose their effectiveness in the face of occupational burnout. The COVID-19 pandemic exacerbated this phenomenon, weakening ties, trust, contributing to the progressive corrosion of social capital and forcing adaptation in strategic management processes (Nowicka-Skowron, Stachowicz, 2020; Bylok, 2021).

„As the OECD points out on its dedicated website, mental disorders account for one of the largest and fastest growing categories of the burden of disease worldwide. One in two people experience a mental illness in their lifetime, yet 80 % of those with a common mental disorder, and up to 50 % of those with a severe mental disorder, do not seek or receive treatment. The total costs of mental ill-health are estimated at 3.5-4 % of gross domestic product (GDP).” (Mental health..., 2021, p. 7)

„A May 2021 policy response brief explains that the coronavirus crisis has heightened the risk factors generally associated with poor mental health, such as financial insecurity, unemployment, and fear. At the same time, protective factors (including social connection, employment and educational engagement, access to physical exercise, daily routine and access

to health services) fell dramatically” (Mental health..., 2021, p. 8). Recommendations include support for the mental health of employees by employers and managers.

Although occupational burnout can occur in any profession, due to the servant role of medical workers, the specificity and working conditions, and the constant stress that accompanies it, they are the group most exposed to the experience of professional smoking. The age at which this condition may appear, unfortunately, is decreasing from year to year. In research on this subject, you can find information about even twenty-something-year-olds suffering from burnout syndrome.

In Poland, research on occupational burnout was initiated by H. Sęk in the late 1980s. The number of studies in this area is still expanding, but there is no research at the national level. To some extent, if not sufficiently, this gap is filled by fragmentary analyzes of a smaller scale. The specificity of occupational burnout stimulates sectoral analyzes, as, for example, health care workers, mainly nurses and doctors, are the second most frequently studied professional group in Poland. It is desirable due to the particular susceptibility of medical personnel to the occurrence of the burnout syndrome.

5. Summary

Summing up, it should be stated that the costs of burnout are high, both for the employee and the employer. The former ultimately leaves the job, loses financial stability, lowers his social status and starts treatment. The employer also incurs costs, the past ones incurred for the employee's development, training and adaptation, then those resulting from absenteeism and the need to find a new employee who will also need training. Economists estimate that the time and cost necessary to find an employee who begins to "earn" for his salary is two years and several hundred thousand zlotys, respectively.

Psychosocial risks and work-related stress are among the key challenges in terms of occupational health and safety. A burned out employee is characterized by weaker concentration and lower perception, which translates not only into the results of work, but also on his own and colleagues' safety. Thus, all psychosocial risks and stress have a significant impact on the health of employees, and consequently also the condition of the organization and, more broadly, the entire economy. Therefore, one of the priorities should be to raise the awareness of workers, especially medical workers, about burnout in order to prevent, not treat. Summing up, we can recall the phrase "to burn out at the end, you have to burn at the beginning". This shows that the employees at risk of burnout are the most committed, ambitious, devoted whole-heartedly to their work and eagerly performing their tasks, and these are the features predestining them to work in medical professions. Thus, the greater the economic and social loss from the "loss" for the professional environment of such an employee.

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HOUSING COOPERATIVES IN A COMPETITIVE REAL ESTATE MARKET

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Purpose: The purpose of the publication was to attempt to present housing cooperatives as a competitive entity in relation to other entities forming the "real estate stock". The resource of housing cooperatives was presented and compared to the resource of other entities operating on the real estate market in Poland. It also shows how housing cooperatives are performing on the real estate market in Poland.

Design/methodology/approach: Empirical research on the competitiveness of housing cooperatives in the real estate market was nationwide. The number of dwellings put into use by particular entities operating on the real estate market in Poland has been analysed with a division into voivodships. The standard of buildings put into use has been characterized, and the quality of housing stock management has been analysed. Data concerning the number of dwellings completed has been obtained from the Local Data Bank of the Central Statistical Office and from the Analysis and Monitoring System form the Real Estate Market (AMRON).

Findings: The legally and historically established position of the owner of often huge housing resources and the gap between housing cooperatives to function without any assessment of their competitiveness. Legal changes, which include the right to transform a cooperative right into separate ownership of premises, the right to change the property manager from a cooperative to a competitive commercial entity, undoubtedly force housing cooperatives to compete in the housing market in Poland.

Originality/value: To date, competition between operators in the property market has not been studied. In this publication, the authors examined the competitiveness of housing cooperatives in relation to other business entities.

Keywords: housing associations, real estate market, real estate, housing stock, competition.

Category of the paper: Research paper.

1. Introduction

Housing policy may refer to different segments of the housing market, to facilitating or hindering the acquisition of housing rights and finally to restraining or stimulating entities operating in the housing market. The subject of the study is housing cooperatives in relation to their competitiveness towards other entities. The competitiveness in the housing market is difficult to analyse due to the enormity of the entities operating in it (thousands of housing cooperatives and millions of housing communities). There are also other entities with housing resources (local government units, the State Treasury, legal persons of churches and religious associations and other legal persons). Housing cooperatives, due to their large resources, can be subject to scientific observation. Own research and research based on statistical data of the Central Statistical Office were presented. What is noticeable is the small amount of scientific literature (except legal studies) concerning the problem of functioning of housing cooperatives. The study may be a contribution to wider research in this field.

2. Volume of housing stock - communal, cooperative and private

The housing stock is the total of occupied and unoccupied dwellings that are located in residential and non-residential buildings (Stettner, 2018). The housing situation in Poland compared to other European countries is unfavourable (Martyniuk, 2020; Antczak-Stępnik, Grodzicka-Kowalczyk, Sobczak, Załęczna, Żelazowski, 2021). The most serious problems are the low availability of rental housing in job-generating centres, the insufficient ability of households to meet their housing needs, the high degree of decapitalisation of housing stock, and the overcrowding of a significant part of housing (Markowski, Sikora-Fernandez, 2019; Chyra-Rolicz, 2019; Głowska, 2018).

One of the most important indicators concerning the housing market is information on the number of newly built dwellings and the investor structure. By studying the share of different types of investors in the distribution of housing effects and their dynamics, it is possible to determine to what extent individual sectors are developing.

The following phenomena are worth noting:

- low share of municipal construction in the whole analysed period,
- low share of total social rental housing: workplaces, municipal and TBS,
- a persistently high share of individual construction; in recent years its share has exceeded 50% of dwellings completed,
- cooperative investments maintained at a good level,
- systematic growth of construction for sale or rent, carried out by developers.

Table 1.*Number of dwellings with separate ownership put into use in 2017-2020*

Voivodships	Research period			
	2017	2018	2019	2020
dolnośląskie	4036	4187	4546	4623
kujawsko-pomorskie	3523	3751	3995	4003
lubelskie	3546	3419	3644	3865
lubuskie	1601	1648	1803	1898
łódzkie	4498	4271	4382	4457
małopolskie	7750	7230	7157	7278
mazowieckie	9745	8740	9546	9760
opolskie	1150	1161	1202	1397
podkarpackie	4904	4699	4999	5237
podlaskie	2041	2013	2230	2347
pomorskie	3936	3954	4302	4475
śląskie	7086	7365	7421	7536
świętokrzyskie	2519	2260	2248	2350
warmińsko-mazurskie	1702	1811	1815	1984
wielkopolskie	7290	7626	7817	7934
zachodniopomorskie	2330	2085	2119	2236
TOTAL	67657	66220	69226	71380

Source: own compilation based on CSO data.

The municipal real estate stock is created by municipalities to enable them to perform their statutory own tasks of a public service nature (Lis, 2017). Among municipal real estate, the residential real estate stock has the basic share. The primary purpose of this resource is to meet the housing needs of specific members of the local government community (Nalepka, 2005).

Table 2.*Number of municipal housing units put into use in 2017-2020*

Voivodships	Research period			
	2017	2018	2019	2020
dolnośląskie	124	102	98	104
kujawsko-pomorskie	222	91	118	120
lubelskie	178	74	25	34
lubuskie	39	13	4	8
łódzkie	33	98	56	63
małopolskie	34	48	221	247
mazowieckie	224	391	130	153
opolskie	0	71	0	6
podkarpackie	15	55	50	61
podlaskie	89	18	122	134
pomorskie	264	187	178	180
śląskie	206	236	221	230
świętokrzyskie	7	23	110	114
warmińsko-mazurskie	94	82	87	92
wielkopolskie	140	306	302	209
zachodniopomorskie	46	68	116	120
TOTAL	1715	1863	1838	1875

Source: own compilation based on CSO data.

The municipal housing stock includes premises owned by municipalities, municipal legal persons, commercial companies with municipal participation (with the exception of TBS), and premises which are owned by these entities themselves. The majority of dwellings in the municipal housing stock are intended for permanent letting and are permanently inhabited (Foryś, Putek-Szeląg, 2010).

Table 3.

Number of dwellings put into use by housing cooperatives in 2017-2020

Voivodships	Research period			
	2017	2018	2019	2020
dolnośląskie	202	263	272	287
kujawsko-pomorskie	229	116	297	302
lubelskie	221	421	436	486
lubuskie	105	172	187	202
łódzkie	150	147	56	37
małopolskie	195	89	78	63
mazowieckie	460	476	525	578
opolskie	0	0	0	0
podkarpackie	356	338	20	14
podlaskie	6	228	48	23
pomorskie	116	203	315	354
śląskie	24	4	1	0
świętokrzyskie	136	119	42	35
warmińsko-mazurskie	376	305	50	43
wielkopolskie	225	128	112	76
zachodniopomorskie	210	164	135	114
TOTAL	3011	3173	2574	2614

Source: own compilation based on CSO data.

In multi-family construction, the trend of a steady increase in the number of dwellings commissioned by developers has continued for several years. In 2020, this amounted to 71380 units, i.e. 2154 units more than in 2019. In second place was cooperative construction, which showed a slight trend towards growth. In 2020, cooperatives commissioned 2614 dwellings (40 more than in 2019).

Compared to previous years, the investor structure of multifamily construction in 2008 underwent significant changes. These consisted in a significant increase in the share of developer construction and a decrease in the share of cooperative, TBS and municipal construction.

Between 2017 and 2020, the average annual construction cycle of multifamily houses lasted between 23.3 and 26.3 months. The period between the start of construction of an individual house and the date of notification of commissioning was between 67 and 74 months during the same period. As a rule, this is not due to the actual construction cycle but, on the one hand, to the fiscal advantages of not declaring the building as completed and, on the other hand, to the lack of legal regulations inducing the investor to declare the investment as completed when the house is fit for use.

3. Competing with the standard of buildings

The definitions and concepts of building standards are variable over time, and there are many of them in legal acts and scientific and technical studies. A standard may be assessed in terms of the technical solutions applied. Nowadays, standards referring to sustainable, low-energy buildings (with the lowest possible energy consumption and emissions) are indicated more frequently. Standards can also refer to the convenience of buildings (wide staircases, lifts) and relate to the dwellings themselves, i.e. equipment with heating, plumbing, electricity, computers, etc.

Housing cooperatives manage a very diverse housing stock. Some of the buildings are pre-war buildings, which is especially true for the provinces in the so-called recovered territories. In large cities in these areas (Gdańsk, Szczecin, Wrocław and others), housing cooperatives in the 1950s took over part of the post-German buildings, which were transferred to them by the then local state administration bodies. In Szczecin the building stock was of a relatively high standard (brick, multi-storey, decorative facades, etc.). The flats in these buildings were relatively large, equipped with bathrooms, but heated from tiled cookers. A large proportion of these buildings, however, had no bathrooms and toilets were located on the mezzanines. This obviously lowered the standard of this group of housing cooperative resources. Nevertheless, the standard of the buildings was undoubtedly competitive in relation to buildings constructed in a similar period in central and eastern Poland. The end of the 1960s and 1970s was a period when it was assumed that the housing needs of the population should be satisfied on the basis of cooperative construction. It may be assumed, in a simplified manner, that a specific "nationalisation" of cooperatives took place at that time (the president of the Central Board of Housing Cooperatives was at the same time Deputy Minister of Construction). During this period, large cooperative housing estates were established, in which even tens of thousands of people lived in large cities. Construction within the W-70 system (large-panel building) caused a huge increase in the cooperative, as well as municipal and company housing stock. The standards of these flats were similar, in fact the same. Large-panel buildings were built in big cities, but also in villages, like the buildings of the then State Agricultural Farms.

In these buildings, competition in building standards was practically non-existent; it could only concern the source of heating (district heating or heating from a local boiler house). Local boiler houses could cause discomfort due to dust and the inconvenience of storing coal/coke. Housing in this system also did not compete on the number or size of rooms, as it was mainly two- and three-bedroom flats offered in and outside housing associations, whose space was generated by designs from house factories.

The actual competition on building standards started after the change of political system in Poland. From the 1990s onwards, buildings were constructed on a commercial basis. Construction entrepreneurs and later developers competed with housing cooperatives on the

market by supply (many flats offered on the market in a shorter time), and soon also by new technologies, finishing materials and a wide offer of flats varying in size and equipment, location, arrangement of living space.

It was also during this period that company and municipal housing disappeared or was limited, while social housing (TBS) emerged. In fact, housing cooperatives ceased to carry out housing investments for their members. What remained was quasi-development activity, i.e. construction of flats for sale on the free market. In this state of affairs, cooperatives could adopt a limited competitive strategy. It is assumed in the literature that a competitive strategy consists of standing out, presenting a different set of resources, searching for a particular mix of values. It also means drawing on the knowledge resources of modern marketing. The question is whether housing associations have a well-thought-out competitive strategy, a set of goals to achieve in a long-term perspective. At the time of active competition on the housing market, housing associations were in a specific situation. They had housing resources occupied by cooperative members and persons who had acquired cooperative ownership rights to premises, and with time also persons who had acquired the right to separate ownership of residential premises. Co-operatives were also in possession of land for development located in attractive parts of cities, including land not saturated with co-operative housing, on which it was possible to erect new buildings without infringing the applicable provisions of the Construction Law.

There was also the problem of thermomodernisation. A large part of cooperative buildings, especially those constructed in the W-70 system, was characterised by high heat loss resulting from unprotected slab gaps and cracks. This undoubtedly affected the aesthetics of the buildings and thus their competitiveness. It seems that after the year 2000, the cooperatives gave up the competitive struggle as far as the standard of the buildings is concerned, however they carried out intensive insulation works (with the standard material – polystyrene). They also introduced decorative facades to the buildings and subsidised the replacement of leaky wooden windows with plastic windows. All these circumstances must undoubtedly be counted as competitive activities. However, it can be assumed that they were not aimed at gaining new residents, but at stopping the technical degradation of the buildings.

4. Competing for efficiency in property management

The statutory objective of housing cooperatives is to meet the housing needs of their members and their families by providing them with independent dwellings or single-family houses. For that reason, housing cooperatives have a statutory duty to manage the real estate constituting their property or the property of their members acquired under the law. The activity of managing the cooperative's property and the property of its members may be the only form

of activity carried out, especially by those cooperatives which do not carry out new housing developments. Persons who have cooperative ownership rights to premises and the right of separate ownership to a dwelling do not have to be members of a cooperative. Any person may acquire a housing unit from a cooperative under the provisions of the Act on Housing Cooperatives. According to the provisions of the Housing Cooperatives Act, a cooperative is not obliged to manage property acquired by non-members (Bończak-Kucharczyk, 2013; Stępień, 2018). However, in practice, it is difficult to separate the management of property acquired by cooperative members from the management of property acquired by non-members if this property consists of premises, especially those located in the same property.

The provisions of the Law on Housing Cooperatives make the housing cooperative an institutional manager (Bończak-Kucharczyk, 2014). The cooperative in this case manages its own properties and those of its members out of the obligation imposed by the Act, but it may also manage other properties under a contract concluded with their owners. Such an agreement will be a real estate management agreement.

The definition of real estate management was contained in Article 185(1) of the Real Estate Management Act (Real Estate Management Act). According to those regulations, real estate management is a set of activities or goals that a manager should in particular undertake. These activities consist in particular in:

- ensuring proper economic and financial management of the real estate,
- ensuring safe use and proper operation of the real estate,
- ensuring proper energy management,
- day-to-day administration of the real estate,
- maintaining the real estate in an undamaged condition according to its purpose,
- making reasonable investments in the property.

Although the provision defining property management has been repealed, the activities listed therein are still valid and should be performed by property managers.

The mission of any housing cooperative should be to guarantee a high level of service to residents and effective management of real estate representing the property of the cooperative or the property of its members, as well as the property of non-members, of which the cooperative is only the manager (Świder, 2014).

The objectives of the cooperative's activity must be inseparable from a credible vision of the future that gives a sense of stability and security, as well as the improvement of management processes that result in meeting the needs of residents in terms of maintaining a high technical level of the cooperative's resources and raising the standards of the quality of life of persons with rights to residential premises (Hońko, Kufel, 2018).

The cooperative law allows cooperators to have an impact on the way management and decisions are made, provided, however, that they are interested in the affairs of the cooperative. This is because sometimes there is a lack of willingness to act together, attendance at general

meetings is low and there is little interest in the affairs of the cooperative, that is, in essence, their own affairs.

Under market economy conditions cooperatives are enterprises treated on an equal footing with other economic entities. Consequently, they have to take over the features and methods of functioning proper for other market entities (Foryś, 2017). Flexibility of operation, organisational efficiency, innovativeness are basic features that should characterise every cooperative regardless of whether it is small, medium or large. An important role is played by the ability to respond to consumer behaviour and expectations in terms of the degree of modernity and diversity of the market offer. The sphere of management and the level of professionalism in managing a cooperative are basic problems whose solution serves to improve competitiveness and rationality. Therefore, the necessity arises to reconcile the managerial system of management with the social character of cooperative management (Kozuch, Książek, 2014).

Among the decisions that most affect the good functioning of housing cooperatives are those concerning the staffing of managers. Hence, it is extremely important to specify the requirements for individual positions in the cooperative (Zakrzewski, 2018). The selection process can be defined as obtaining people for the needs of the organisation and leading to the most appropriate staffing. It is worth noting that the composition of the bodies of many cooperatives is fixed for many years, as there is no tenure of positions. Promotion to higher positions is often made by selecting a candidate from among the existing employees.

The advantages of collegial decision-making include the possibility to use the knowledge and experience of several people (Skotarczak, Blaszkę, 2016a). This creates conditions for a more effective and objective consideration of all aspects related to decisions made in connection with the management of the housing stock (Stefaniak, 2018). This, in turn, is associated with easier implementation of the decisions made. Decision-making by a single person may be associated with a higher degree of subjectivity and, consequently, the possibility of making a wrong choice (Tymieniecka-Cichoń, 2019). Collegial decision-making, on the other hand, is characterised, among other things, by a slower pace of the decision-making process due to the difficulty in establishing responsibility for the consequences of the choice and the need for compromise. Collective decision-making includes decisions taken by the general assembly or the meeting of representatives, which express the will of all members in determining the directions of the cooperative enterprise.

A feature of the cooperative management system is participation, meaning the participation of members in management. The meaning of participation is to increase the efficiency of the management system. It can fulfil the following functions (Skotarczak, Blaszkę, 2018; Skotarczak, Śpiwak-Szyjka, 2016):

- constitutes a comprehensive instrument for motivating people to work better by integrating personal, team and social interests,
- creates extrinsic and intrinsic motivation, so it is a full instrument of motivation related to one's own ego, the need for self-actualization, performing more complex tasks,
- it is an important element of activity formation and democratisation in social relations,
- it increases the accuracy of decisions and contributes to their better implementation.

Management of the assets belonging to a housing cooperative is carried out mainly under the provisions of the Act on Housing Cooperatives, the Cooperative Law and the internal law of each cooperative, i.e. its statutes. The management of the cooperative's assets is not about generating income from residential properties, but about maintaining a balance between revenues and costs (Skotarczak, Blaszkę, 2016b; Zakrzewski, 2021).

The effect of this form of governance is to bring the administration closer to the residents. The introduction of an intermediate level may make access to the cooperative bodies entitled to make decisions more difficult. A characteristic feature of property management by housing cooperatives is that they create a special administrative infrastructure in the form of administration of a set of buildings or housing estates.

The activities performed by housing cooperatives in connection with the administration of a group of buildings or housing estates may be divided into two groups. The first group comprises maintenance activities which in most cases are entrusted to the administration of a group of buildings or housing estates. The second group consists of dispositive activities, strategic for the cooperative, in a way determining its existence. Dispositive actions are taken by the management board of a cooperative after obtaining the consent or on the basis of a resolution of collective bodies – the general assembly or the supervisory board.

The arguments presented above are postulative to a large extent. The research shows that management in cooperatives is not highly appreciated by the persons occupying their premises. However, there is no doubt that cooperatives have experience in managing large housing resources, which should be evaluated positively. There is also a baggage of several decades of negative experience. It is difficult to point to a competitive advantage of management by a housing cooperative in relation to management in buildings handed over by developers. A review of the comments made at meetings of owners of premises outside the cooperative's stock and those in the stock shows a convergence of assessments of management. The differences are due to the size of the managed resources. In small housing communities there is more pressure to participate in management activities. In housing cooperatives and large communities this cannot be observed and thus their competitiveness is demonstrated.

5. Competing costs of maintaining resources

The housing stock of housing cooperatives is maintained by its members on a self-supporting basis. This means that the sources of financing are the monthly fees paid by members of the cooperative, as well as by non-members (owning premises belonging to the resources of a given housing cooperative) in the form of rent. These fees cover expenses for: maintenance of cleanliness, current repairs and maintenance, charges for water supply and sewerage, repayment of loans contracted for the construction of flats, management costs and for a number of other expenses resulting from the fact of living in and maintaining the technical condition of buildings and technical equipment, as well as maintaining the environment of buildings and facilities in good condition (Każmierczyk, 2014).

Housing cooperatives obtain revenues from fees for residential premises and premises for other purposes. These fees consist of charges independent of housing cooperatives related to the costs of services provided and service charges (Herbin, 2015). According to the provisions of the Law on Housing Cooperatives, these fees must be paid monthly in advance by the 10th of the month, unless the cooperative's statutes provide for other deadlines, but not earlier than the statutory ones. These payments are of an advance nature. At the request of a person entitled to premises, cooperatives are obliged to provide a written calculation of the amount of the fees. The calculation should reflect the actual or projected costs related to the maintenance and exploitation of the common property in which the premises are located and the premises themselves, maintenance of employees, managers and the office of the cooperative and maintenance of the cooperative's property, which most often applies only to its members, while the statutory provisions may be different (Sklarz, 2005).

Housing cooperatives that aim to meet the basic needs of their members have a multi-level cost system. This consists of three basic levels. The first level includes the maintenance costs of individual properties. This level includes the costs of property maintenance, investment activities of the cooperative and its other activities. The settlement of these costs is made to the structure of income in a proportional manner, which is the most advantageous for the cooperative.

The second level, concerning indirect costs, includes the costs of real estate maintenance, mainly housing estate administration and investment activities, but also technical maintenance of the cooperative's resources and costs of other activities.

The third level, i.e. direct costs, is composed of costs related to the maintenance of real estate, including those constituting the property of the cooperative.

Moreover, these are also the costs of construction of premises, which are intended for sale or financed with own contribution. The costs of this level include the costs of functioning of the repair and maintenance teams.

The costs of services provided to the premises for the needs of the owners and the maintenance of the flats are settled for each apartment separately.

In housing communities we distinguish between costs of management of the common property (Article 14 of the Apartment Ownership Act) and expenses related to the maintenance of the premises, but settled through the community (e.g. water, thermal energy).

Competitiveness can only exist in relation to management costs in housing communities and the corresponding costs of managing cooperative premises. Research shows that these are hardly comparable and there is rather an element of market competition between managers of common property. Cooperatives, on the other hand, do not participate in the market competition because, as a rule, they do not have to compete with the managers of the communities. On the other hand, the costs of resource maintenance result from the condition of buildings and standards of construction materials. The cooperatives have older buildings in their resources, therefore the costs of maintenance of the resource are higher.

6. Competition in community organising

Housing cooperatives carry out social, educational and cultural activities for the benefit of their members and persons with cooperative ownership rights to premises or separate ownership of premises, but who are not members of the cooperatives and for other persons living in the housing resources of the cooperatives.

The primary purpose of social, educational and cultural activities is to meet the educational and cultural needs of the members of the cooperative and their families. The purpose of social, educational and cultural activities is primarily:

1. activating members and their families by:
 - a) stimulating artistic, cultural, technical and sporting interests,
 - b) developing various forms of cultural activities,
 - c) organisation of free time,
 - d) participation of children and young people in summer and winter activities,
 - e) shaping patterns and habits of active participation in culture,
 - f) cultural education and popularisation of knowledge and art,
2. integration and activation of residents.

Housing cooperatives most often conduct social, educational and cultural activities in cooperative houses of culture. Cooperative community centres do not have legal personality. They operate on the basis of the status of the respective housing cooperative. Decisions are taken on the initiative of the management board of the cooperative. Cooperative community centres are financed by the members of the cooperative. Each resident with a flat in the cooperative pays a lump sum, as it were, which is added to their rent every month.

The basic sources of financing social, educational and cultural activities are:

1. fees charged to members of the cooperative as part of the charges for the use of residential premises occupied under the terms of a cooperative ownership right to premises or separate ownership of premises,
2. fees paid by owners of premises or persons with cooperative ownership right to premises who are not members of a cooperative, in the amount established by the cooperative's supervisory board,
3. payments of business entities, institutions and organisations for their participation in events organised by a housing cooperative – as a partial reimbursement of costs incurred,
4. voluntary contributions to social, educational and cultural activities made by members of the cooperative, institutions, organisations, natural and legal persons,
5. other incomes.

The funds collected for social, educational and cultural activities are used to cover material and personnel expenses related to programme activities and maintenance of cooperative community centres or housing estate clubs. These costs include in particular:

- costs of programme activities including, inter alia, the purchase of materials for conducting classes in studios and circles and equipment for conducting programme activities,
- costs of organising festivals, tournaments, etc.
- costs of purchasing office and decorative materials to conduct classes in studios and interest circles,
- various forms of dissemination and presentation of the achievements of social, educational and cultural activities,
- costs of renovation and maintenance of equipment,
- costs related to the maintenance and operation of premises used for social, educational and cultural activities (e.g. renovation, maintenance and operating costs),
- staff costs, including, for example, staff costs and the salary costs of instructors conducting classes,
- other expenditure necessary for the operation of activities.

The activities of housing cooperatives indicated above are absolutely competitive with other forms of housing. Development estates do not have any form of stationary cultural and educational activities. Housing cooperatives stand out and are definitely competitive in this respect.

Summary

The housing cooperatives are a permanent element, historically established institution of the Polish housing market. Currently, they function in the conditions of competition on this market within the scope indicated in the study, but also in various other dimensions of economic reality.

It may be assumed, and this is what the results of the presented research indicate, that their legally and historically established position as the owner of often huge housing resources and the existing gap between the supply and demand for housing in Poland allows cooperatives to function without evaluation of their competitiveness.

Legal changes, which include the right to transform a cooperative right into separate ownership of premises, the right to change the property manager from a cooperative to a competitive commercial entity and others, undoubtedly force housing cooperatives to compete in the housing market in Poland. This competition is hindered by the standard of buildings in their resources, the efficiency of management, especially cost management. Definitely, housing cooperatives are competitive in organising local communities. We assume that exposing (without abandoning other forms of competition) the activity and support of local communities (housing estates) may determine the maintenance of the significant position of cooperatives on the Polish housing market.

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ENVIRONMENTAL RESTRICTIONS ON AGRICULTURAL PROPERTIES LOCATED IN PROTECTED AREA IN THE WESTERN POMERANIAN VOIVODSHIP

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Purpose: The aim of the publication is to provide a concise overview of the restrictions on the use of agricultural properties located in protected areas.

Design/methodology/approach: As regards protected areas the Central Statistical Office publishes basic information annually in its studies and in the Local Data Bank on the forms of nature protection established in a given area, such as the area and forms and use in general terms for the whole country or by voivodeship, district and sometimes commune. However, it does not provide information on the overlapping of individual forms of nature protection and their spatial distribution, which was necessary in the case of this study. Therefore, an analysis of the spatial distribution and diversity of protected areas in the West Pomeranian Province was carried out using data made available by the General Directorate for Environmental Protection (individual forms of nature protection), the Central Geodetic and Cartographic Documentation Centre (territorial division units of the country), and cadastral data by districts from the Land Parcel Identification System.

The study also used data from the Central Register of Nature Protection Forms maintained by the General Directorate for Environmental Protection and the Local Data Bank provided by the Central Statistical Office.

Findings: The most restrictive restrictions on the management of agricultural real estate in protected areas occur in the case of the two most important legal forms of nature protection: national parks and nature reserves. With regard to the other forms of nature conservation, these restrictions are not felt as much by property owners.

Originality/value: Research on the analysis of specific properties located in protected areas is rare. The authors wanted to show the constraints, difficulties faced by owners of agricultural properties located in environmentally valuable areas.

Keywords: agricultural real estate, protected areas, restrictions, use.

Category of the paper: Research paper.

1. Introduction

Empirical research on the agricultural real estate market had a regional character. It covered Zachodniopomorskie Voivodship, in which, as mentioned above, over 48.7% of the area is occupied by agricultural land, and protected areas account for approximately 21.58% of the area of the voivodship.

The study covered all poviats (counties) of Zachodniopomorskie Voivodeship in which protected areas covered by forms of nature protection occur.

Cities with poviat rights (Szczecin, Koszalin and Świnoujście) were excluded from the analysis due to their specific character.

In the studied poviats characterised by special natural values, the reconciliation of nature protection requirements and ensuring the possibility of exploiting natural resources requires the application of sustainable development principles and ensuring the favour of society for the development of protected area systems.

In Poland, the list of national parks, nature reserves and landscape parks has remained unchanged for many years, almost all Natura 2000 sites have also been designated.

The subject of the research was the agricultural real estate market, and the distinguishing feature of the agricultural real estate accepted for the research was its location in protected areas.

Environmental protection is the totality of measures designed to remedy or prevent damage to physical surroundings or natural resources, as well as measures designed to reduce the risk of such damage or encourage the efficient use of natural resources, including measures to save energy and use renewable energy sources (EU Commission Regulation No 651/2014). Due to the enormous importance of environmental protection in the economy, it is one of the most discussed topics. The search for how to achieve optimal economic development has always been one of the fundamental problems of modern economics. Taking into account the fact that societies, through their development, cause changes in the natural environment and spatial structure, the need for rational shaping of space and protection of natural resources is not in doubt and there are more and more arguments in favour of its implementation. However, we must be aware that certain investment arrangements cannot be introduced without detriment to ourselves. The role of the legislator in this process is to guarantee and reconcile different values in the system of law, so that to protect the environment but not to limit the economic progress. Unfortunately, restrictions on the use of property due to environmental protection is one of many cases where the property cannot be used to its full potential, regardless of the legal title held. Thus, environmental restrictions are able to affect the agricultural real estate market in a very burdensome manner, although those interested in acquiring agricultural real estate are usually interested in carrying out agricultural activities on it. In the case of this branch of economy, the dependence on environmental conditions is obvious. The production space here

is defined by environmental conditions, and agricultural production is based on the use of environmental resources (Otwowski, 2007). However, trading in agricultural real estate, in areas protected by establishing one or more legal forms of nature conservation, is subject to various restrictions.

2. Restrictions on agricultural real estate transactions in protected areas

Restrictions on agricultural real estate trade in protected areas result from local spatial development plans and protection plans established for particular forms of protection. Under the provisions of the Nature Conservation Act, protection plans are prepared for national parks, nature reserves, landscape parks and Natura 2000 sites. In the case of national parks, nature reserves and landscape parks, the protection plan is the basic document planning nature protection. For Natura 2000 areas, the plan of protection tasks is such a basic document, and the plan of protection is prepared for the area or its part only if there is a need to make the planning more detailed.

Table 1.

Validity of protection plans and protection tasks in individual forms of nature protection in the zachodniopomorskie voivodship

Specification	Protection plan	Conservation tasks
National parks	not in force	mandatory in two
nature reserves	in force in eighty-one	mandatory in seven
Landscape parks	mandatory in three	valid in seven
Natura 2000 area	mandatory in seventeen	not established

Source: own study.

In two existing national parks in Zachodniopomorskie Province, plans for protection tasks have been established. In case of nature reserves, out of one hundred and eighteen existing ones, only in eighty-one a protection plan is in force, in seven a plan of protection tasks is in force, in two of them both documents. For thirty-two reserves there are no protection plans or protection task plans in force. Out of seven landscape parks established in the voivodeship, three have valid plans of protection and four have plans for protection tasks. In the case of eighty-five Natura 2000 areas established in the Zachodniopomorskie Voivodeship, only seventeen have a protection plan.

It is very important that the marketing of agricultural properties located in areas valuable for natural reasons depends on the possibility of using the property for economic activity (Blaszke, 2018a). As a rule, the activities undertaken on the property must not adversely affect the protected nature (Blaszke, 2018b). In national parks and nature reserves there are restrictions on most types of use, with a full prohibition of interference in the case of strict protection zones. The establishment or enlargement of a national park or nature reserve by areas

that constitute real estate not owned by the State Treasury takes place with the consent of the real estate owner. If the owner does not agree then expropriation of the property in question is carried out (Ogonowska, 2018).

The conducted research has shown that the properties included in the two national parks established in the West Pomeranian Voivodeship are in the vast majority owned by the State Treasury. Ownership of real estate by natural or legal persons concerns 1,237.43 ha under active protection (87 properties, including 31 agricultural ones) and 1.54 ha under landscape protection (three properties, including one agricultural one) in the case of Wolin National Park, as well as an area of 2.4164 ha under landscape protection (one property) in Drawieński National Park.

Table 2.

Entities that own properties included in the Wolin National Park and the Drawa National Park

Type of protection	Ownership	Area
Wolin National Park		
strict protection	State Treasury	500,19 ha
active protection	State Treasury	9 135,66 ha
	natural and legal persons	1 237,43 ha
landscape protection	State Treasury	60,08 ha
	natural and legal persons	1,54 ha
Drawa National Park		
strict protection	State Treasury	18 553,6482 ha
active protection	State Treasury	10 563,8814 ha
landscape protection	State Treasury	82,2182 ha
	natural and legal persons	2,4164 ha

Source: own study.

In the surveyed period no agricultural real estate owned by a natural or legal person located within the boundaries of national parks was traded. However, if the owner of a property located within the boundaries of a national park decided to sell it, then the national park has the right of first refusal to purchase this property in favour of the State Treasury.

3. Statutory prohibitions and restrictions on agricultural properties located in protected areas

On the territory of national parks and nature reserves it is prohibited to carry out agricultural activities, except for places designated for this purpose and the use of chemical and biological plant protection products and fertilizers (Skotarczak, Blaszkę, 2019). The area in which farming is possible is determined by the Minister for the Environment (Slusarz, 2018). The said prohibition does not apply to areas under landscape protection during their economic use by organisational units, legal or natural persons and the exercise of property rights.

Table 3.*Occurrence of the catalogue of statutory prohibitions and restrictions in protected areas*

prohibitions and restrictions		
obligatory	optional	do not occur
national parks	landscape parks	Natura 2000 areas
nature reserves	protected landscape areas	
	nature monuments	
	documentation sites	
	nature and landscape complexes	
	ecological grounds	

Source: own study.

All persons owning agricultural property in protected areas may carry out economic, forestry, fishing, hunting and agricultural activities, however, these activities must be adapted to the requirements of nature conservation (Stelmasiak, Lebowa, 2018). Depending on the rank of the respective form of nature conservation, the rules for the use of the area differ. Within the areas where a landscape park, protected landscape area or Natura 2000 are located, many forms of activities are allowed, such as agriculture, forestry, tourism, fishing, among others.

With regard to landscape parks, if there are agricultural or forest properties or other properties within their boundaries that have been used economically so far, they are left for further economic use. However, the consent to economic use of the land included in the property located within the boundaries of the park, mentioned in the regulations, does not mean arbitrariness. The owner of the real property located within the boundaries of the landscape park must respect the limitations imposed in the park. In landscape parks established in the zachodniopomorskie voivodeship there are prohibitions concerning agricultural use of agricultural properties. They mainly concern:

- implementation of projects likely to have a significant impact on the environment,
- discharging liquid manure, with the exception of fertilizing one's own agricultural land,
- keeping animals without litter,
- keeping open drainage ditches and sewage tanks.

The above mentioned prohibitions concern mainly the situation in which the landscape protected in the park may be endangered and do not significantly affect the quality of agricultural activity.

In the area of landscape parks located in the zachodniopomorskie voivodeship, ways of making available and using the areas of parks have been defined which are valid in the entire area with respect to farming. They refer mainly to:

- agricultural use of land with a preference for extensive methods and the implementation of agri-environmental packages, with permanent and temporary grassland being the most recommended form of use,
- the location of indoor livestock buildings with a stocking density of no more than 350 LU for cattle and sheep and 240 LU for other livestock species in one complex of livestock buildings,

- the location of market orchards outside the coastal zones of surface waters and directly adjacent to forests,
- the removal of volunteer trees and bushes up to the age of 15 years on agricultural land,
- prohibition on building on open farmland, except within the limits of former habitats until local spatial development plans have been adopted,
- prohibition to afforest meadows and pastures and areas where afforestation may cause degradation of habitats of rare species of flora and fauna,
- prohibition on removing mid-field, roadside and waterside trees,
- prohibition on creating plantations of perennial energy crops covering an area of more than 10 ha,
- a ban on the construction of new drainage facilities used exclusively for drainage.

Agricultural properties located within the boundaries of landscape parks can still be used for agricultural activities, except that these activities must be rational (Alemu, 2022). The rationality of the agricultural activity is, in fact, the observance of rules that avoid disturbing the natural arrangement of natural factors and the harmony or aesthetics of the landscape (Tóth, Czeglédi, Kern, Erős, 2019). When designating a protected landscape area, the future development of ecological, tourism and recreational functions is taken into account and restrictions are related to preventing the devastation of the environment and landscape. In case of designation of a protected landscape area, entities that own an agricultural property in the area covered by this form must pay attention to a certain circumstance. Namely, the prohibitions that may be in force in this form do not have to be the same for the entire protected landscape area, but different restrictions may apply in different parts of it (Gruszecki, 2010). In the case of protected landscape areas, prohibitions are introduced that may be in force in the whole protected area or in its part.

The following prohibitions of agricultural activities may be introduced in a protected landscape area:

1. kill wild animals, destroy their burrows, lairs, other shelters and breeding places and spawning grounds, spawn eggs, with the exception of amateur fishing and activities related to rational agricultural, forest, fishing and hunting management,
2. carrying out projects likely to have a significant impact on the environment (Act on Disclosure of Environmental Information),
3. erecting new buildings within a 100 m wide strip of land from:
 - a) the coastlines of rivers, lakes and other natural bodies of water,
 - b) the extent of the water surface in artificial water reservoirs situated in flowing waters at the normal level of impoundment specified in the water permit (Water Law Act, Art. 122 (1) (1)),
 - with the exception of water equipment and facilities used for rational agricultural, forestry or fishery management.

Natura 2000 is a programme of a network of nature conservation areas within the territory of the European Union whose aim is to preserve certain types of natural habitats and species which are considered valuable and endangered throughout Europe. They are established by an appropriate regulation of the minister in charge of the environment in agreement with the minister in charge of agriculture, the minister in charge of rural development, the minister in charge of fisheries and the minister in charge of water management. According to research conducted by P. Otowski, the majority of areas included or intended to be included in the Natura 2000 network in Poland are forest properties or agricultural properties (Otowski, 2007). Therefore, it is natural that the type and manner of agricultural activity carried out in those areas will be crucial for achieving protection goals. When comparing Natura 2000 to other existing area forms of nature protection in Poland, certain differences can be observed. In the case of this form, there is an assumption that, if it is possible, nature protection should be connected with the activity conducted on the given areas so far, if this activity does not threaten the objectives for which the form was established (Schulze, Knights, Coad, Geldmann, Leverington, Eassom, Burgess, 2018; Gąsiorowska-Mącznik, 2018). Such an assumption is motivated by the pursuit of social acceptance of this form of protection, as well as the need to continue agricultural activities in specific areas to ensure the survival of selected plant and animal species and natural habitats (Stasiak, 2001; Niewiadomski, 2020).

Economic, agricultural, forestry, hunting and fishing activity conducted in Natura 2000 areas is not subject to restriction if it does not have a significantly negative impact on the protection objectives of the Natura 2000 area. Conducting economic activity, not excluding agricultural activity in Natura 2000 areas which are part of national parks and nature reserves, is only allowed in the scope which does not infringe the prohibitions binding in those areas. In the case of each Natura 2000 area, an entity managing an agricultural property located in this area must consider whether the type and manner of its activity may have a significant negative impact on the components of the natural environment for the protection of which the area was designated. In Natura 2000 areas, there are no separate prohibitions and restrictions on activities that can be carried out in these areas (Kozłowska-Burdziak, 2020). With regard to national parks and nature reserves, obligatory prohibitions occurring in these areas are applied. A separate list of prohibitions has also been created for landscape parks and protected landscape areas. For nature monuments, documentary sites, natural and landscape complexes and ecological grounds, a common list of such prohibitions applies, while for Natura 2000 areas there is no such list (Cupiał, Rorat, Szelaż-Sikora, 2018). For a Natura 2000 area, the regional director of environmental protection prepares a draft plan of protection tasks for a period of 10 years, but the first draft is prepared within 6 years from the date of approval of the area by the European Commission as an area of Community importance or from the date of designation of a special bird protection area (Nature Conservation Act, Article 28). In the case of Natura 2000 areas, it is the plan of protection tasks that includes determination of the conditions of maintenance or restoration of the proper level of protection of the objects of protection of

Natura 2000 area, maintenance of integrity of Natura 2000 area and a coherent network of Natura 2000 areas, relating inter alia to farming, forestry and fishing.

4. Summary

Undoubtedly, it should be stated after R. Cymerman that the introduction and creation of protected areas is a "brake on freedom" in real estate management (Cymerman, 2000). In particular, it restricts the exercise of rights to real estate by excluding certain development functions, as well as largely reducing the development areas. Where it is possible to develop a property, many requirements are created during the investment, including the need to obtain a decision on environmental conditions. It should be noted that restrictions on the use of real estate may cause damage to owners and perpetual usufructuaries and may provide grounds for claiming damages. On the other hand, we observe the growing, especially in economic terms, importance of agricultural real estate as an important income generating factor. Frequent changes in the use of property lead to changes in its function and value. These changes in use intensify as the economy develops, often stimulating spatial and environmental conflicts. It should be remembered, however, that the consequence of misallocated land functions may be inadequate allocation of land resources, e.g. causing irreversible environmental changes.

In view of the introduced restrictions on the ownership of property, potential sources of assistance have been identified to compensate for the losses incurred by entities due to these restrictions. The basic compensation arises from the established support schemes for the reduction of the profitability of activities. If the provisions on support for reductions in income do not apply in a given area, the regional director for environmental protection may conclude an agreement with the owner, perpetual usufructuary or holder of agricultural property on the basis of other legal titles which contains a list of the necessary measures, the methods and deadlines for carrying them out and the conditions and deadlines for the settlement of payments for the measures carried out, as well as the value of compensation for lost income resulting from the restrictions introduced (Law on Nature Protection, Art. 36 (3)).

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COST EFFICIENCY OF ADMINISTRATIVE SERVICE IN PUBLIC HIGHER EDUCATION IN POLAND

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Purpose: The aim of the study is to determine changes in the cost efficiency of the administration of public higher education in Poland.

Design/methodology/approach: The biennial cost Malmquist productivity index was used to study changes in cost efficiency of 58 public higher education institutions in 2014-2016. The results were presented for 6 groups of universities, according to the Ministry of Science and Higher Education in Poland classification.

Findings: The research shows that out of 6 groups of institutions accepted for the study, 2 achieved an increase and 1 a decrease in the Malmquist cost index in both study periods. Changes in the Malmquist cost index in the analyzed period are small as the index ranged from 0.98 to 1.06. Both component overall efficiency change and cost-technical change contributed to the change in the Malmquist index level.

Research limitations/implications: The main limitation of the study are the analysis of changes in cost efficiency only. Additionally, only public universities supervised by the ministry responsible for higher education were studied. Future research should include changes in allocative efficiency using the Malmquist index. In addition, a larger research sample should be considered, taking into account other public universities, including medical, arts, etc., and non-public universities.

Practical implications: The considerations presented are relevant to public university authorities. The article indicates the need to assess cost effectiveness in evaluating the functioning of a higher education institution. This belongs to the responsibilities of management control in terms of effectiveness and efficiency of HEIs and spending of public funds. Information on the variation of cost efficiency between HEIs, assigned to 6 groups, may become a stimulus to conduct an assessment of this economic category in a given unit and strive to improve it.

Originality/value: The added value of the article is the use for the first time of the cost Malmquist index to examine higher education. Also, the use of a modified version of the cost Malmquist index to estimate efficiency assuming variable returns-to-scale.

Keywords: Cost, Efficiency, Malmquist, DEA, Higher education.

Category of the paper: Research paper.

1. Introduction

Higher education plays an extremely important role in every country, because it educates staff for the needs of the economy and influences the R&D activity and innovation of the country. Due to the role of the higher education system, it has been changed and reformed several times in Poland in the last 10 years in order to adapt it to new conditions and socio-economic expectations, both domestic and international. The first major reform was implemented in 2011, followed by further reforms in 2014, 2016 and 2018.

It is worth emphasizing that cost issues in higher education have gained importance in recent years due to the deepening decline in the number of students, which translates into an increase in costs. According to Statistics Poland (2017), employee salaries constitute as much as 57% of the costs of public institutions. However, while the compensation of academic teachers has a substantive justification, because this group of employees performs the basic tasks of the institution in the field of teaching and research, the high compensation of other employees is quite controversial. It is worth noting that higher education institutions receive from the didactic subsidy only funds for the salaries of teaching staff from the Ministry of Higher Education and Science. Whereas the salaries of administrative staff are financed from the higher education institutions' own revenues, mainly from teaching revenues (77.9% of total revenues) (Statistics Poland, 2017).

However, it should be noted that, as part of their autonomy, higher education institutions were free to make changes to salaries of administrative staff at their discretion, so it is important to check whether they have used this option, as the remuneration system should be adjusted to the labor intensity and results achieved by employees.

In the twenty-first century, there are many opportunities to automate the tasks and processes of higher education institution administration, using widely available, advanced ICT tools (Williamson, 2020), thus reducing the costs of institution operation. In Poland, modern IT solutions are introduced both at the level of higher education institutions and at the level of the ministry responsible for higher education.

Modern IT solutions are available at universities for such areas as admissions, student registry, HR and payroll, and management of courses of study (Janczyk-Strzała, 2018). Ryttberg and Geschwind (2021) indicate that IT solutions will successfully contribute to more efficient performance of standard repetitive and routine tasks, and thus create new ways of organizing work. However, in the future, it is expected that HEIs will embrace more complex IT solutions “such as artificial intelligence (AI) and cognitive computing (CC); augmented reality (AR), virtual reality (VR), and mixed reality (MR); Internet of Things (IoT); and blockchain” (Visvizi et al., 2019, p. 1) “to improve the overall efficiency of HEIs” (Visvizi et al., 2019, p. 5). It is important to note that the pandemic period has shown that some administrative work in public sector can be done remotely. Although the technical possibilities

were already available much earlier, the mental limitations of the management staff meant that the solution of remote working was not used (Iwaniuk et al., 2021).

Whereas, at the ministry level, the POL-on system was implemented, i.e. POL-on, i.e. The Integrated System of Information on Science and Higher Education in Poland (Janczyk-Strzała, 2018). It is worth emphasizing that each change in the system of higher education in Poland influenced the functioning of both teaching and research activities, e.g., in the field of service and reporting through the POL-on system.

Casu and Thanassoulis (2006) indicate that too little attention is focused on the efficiency of university administrative staff, much less on assessing cost efficiency. Moreover, Prędko (2015) points out the study of non-profit entities subsidized from the state budget in terms of cost efficiency is of key importance. It results, first of all, from the assumptions of management control in terms of effectiveness and efficiency of the higher education institution's operation. Secondly, it results from the Public Finance Act, which also applies to public higher education. The act emphasizes that making public expenditure should be carried out in a purposeful and cost-effective manner, with principles of obtaining the best results from given inputs, aimed at achieving the assumed goals. "The society should be able to know how to evaluate the effectiveness of state funding of science" (Łącka, 2013, p. 87).

On the other hand, the increase in salary costs may be due to organizational changes in higher education administration towards the so-called professionalization of the workforce.

The aim of the study is, therefore, to determine changes in the cost efficiency of the administration of public universities in Poland. The added value of the article is the use for the first time of the cost Malmquist index to examine higher education. Also, the use of a modified version of the cost Malmquist index to estimate efficiency assuming variable returns-to-scale.

2. Research background of higher education administrative services

Organizational changes that have been observed in higher education for several years are a result of increased competition, differentiation of university missions and their internationalization (Sułkowski et al., 2020). Baltaru and Soysal (2018) indicate that the implementation of the extended and differentiated missions of universities is one of the main factors influencing the development of university administrative bodies. Research conducted on a sample of British (Wolf, Jenkins, 2020), Norwegian (Gornitzka, Larsen, 2004), Danish (Stage, Aagaard, 2019), and Australian HEIs (Croucher, Woelert, 2021) suggests that changing the functioning of HEIs, directly impacts changes in administrative staff towards a more professionalized workforce. The noted trend in higher education varies in scope, duration of implementation, and impact on other areas of entity operations.

Gornitzka and Larsen (2004) noted two main patterns of change in university administration. The first pattern concerned changes in the size of the administrative staff, and the second pattern concerned qualitative changes that can be interpreted as the professionalization of the administrative staff. Stage and Aagaard (2019) observed that the number of specialized and highly educated employees in university administration has increased, while less expensive positions, relatively decreased. Baltaru's study (2019) shows that universities that moderately increase the proportion of administrative staff (not teachers) demonstrate higher student graduation rates, but no significant differences can be observed in terms of research quality, good honors degrees, and graduate employability. Croucher and Woelert (2021) indicate that a number of global studies undertaken in recent years have noted a trend of increasing proportions of non-academic staff in universities and a shift towards more highly skilled and remunerated non-academic roles. In contrast, the results of their study (Croucher, Woelert, 2021) provide partial confirmation of these observations in Australian universities as well. The authors (Croucher, Woelert, 2021) report that while the proportion of non-academic positions in Australian universities has remained largely stable, there has been a striking and uniform increase in management positions, with a significant decline in lower level and less costly administrative support roles.

3. Literature review

The study of various types of efficiency in the sphere of education is most often carried out using the non-parametric Data Envelopment Analysis (DEA) method or the parametric Stochastic Frontier Analysis (SFA) method. Górecka et al (2021) following Nazarko et al. (2008), indicate that a view has formed in the literature that the DEA method is most appropriate for estimating efficiency when we do not have price or cost information, while SFA is most appropriate when we have this information. The analysis by Rhaiem (2017) shows that the vast majority of research is conducted with the use of the DEA method. On the other hand, the review of educational research by De Witte and López-Torres (2017) shows that they are very diverse in many respects. However, researchers usually measure the efficiency of educational entities separately in individual years using the DEA method, and less frequently they analyze the change in efficiency between years using the Malmquist index.

The authors examining the efficiency or productivity of higher education adopted various categories of data, depending on the purpose of the analyzes. Most studies that include the number of higher education administrative staff or their costs are included among many other variables when estimating the overall efficiency of higher education. Extremely few studies examine the efficiency of higher education administration itself (Brzezicki, 2020; Tran et al., 2020). Summary of previous studies is shown in Table 1.

Table 1.*Previous research on efficiency and productivity of higher education*

Autor	Inputs (I)/Outputs (O)/Prices (P)	Methodology
Agasisti and Salerno (2007)	I: costs for academic staff, costs for non-academic staff, other costs (no salaries) O: number of students enrolled in: scientific courses (no medicine), non-scientific courses, medical courses, PhD courses and external funds for research per researcher	CCR, BCC
Agasisti and Bianco (2009)	I: costs for academic staff, costs for non-academic staff, costs for all staff, other costs and total costs O: total number of students, Ph.D. students, students enrolled in scientific courses, non-scientific courses, external funds for research activities	SFA, DEA: BCC
Abramo et al (2011)	I: academic staff: full professors, associate professors, assistant professors O: standardized number of citations of publications P: salary costs of research staff	Cost DEA
Tochkov et al. (2012)	I: academic staff, floor area, library items, research funds O: all students, domestic students, foreign students, unemployment, starting salary, publications, citation index P: academic salary, operating costs	BCC, Cost DEA,
Edvardse et al. (2017)	faculty employees, administration and other employees for outlays, publishing points, Ph.D. students, study points for courses of a lower or higher degree	Malmquist index
Wolszczak-Derlacz (2018)	I: total revenue, academic staff, administration staff, and total students O: publications and graduates	Malmquist index
Brzezicki (2020)	I: number of non-teacher employees O: the number of students, doctoral students and teachers	SBM, Global Malmquist index SBM
Tran et al. (2020)	I: total number of administrative staff, O: total number of students, the total number of academic staff, total operating expenditure	SFA
Górecka, et al. (2021)	I: value of fixed assets, research and teaching staff and other non-teaching staff O: total revenue from teaching and research activities P: average salary of a teaching and research employee, average salary of another employee (non- teacher)	SFA, Cost DEA

Note: publications ranked by year of publication.

Source: own elaboration base on literature.

It should be emphasized that due to the difficult access to detailed data on higher education, especially financial ones, authors using the DEA method, or the Malmquist index often measured efficiency to a very limited extent. It is worth noting that public institutions are usually not tested in terms of cost efficiency (but also profit efficiency), i.e., taking into account the prices of inputs or types of costs, as is the case with profit-oriented market enterprises. Usually, only technical efficiency is analyzed, i.e. the possibility of minimizing the inputs while maintaining the established outputs (input-oriented models) or maximizing the obtained outputs with given inputs (output-oriented models). On the other hand, in the cost efficiency study, the DEA methodology analyzes the potentially lowest costs incurred by the unit in relation to the actual costs of the unit (Prędko, 2015). In other words, „The cost efficiency of a producer using input vector x to produce output vector y when input prices are w is measured by the ratio

of minimum cost to actual cost” (Lovell et al., 1994, p. 182). As Sengupta and Sahoo (2006, p. 36) rightly points out, “Nonparametric cost efficiency models in data envelopment analysis (DEA) are more flexible in the sense that cost data are usually available even for public sector (nonprofit) enterprises and overall cost minimization may be used as an efficiency criterion, where output price data are not available”.

Only a few studies analyzed the cost efficiency of higher education using the DEA method (Abramo et al., 2011; Tochkov et al., 2012; Górecka et al., 2021). So far, however, changes in cost efficiency have not been measured using the cost Malmquist index. The literature review shows that the Malmquist index study of changes in the efficiency of higher education concerned only the analysis of technical efficiency. Therefore, the found research gap should be filled.

In Poland, so far only one study has been carried out using quantitative methods (e.g. DEA), which has been directly devoted to the efficiency of higher education administration in terms of its size. In the study by Brzezicki (2020), attention was drawn to efficiency of public higher education administration staff in Poland. The author (Brzezicki, 2020) in his research indicates that the level of employment in the administration of higher education institutions was related primarily to systemic changes in higher education. However, this work focuses only on technical efficiency (static approach: DEA method and dynamic approach: Malmquist index was used) in this area, and therefore it was noted in it that future research directions should take into account the measurement of cost efficiency of higher education institution administration. It was decided to overcome the limitations of previous studies (Brzezicki, 2020) and measure the cost efficiency of higher education administration in dynamic terms. Therefore, it seems reasonable to carry out this type of analysis.

4. Research methodology

Charnes et. al. (1978) introduced DEA, which is a non-parametric method to measuring the efficiency of decision-making units (DMU) with multiple inputs and multiple outputs using mathematical programming. In the first model namely CCR or CRS developed by Charnes et al. (1978) assumed constant returns-to-scale. Then Banker et al. (1984) presented a model with variable returns-to-scale, namely BCC or VRS.

Under the DEA method, only technical efficiency can be estimated if there is no information on the prices of inputs or products of the DMUs tested. On the other hand, when information on price or cost of inputs is available, then the cost efficiency can be estimated (Cooper et al., 2007).

Initially, the DEA models were not adapted to dynamic analysis of efficiency, therefore Caves et al. (1982), using the earlier work of Malmquist (1953), introduced a measurement of the change in productivity over time using the so-called Malmquist index. Next Färe et al. (1992) proposed its calculation using the DEA method. Originally, Färe et al. (1992) decomposed this index into two components, assuming constant returns-to-scale (CRS). In the next work by Färe et al. (1994) decomposed into three elements, assuming variable returns-to-scale (VRS). However, as noted in Grifell-Tatjél and Lovell (1995), the Malmquist index may incorrectly measure changes in productivity over time, assuming variable returns-to-scale (VRS). Moreover, in this case there may not be finite values of the so-called intertemporal measures, which are components of the index under consideration (Cooper et al., 2007).

In order to overcome the above-mentioned problem, several modifications of the classic Malmquist index were proposed, assuming variable returns-to-scale, e.g. sequential Malmquist index (Shestalova, 2003), global Malmquist index (Pastor, Lovell, 2005) and the biennial Malmquist index (Pastor et al., 2011). It should be noted, however, that sequential Malmquist (Shestalova, 2003) ignores the natural technological regression during the study and, therefore, does not indicate negative technological changes. In the case of global Malmquist (Pastor, Lovell, 2005), it is difficult to constantly add a new period to the survey, which entails the need to calculate the index multiple times. The Malmquist index biennial does not pose such problems (Pastor et al., 2011).

All the above-mentioned modifications to the Malmquist index concerned the measurement of changes in technical efficiency. Therefore, Maniadakis and Thanassoulis (2004), proposed the cost Malmquist index to measure changes in cost efficiency between period t and $t + 1$. Cost Malmquist index was use when DMU are cost minimizers and input prices are known. Then Tohidi et al. (2012) proposed a combination of both solutions, i.e. the global Malmquist index (Pastor, Lovell, 2005) with cost Malmquist index (Maniadakis, Thanassoulis, 2004), calling this construct global cost Malmquist productivity index. Next Tohidi and Tohidnia (2014) proposed biennial cost Malmquist productivity index (CM) as:

$$CM_V^B = \frac{w^B x_j^{t+1} / C_V^B(y_j^{t+1}, w^B)}{w^B x_j^t / C_V^B(y_j^t, w^B)} \quad (1)$$

where biennial cost function is defined as $C_V^B(y, w^B) = \min \{w^B x | (x, y) \in T_V^B, w^B > 0\}$. The input price vector is $w^B \in R_+^m$, input vector $x_j \in R_+^m$ and output vector $y_j \in R_+^s$.

The biennial cost Malmquist productivity can be decomposed into overall efficiency change (OEC) and cost-technical change (CTC) as:

$$CM = OEC \times CTC, \quad (2)$$

where overall efficiency change (Tohidi, Tohidnia, 2014) is:

$$OEC_V^B = \frac{w^{t+1}x_j^{t+1}/C_V^{t+1}(y_j^{t+1}, w^{t+1})}{w^t x_j^t / C_V^t(y_j^t, w^t)} \quad (3)$$

and cost-technical change (Tohidi, Tohidnia, 2014) is:

$$CTC_V^B = \frac{CM_V^B}{OEC_V^B} = \frac{\frac{w^B x_j^{t+1}}{C_V^B(y_j^{t+1}, w^B)} / \frac{w^{t+1} x_j^{t+1}}{C_V^{t+1}(y_j^{t+1}, w^{t+1})}}{\frac{w^B x_j^t}{C_V^B(y_j^t, w^B)} / \frac{w^t x_j^t}{C_V^t(y_j^t, w^t)}} \quad (4)$$

Maniadakis and Thanassoulis (2004, p. 401) indicate that „OEC component captures input between period t and $t+1$. In the terminology of Färe et al. (1992, 1994) this measure indicates whether the production unit “catches up” the cost boundary when going from period t to period $t+1$ ”. In other words, OEC “is the technological gap between the VRS cost frontier of period t and the VRS biennial cost frontier of time periods t and $t+1$ along the ray (x_j^t, y_j^t) ” (Stage, Aagaard, 2019, p. 27). Maniadakis and Thanassoulis (2004, p. 401) indicate that CTC „measures the shift of the cost boundary evaluated at the input mixes x^t and x^{t+1} ”.

Values for the Malmquist index and its components greater than 1 indicate an increase, less than 1 indicate a decrease, and 1 indicate no change. Therefore, 1 is the cut-off value that separates progress from regress and indicates no such change over the period under review.

5. Data and DMU

The choice of variables for the study was guided primarily by the aim of the analysis undertaken, as stated in the introduction, as well as the categories used in the literature on the subject to analyze the efficiency of higher education. The only input was the average number of administration staff (x_1). On the other hand, the results include the values characterizing the three main groups of internal stakeholders of an academic institution for whom administrative services perform their various tasks. The first output included in the study is the total number of students (y_1), the second is the total number of doctoral students (y_2), and the third and last result is the total number of academic teachers (y_3). This cost efficiency study of administrative staff uses the conceptual framework proposed by Casu and Thanassoulis (2006) and Brzezicki (Brzezicki, 2020).

In order to measure cost efficiency, it is also necessary to determine the input cost (price), which in this case is the average compensation of other employees in a given year (p_1). For each institution, the value of the average compensation of other employees was determined by dividing the cost of compensation in a given year by the number of employees. The list of variables used in the empirical study is presented in Table 2.

Table 2.*Variables use in study*

Variable	Description
<i>Inputs</i>	
x ₁	number of administration staff
<i>Outputs</i>	
y ₁	total number of students
y ₂	total number of doctoral students
y ₃	total number of academic teachers
<i>Cost of input</i>	
p ₁	average compensation remuneration of administration staff

Source: own elaboration.

Descriptive statistics of the variables used in the study are presented in Table 3. Data for the study for 2014-2016 were obtained from the Ministry of Science and Higher Education, upon request for disclosure of public information.

Table 3.*Statistical descriptions for variables use in study*

Variable	2014		2015		2016	
	Mean	SD	Mean	SD	Mean	SD
<i>Inputs</i>						
x ₁	911	733	898	731	880	717
<i>Outputs</i>						
y ₁	15991	10525	14932	10271	14748	10120
y ₂	565	656	560	649	599	768
y ₃	1077	814	1069	818	1073	827
<i>Cost of input</i>						
p ₁	47	6	51	7	51	8

Notes: Mean – arithmetic average, SD – standard deviation.

Source: own elaboration.

The 58 public higher education institutions supervised by the Ministry of Science and Higher Education in Poland were accepted for the empirical study (Table Z1 in Appendix). However, the obtained results of the analysis were averaged and presented within groups of institutions of a similar nature according to the Ministry of Science and Higher Education classification, namely (see Table Z1): universities (U, 18 units), technical universities (UT, 18 units), economic universities (EU, 5 units), pedagogical universities (UPe, 5 units), natural and agricultural universities (UPrz, 6 units) and the Academies of Physical Education (AWF, 6 units).

6. Empirical results

Using the CM will allow to determine whether the cost efficiency in higher education has changed in the analyzed period. In turn, its decomposition into two components will also enable the identification of factors affecting the improvement or deterioration of productivity.

Figure 1 shows the cost Malmquist index results for the expression $(CM - 1)$ in the years 2014-2016. The average CM level in 2014/2015 was 1.000, and in the following period 2015/2016 it increased to 1.014. The results show an increase in CM productivity as the values are greater than 1 and indicate progress. The largest increase in CM was recorded in economic universities (EU) in 2015/2016 (1.065), and a decrease in technical universities (UT) in 2014/2015 (0.980). In the case of the group of economic universities (EU: 1.001 and 1.065) and academies of physical education (AWF: 1.045 and 1.041), an increase in CM productivity was recorded in both study periods. On the other hand, technical universities (UT) recorded a decrease in CM productivity in both periods (0.980 and 0.998 respectively). Varying results were obtained for universities (U) where there was a slight decrease in 2014/2015 (0.996), and in 2015/2016 an increase in CM productivity (1.018). The opposite situation was observed in teaching universities (UPe), where first there was an increase (1.019), and then in 2015/2016 a decrease in CM productivity (0.987).

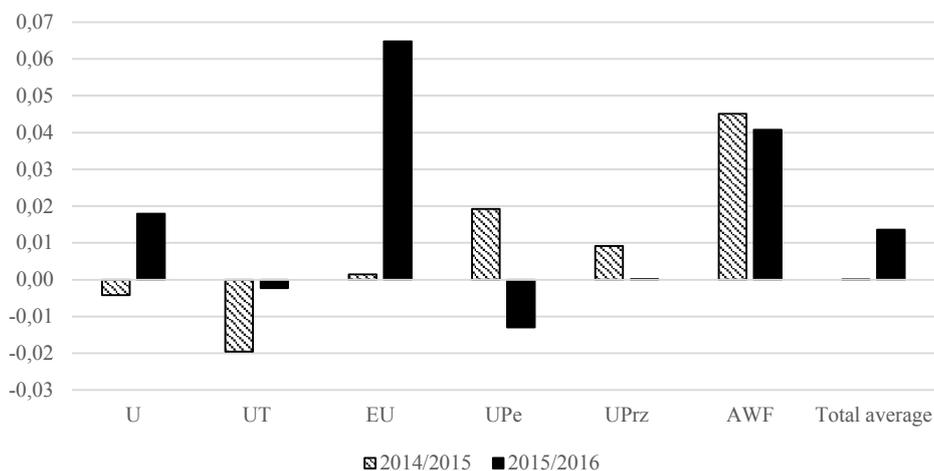


Figure 1. Change CM. Note: the graph shows the difference from the cutoff value of 1, i.e. $CM - 1$. Source: own elaboration.

According to the research assumption, CM was decomposed into two components. Overall efficiency change is presented in Figure 2 (for the expression $OEC - 1$), and cost-technical change is presented in Figure 3 (for the expression $CTC - 1$). In both periods (2014/2015 and 2015/2016), the average values of overall efficiency change (0.981 and 0.999) indicate a decrease. The largest decrease in overall efficiency change was recorded in the group of natural and agricultural universities (UPrz) in 2014/2015 (0.959) and 2015/2016 (0.960). On the other hand, the largest increase was observed in the group of physical education academies (AWF: 1.089) and economic universities (UE: 1.075) in 2015/2016. For almost all university groups, overall efficiency change had the same impact in both periods, only in the case of pedagogical universities (UPe) there was a decrease in 2014/2015 (0.994), and then a slight increase in 2015/2016 (1.004).

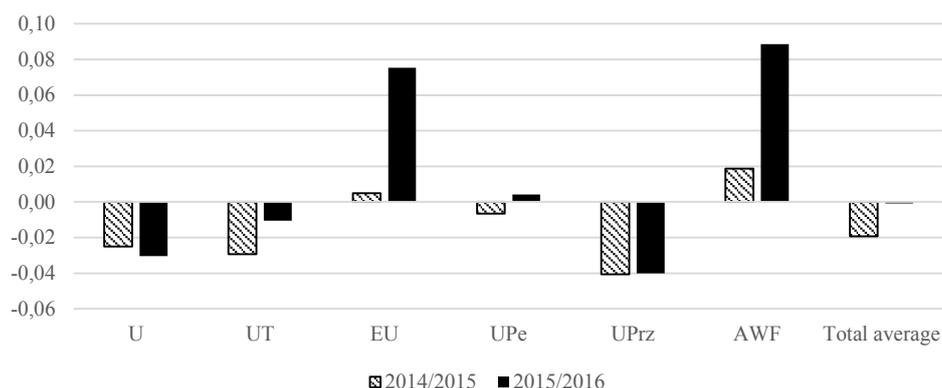


Figure 2. Decomposition CM to overall efficiency change. Note: the graph shows the difference from the cutoff value of 1, i.e. OEC value – 1. Source: own elaboration.

Average values of cost-technical change (1.023 and 1.051) indicate an increase in the analyzed years. The largest increase in cost-technical change was recorded in the group of science universities (UPrz) in 2014/2015 (1.053) and universities (U) in 2015/2016 (1.051). On the other hand, the largest decrease (0.957) was observed in the group of physical education academies (AWF) in 2015/2016. The increase in cost-technical change in both periods was observed in universities (U), universities of technology (UT) and natural and agricultural universities (UPrz). On the other hand, in the case of pedagogical universities (UPe) and academies of physical education (AWF), an increase was recorded in 2014/2015 (1.026 and 1.026 respectively), and then in 2015/2016 a decrease (0.983 and 0.957 respectively). Only economic universities (EU) recorded a decrease in cost-technical change in both study periods (0.997 and 0.990 respectively).

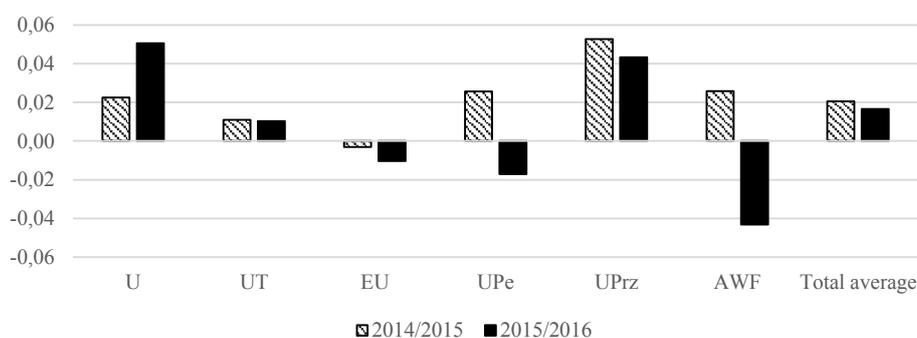


Figure 3. Decomposition CM to cost-technical change. Note: the diagram shows the difference from the cutoff value of 1, i.e. CTC value – 1. Source: own elaboration.

The increase in CM productivity of economic universities (EU) and physical education academies (AWF) was influenced by the increase in overall efficiency change in both periods. On the other hand, the decrease in the CM index of universities (U) and technical universities (UT) in 2014/2015 was caused by a decrease in the overall efficiency change component. In the case of science universities (UPrz), the increase in cost-technical change resulted in a slight increase in CM. The increase in CM of pedagogical universities in 2014/2015, as well

as the decrease in CM in 2015/2016 was dictated primarily by analogous changes in the cost-technical change component.

7. Conclusions

The conducted research shows that out of 6 groups of higher education institutions admitted to the study, 2 were characterized by an increase and 1 by a decrease in the CM index in both study periods. The probable reason for the differences between groups of universities is the current state of development of a given organization and, consequently, the different current needs and tasks performed by universities. On the other hand, in the case of 3 groups of institutions, the CM indicator varied in the analyzed years. Changes in the CM level in the analyzed period 2014/2015-2015/2016 are small. The maximum CM increase was just 1.065 and the maximum decrease was 0.980. In the case of OEC and CTC components, there were also slight changes in their values. The difference between the highest and the lowest OEC values was 0.129, and in the case of the CTC it was 0.096. Only the EU and AWF on their own initiative improved their cost efficiency in two periods. Other higher education institutions have misused their autonomy and lowered their cost efficiency. For the majority of higher education institutions, the shift of the efficiency frontier caused by systemic changes in higher education had a positive impact on their cost efficiency. A different situation was observed for the EU in two periods and in UPe and AWF in one period.

The authors are aware of the limitations of this study. First, only changes in cost efficiency were analyzed. Secondly, only public higher education was examined, which is a fundamental restriction. Finally, thirdly, the quality of work of higher education institution administration has not been analyzed. Therefore, this research should be developed in future analyzes. In the future, it is planned to use other extensions of the Malmquist index to measure changes in revenue, profit and allocation efficiency in higher education. Moreover, a more detailed decomposition of the Malmquist index should be made in order to analyze what components influence the changes in efficiency over time.

It should be emphasized, however, that this research filled the gap in the literature. First, only a few studies focused on university administration employees. Secondly, the costs of the administration of higher education institutions have not been properly analyzed in relation to many studies of academic teachers. Finally, thirdly, the newer version of the Malmquist index was used for the cost efficiency analysis, and not for technical efficiency, for which it was previously mainly used.

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Appendix

Table Z1.

List of higher education in Poland accepted for the study

DMU	Name
P1	University of Warsaw
P2	University of Białystok
P3	University of Gdańsk
P4	Adam Mickiewicz University in Poznań
P5	Jagiellonian University in Kraków
P6	University of Łódź
P7	Maria Curie-Skłodowska University in Lublin
P8	Nicolaus Copernicus University
P9	Opole University
P10	University of Szczecin
P11	University of Silesia
P12	Rzeszów University
P13	University of Warmia and Mazury
P14	University of Wrocław
P15	Cardinal Stefan Wyszyński University
P16	University of Zielona Góra
P17	Kazimierz Wielki University in Bydgoszcz
P18	Jan Kochanowski University in Kielce
P19	West Pomeranian University of Technology in Szczecin
P20	Warsaw University of Technology
P21	Białystok University of Technology
P22	University of Technology and Humanities in Bielsko-Biała
P23	Częstochowa University of Technology
P24	Gdańsk University of Technology
P25	Silesian University of Technology
P26	Kielce University of Technology
P27	Koszalin University of Technology
P28	Cracow University of Technology
P29	AGH University of Science and Technology
P30	Lublin University of Technology
P31	Łódź University of Technology
P32	Opole University of Technology
P33	Poznań University of Technology
P34	Kazimierz Pułaski University of Technology and Humanities in Radom
P35	Rzeszów University of Technology
P36	Wrocław University of Technology
P37	University of Economics in Katowice
P38	Cracow University of Economics
P39	Poznań University of Economics
P40	Warsaw School of Economics
P41	Wrocław University of Economics
P42	Maria Grzegorzewska Academy of Special Education
P43	Jan Długosz University in Częstochowa
P44	Pedagogical University of Cracow
P45	Pomeranian University in Słupsk
P46	Siedlce University
P47	Warsaw University of Life Sciences
P48	UTP University of Science and Technology in Bydgoszcz
P49	University of Agriculture in Kraków
P50	University of Life Sciences in Lublin

Cont. table Z1

P51	Poznań University of Life Sciences
P52	Wrocław University of Environmental and Life Sciences
P53	Gdańsk University of Physical Education and Sport
P54	Jerzy Kukuczka Academy of Physical Education in Katowice
P55	University of Physical Education in Kraków
P56	Poznań University of Physical Education
P57	Józef Piłsudski University of Physical Education in Warsaw
P58	University School of Physical Education in Wrocław

Note: group of: universities (P1-P18), technical universities (P19-P36), economic universities (P37-P41), pedagogical universities (P42-P46), natural and agricultural universities (P47-P52) and the Academies of Physical Education (P53-P58).

Source: own study.

**INFRASTRUCTURE PROJECTS AND TRANSPORT EXCLUSION –
CASE STUDY OF THE POMORSKA KOLEJ METROPOLITALNA**Mariusz CHMIELEWSKI^{1*}, Joanna PIOCH², Renata PŁOSKA³¹ University of Gdansk, Department of Business Economics; mariusz.chmielewski@ug.edu.pl,
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Purpose: The purpose of this paper is to analyse the effects of the Pomorska Kolej Metropolitalna infrastructure project from the perspective of transport exclusion of the Gdańsk-Gdynia-Sopot Metropolitan Area residents. The reason for undertaking the topic is the importance of this project for many different groups of stakeholders and the possibility of analysing some of the already visible effects of its implementation.

Design/methodology/approach: The theoretical part describes the phenomenon of transport exclusion as well as the specifics and importance of infrastructure and infrastructure projects. The research part is based on a case study: an analysis and evaluation of selected effects of the presented project. The subject matter covers a regional transport investment – the Pomorska Kolej Metropolitalna. The study used statistical data analysis and the descriptive method.

Findings: The analysis of selected parameters concerning various aspects of the infrastructure project's effects showed that the Pomorska Kolej Metropolitalna improves the residents' quality of life by reducing the phenomenon of transport exclusion. Increased transport accessibility affects both residents of the region's capital city and other towns in the analysed area.

Research limitations/implications: The main limitation of the study is that the project is still in the implementation phase. As a result, not all of its effects are discernible and quantifiable. Therefore, the study takes into account only selected elements describing the effects of the Pomorska Kolej Metropolitalna, mainly in the context of the problem of transport exclusion.

Practical implications: The findings of the study may be used by the entities responsible for the implementation of public investments as an argument for choosing transport projects as a tool to improve the quality of life in the region.

Originality/value: The value of the study is to indicate that the benefits of infrastructure investments are linked not only to measurable: financial and material results, but also to other aspects relating to the quality of life of the society and reducing the problem of transport exclusion. The paper raises the issue of benefits for the local community, providing arguments for decision makers responsible for spending public funds earmarked for regional development.

Keywords: infrastructure projects, transport exclusion, Pomorska Kolej Metropolitalna.

Category of the paper: Conceptual Paper. Case study.

1. Introduction

The quality of life of residents of particular regions – an extremely important issue, in the light of the strongly promoted concept of sustainable development – depends on many factors, including the availability of various goods and services. One of the conditions for this availability is the ability to reach the place where these goods and services can be found. This means, therefore, that an important factor affecting the residents' lives is an adequate transport infrastructure and the availability of public transportation. If there are deficiencies or limitations in this area, we can observe the phenomenon of transport (communication) exclusion affecting various social groups. One of the key elements of fighting against transport exclusion are investments in the development of transport infrastructure and public transport services.

The aim of this paper is to analyse the effects of the Pomorska Kolej Metropolitalna (PKM) infrastructure project from the perspective of transport exclusion of the Gdańsk-Gdynia-Sopot Metropolitan Area residents. The research is based on a case study, in which selected elements were analysed, such as: the number of passengers using the PKM services, the scale of adjusting the PKM railway infrastructure to the requirements of people with special needs, the service potential of the metropolitan area's capital city, to which access was improved or gained, and the number of people living in the metropolitan area along the route of the PKM.

For the purposes of the study, the problem of transport exclusion was identified, and the specifics of public infrastructure and infrastructure projects were presented. The PKM project was also presented and parameters to assess its impact on the level of transport exclusion were selected. The study adopted a research hypothesis that the implementation of the infrastructure project will contribute to reducing the phenomenon of transport exclusion in the region. The following research methods were used: case study, statistical data analysis, and the descriptive method.

2. Transport exclusion

One of the phenomena affecting the possibility of integration and development of the region is the so-called transport exclusion. This topic appears both in scientific publications and expert studies, including those prepared by NGOs, as well as in official documents concerning policies and strategies for regional development worldwide (See e.g. Binder, Matern, 2020; Currie, 2011; Hine, Mitchell, 2003; Levitas et al., 2007; Perez-Barbosa, Zhang, 2017).

Transport exclusion¹ refers to situations in which individuals experience a lack of, or limitation of the possibility to use transport, which in turn restricts their mobility and access to goods, services, and opportunities to build and maintain social relationships (Kamruzzaman et al., 2016). Transport exclusion should be considered a form of social exclusion, preventing full participation and activity in social life (Błażewski, 2019; Jaroš, 2017; Koliński, 2021). Moreover, it contributes to the emergence of other forms of social exclusion. Its consequence may be impeded access to healthcare organisations and the medical services they provide, or to educational facilities and services. Lack of access to means of transport may limit the possibility to contact public administration organisations and handle official matters, as well as use shopping facilities. Finally, it can significantly hinder, and in extreme cases even prevent employment or change of employment (Zmuda-Trzebiatowski, 2016). The negative effects for the individual are therefore evident. The broader effects must also be mentioned: transport exclusion of entire areas or social groups may, especially in the long run, generate such undesirable phenomena as: unemployment, poverty, or, as a result of health deterioration, reduced capacity to work in the community affected by this type of exclusion. The intensification of migration processes, as part of which people leave their place of residence and move to places that provide better living conditions, including better transport accessibility, should also be mentioned (Kaczorowski, 2019).

The problem of transport exclusion can affect different groups, but those particularly vulnerable include people on lower incomes, people with disabilities, and the elderly. They can also include children, adolescents, and single parents. In the context of countries like the United Kingdom, groups such as women and certain ethnic, usually minority, groups are also mentioned (Mackett, Thoreau, 2015; Zmuda-Trzebiatowski, 2016).

The problem of transport exclusion affects various countries and regions around the world. Therefore, the issue appears, among others, in the context of the global strategy for sustainable development, expressed in the form of the so-called Sustainable Development Goals². The problem of transport accessibility is particularly relevant to two of them: Goal 10 – „Reduced inequalities” and Goal 11 – „Sustainable cities and communities”. The first of these goals postulates the reduction of inequalities both between countries and within individual countries. Reducing problems related to transport accessibility can be treated as part of the implementation of Target 10.2, under which activities are to be undertaken to empower and promote the social, economic and political inclusion of all people. In turn, under Goal 11,

¹The literature on the subject also uses the term: communication exclusion (see: Smolarski, Raczyk, 2017).

²The list of 17 Sustainable Development Goals includes 1: No poverty; 2: Zero hunger; 3: Good health and well-being; 4: Quality education; 5: Gender equality; 6: Clean water and sanitation; 7: Affordable and clean energy; 8: Decent work and economic growth; 9: Industry, innovation and infrastructure; 10: Reduced inequalities; 11: Sustainable cities and communities; 12: Responsible consumption and production; 13: Climate action; 14: Life below water; 15: Life on land; 16: Peace, justice and strong institutions; 17: Partnerships for the goals (The 17 Goals, 2021).

Target 11.2 was defined, which explicitly mentions providing access to safe, affordable, and sustainable transport systems for all (The 17 Goals, 2021).

In Poland, the problem of transport exclusion intensified in the 1990s, during the period of socio-economic transformation (Kaczorowski, 2019). Over the following decades, the problem grew in many places. According to the data of the Jagiellonian Club, in Poland, nearly 13.8 million people live in municipalities where there is no local transport organised by the local authorities (Dulak, Jakubowski, 2018).

The sources of transport exclusion can be very diverse. These include the too high, for some people, cost of using infrastructure and means of transport, lack of information on the availability of transport services, and psychological barriers such as fear or resistance to using public transport (e.g. by the elderly or people with disabilities), and lack of transport accessibility in some regions (Mackett, Thoreau, 2015). In the case of the last two sources of transport exclusion, investments related to the development of transport infrastructure are a way to overcome this problem.

3. Infrastructure and infrastructure projects as a way of improving the quality of life of the local community

The development of infrastructure is connected with the implementation of infrastructure projects. The definitions of infrastructure are derived from the Latin words: *infra* and *structura*, which mean „the basis of a certain system or construction, a foundation” (Ratajczak, 1999, p. 11). Many different approaches to defining infrastructure are presented in the literature (Chmielewski et al., 2019).

The most common definitions characterise infrastructure as a basic public good, of strategic importance for the economy and society, whose purpose is to improve the quality of life and conduct business in its vicinity (Kozłowski, 2012). The process of human creation of permanently located linear and point public utility facilities constituting the foundations of socio-economic life, taking into account functions such as transport, communication, water management or energy supply, is one of the most frequently used concepts for defining infrastructure (Piskozub, 1998). Other definitions focus on the economic purpose of building infrastructure (Grzywacz, 1982). The definition proposed in recent years indicates that the most important aspects of infrastructure are that it enables the movement of media, persons, and things, is made available free of charge or for a reduced fee, and is the responsibility of the public authorities who are obliged to create and keep it in good condition (Brzozowska, 2009, p. 12).

The variety of definitions is due to the broad scope of the concept in question. This is shown in the figure below indicating the scope of the concept of infrastructure, in which tangible and intangible, formal and informal elements appear, as well as those that may be created as a result of human activity and those which arise without it. A distinction between investments in “hard” economic infrastructure, and “soft” infrastructure related to the socio-cultural aspect appears here (Miś, 2021).

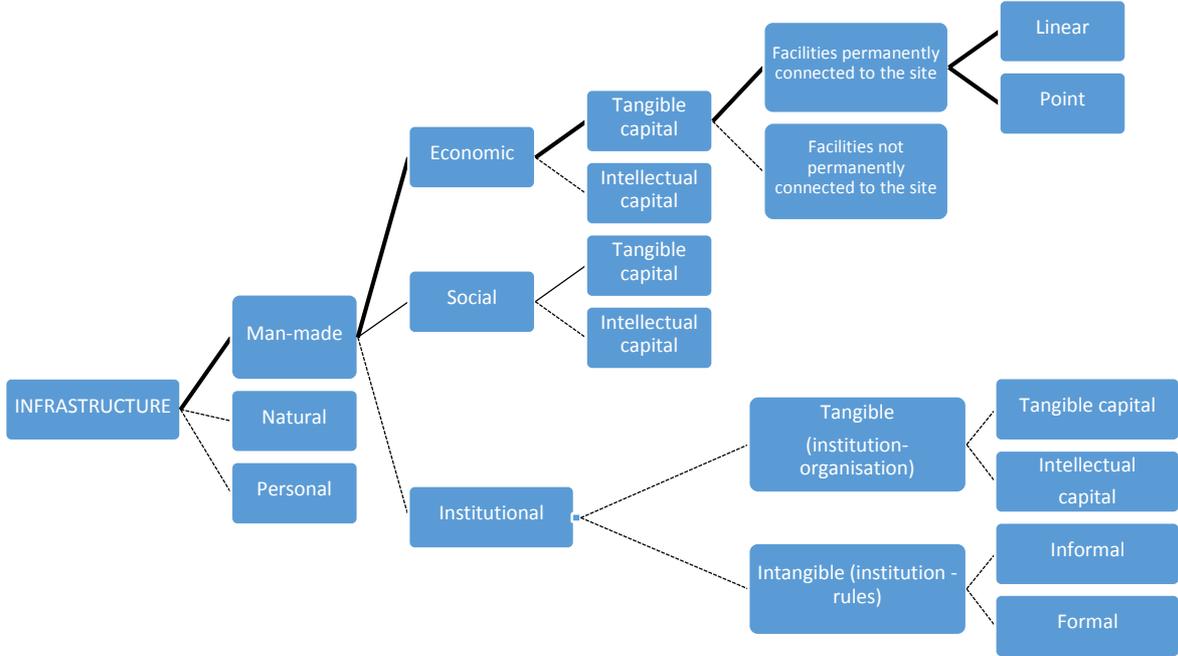


Figure 1. Scope of infrastructure. Adapted from: Ratajczyk M. (1999). *Infrastruktura w gospodarce rynkowej*, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań, p. 22.

Many renowned economists pointed to different aspects of its impact. A. Smith emphasised the duty of the state to create and maintain public utilities such as roads. J. Schumpeter stressed the importance of infrastructure in strengthening entrepreneurial innovation. Nowadays the importance of infrastructure as a direct and indirect factor in economic growth and development is emphasised (Ratajczyk, 1999).

In the theory of literature, infrastructure plays an important role in the analyses of its significance for the stabilisation of growth and economic development. The definitions presented above indicate that it is described as one of the elements of the socio-economic system that conditions the economic development of a given region.

The strong ties between infrastructure and economic development are indicated by the authors of numerous studies. The role of EU funds in increasing the possibilities of creating infrastructure by the local governments and local authorities, which intensifies broadly understood development, is emphasised. EU funds are used to improve indicators used to assess the socio-economic level of regional development. Despite indicating such links, it should be remembered that cohesion policy does not guarantee the reduction of disproportions, although it does increase the possibilities of the local governments and local authorities to effectively use resources and improve the quality of life (see e.g. Gricer et al., 2021; Węgrzyn, 2014).

Infrastructure projects are a tool used in infrastructure creation processes. A project is defined as a temporary venture that is carried out in order to produce a unique product or service. This definition is based on two characteristics of projects: temporariness and intentionality. Among the various characteristics attributed to infrastructure projects are (Nicholas, Stein 2012):

- interdisciplinarity,
- use of a variety of resources,
- the presence of a large group of stakeholders,
- uncertainty,
- the existence of a target group.

It should be noted that there is a great deal of variety between different infrastructure projects, but that each of them requires significant financial resources for their implementation at the beginning and later for their maintenance.

4. Pomorska Kolej Metropolitalna – case study and research on selected parameters

The Pomorska Kolej Metropolitalna (PKM) is an infrastructure project that had been planned since the beginning of the 21st century. However, the first plans to rebuild the railway line connecting Gdańsk with Kashubia, which was built at the beginning of the 20th century and destroyed in 1945 (the so-called Gdańsk Wrzeszcz – Kokoszek – Kashubia line) appeared already in the 1960s and 1970s (Jurasz, 2020). The main problem with their implementation was the lack of funding for such a large infrastructure project. In 2005, the first studies on the reconstruction of the railway line, which was to become an alternative to car connections between Gdańsk and Kashubia, were prepared (PKM, 2021). The studies carried out at that time pointed out that the implementation of this infrastructure project would bring many benefits to the region, such as a reduction in car traffic in Gdańsk and, as a consequence, an increase in the availability of parking spaces in the city. Less car traffic will in turn reduce CO₂ and greenhouse gas emissions, reduce travel time by rail from Kashubia to the voivodeship's capital, which will mean a reduction in the transport exclusion of residents of municipalities located near Gdańsk. Attention was also drawn to facilitated access to Kashubian towns for the residents of Gdańsk, which affects the development of tourism in these places.

In the following years (2007-2009), a project feasibility study was prepared and the Marshal's Office of the Pomeranian Voivodeship established the Pomorska Kolej Metropolitalna SA company, which was to carry out the planned infrastructure project (PKM, 2021). In 2012, the Pomorska Kolej Metropolitalna infrastructure project received funding from

the European Union at a level of approximately PLN 663 million, which accounted for around 85% of the value of the entire planned investment (PKM, 2021).

The implementation of the project in its first phase was related to the revitalisation of the Kokoszki railway line – there were two project phases: the preparatory phase (the value of this phase amounted to approximately PLN 6.4 million) and the implementation phase (the value of this phase amounted to PLN 656.5 million) (PKM, 2021). The second phase of the infrastructure project started in 2013 when demolition and construction works along the route of the new railway line began. The completion of construction works under the infrastructure project related to the revitalisation of the Kokoszki railway line took place in August 2015 after more than 2.5 years of construction works.

As part of wider implementation of this infrastructure project, further expansion of the project scope is planned. Under this phase of the project, 19.5 km of railway line were constructed, with more than 40 engineering structures (viaducts, footbridges, culverts, and underpasses) and 8 stations built.

At the moment (October 2021), the next phase of the project related to the electrification of the already constructed railway line is being implemented, new stations on the existing railway line are being created, and the PKM SA company serving the newly established railway line is also developing the infrastructure that will enable the use of electricity from renewable energy sources in order to make a greater contribution to reducing environmental pollution. The electrification of the railway line will make it possible to use larger train sets for transport, which will contribute to a significant increase in the passenger capacity.

4.1. Passenger transport data analysis

Passenger transport estimates for the entire infrastructure project show a very dynamic increase in the number of passengers served. In 2016, the first full year of operation of the new railway line, 2 million passengers were served. In the following year of 2017, 3 million passengers were served, and in 2018 there was another increase of more than a million passengers to over 4 million people. In the record year of 2019, the number of passengers who used the new railway line was almost 4.5 million (PKM, 2021). Analysing the number of passengers carried on the three key routes from the point of view of the infrastructure project in question, we can see a continuous dynamic increase in the number of passengers until the record year of 2019.

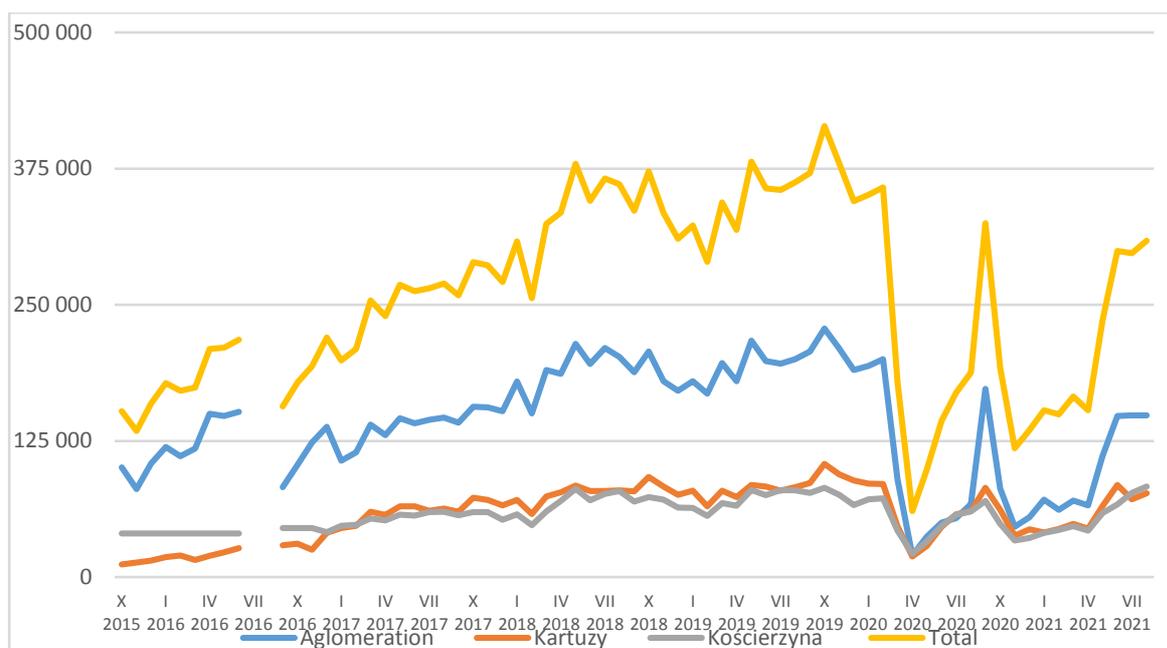


Figure 2. Monthly number of passengers carried on the three key routes of the Pomorska Kolej Metropolitalna from September 2015 to October 2021. Adapted from: Author's own work based on data from PKM SA (PKM, 2021).

In July 2016, heavy rainfall caused damage to the railway line that took two months to repair. Therefore, for two months of that year passengers could not be transported. The presented data shows that the highest number of passengers was carried on the agglomeration route (in October 2021 it was 200,000 passengers, which accounted for 53% of all passengers on the three analysed routes) and both regional routes (Kartuzy and Kościerzyna) generate a total number of passengers comparable to the agglomeration route (in October 2021 it was a total of 176,100 passengers, which accounted for 47% of all passengers on the three analysed routes) – while the number of passengers on both regional routes was at a similar level at the end of the analysed period (in October 2021 99.4 thousand passengers were carried on the Kartuzy route, and 76.4 thousand passengers were carried on the Kościerzyna route). The COVID-19 pandemic had a significant impact on the number of passengers at the end of the analysed period (October 2021). Its outbreak at the beginning of 2020 caused a sharp decrease in the number of passengers - in March 2020 the total number of passengers carried on the three analysed routes fell from 357,000 (February 2020) by almost 50% (to 179,000), and in April there was a further decrease to 60,000 passengers – compared to February 2020, this was a decline of 85% (April 2020 was the month with the lowest number of passengers in the entire analysed period since the inception of the Pomorska Kolej Metropolitalna). In October 2021 the number of passengers using the three routes of the Pomorska Kolej Metropolitalna almost returned to the level of 2019 (414,000 passengers were carried in October 2019, and in October 2021 – 380,000 passengers).

The analysis of data in individual years from the launch of the Pomorska Kolej Metropolitalna is presented in Table 1.

Table 1.

The number of passengers and the dynamics of their changes by PKM on three key routes in 2015-2021

Routes	2015*	2016**	2017	2018	2019	2020	2021***
Aglomeration	285 800	1 245 100	1 676 500	2 274 700	2 371 400	1 067 600	1 213 500
Kartuzy	40 300	248 900	733 000	932 500	1 000 600	655 900	668 400
Kościerzyna	120 000	416 300	663 700	821 300	869 300	594 400	604 800
Total	446 100	1 910 300	3 073 200	4 028 500	4 241 300	2 317 900	2 486 700

Routes	Dynamics 2020/2017	Dynamics 2019/2017
Aglomeration	63,68%	141,45%
Kartuzy	89,48%	136,51%
Kościerzyna	89,56%	130,98%
Total	75,42%	138,01%

* Data for the period X-XII 2015.

** Data for 2016, excluding VII and VIII due to the shutdown of the railways due to the flood.

*** Data for the period I-X 2021.

Source: own study based on data from PKM SA.

The analysis of transport on the three main routes of PKM shows a steady increase in the number of passengers, from the launch of the project until the appearance of the external factor, which was the COVID-19 pandemic. This external factor caused a sharp drop in passenger numbers in 2020. The dynamics of the increase in the number of passengers - by analyzing the years in which there were no external factors (such as: flood and COVID-19 pandemic), having a direct impact on the number of passengers (changes in 2017/2019) - on three key routes there is a noticeable dynamic (over 30% over 3 years) growth in the number of passengers. It means that in the analyzed directions of transport in each of the analyzed years, the growth dynamics was on average over 15% year to year. The agglomeration route showed the highest growth dynamics.

4.2. Functionality analysis of project facilities

It should be noted that the entire infrastructure created as part of the project was prepared with a view to limiting the exclusion of disabled people – all stations built as part of the project are prepared to serve people with various types of disabilities. At the implementation stage of individual facilities built within the framework of the Pomorska Kolej Metropolitalna project, appropriate infrastructure was provided for groups of people who may be subject to potential exclusion.

The platform infrastructure (rail passenger stations) built in 2015 complies with the Technical Specifications for Interoperability that ensure access to train cars for people with disabilities. Meeting these requirements is possible thanks to additional equipment that facilitates movement for people with, among others, hearing impairment (each station has a voice information system for passengers, and information is also provided in English) and visual impairment (at each station, information systems and facilities are adapted to the blind and visually impaired people). All stations have also been equipped with devices facilitating

access for people with motor disabilities – each station has been equipped with lifts taking people directly to the platform. The Pomorska Kolej Metropolitalna SA company, which implemented the infrastructure project, currently manages the railway line built as part of the project, as well as eight separate passenger facilities, i.e. railway stations. Each railway station has been equipped with two platforms, lifts to the platforms, shelters, paths to the station, electronic machines for automated ticket sales and traveller information systems, with special attention paid to people with disabilities. In addition, a Park&Drive car park with over 360 parking spaces was built at five stations - the largest car park in the first phase, with 140 parking spaces, was built outside the Gdańsk Matarnia station. As interest in parking spaces increases, expansion of these car parks is planned. Railway stations constructed as part of the project have become transport hubs connected with other means of public transport (buses, trams). In addition to live PKM train running status, there is also information on other means of public transport. Railway diagnostics, as well as management of the entire line and information systems are carried out using the Traffic Control Centre built as part of the project and located in Gdańsk Matarnia. There are 95-99 train journeys per day, with the highest frequency in the morning when people head to work in the centre of Gdańsk and in the afternoon when they go home from work in the centre of Gdańsk. At present, as a result of the construction work carried out as part of the railway electrification which will be completed in mid-2022, the frequency of journeys has slightly decreased. The capacity of the railway line will be higher due to the use of larger train sets.

4.3. Analysis of the potential of benefits located in Gdańsk for the region's residents

One of the problems faced by the residents of the more remote districts of Gdańsk and the municipalities constituting the Gdańsk-Gdynia-Sopot Metropolitan Area (contrary to its name, it includes not only the Tricity area, but a total of 59 municipalities, towns and counties with more than 1.6 million residents) was poor transport connections to the region's and voivodeship's capital, Gdańsk. The development of the metropolitan railway facilitated, and in some cases actually enabled access to the rich offer of goods and services within the city. It should be noted that Gdańsk is the largest centre of the Gdańsk-Gdynia-Sopot Metropolitan Area, with a population of over 470,000, which accounts for around 20% of the entire Pomeranian Voivodeship population. In Gdańsk, there are almost 270 outpatient clinics, over 160 pharmacies, and 14 general hospitals. Gdańsk is an important academic and educational centre. In 2020, there were 13 higher education institutions with over 67,000 students. At the same time, the city had 48 day nurseries and 52 children's clubs, 309 kindergarten institutions, 107 primary schools, 70 secondary schools, and 26 post-secondary schools. Gdańsk also plays an important role as a cultural centre, which is evidenced by the existence, according to the figures for the end of 2020, of 30 public libraries, 27 museums and museum branches, 7 theatres and music institutions, and 11 art galleries. Sport is also developing in the city – there are over 120 sports clubs, while the available sports infrastructure includes the Ergo

Arena sports and entertainment hall and the Polsat Plus Arena Gdańsk football stadium. There are over 83 thousand business entities in Gdańsk, which accounts for over 1/4 of all business entities in the Pomeranian Voivodeship. The registered unemployment rate at the end of 2020 was 3.5%, while at the same time the unemployment rate in the Pomeranian Voivodeship reached 5.9% (CSO & Gdańsk Main Town Hall, 2021). One should not forget that Gdańsk is also the seat of the voivodeship authorities, other public and local administration institutions, and the judiciary. Finally, the voivodeship's capital has a rich and varied retail offer, including, among others, large shopping centres.

It is worth noting that the creation of connections between the districts of Gdańsk and the municipalities lying along the railway line and the central part of Gdańsk has also increased the availability of services and goods offered by Gdynia and Sopot which co-create the Tricity area. Gdynia alone has over 42.6 thousand registered businesses, with an unemployment rate (at the end of 2020) of 3.4% (Public Information Bulletin of the Gdynia City Hall, 2021). With regard to medical services, there are three large public hospital facilities in Gdynia. As far as cultural services are concerned, it is worth mentioning the two large theatres operating in Gdynia, as well as the Gdynia Film Centre.

4.4. Analysis of the number of people living in the PKM accessibility area

Four routes were created as part of the infrastructure project: one agglomeration route (Gdańsk Wrzeszcz – Gdańsk Osowa – Gdynia Główna) and three regional routes (Gdańsk Główny – Kartuszy, Kościerzyna – Gdańsk Osowa – Gdynia Główna, and Kościerzyna – Gdańsk Wrzeszcz – Gdynia Główna).

In the metropolitan area of the PKM, the districts of Gdańsk and Gdynia, which previously had no rail access, gained a good connection to the city centre, e.g. Osowa, and the travel time by rail from selected districts to the centre of Gdańsk was significantly reduced. This is shown in table 2.

Table 2.

Number of residents of Gdańsk and Gdynia districts in the area covered by the metropolitan PKM line and the dynamics of its changes in the years 2015 and 2020

City	Name of district	Population (people with registered residence)		Dynamics in %
		as at 31.12.2020	as at 31.12.2015	Year 2020 to 2015 (in 5 years)
Gdańsk	Brętowo	7 551	7 602	-0,67%
	Jasień	20 972	13 640	53,75%
	Kokoszki	9 888	8 898	11,13%
	Matarnia	5 996	5 867	2,20%
	Osowa	16 121	14 933	7,96%
	Piecki- Migowo	27 527	25 515	7,89%
	Strzyża	5 299	5 507	-3,78%
	Wrzeszcz Dolny	22 350	24 107	-7,29%
	Wrzeszcz Górny	21 568	23 596	-8,59%
	Razem	137 272	129 665	5,87%

Cont. table 2.

Gdynia	Karwiny	10 016	10 605	-5,55%
	Mały Kack	9 718	8 716	11,50%
	Wielki Kack	11 233	11 002	2,10%
	Witomino	16 748	18 312	-8,54%
	Wzgórze Św. Maksymiliana	10 668	11 639	-8,34%
	Śródmieście	11 555	12 757	-9,42%
	Razem	69 938	73 031	-4,24%

Statistical data from the City of Gdynia website, <https://bip.um.gdynia.pl/dane-podstawowe,1762/dzielnice,364788>, 30.11.2021.

Analysis of the data in Table 1 shows that in 2020, the number of residents who could use the metropolitan route created as a result of the investments made to date was more than 207,000 in Gdańsk and Gdynia combined - it means an increase of more than 13,000 from 193,980 people in 2015. Between 2015 and 2020, the number of residents living in the districts of Gdańsk and Gdynia located in the vicinity of the metropolitan route increased by 7,607 people in Gdańsk and decreased by 3,093 people in Gdynia, with a simultaneous increase in the total number of residents in both cities. Of course, it is not possible to make a simple inference that the increase in the number of residents of a given district depends solely on transport accessibility, but the observed changes may indicate potential links between these phenomena.

The planned development of the PKM to cover the southern districts in the next 10 years may result in increasing the number of Gdańsk residents who can potentially benefit from the railway transport by more than 105,000, as shown in table 3.

Table 3.

Number of residents of the southern districts of Gdańsk covered by the new PKM line and the dynamics of its changes in the years 2015 and 2020

Name of Gdańsk district (development of the PKM on the route Wrzeszcz - southern districts)	Population (people with registered residence)		Dynamics in %
	as at 31.12.2020	as at 31.12.2015	Year 2020 to 2015 (in 5 years)
Śródmieście	24 536	28 000	-12,37%
Chełm	31 764	32 553	-2,42%
Orunia Górna-Gdańsk Południe	20 786	17 476	18,94%
Ujescisko-Lostowice	28 254	22 785	24,00%
Razem	105 340	100 814	4,49%

Statistical data from the Gdańsk Information Centre website, https://gcigdansk.sharepoint.com/:x:/s/UMG-OtwarteDane3.0/Efb5_LEQvYNGrsuchHPOxYJ4ByHt-W1gQ2kqJLRxv-lhW2Q?e=XomyLI, 30.11.2021.

Based on the data in table 3, it can be concluded that there is a real need to build an additional railway line allowing to reduce transport exclusion of a part of the population, especially of those who use public transport. Long-term effects also include a reduction in the number of motor vehicles, cleaner air, and an improvement in the quality of life of agglomeration residents.

Apart from the line serving the districts of Tricity, the PKM offers transport on routes connecting Tricity with Kartuzy and Kościerzyna. Residents of municipalities and towns located along these routes may also benefit from greater accessibility to healthcare, cultural, and educational facilities located in the metropolitan area. Table 4 presents data on the population living in municipalities on the route to Kartuzy.

Table 4.

Population of Kartuzy County and the dynamics of its changes in the years 2015 and 2019

Kartuzy County (8 municipalities)	Population		Dynamics in %
	as at 31.12.2019	as at 31.12.2015	Year 2019 to 2015 (in 4 years)
Chmielno	7 805	7 426	5,10%
Przodkowo	9 663	8 824	9,51%
Sierakowice	20 054	19 106	4,96%
Somonino	10 814	10 304	4,95%
Stężycza	10 664	10 131	5,26%
Sulęczyno	5 547	5 386	2,99%
Kartuzy	34 013	33 400	1,84%
Żukowo	40 837	34 348	18,89%
Razem	139 397	128 925	8,12%

Statistical data from: <https://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/powierzchnia-i-ludnosc-w-przekroju-terytorialnym-w-2020-roku,7,17.html> (access: 30.11.2021); <https://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/ludnosc-stan-i-struktura-ludnosc-i-oraz-ruch-naturalny-w-przekroju-terytorialnym-stan-w-dniu-31-grudnia-2015-roku,6,19.html>, 30.11.2021.

In all municipalities situated along the Gdańsk – Kartuzy PKM route, an increase in population has been noted. It primarily concerns Żukowo, where there are two PKM stations. This municipality located in the middle of the analysed route has significantly benefited from increased transport accessibility. The number of residents of Żukowo increased by about 6.5 thousand people over the period of 4 years.

Table 5 provides information on the number of residents in the municipalities of the Kościerzyna County which is affected by the extension of the Gdańsk – Kościerzyna PKM line.

Table 5.

Population of Kościerzyna County and the dynamics of its changes in the years 2015 and 2019

Kościerzyna County (8 municipalities)	Population		Dynamics in %
	as at 31.12.2019	as at 31.12.2015	Year 2019 to 2015 (in 4 years)
Kościerzyna	23 742,00	23 744,00	-0,01%
Dziemiany	4 410,00	4 284,00	2,94%
Karsin	6 239,00	6 255,00	-0,26%
Kościerzyna	16 091,00	15 550,00	3,48%
Liniewo	4 597,00	4 642,00	-0,97%
Lipusz	3 744,00	3 660,00	2,30%
Nowa Karczma	7 049,00	6 825,00	3,28%
Stara Kiszewa	6 816,00	6 664,00	2,28%
Razem	72 688,00	71 624,00	1,49%

Statistical data from: <https://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/powierzchnia-i-ludnosc-w-przekroju-terytorialnym-w-2020-roku,7,17.html> (access: 30.11.2021); <https://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/ludnosc-stan-i-struktura-ludnosc-i-oraz-ruch-naturalny-w-przekroju-terytorialnym-stan-w-dniu-31-grudnia-2015-roku,6,19.html>, 30.11.2021.

No evident increase in the number of residents was observed in these municipalities, although the possibility of commuting to Tricity increased the availability of services to agglomeration residents. This is also evidenced by data on the number of serviced passengers on this route, indicating an almost doubling of this number in the analysed period of 5 years.

The greatest benefits from the agglomeration line were achieved by the residents of the new housing estates built near the railway, as well as the residents of housing estates that previously had difficult access to regular rail transport (Gdańsk Osowa). On the regional routes, the greatest benefits were achieved by those using the Gdańsk – Kartuzy route, and to a lesser extent, Gdańsk – Kościerzyna.

At the same time, it should be noted that the new rail line has significantly improved access to Poland's third largest airport, Gdańsk Airport, which served over 5 million passengers in the record-breaking year of 2019, with a significant number of them benefitting from a convenient and fast connection to the city centre using the Pomorska Kolej Metropolitalna line (Airport, 2021).

Conclusions

The quality of life in a given region depends on many factors. One of them is good accessibility of each town, so that the residents can easily and affordably reach places where they can use services and goods to satisfy their needs. The lack of adequate transport infrastructure and public transport services most often leads to transport exclusion, which is part of a wider phenomenon, namely the social exclusion of entire social groups.

One of the key tasks of the local authorities is to counteract transport exclusion, mainly through the development and maintenance of transport infrastructure and the organisation of a system for the provision of transport services. An example of this type of activity is the Pomorska Kolej Metropolitalna project described in the paper. Having analysed the selected and identifiable at this stage effects of the investment related to limiting the phenomenon of transport exclusion, it was found that:

- the number of PKM passengers between 2016 and 2019 increased from 2 million per year to 4.5 million; 2020 saw a sharp decrease in the number of passengers due to the COVID-19 pandemic, but by 2021 there was already a clear return to the level of passenger transport in the years preceding the pandemic,
- the introduced facilities, especially for people with special needs, increased transport accessibility for groups particularly affected by transport exclusion,
- better transport links between the metropolitan area and Gdańsk means access to the labour market and a wide range of administrative, educational, medical, and cultural services for its residents, among others,

- the development of the Pomorska Kolej Metropolitalna made it possible to extend transport services to a total of over 420,000 out of 1.6 million residents of the Gdańsk-Gdynia-Sopot Metropolitan Area – previously, these people had fewer, and in some cases very limited, opportunities to reach the region's capital,
- in the next few years, along with the further development of the PKM, they will be joined by another 100,000 people living in the southern districts of Gdańsk.

The analysis shows a high level of acceptance for the presented project by the residents of the metropolitan area. It can, therefore, also be assumed that in the future, the project will continue to develop and the number of people using the created infrastructure will increase. The PKM project also generates additional opportunities for the growth of the urban area by including areas hitherto inaccessible due to transport exclusion. At the same time attention should be paid to the fact that the local governments have limited financial resources for the implementation of infrastructure projects and should select those projects which generate significant benefits to the development of the region. In the context of the performed analysis, it appears that the project under study meets the requirements in this respect. The analysis carried out confirmed the hypothesis on the impact of the infrastructure project in question on reducing transport exclusion in the region where the project operates.

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PROBLEMS OF SUSTAINABLE ECONOMIES DURING THE PANDEMIC

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Purpose: The purpose of this paper is to answer the question: does the pandemic affect the ability to achieve the sustainable development goals?

Design/methodology/approach: The article analyzes selected, available literature on sustainable development, from the genesis of the phenomenon to the current situation. It invoked, among other things, the idea of the European Green Deal. The most current issues related to the pandemic reality were addressed. The themes and changes highlighted are based on data from available reports and statistical analyses.

Findings: By the time the pandemic broke out, the sustainability goals had been achieved gradually. But the pandemic has forced policymakers to think long-term. The conditions for transition to the green economy, i.e. the green transition, have also become crucial. In many countries, including Poland, the need for better achievement of social goals in addition to economic or environmental ones has become apparent. Further work is needed to achieve the sustainable development goals.

Research limitations/implications: The text refers to a limited number of studies. The problems presented in the paper still need to be empirically confirmed in relation to a greater number of examples, which should result in the publication of subsequent studies. It will also be necessary to fully diagnose the post-pandemic situation and retrace the threads taken up.

Originality/value: The article points to already visible changes, being the result of the continuing pandemic, from the perspective of sustainable development goals.

Keywords: Sustainable Development, the COVID-19 pandemic, the COVID-19 crisis, Sustainable Economy.

Category of the paper: Conceptual paper.

1. Introduction

Sustainable development has been one of the topics of scientific discussions for many years. The author treats it as a compatible element with integrated order, which is most often defined in the literature as a *positive terminal state* for developmental change (Borys, 2011, p. 77; Kołodziejcki, 1994, p. 37). It combines the constituent orders in a coherent and non-contradictory manner and implies the simultaneous creation of social, economic and environmental orders. The titular sustainable economy will therefore be one in which all three dimensions find their place. It should be built on ethical principles, with innovation, investment, and a sound financial foundation, and use available resources for maximum benefit. The idea is therefore to promote effective and responsible management of natural resources that can provide long-term benefits, i.e. to set a course for sustainable management so that the economy achieves the desired state.

As emphasized by T. Borys (2011, p. 77), in the field of economics (especially in macroeconomics), sustainable development is treated as a paradigm imposed on economics from the outside, by international organizations, environmental organizations or legal provisions, and not as a paradigm created by economics itself¹. Thus, it can be concluded that the foundation of sustainable development economics is based on the assumptions of ecological economics². The example of the so-called energy revolution fits here perfectly. Limiting global warming to acceptable levels within the next thirty years (by 2050), is dependent on changes in the energy industry and a shift of the entire economy to other energy sources (renewable energy). It will therefore be not without significance to refer later in this article to the idea of the European Green Deal (*What is...p. 1-2*).

The argument so far can be summed up by saying that the very idea of sustainable development came about as a result of opposing the ideology of consumerism, developed especially at the end of the twentieth century, which can generate serious ecological threats (Sztumski, 2008, pp. 133-139). Balanced and controlled development was to replace unrestrained and spontaneous development. According to the assumptions of integrated development, the pursuit of profit was to be balanced with concern for the environment. Therefore, sustainable development only makes full sense when it happens everywhere, not just in certain local areas (it has to apply to entire economies).

¹ At the microeconomic level, the most promising trend seems to be the introduction of the concept of sustainable development to the organizational level, through the idea of corporate social responsibility. According to it, it would consist of more than just focusing on activities that directly bring profit to the owners (Borys, 2011, p. 77).

² Ecological economics was founded in the 1980s as a modern discipline on the works of and interactions between various European and American academics (see i.e. Warszawski Ośrodek Ekonomii Ekologicznej (WOEE) or read Scott Cato, M. (2009). *Green Economics*. Earthscan, London: Ecological Economics. ISBN 978-1-84407-571-3).

Opinions on the idea of sustainability have not always been or not always are positive. W. Sztumski himself emphasized (2008, p. 139) that it is indisputable that the emergence of the idea was a spontaneous, positive reaction to negative economic and social phenomena. However, his observations indicated that the idea had begun to transform into “an instrument of deliberate social manipulation in the hands of the international elites in power”. The lack of “objective criteria for happiness” supported this view. So it remains to think of what the situation looks like now, in the face of an ongoing pandemic.

2. Sustainable development goals – an outline of the issue in the historical, economic and legal aspect

In 1950, Wilhelm K. Kappa published the first important work on the subject: *The Social Cost of Private Enterprise*. Eighteen years later, the Club of Rome was founded – an organization of politicians, scientists and businessmen who were not indifferent to global problems of the world. In the same year, a UNESCO conference was also held to analyze the rational use and conservation of the biosphere (Czaja, Bedla, Włodarczyk, 2012, p. 83). The concept of the idea of sustainable development was finally formulated at the Second Session of the Governing Body of the United Nations Environment Programme in 1975. It assumed such a course of inevitable and desirable economic development, which would not irreversibly damage the human living environment and would not lead to degradation of the biosphere, which would not violate the laws of nature, economics and culture (Fiut, 2006, p. 36). Almost half a century has passed since then. The concept of sustainable development, based on the above assumptions, has become the basic direction of development of European Union societies. Following the provisions of the Treaty on European Union, we can conclude that the Union and its institutions have taken action over the years to ensure the sustainable development of Europe. They were based on sustainable economic growth, price stability, and a highly competitive social market economy (striving for full employment and social progress, as well as environmental protection).

The UN General Assembly Millennium Summit, held on the threshold of the 21st century³, listed the world's biggest problems. Already at that time it was emphasized that in the following years decisions should be made to:

- eliminate extreme poverty and hunger,
- ensure universal primary education,
- promote gender equality and social advancement of women,
- reduce child mortality,

³ It took place on September 6-8, 2000.

- improve health care for mothers giving birth,
- use sustainable methods of managing natural resources,
- reduce the spread of HIV/AIDS, malaria, and other infectious diseases,
- create a global partnership for development (Czaja, 2007, pp. 125-146).

When writing about sustainable development and sustainable economies, it is also important to recall *The 2030 Agenda for Sustainable Development*, which covers 17 goals (including 11 social and economic goals, which are presented in Table 1).

Substantive support and capacity building for the sustainable development goals and related issues (water, energy, climate, oceans, urbanization, transport, science and technology, the Global Sustainable Development Report (GSDR), partnerships and small island developing states) is currently provided by the Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA). The DSDG also plays a key role in assessing the UN's system-wide implementation of the 2030 Agenda and in activities related to the sustainable development goals.

Table 1.
Sustainable development goals

Goal No.	Goal description
1.	Eliminate poverty in all its forms throughout the world
2.	Eradicate hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3.	Ensure all people of all ages live healthy lives and promote prosperity
4.	Provide quality education for all and promote lifelong learning
5.	Achieve gender equality and empower women and girls
6.	Ensure access to water and sanitation for all through sustainable management of water resources
7.	Ensure affordable access to stable, sustainable and modern energy for all
8.	Promote stable, sustainable and inclusive economic growth, full and productive employment and decent work for all people
9.	Build stable infrastructure, promote sustainable industrialization and support innovation
10.	Reduce inequality within and between countries
11.	Make cities and human settlements safe, stable, sustainable and inclusive
12.	Ensure sustainable consumption and production patterns
13.	Take urgent action to combat climate change and its impacts
14.	Protect the oceans, seas and marine resources and use them sustainably
15.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss
16.	Promote peaceful and inclusive societies, ensure access to justice for all, and build effective and accountable, inclusive institutions at all levels
17.	Strengthen means of implementation and revitalize the global partnership for sustainable development

Source: own study based on: *Przekształcamy nasz świat: Agenda na rzecz zrównoważonego rozwoju 2030*. Available online http://unic.un.org.pl/files/164/Agenda_2030_pl_2016_ostateczna.pdf, pp.16-17.

For the 2030 Agenda goals to become a reality, broad responsibility for the sustainable development goals must translate into a strong commitment by all stakeholders to the implementation of global goals. The analysis of the text by E. Bendyk (2018, p. 68 et seq.) and the report of the Club of Rome shows that the set goals cannot be achieved if the actions are based on conventional growth policies. In this context, P. Romer's statement acquires a special

meaning, as E. Mączyńska points out (2020, pp. 17-18). It shows that the rationalization of rules and regulations in the socio-economic system can do more for socio-economic development, increasing productivity and efficiency in the use of natural resources and limiting undesirable side effects, than the pursuit of ever greater economic growth. He adds that the “New Normal” as it is known today, in the face of the COVID-19 pandemic, requires “profound socio-economic system reforms aimed at shaping crisis resilience, eliminating the degeneration of economic measurement and the falsification of price and cost accounting” (quoted from: Mączyńska, 2020, pp. 17-18).

3. The European Green Deal and beyond in the light of research – an outline of the issues

In December 2019, the European Commission unveiled the strategy for “The European Green Deal”. It aimed to transform the Union into an economy that is modern, resource-efficient and competitive, and one which takes into account environmental challenges. Thus, the sustainable development of the European Union was to concern all institutions and member states, and the adopted strategy – to include activities aimed at halting negative climate change (thus restoring order and reducing pollution). However, the outbreak of the pandemic brought other goals, not just environmental ones, to the forefront. This raises the question of what major trends have become apparent since the onset of the pandemic and what selected problems are associated with its emergence? A preliminary range of considerations is presented in Table 2.

Table 2.

Impact of the COVID-19 pandemic on sustainable development – key areas of change

Area of change	Brief description
A resilient health care system	Building a resilient health care system based on universal health insurance that will focus on equal access, quality and financial protection.
Climate and environment	Creating an environmentally sustainable, inclusive and dynamic economy, driven by clean, resource-efficient and resistant to climate change growth that reduces emissions, protects biodiversity and natural capital, and promotes sustainable consumption and production patterns.
Digitization	Exploring new technology solutions with a focus on open, integrated, affordable and secure digital access and developing digital skills for all to better meet today's social challenges.
Inclusions	Just, more sustainable societies, especially for women and girls, people with disabilities, the marginalized and those in crisis; building inclusive institutions

Source: own study based on: *Financing for Development in the Era of COVID-19 and Beyond Menu of Options for the Consideration of Heads of State and Government Part I OCTOBER 2020*, Retrieved from https://www.un.org/sites/un2.un.org/files/financing_for_development_covid19_part_i_hosg.pdf, 10.07.2021, pp. 23.

In the initial phase of the pandemic, all forces targeted the health crisis. The search for and distribution of a vaccine seemed to be the most effective action to end the pandemic quickly. However, right after that, the “vision of a better future” began to come into play. The COVID-19 pandemic provided an opportunity to build a cleaner, greener, healthier, more resilient, and more inclusive economy (Financing... part I, p. 6).

Thus, it can be concluded that a political shift emerged during the pandemic period and global interest in zero carbon by mid-century began to grow. The *net-zero emissions global economy*, from a sustainability perspective, sounds promising. However, the scale of the phenomenon should not be overlooked. With 81 countries accounting for ¼ of the world's GDP, and half of the world's population, mineral extraction remains critical⁴. It is therefore highly likely that this trend will continue. Indeed, extractive industries have enormous potential in developing countries: they drive growth there, support sustainable development and reduce poverty. Thus, for the transformation of the extractive system to be viable, it falls on the rich countries to provide raw materials. Only in this way can “green change” begin to benefit everyone. This requires simultaneous re-qualification of low-income economies and change of mindsets. If one assumes that the pandemic is meant to initiate a transition to an inclusive, global, zero-emissions economy, then it makes sense to begin conversations now about the role of extractive industries and to set specific recommendations not only on a global scale but also on a national and regional scale (Transforming Extractive..., pp. 3-5).

It should not be forgotten that historically the extractive industry generates many jobs. However, it can have negative social impacts of a different nature unless its direct and indirect effects are controlled (as it contributes to population displacement, economic, social and gender inequalities, and even armed conflict). There is also the trouble of inadequate legislation. With insufficient compliance with legal provisions, ecosystem degradation is exacerbated. Thus, it can be summarized that a pandemic is a kind of “check” for estimating the capacity of economies to recover in the long run. The beginning of the pandemic showed that commodity prices began to fall. In countries with lower tax revenues based on extractive industries, debt began to rise. The fossil fuel sector needed financial support (Transforming Extractive..., p. 8).

Estimates of the impact of the pandemic and its effect on jobs are not optimistic. Data released in September 2020 suggested that up to 400 million full-time workers could be affected by job losses during the pandemic in Europe. So financial support of the social sphere is still essential. The national and global mobilization of resources to extend social protection programs to all workers, but specifically targeting the vulnerable, has also proven important.

Technology and innovation are important driving forces for improving sustainability. However, they require investment in research, as well as cross-sectoral collaboration or changes in existing practices. Digital solutions that provide access to a global population and global

⁴ This is especially true in low- and middle-income countries. Moreover, the COVID-19 pandemic has left many countries facing fiscal deficits.

solutions can help. However, a lack of research funding prevents recommended new forms of partnership from emerging. For this reason, public finance began to play first fiddle in the first months of the COVID-19 crisis. Banks, too, sought to provide liquidity as a way to save businesses and households (Financing... Part II, p. 4).

Generalizing, there is no doubt that the pandemic has affected all three dimensions of sustainability: the economic, the social, and the environmental one (but with varying degrees of intensity). According to the researchers, every government has had to, and still has to, take action to suppress the pandemic first, through non-pharmaceutical interventions and global access to vaccines. During the pandemic, sustainability and economic recovery are difficult (Sachs et al., 2021). However, it can be projected that international production will be transformed between 2020 and 2030. It is during this time that it is expected to: reverse the pandemic-observed decline in FDI, revitalize the global supply chain, overcome disruptions and build resilience during and after the crisis. However, such actions require immediate and medium- to long-term policies that promote trade and investment, support SMEs and social economy providers, and increase capacity for essential goods and services (particularly in the areas of food and health and other sectors), especially in small and vulnerable economies (Financing... Part II, p. 8).

4. Summary and conclusions

In recent years, a number of publications have featured analyses arising from the existence of the need to pursue sustainable development, i.e. development based on the harmonization or even reconciliation of economic, social and environmental interests. It has been repeatedly emphasized that the weakening of harmony may result in the erosion of the system of values, especially ethical ones (cf. Mączyńska, 2018, p. 34). They also discussed the negative consequences and existing dysfunctions of the modern world and the growing inequalities, including those in the labor market. It is also no revelation that high unemployment in many countries has had and will continue to have economically and socially damaging effects (the pandemic is not over yet). As pointed out by G.W. Kolodko (2013, p. 44), the dichotomous labor market situation translates directly into living standards. However, this is not always reflected in GDP. As early as 2013, this economist pointed out the need for a paradigm shift in economics. He emphasized the need for “just economics” and “just management”. He suggested the need to prevent waste of resources and destruction of the environment. In doing so, he saw a specific role for the state, which could not just be a “night watchman”. He stressed that its role should be optimized, that is, adapted to the socio-economic requirements and challenges. In doing so, he pointed out that it was the treatment of the state as a night watchman that became the cause of chaos in the economies of many countries (Kołodko, 2017, pp. 59-68).

Observing the situation since the beginning of the pandemic, it is hard not to notice that its impact can be seen in many areas of socio-economic life. At the same time, there was a need to coordinate activities, both in the area of social security and protection of people's health or financial support for particularly needy groups. The pandemic clearly shows the scale of needs in the economic (but also environmental and social) sphere. It also highlights the need for multiple institutions to work together on the aforementioned fronts. Thus, it can be concluded that the pandemic not only triggered a global crisis, but also reignited the discussion on the implementation of the Sustainable Development Goals. It seems that integrated principles for all economies, including the promotion of resource efficiency, integrated waste management, and other measures of “sustainable production and consumption” should now become vital. The actions underlying the aforementioned Agenda 2030 are still a signpost for the sustainable reconstruction of not only Poland, but also Europe and even the world. Nonetheless, there can be no talk of fully achieving the goals unless the pandemic starts to decline.

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MARKETPLACE TRADE – SELECTIVE DEVELOPMENT OR INEVITABLE DECLINE?

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Purpose: The aim of this article is to present changes in the role of marketplace trade as a form of retail. Marketplace trade is one of the oldest forms of retail; however, its importance in supplying buyers with everyday items is systematically decreasing. The author attempts to answer the question of whether this form of retail is facing inevitable decline, or whether its selective development is possible.

Design/methodology/approach: The article presents official data from the Central Statistical Office, the Local Data Bank of the Central Statistical Office, and the Statistical Office in Poznań, as well as the results of surveys published in specialist literature. The above-mentioned statistical data concern both the whole country and the Wielkopolska region. The conducted analyses cover the years 2010-2020.

Findings: The article discusses the level of development of marketplace trade, its importance in the distribution of everyday products (FMCG) and the factors determining the use of this form of retail by customers. The main part of the analysis concerns the issue of whether marketplace trade is in the phase of decline or development. The discussion is supported by data on the changes in the number of permanent and temporary marketplaces in Poland and selected counties of the Wielkopolska region. Also included is a diagnosis of customers' preferences regarding the choice of a marketplace/bazaar/market as a place for doing their shopping.

Research limitations/implications: In the future, it is worth repeating the research among actual and potential customers of bazaars and markets; also among the lessees of market stalls and booths, i.e. the sellers of goods.

Practical implications: The article also indicates the determinants of choosing a specific marketplace, bazaar or city market as a place for making purchases. For this purpose, the results of several surveys relating to the functioning of marketplace trade in selected cities are presented.

Originality/value: The results of the analyses have both cognitive and pragmatic value, especially in the context of preparing and implementing development plans for this retail format in individual cities and municipalities.

Keywords: Marketplace trade, retail trade marketing.

Category of the paper: Research paper.

1. Introduction

Marketplace trade is one of the forms of traditional out-of-store retailing. It has a centuries-old tradition in our country. In the past, the market square was the vital “heart of the city”, its true centre, where trade and crafts thrived, and public life flourished. The square where the market was held was an inherent element of the structure of each city, playing an important role in creating the final form of the current urban space. The process of the creation and expansion of market squares began in Poland in the 11th century with the emergence of commercial settlements in the vicinity of rulers’ castles and castle towns. These settlements were inhabited by merchants and townspeople. The market square was situated in the central part of such settlements, where stalls and inns appeared. The town square performed commercial functions and was the most important focus of urban life. The town square was a form of the original spatial concentration of trade. Over time, the importance of market squares changed as a result of spatial transformations. As the population of the city grew, so did the demand for commercial space. In the twentieth century, street trading began to be relocated and removed from market squares, with the result that the primary function of the centre square was a purely representative one. Street and marketplace trade was pushed out of city centres and moved to new locations, namely squares and market halls located in the centres of city districts. In addition, large fairs, exhibitions and trade fairs began to appear, giving some cities, such as Poznań or Kraków, a special market character.

It is also worth mentioning that in Poland a dynamic growth in the importance of markets and bazaars occurred during the political transformation, i.e. at the turn of the 1980s and 1990s. The most famous marketplace of that time was Stadion Dziesięciolecia in Warsaw, where over 5,000 business entities operated. Thousands of people made a living at that marketplace. The Różycki Bazaar was also very popular. The activity of the largest marketplaces involved both exporting goods and supplying the domestic market. In 1997, the largest exporters among marketplaces were the following (Kropiwnicki, 2003, p. 170):

- Stadion Dziesięciolecia in Warsaw – with a value of exports at 370 mln USD,
- Białystok – with 145 mln USD,
- Tuszyn near Łódź – with 110 mln USD.

In the times of real socialism, marketplaces gave an opportunity to obtain goods that were otherwise difficult to get, as well as being enclaves of the first stirrings of a market economy (Świetlik, 2020, p. 102). The political transformation in 1989 resulted in the creation of over a million micro-enterprises which sold goods directly to customers from stalls, camp beds and so-called “jaws” (metal booths) (Ciechomski, 2014, p. 27). They were the impetus for the primary accumulation of capital and the transformation of the archaic economy of permanent scarcity into a new economic system.

A separate issue is the rapid development of marketplace trade in border regions. A real market boom occurred there at that time as a consequence of the opening of previously sealed state borders (Powęska, 2016, p. 17; Dołzblasz, 2013, p. 102). Disproportions between prices and incomes on both sides of the borders as well as the underdevelopment of the retail infrastructure resulting from the previous economic system, the privatisation of trade, the liberation of entrepreneurship and, above all, the economic transformation that initiated all these changes played a significant role in the dynamic development of cross-border trade, particularly in marketplaces (Zuba, Zuba, 2018, p. 327). However, cross-border marketplace trade in such cities as Gubin and Guben, Zgorzelec and Görlitz, Cieszyn and Český Těšín or Terespol and Brest is now past its glory days. Undoubtedly, this was to a large extent influenced by the long-lasting restrictions of international transport and border traffic due to the Covid-19 pandemic.

Marketplace trade, while maintaining its primarily local character, complements other forms of retailing, including those based on stationary retail outlets (Szumilak, 2008, p. 26). At the same time, is a form of retail whose organisation and functioning are most influenced by local government.

Markets perform a number of important socio-economic functions, particularly in relation to the local commercial space. First and foremost, they provide an important complement to other forms of retail; affect the development of the local labour market, production and marketing; and contribute to the construction of local food systems; as well as fulfilling a socio-cultural role (Gonzalez, Waley, 2013, p. 965).

2. Statistics illustrating marketplace trade in Poland

It should be assumed that the terms *market square*, *trading square*, *marketplace* and *bazaar* can be treated as synonyms and used interchangeably. According to the definition included in the methodology of marketplace research, a marketplace is “a separate area, a square (sometimes fenced), where agricultural products (animal and plant) are sold locally between agricultural producers (farmers) and commercial units or between farmers and non-agricultural population on specific days of the week” (Metodologia..., 2002, p. 5). The above definition focuses on the selling and purchasing of agricultural produce, but also other goods are traded in marketplaces. According to the definition of the Central Statistical Office (GUS), marketplaces are separate areas and structures (squares, streets, market halls) with permanent or seasonal small-retail outlets or facilities intended for trading on specific days of the week or every day (Rynek Wewnętrzny..., p. 29). Seasonal markets are defined as those squares and streets where retail facilities operate for a period of up to 6 months due to increased customer traffic (e.g. seaside tourist traffic) and this activity is repeated in subsequent seasons.

The role of marketplace trade is confirmed primarily by the fact that its share in the retail FMCG market is estimated at about 5-10% (Kosicka-Gębska, Tul-Krzyszczuk, Gębski, 2011, p. 30 et seq.). This share, as well as the number of permanent and seasonal markets, is systematically decreasing. Analysing changes in the number of selected types of stores and retail facilities in Poland in the last decade, one can observe a very significant increase in the number of supermarkets, which in the years 2010-2020 rose by 83%. According to the methodology of the Central Statistical Office, this category also includes discount stores. On the other hand, as regards the formats of hypermarkets, department stores and petrol stations, a process of retail concentration and saturation of commercial space with these types of retail outlets is observed. Data relating to this issue are presented in Table 1.

Table 1.

Number of selected types of stores and retail facilities in Poland in 2010-2020

Specification	Supermarkets	Hypermarkets	Department stores	Trade stores	Petrol stations	Permanent markets	Seasonal markets
2010	4461	562	67	303	9603	2235	6913
2011	5006	565	66	280	9596	2232	6564
2012	5468	572	64	246	9481	2215	6506
2013	6210	592	64	227	9053	2207	6460
2014	6509	593	66	217	8905	2210	6729
2015	6903	589	70	205	8991	2222	6768
2016	7042	586	54	177	9099	2199	6938
2017	7317	564	75	182	9326	2173	7194
2018	7659	570	73	177	9340	2156	7127
2019	7945	567	73	171	8666	2156	7088
2020	8170	546	75	157	8120	2122	6248
Growth rate 2020/2010 in %	183.1	97.2	111.9	51.8	84.6	94.9	90.4

Source: own compilation based on Central Statistical Office data: Rynek Wewnętrzny w 2020 r. table 36 and Rynek Wewnętrzny w 2014 r. table 31.

In 2020, the national register kept by municipal local government units contained 2,122 permanent markets, including 2,047 markets with predominantly small-retail trade. The total number of permanent markets was lower by 34 compared to the figure for the previous year (Rynek Wewnętrzny..., p. 31).

Changes in the numbers of selected retail forms (markets, supermarkets and petrol stations) in Poland in the years 2010-2020 are presented in Figure 1.

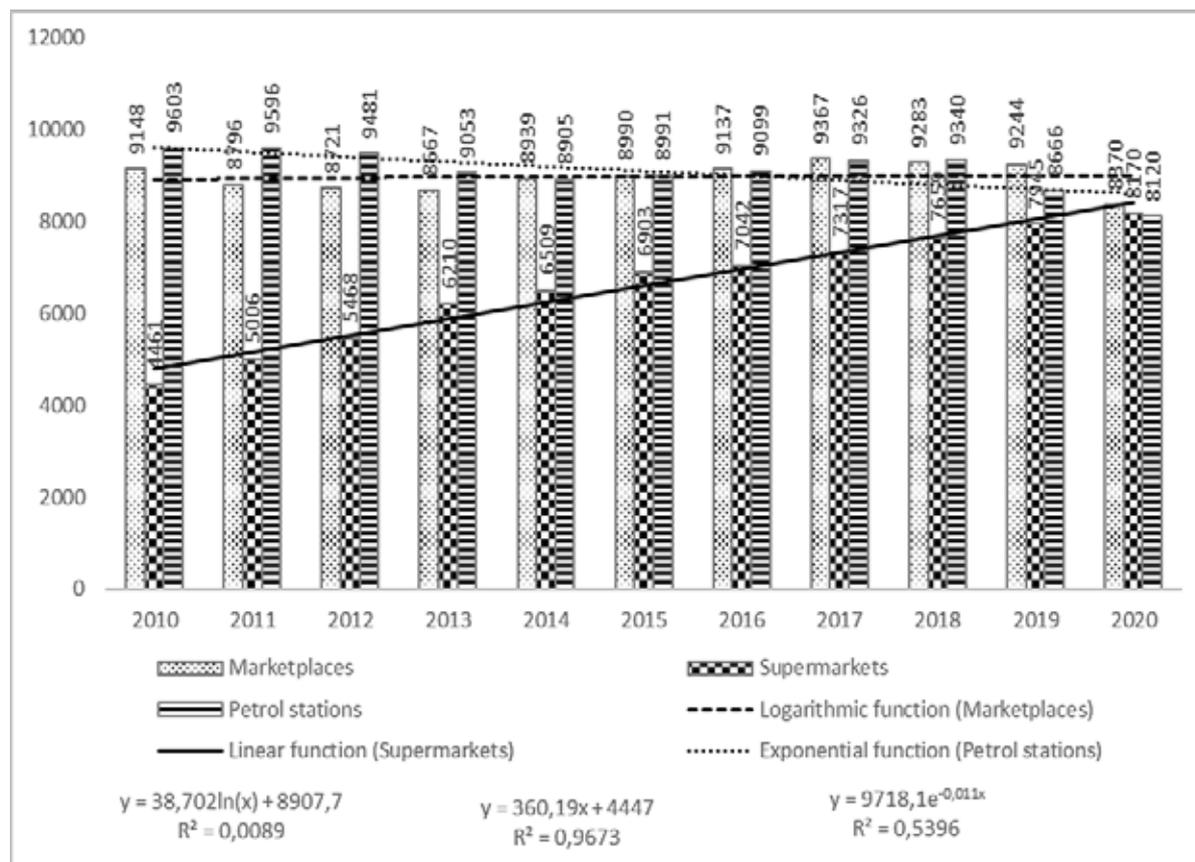


Figure 1. Changes in the number of marketplaces, supermarkets and petrol stations in Poland in the years 2010-2020. Source: own compilation based on data from Table 1.

A significant decrease in the number of marketplaces occurred in the years 2010-2013. During this period, the Polish economy experienced the effects of the global financial and economic crisis, which was reflected in the intensification of negative trends on the labour market and a deterioration of consumers' incomes. Consumers' willingness to spend money on food decreased, and the importance of price as a criterion for its selection increased (Świetlik, 2014, p. 9 et seq.). Intense competition led to the development of new large retail formats, especially discount stores, which became a real threat to the development of marketplaces. In the past decade such discount chains as Biedronka, Lidl, Netto and Aldi recorded significant increases in terms of newly opened stores. Biedronka, the retail leader in Poland, recorded particularly impressive increases in turnover and FMCG market share. A sharp decline in the number of seasonal markets (from 7088 to 6248, i.e. by almost 12%) occurred in 2020, as illustrated in Figure 2.

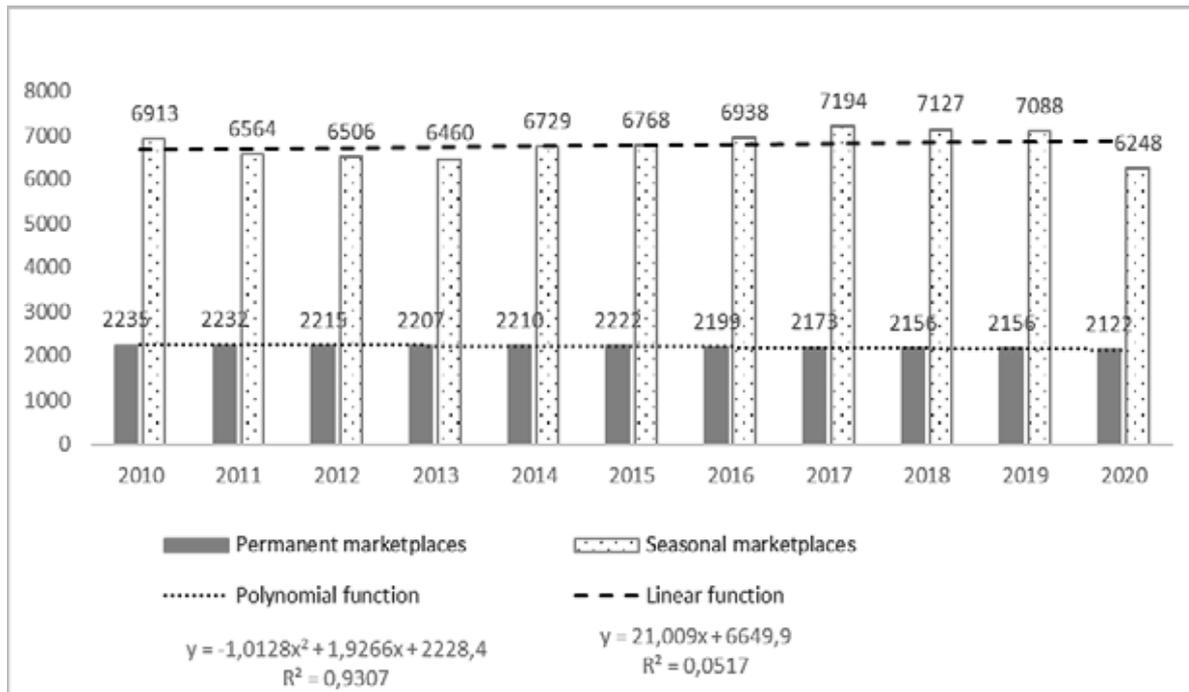


Figure 2. Number of permanent and seasonal marketplaces in Poland in 2010-2020. Source: Own compilation based on data from Table 1.

Data from the Central Statistical Office show that in the analysed period in Poland there were on average about 6 marketplaces per 100,000 people.

In 2020 the largest number of marketplaces disappeared in the Mazowieckie Province – 6 establishments, followed by 5 establishments each in the Łódzkie, Pomorskie and Wielkopolskie Provinces. In comparison to the previous year, the total area of permanent marketplaces decreased by 1.8% (Rynek Wewnętrzny..., p. 31). The largest decreases in marketplace area occurred in the Mazowieckie Province (by 69.1 thousand m²), Łódzkie Province (by 54.1 thousand m²), Świętokrzyskie Province (by 38.5 thousand m²) and Pomorskie Province (by 37 thousand m²). In permanent marketplaces, transactions were made in approximately 86.6 thousand permanent small-retail outlets, among which 45.7 thousand operated daily. The permanent market network was supplemented by seasonal markets, the number of which decreased by 840 establishments in 2020. Significantly lower annual receipts from marketplace fees (by 20.5%) compared to 2019 were recorded.

As regards comparing the level of development of marketplace trade in spatial terms, very interesting research results are presented in Wojdacki, K. (2016), p. 228. These are shown on the map below (Figure 3).



Legend:

Dark colour: development of marketplace trade.

Grey colour: stagnation in the development of marketplace trade.

Light colour: recession of marketplace trade.

Figure 3. Spatial differentiation of marketplace trade development in Poland. Source: Wojdacki, K. (2016). Terytorialne zróżnicowanie rozwoju handlu targowiskowego w Polsce – analiza statystyczna, Wydział Zarządzania UW, Problemy Zarządzania 14/1(1), p. 227.

The highest level of marketplace trade development is noted in the Podlaskie and Świętokrzyskie Provinces. The situation in the Podkarpackie and Warmińsko-Mazurskie Provinces is also favourable. The Opolskie, Dolnośląskie and Pomorskie Provinces are at the other extreme: in these regions there is a strong downward trend in the importance of marketplace trade as a distribution channel for frequently purchased goods.

3. Marketplace trade in Wielkopolska

A downward trend in the number of permanent and seasonal markets was also observed in the past decade in Wielkopolska (Table 2).

Table 2.

Marketplaces in Wielkopolska

SPECIFICATION	2010	2015	2018	2019
Permanent marketplaces (as of 31 December)	237	235	226	225
Permanent small-retail sales outlets	11840	10032	9092	8557
Seasonal marketplaces (during the year)	473	436	453	451
Annual receipts from marketplace fees in thousand PLN	27602.5	23098.2	17395.2	17437.5

Source: own compilation based on: Rocznik Statystyczny Województwa Wielkopolskiego 2020, p. 135.

The number of permanent small-retail outlets on marketplaces, such as stalls or kiosks, decreased within the decade by as much as 27%. It is also worth noting the significant decrease (from 27.6 million PLN to 17.4 million PLN, i.e. by more than 1/3) in the annual receipts from

marketplace fees. Admittedly, these fees usually do not exceed 1% of the income of an average municipality, but there are some local government units, such as the municipality of Tuszyn in the Łódzkie Province, where 15 years ago this figure exceeded 30% whereas currently it stands at 10% (Bury, 2013, p. 128). Due to the decrease in the number of tenants, revenues from fees for the operation of municipal and community markets and revenues from parking fees charged to motorised customers are falling.

In 2018, the annual receipts from marketplace fees on permanent and seasonal markets amounted to approximately 187.4 million PLN, which was about 76.5 million PLN less than in 2008. The fact that from 2016 some municipalities took advantage of the possibility to waive the collection of fees, in order to support small entrepreneurship and maintain marketplaces on their territory, was of significant importance here (Świetlik, 2020, p. 108). It is worth noting at this point that receipts from market fees are a significant source of income in some cities and municipalities, especially those smaller ones that do not have a developed industry. As the number of marketplace sellers drop, these receipts decrease significantly.

Tables 3 and 4 present statistical data on marketplace trade in Wielkopolska, taking into account the sub-regions, counties and the largest cities of the province.

Table 3.
*Marketplaces in Wielkopolska in 2019**

Specification	Permanent marketplaces					Seasonal marketplaces (during the year)	Annual receipts from marketplace fees in thousands PLN
	number	area in m ²		permanent small-retail sales outlets			
	total	total	of which sales area	total	of which marketplaces opened daily		
Province	226	1122845	824963	9092	5259	453	17395.2
Poznań Subregion	37	215549	197992	1271	718	6	3742.1
Kalisz Subregion	50	306720	223198	2021	1078	15	4896.2
Konin Subregion	57	279194	189776	2491	1339	405	2791.5
Leszno Subregion	40	153309	103377	731	230	9	3337.2
Piła Subregion	32	138847	101306	968	303	17	2628.2
City with county status:							
Poznań	10	29226	9314	1610	1591	1	–
Kalisz	5	95606	77842	347	337	–	2254.0
Konin	4	49398	28101	396	396	3	694.3
Leszno	3	23929	9872	78	78	–	380.3

*As of January 1st.

Source: own compilation based on: <https://poznan.stat.gov.pl/dane-o-województwie/powiaty-865/handel---dane-powiatowe-1071/>.

Table 4.
Marketplaces in Wielkopolska according to county*

Specification	Permanent marketplaces					Seasonal market-places (during the year)	Annual receipts from market-place fees in thousands PLN
	number	area in m ²		permanent small-retail sales outlets			
	total	total	of which sales area	total	of which market-places opened daily		
Jarocin	6	27160	12396	24	24	6	160.7
Kalisz	6	49202	41780	200	8	2	157.3
Kępno	1	15234	11000	–	–	1	136.0
Krotoszyn	7	41353	25449	730	–	–	970.3
Ostrów Wlkp.	13	34776	19642	658	657	2	666.2
Ostrzeszów	6	35841	30777	42	32	2	303.9
Pleszew	6	7548	4312	20	20	2	247.8
Gniezno	9	23862	17195	375	282	2	342.6
Koło	8	31857	26688	279	161	3	257.4
Konin	13	86536	55323	230	19	7	345.5
Słupca	6	28894	19813	370	18	270	762.2
Turek	9	29954	25369	368	290	120	139.9
Września	8	28693	17287	473	173	–	249.6
Gostyń	11	27645	21209	185	–	1	686.5
Grodzisk Wlkp.	2	6434	6110	–	–	2	410.6
Kościan	4	32370	29174	75	75	–	872.6
Leszno	2	3300	3300	–	–	3	29.7
Międzychód	5	5400	2190	75	75	1	76.8
Nowy Tomyśl	6	18044	8242	14	2	1	430.9
Rawicz	5	23985	15130	24	–	1	220.5
Wolsztyn	2	12202	8150	280	–	–	229.3
Chodzież	4	15859	10249	24	–	–	90.0
Czarnków-Trzcianka	8	21996	15442	126	5	7	551.6
Piła	8	53210	35725	705	190	6	1158.2
Wągrowiec	5	34331	29416	28	28	3	390.4
Złotów	7	13451	10474	85	80	1	438.0
Oborniki	8	32283	31192	538	6	–	222.8
Poznań	18	146520	138159	106	86	3	2200.5
Szamotuły	5	18200	17640	626	626	1	462.6
Środa Wlkp.	3	8394	4593	–	–	1	605.4
Śrem	3	10152	6408	1	–	1	250.8

*As of January 1st 2019.

Source: own compilation based on: <https://poznan.stat.gov.pl/dane-o-województwie/powiaty-865/handel---dane-powiatowe-1071/>.

The largest numbers of permanent and seasonal markets are located in the Konin sub-region, and at the county level, in the counties of Ostrów Wielkopolski, Konin and Gostyń. This is due to long historical traditions (these were once privileges granted to cities) in organising fairs and markets.

In Poland, new marketplaces are being built and old ones are modernised with co-financing from European Funds. Many of them were built or modernised under the “My Marketplace” programme, which offered funding towards the building of marketplaces to local government units with a population of up to 50,000. A marketplace could be built on condition that 50% of the produce sold there came from local farmers. The sum of 54 million euros was allocated for this purpose from the Rural Development Programme for 2007-2013.

4. Customer attitudes to marketplace trade

The reasons for the recession in marketplace trade are manifold. Among them, there are external reasons related to intense competition for customers and their financial resources from such retail formats as online shops, shopping centres, discount stores, supermarkets and many others. Changes in the shopping preferences of some consumers, especially the younger generation, are undoubtedly of significant importance as well.

A study carried out by researchers from the Department of Market and Consumption at the University of Economics in Katowice involved 1,100 respondents who shopped at marketplaces, fairs, bazaars and market squares (Malinowska, 2016, p. 117). Only about 16% of them declared that the marketplace was the most frequent place for doing their shopping. The respondents were also asked to assess the number of markets in the place where they lived. Almost 2/3 of the respondents thought that the number of such points of sale was appropriate, and 1/4 said that there were too few markets. Only slightly over 4% of the respondents said there were too many markets in their area, and the remaining participants had no clear opinion on this matter.

The respondents were also asked to evaluate the functioning of marketplaces in terms of selected criteria. The results indicate that customers generally favourably assessed the functioning of marketplaces (average rating 4.05 on a scale from 1 to 7, where 7 was the highest). The best assessment was given to the level of customer service at marketplaces (average rating 4.55, over 50% of positive ratings). The choice of products was also assessed highly (47% of positive ratings), but one in four respondents negatively assessed the variety of products on offer at marketplaces. Over 46% of respondents also positively assessed the level of prices of products offered at marketplaces and the quality of the goods (45%). At the same time, 1/3 of the respondents had reservations about the quality of the products offered. The worst scores were given for the forms of payment offered to customers by traders – over 64% of negative ratings. The hours of operation of marketplaces also received as much as half of negative opinions (50%). On the other hand, for the vendors selling goods at marketplaces a big drawback is sometimes their unsatisfactory technical infrastructure, and in particular a lack of sanitary facilities, as well as quite excessive, in their opinion, fees charged for renting a stall or entering a marketplace (Michalak, Sojkin, 2018, p. 237 et seq.).

The results of a survey carried out on a group of 119 inhabitants of Cieszyn show a generally positive attitude to the existence of marketplaces in Cieszyn (66%), with only 8% of the respondents regarding markets in Cieszyn as a negative phenomenon, and 25% having no opinion on the matter (Kulczyńska, 2020, p. 38). The factors most often indicated by the residents who positively assess the functioning of the markets in the city space include lower prices of goods (23% of responses), atmosphere of the marketplace (20%), wide selection of products (18%), high quality of products (12%) and favourable location of the market (10%).

On the other hand, the respondents with a negative attitude to Cieszyn markets indicated poor organization of the market's operation as a reason for their opinion, and in particular a shortage of parking spaces (69%), excessive noise (42%), and litter around the market square (36%). A small number of respondents also indicated a poor sense of security and fear of theft (22%). The survey also showed that despite the declining role of marketplaces, the residents of Cieszyn continue to shop there (85%). The respondents buy both food (62%) and non-food products (38%) at the markets. Vegetables (29%) and fruit (24%) are the most frequently bought food products because their availability is the best and their quality is the highest.

Interesting results from an assessment of large cities in Poland according to their level of development in marketplace trade are presented in Bieszk-Stolorz, B., Felsztyńska, I. (2018), p. 415. All Polish cities with a population of over 200,000 (16 cities) were included in the study. In 2016, the leaders were Kraków, Radom, Częstochowa and Wrocław, with Sosnowiec coming at the bottom of the ranking.

In conclusion, the results of the analyses show that a typical customer who shops at marketplaces prefers organic products, which are not mass-produced and which are also relatively cheap. Marketplace customers, especially the elderly, particularly appreciate the greater availability of fresh products; direct contact with the seller, who can inform them about the origin of the products; lower prices; as well as the possibility of bargaining.

5. Conclusions

With more and more customers moving to shopping centres, discount stores and online shops, it seems important not to let marketplaces fade into oblivion. It is essential to provide city residents with alternative and diverse shopping options and choices. Therefore, marketplaces should continue to enrich the range of alternative options as regards shopping for daily necessities, especially fresh fruit and vegetables. Their function of integrating local communities is also important. Meanwhile, in the reality of the very modest budget resources of many local governments, one can often see the rather passive attitudes of some city and municipality authorities with regard to modernising marketplace trade, including the infrastructure of market squares, or offering promotional and financial support to market traders.

Marketplace revitalisation programmes and favourable legislation which makes it easier for agricultural producers to sell food produced on their own farms have not slowed down the recessionary tendencies. The Covid-19 pandemic has also had a decidedly negative impact on the number of transactions and the sales revenues generated by market sellers.

As regards the question posed in the title of this article, whether the future of marketplace trade is selective development or inevitable decline, the answer seems to be selective development. The Covid-19 pandemic has caused a re-evaluation of many things: it has changed shopping preferences, eating habits and lifestyles. It has changed attitudes regarding health protection, including the way of doing shopping and the safety of the origin of the purchased goods. One can hope that in the near future there will be a revival in marketplace trade, prompted by a growing interest among consumers in purchasing safe and unprocessed food.

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STAKEHOLDER IDENTIFICATION AS A DETERMINANT OF SUSTAINABLE PROJECT MANAGEMENT

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Purpose: The purpose of this paper is to present part of a report on stakeholder analysis (indicating the importance of stakeholder identification and prioritisation) in projects implemented by sustainability-oriented teams.

Design/methodology/approach: The results were obtained based on a focus group interview with forty-eight participants – representatives of different organisations, experienced in project management and possessing expertise on the tourism industry in Pomerania. The study was carried out in Gdańsk, from May to September 2021.

Findings: The results of the study showed that an effective policy regarding sustainable development measures should be based on intensive stakeholder outreach. The determinant of this effectiveness is to entail proper and comprehensive stakeholder identification, which can play a key role in the success of any investment.

Research limitations/implications: The purpose of the marketing research on stakeholder identification and mapping is to provide insights on the public opinion in this regard. In the course of the study, some limitations were recognised. Firstly, the sampling techniques involving audience generation and data filtering, such as data collection from only those persons who had participated in a focus survey, certainly resulted in a bias in the type of the data collected. Secondly, the study, due to the outbreak of the pandemic, was limited to 2021 only, and despite the implementation of selected projects in five countries in the South Baltic region, it was conducted in Poland exclusively, due to limited travel possibilities.

Practical implications: The research was commissioned by a real project team and concerned the operating environment of the tourism enterprises in the Pomerania region. The survey results were applied in practice and served as a project implementation indicator.

Social implications: The research topic of stakeholder identification as a component of sustainable development policy undoubtedly has impact on the society. This is because it leads to the promotion of an approach that takes the balance between the actions undertaken for the environment and the local community as well as corporate profit generation into account.

Originality/value: It is the first study of this kind (on the Polish market at the least), examining the sustainable development approach in international projects, in the context of stakeholder outreach.

Keywords: stakeholders, stakeholder analysis, stakeholder mapping, sustainable development, project management.

Category of the paper: Research paper.

1. Introduction

Sustainability entails proper positioning of an organisation in economic reality, taking the social and economic challenges as well as the environmental opportunities and threats into account. The concept should therefore be seen as a potential for organisations that are aware of the importance of stakeholder relations. The building and nurturing of good environment relationships, based on engagement and dialogue, is crucial, as such relations not only allow for effective risk management, especially in the today's rapidly changing business environment, aptly described as the VUCA times (Mack et al., 2015), but also support the development of organisations, not only allowing their survival, but even achievement of competitive advantage.

Awareness of the fact that a company's activity affects the functioning of others makes responsible stakeholder cooperation an imperative that should thus be based on harmonious development of an organisation and its long-life cycle. Moreover, to maintain coherence between the various dimensions of business, a holistic approach to organisational management is required. This is because organisations are encompassed by people, communities, and other stakeholders, who are interested in interacting at different levels. Corporate responsibility is based on the interests and expectations of all the stakeholders of an organization.

The same is true for projects – sustainability is now a common approach, associated with the management of projects, programmes, institutions, organisations, people, and other entities requiring efficient and effective product and service development, manufacture, marketing, distribution, and delivery. In general, for projects to be sustainable, certain indicators and standards need to be established, from project identification, through feasibility studies, concept and activity design, assessment, financing, to implementation and evaluation. It is a proven truism that most projects fail due to the lack of an adequate sustainability plan. Therefore, a comprehensive analysis of a project's social, economic, legal, cultural, educational, and political environment is essential the course of its implementation. The role of stakeholders cannot be overlooked here, as their involvement facilitates the logistical preparations in a project (Morfaw, 2014). Such analysis, i.e., taking a project's philosophy, mission, vision, values, objectives and tasks into account, should be clearly articulated, as attention to accurate assessment of the beneficiaries, identification of the legal and regulatory frameworks, as well as marketing analysis, partnership development and institutional analysis, give room for effective and efficient project intention implementation.

2. Literature review

Many definitions of sustainability have emerged in recent years, of both academic and business background. Sustainability is defined as linkages to develop a common idea and better communication in the process of developing and transforming society's action for sustainable development (Glavič, Lukman, 2007, p. 1884). Long-term actions involve the use of the triple bottom line (TBL) model, which reflects the dimensions of sustainable development, namely the social, environmental, and economic aspects, encouraging commercial companies, NGOs and individuals to implement the idea of sustainable development. Considering the pillars of sustainable development, one might get an impression that the concept is not dissimilar to another well-established field, i.e., impact assessment. Nevertheless, impact assessment is a broader concept than TBL, especially in the context of social impact assessment. Vanclay (2004, p. 27) describes TBL as:

- social, environmental, and economic achievements,
- sustainable development, sustainable environment, sustainable communities,
- impact on the society, environment, and economic sustainability,
- economic, environmental, and social sustainability,
- economic prosperity, environmental quality, and social justice,
- economic growth, ecological balance, and social progress,
- economy, environment, equity,
- profit, people, planet (or planet, people, profit).

Depending on the context, sustainability has therefore implications for innovation per se, as well as for the processes and the organisational management style (Lang, Murphy, 2014). It is a goal in itself for many organisations, because it is the managers running organizations who are to build sustainability, not merely adopt it as a social goal (Jennings, Zandbergen, 1995).

Sustainable development is a systematic concept that refers to the continuity of economic, social, institutional, and environmental aspects of the human society and the non-human environment. It characterises a process or a state that can be maintained indefinitely at a certain level. In 1987, the Brundtland Commission of the United Nations defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The definitions of sustainable development can vary, however, depending on the area of study or interaction and the context or the situation across many scales of space and time, from small to global production and consumption balance.

According to the *United Nations Environment Programme*, people form the social system, profit is linked to the economic system, while the planet is associated with the environmental system. This shows that sustainability is multi-stakeholder in nature. According to Achman

(2011), therefore, sustainability is not a top-down solution to balance the three elements, referred to as the 3Ps (Planet, People, Profit), but rather a consensus-based solution, where stakeholders are involved in the decision-making process.

The definition of sustainability evolves, influencing the politics, technology, and economics more intensively. Hence, there is an increasing need to involve more stakeholder groups in the development and management of the 3Ps (Mulder, 2006).

Whether dealing with an organisation or a project operation, as the business situation changes, the need to operate in a less secure (unpredictable) and more complex environment emerges, forcing managerial or project team members to plan their strategies, so as to meet the wide range of the demands in the internal and external environment. According to Thomas (1995), low manufacturing costs, high responsiveness and managerial flexibility are required not only for market expansion but also for economic sustainability. Sustainability is defined as the "ability to solve complex sustainability challenges in a profitable way, with rapidly evolving business innovations, applications, methods, products and processes, adapted to changing situations" (Dixon, Gorecki, 2010). As such, sustainability has been becoming an integral part of business strategy, delivering, through sustainable long-term decisions, shareholder value, in a responsible manner. Maintenance of both sustainability and agility, therefore, provides a potential for growth rather than, as some tend to simplify, achievement of actual growth and expansion.

3. The respective roles of stakeholders in an organisation and a project

Different interest groups can be identified in every organisation. The group that can or does influence the achievement of an organisation's goals (Freeman et al., 2010) are the stakeholders. Modern organisations, which are sustainability-oriented, should proactively manage the relations with all important stakeholders. Freeman specified that "[a] stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984), whereas R.K. Mitchell (1997) defined stakeholders as groups which influence an organisation's life. In this context, stakeholders can be considered random groups or individuals who may significantly influence or be influenced by an organisation (Evan, Freeman, 1988; Freeman et al, 2010; Donaldson, Preston, 1995; Greenley, Foxall, 1997).

This concept has been further expanded to include non-human stakeholders (Buchholz, 1993; Starik, 1995; Stead, Stead, 2000). A narrow definition of stakeholders refers to those distinguished by the way an organisation is managed, the role of stakeholders in the organisation, and the company's risk management (Barney, 1997; Clarkson, 1994; Greenley, Foxall, 1997; Harrison, St. John, 1996; Nasi et al., 1995). The objective of management is

usually to maximise the shareholder return (increase the organisation's value) in joint stock companies and corporations. It is also the main stakeholder objective (Shrivastava, 1995). The nature and the types of the relationships between organisations and the stakeholders involved have been discussed, *inter alia*, by Jones and Wicks (1999), Hill and Jones (1992).

Stakeholders thus include company owners, shareholders, the government and local administration, competitors, employees, volunteers, customers, schoolkids, suppliers, partners, labour unions, parent boards, analysts, global society, subcontractors, media, NGOs (non-profit organisations), local community, natural persons, insurers, banks, religious leaders, founders, beneficiaries etc. The list of stakeholders can vary, depending on an entity's industry, its development level, range, organisational culture, position, and its place in the supply chain and the organisation strategy. There are also the so-called silent stakeholders, such as the natural environment for example.

In a successful organisation (as well as in a well-managed project), the list of potential stakeholders should be constantly updated, as stakeholders are not given once and for all. Their interests and positions are subject to modification and change. It is also important to assess and prioritise them on this basis. The selection of key stakeholders should be initiated already at the level of objectives, in relation to the level of organisation/project development and the manner of objective achievement. K. Obłój (2007) defines stakeholders as "the institutions and organisations that fulfil two conditions: they are valuable to the organisation, participate in its decisions and effects, and are able to exert pressure on the organisation" [translated from the original in Polish by A.D.].

The following issues should be considered in stakeholder analysis:

- the stakeholders' power, understood as identification of the potential allies for the strategy implemented and the potential opponents who can influence strategic goal change and activity;
- stakeholder empowerment, meaning the process of providing the front-line stakeholders with authority to make the decisions once reserved for the organisation managers exclusively. It has become an important topic in social involvement and joint social projects;
- the urgency of stakeholder demand, which basically entails subjective assessment of stakeholder expectations, following a situation audit (Obłój, 2007).

Each stakeholder group is characterized by different needs, different life values, and different manner in which they affect the company. R. Mitchell et al. (1997) defined and listed seven main stakeholder groups, presented on Figure 1.

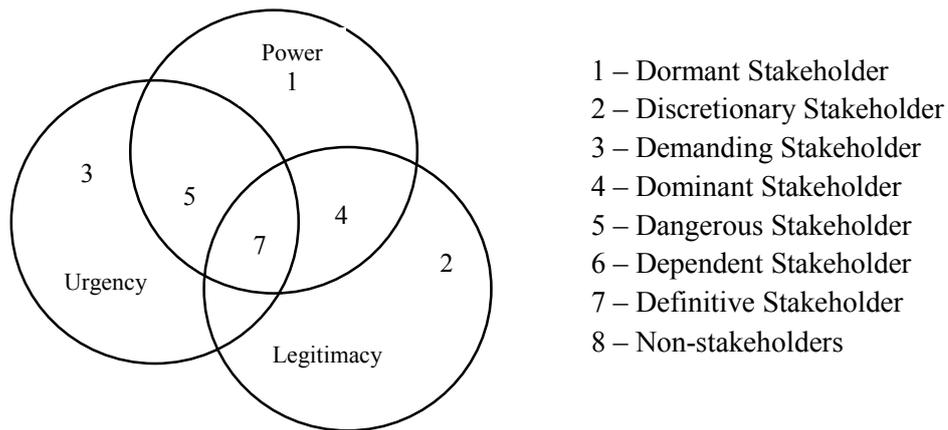


Figure 1. Stakeholder Classification: Saliency model. Source: Mitchell, et al., 1997.

Mitchell et al. divided stakeholders into three groups, in distribution by stakeholder power, legitimacy, and stakeholder need urgency. A distinction can be made between silent stakeholders (whose behaviour and attitudes are not easy to identify and thus their value assessment poses difficulties), undefined stakeholders (whose behaviour can be inspiring for entrepreneurs), and strict stakeholders (who expect the highest quality relations). These three groups are also called 'invisible' stakeholders, since their role is secondary for an organisation.

The next three subgroups include: dominant stakeholders, who affect the decisions and business activities; dependent stakeholders, who are loyal to the company, but they pose a threat, as their actions can result in a loss of company value; and 'pending' stakeholders, who play a minor role with regard to the company. The stakeholders considered the most important are 'crucial' (final) stakeholders. The authors of this concept also identified the so-called non-stakeholders, who are neutral for the company.

In the age of enormous progress, digitisation, systematically improved communication, people exert huge influence on one another. Regardless of whether this influence is positive or negative, relationships are always formed. One might even say that these ties are a resource which, if skilfully managed, can constitute a significant competitive advantage. This resource can affect the financial strength and guarantee company growth and development (Jablonski, 2013). According to Savage et al. (1991), the process of stakeholder management needs to be improved by development of organisational relationships. This process consists of four stages:

- identification of all the stakeholders in an organisation,
- stakeholder diagnosis and classification, based on their priority to the organisation,
- development of strategies improving or changing the current relationships with key stakeholders,
- effective implementation of the strategies developed.

Depending on the relationship type, stakeholders should be defined as follows (Johnson, Scholes, 1999):

- positive – they contribute to the company's development (more or less) and its value,
- indifferent – have no influence on the organisation,
- negative – hostile, they put negative pressure on the organisation (e.g., competitors, who are or were related to the company, former dissatisfied employers, cooperants and suppliers). Influential institutions, dissatisfied with the cooperation with the company, can also be hostile stakeholders, who, through their own relations or via influence on the legal conditions, are able to weaken a company's position or decrease its value.

Considering their role to the company, stakeholders can be divided into:

- first-order stakeholders (also called primary or priority stakeholders) – people, institutions and groups who cooperate directly with the company and impact its activity,
- second-order stakeholders (also called secondary stakeholders) - people, institutions and groups who do not have a direct impact on the organisation, but they are tightly connected with it,
- third-order stakeholders, the other persons involved, having indirect impact on the organisation, whose relations with the organisation are neither crucial nor necessary for effective company performance.

Having developed a list of stakeholders, based on Johnson and Scholes stakeholder mapping (1999), it is worth to consider:

- the degree of the stakeholders' interest in the organisation,
- the degree of the organisation's interest in the stakeholders,
- the stakeholders' impact on the organisation,
- the organisation's impact on the stakeholders.

According to these authors, high levels of influence and interest are reserved for the key stakeholders. Stakeholders with low influence and high interest should be merely informed about company activity. With regard to stakeholders characterized by high influence and low interest, organisations should use a tactic of constant contact and communication, in order to develop good stakeholder relationships. Low-impact, low-interest stakeholders expect minimal effort from the organisation and should thus be treated as such.

4. Methodology

4.1. Research background

The empirical part of this study is an excerpt from a report on stakeholder analysis under three international projects: SB WELL: Wellbeing Tourism in the South Baltic Region – Guidelines for good practices and Promotion¹; and ArchaeoBalt: Laying fixed foundations for innovative archaeotourism – a new ‘green’ archaeoroute in the southern Baltic Sea region², both implemented in 2018-2021; as well as Cirtoinno: Circular economy tools to support innovation in green and blue tourism SMEs³, implemented in 2016-2019. The projects were co-financed with EU funds, under the Interreg South Baltic Programme. The axis connecting the projects entailed a programme objective of more intensive development of the natural and cultural heritage sites in the South Baltic area to create sustainable tourism areas.

One of the elements embedded in the project implementation strategy involved identification and prioritisation of stakeholders, using the criterion of their importance and impact in selected phases of project implementation.

4.2. Description of the study

In order to collect data for the stakeholder analysis it was necessary to conduct a Focus Group Interview (FGI). The researchers’ current experience indicates that inclusion of some (not all) stakeholders and identification of relations between them prevents projects from being implemented as intended.

The study was conducted in Gdańsk, from May to September 2021. Forty-eight participants took part in the focus groups – representatives of various companies, experienced in project management, possessing expert knowledge on the functioning of the tourism industry in the Pomeranian region. This ensured an appropriate level of substantive discussion and high quality of argumentation.

¹ Project No. STHB.02.01.00-SE-0137/17. The project leader is Linnaeus University from Sweden, and the partners represent universities, authorities and tourism non-profit organisations from Poland, Lithuania, Germany, and Denmark. The project aims to increase public awareness about the concept of wellbeing and the possibilities of its use in the tourism sector as well as to promote the South Baltic Region as an attractive tourism destination.

² Project No. STHB.02.01.00-22-0138/17-00). The project leader is the University of Gdansk. Other partners are University of Aarhus and Lund University, Gdansk Museum and Bornholm Museum. The aim of the project is to create a tourism brand strategy for archaeotourism in the South Baltic region.

³ Project No. STHB.01.02.00-22-0058/16-00. Pomerania Development Agency was the project leader. Other partners represent universities, offices and tourism non-profit organisations from Poland, Lithuania, and Denmark. The aim of the project was to increase innovation of tourism companies from the SME sector, to implement selected elements of closed-loop economy in services, products, and business models in the South Baltic area.

The research tool used entailed an interview scenario (survey questionnaire), which involved:

- analysis of the concept of 'stakeholders' and their classification,
- project data validation into database,
- stakeholder classification for selected international projects.

The interview participants were asked to fill in a questionnaire, the main purpose of which was to test their knowledge of the concept of 'stakeholder'. The following steps were suggested by the focus participants themselves and concerned:

1. identification of the stakeholders who, according to the respondents, are crucial for project success (the forms were filled in by each participant individually),
2. decision making on the stakeholder selection for the initial phase of the project,
3. specification of selected stakeholders' attitude to the solutions to be (or those which have been) developed as part of the project:
 - positive attitude (+),
 - negative attitude (-),
4. definition of the impact of the solutions developed as part of the project on the stakeholders identified:
 - positive influence (+),
 - negative influence (-).

The first part of the FGI aimed to verify how the concept of a 'stakeholder' is understood in international projects. In the course of the discussion, the following conclusions were drawn:

1. The respondents define stakeholders as individuals/groups/institutions that benefit from the products developed under a project.
2. A need to classify stakeholders in terms of their involvement in different project life cycle phases exists (Mingus, 2002).
3. The lack of clear segmentation criteria results in important stakeholder group ignoring.
4. Project teams should view stakeholders from a broader perspective, including analysis of the scope and the direction of their relationship with the project.
5. Lack of sufficient awareness of the two-way relationship between the stakeholders and projects affects project success.
6. The respondents ignored the negative impact/influence on the stakeholders and projects (in both directions).

To continue the focus research, respondents were presented with a top-down definition of stakeholders provided by Donaldson and Preston (1995).

4.3. Characteristics and classification of stakeholders

The findings from the first part of the FGI, in particular those concerning the two-way relationship (impact/influence) between the stakeholders and projects and the project phase, allowed the facilitators to proceed to the next stage. The respondents were asked to:

- identify the stakeholders, in relation to the project life cycle phase,
- assess the stakeholders' influence on the project and the project's impact on the stakeholders, in positive or negative terms.

Table 1 shows the results of this stage of the survey.

Table 1.
Stakeholder analysis in selected projects

Phase	Stakeholders	Stakeholder influence on projects	Impact of projects on stakeholders
I. Initial	Nearest neighbourhood	+	-
	Buyers of real estate in the neighbourhood	+	+
	Local authorities	+	+
	Regional authorities	+	+
	Developers	+	+
	Individual Opponents	-	No impact
	Tourism Industry (Large companies)	-	No impact
	Organisations promoting sustainable development and ecology	+	+
	Road and Greenery Administration	+	+
	Project Representatives	+	+
	Equipment Suppliers	+	+
	Universities	+	+
	Urban transport	No impact	-
	Green transport	+	+
Competitors in the tourism industry not interested in implementing sustainable development	-	No impact	
II. Intermediate	Nearest neighbourhood	+	+
	Tourists	+	+
	Designers	+	+
	Competitors in the tourism industry not interested in implementing sustainable development	-	-
	Tourism Organisations	+	+
	Local Authorities	+	+
	Universities	+	+
	Tourism Industry (large companies)	-	-
III. Implementation	Nearest neighbourhood	+	+
	Further surroundings (tourism industry in other regions)	+/-	+
	Urban transport	+	+/-
	Tourists	+	+
	Green transport	+	+
	Leisure centres	+	+
	Local Authorities	+	+
	Regional Authorities	+	+

Legend: influence: (+) positive, (-) negative.

Source: own study and elaboration.

It is worth noting that the respondents identified stakeholders only through the lens of direct benefits or in the light of possible/negative direct barriers (despite the definition presented to them). This shows how wide the gap between the theory and practice is.

The aim of the next stage was to select and assess the stakeholders. Stakeholder attitude was assessed using an 11-point scale (from -5 to +5), where +5 indicated a strongly positive stakeholder attitude towards a given project and -5 indicated a strongly negative attitude. Stakeholder importance was assessed using a scale from 0 to 5. As mentioned, in this case, stakeholder importance referred to the stakeholder's ability to influence a given project. According to Mitchell (1997), this means stakeholder 'strength', while Lindenberg (1981) defines it as stakeholder 'influence'. The third criterion remained unchanged. The impact of a given project on a stakeholder was assessed in a similar way, so that +5 was defined as a strong positive impact, while -5 was defined as a strong negative impact of a given project on a stakeholder. The average scores calculated based on the survey forms are shown in Table 2 (responses of 'none' and '+/-' were not included in the calculations).

Table 2.

Impact and importance of stakeholders in the final phase of selected projects

Stakeholders	Stakeholder influence on projects		Impact of projects on stakeholders*
	Stakeholder attitude to projects*	Scale**	
Nearest neighbourhood	+4.00	3.50	+3.80
Further surroundings	+4.30	4.70	+1.60
Local authorities	+3.80	4.20	+4.60
Regional authorities	+3.40	3.80	+3.40
Business institutions	+4.20	4.50	+3.63
Investors	+1.20	3.00	+1.50
Designers	+1.60	3.70	+2.50
Organisations promoting sustainable development and ecology	+4.00	3.60	+3.70
Universities	+4.70	4.00	+3.50
Tourism organisations	+4.80	+1.23	4.70
Media	+2.60	+2.00	2.50

Legend: * Scale from -5 to +5, ** Scale from 0 to 5.

Source: own study and elaboration.

4.4. Mapping of stakeholder priorities

Three attributes (impact, attitude towards a project, importance) have placed the stakeholders on the so-called stakeholder map. The impact of a given project on a stakeholder is presented on the vertical axis, with a scale ranging from -5 to +5. The stakeholder attitude to a given project is presented on the horizontal axis, with a scale ranging from -5 to +5. The sphere size indicates each stakeholder's importance. All the study participants positively rated the stakeholder attitude towards the project and the project's impact on each stakeholder. All the results are therefore placed in the upper right corner of the map, as shown in Figure 2.

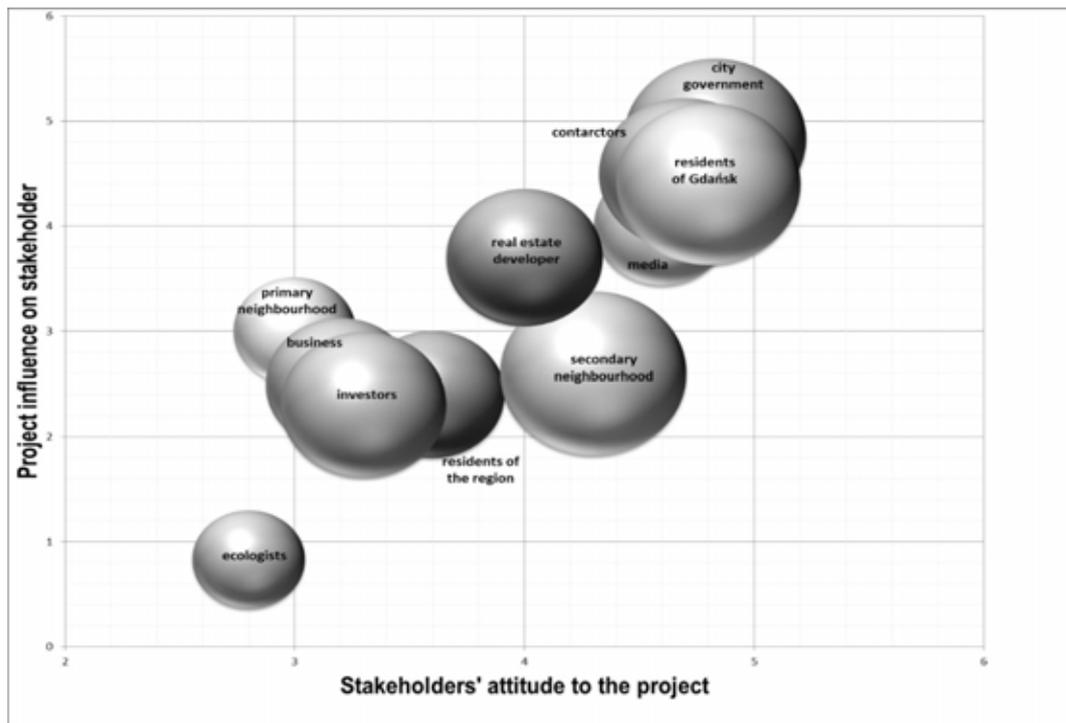


Figure 2. Stakeholder perception map for a railway project in its final phase. Source: own study.

It is worth noting that all stakeholders were described as characterized by positive attitude to the project. At the same time, the project was rated as having a more or less positive impact on the stakeholders defined in the course of the study.

5. Discussion

The topic of discussion is to clarify the specific role of projects promoting sustainable development. This is because the article emphasises the application of sustainability policies to the project management process itself. However, despite emphasising that in the three selected projects the primary objective was to educate and promote the tourism industry on sustainable development, there was no analysis of how effective stakeholder assessment affects the project. It is therefore worth discussing this topic in future research.

However, returning to the projects in question, it should be noted that despite the understanding of the importance of sustainable development actions, the environment is aware of the fact that projects have specific duration (in this case 3 years of implementation and 5 years of sustainability). The decisive role here thus lies with the project leaders, who should be able to convince the environment to support projects that are to end in the near future. This awareness was defined as a key factor of project success.

The results obtained during the focus group research indicate positive relations between projects (regardless of their nature) and their stakeholders. The positive dimension of these relationships is the result of a focus on sustainability, where its three pillars – planet, people, and profits for the organisation – are considered at every stage of the project.

This fact was repeatedly stressed in this study. The respondents, who took part in the focus study, saw positive relations with stakeholders as the source of success of each project.

It would be worthwhile, once the pandemic has subsided (and this is the authors' intention), to conduct a similar focus study in the other countries where projects have been and are being implemented. It would then be worth comparing the results, in terms of impact and strength, and the types of stakeholders in the projects.

The authors also intend to extend the survey to identify barriers that hinder cooperation between stakeholders and different actors in projects. This will tie the whole study together and make it complete.

6. Summary

An effective management policy for projects based on sustainability is founded, among other things, on an intentional stakeholder analysis. It should be adapted not only to the environmental conditions and stakeholder expectations (in the case of the projects concerned, they are the owners and managers of the tourist facilities), but also to the needs of the social groups that are to varying degrees involved in the activities undertaken as part of a given project.

The importance of identifying and managing stakeholder relations is determined by the research findings presented in this paper, have unambiguously proved that an effective policy in terms of sustainable development activity should be based on intensive actions directed at stakeholders.

This effectiveness is determined, in the opinion of the respondents, by proper and comprehensive stakeholder identification, which is of key importance to the success of any investment. Since the stakeholders had been identified and prioritised at the planning stage, a strategy based on sustainable development was created as a consequence. Its success has been evidenced by, *inter alia*, the attention focused on all the stakeholder groups, with proper priority given to selected stakeholder groups, the taking of remedial action in the case of potentially unfavourable stakeholder behaviour, and the effective use of the activities that contribute to the investment implementation, including the transparency of all project activities and the open communication between the project partners, managers, and the ultimate project users.

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THE USE OF MANAGERIAL DASHBOARDS IN MANUFACTURING COMPANIES

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Purpose: The aim of the publication is to diagnose the level and to assess the possibility of using managerial dashboards created in an Excel spreadsheet to supervise management processes in enterprises.

Design/methodology/approach: The research developed the method of a directed interview with the staff at various management levels. The supervision of technological processes, economic analysis, and the provision of broadly understood services for citizens have been the subject of the research.

Findings: Managers show little interest in improving their employees' analytical skills. Training in this area is not planned and the impact of analytical capabilities of the tools available for the functioning of the company are not appreciated.

Research limitations/implications: The results of the research are not representative, but they encourage the authors to carry out a broader and more in-depth analysis of the existing situation in enterprises.

Practical implications: The research shows the need to rationalize human resources management. This process requires an increased supervision over employee development planning with the use of the appropriate training. This may have a significant impact on efficient management and, consequently, on the company's financial results.

Originality/value: The article is to be an element stimulating the management to more thoughtful activities in the field of selection, training, and use of personnel at various levels of management in the company.

Keywords: dashboards, data visualization, business intelligence, BI.

Category of the paper: research paper.

1. Introduction

Nowadays, it is difficult to imagine a large company or even medium-sized one operating without the support of IT systems. In the case of many enterprises, one of the most popular and most frequently implemented systems is ERP (Enterprise Resource Planning), which in the short term translates into the improvement of management processes, and in the long term may help build a competitive advantage. However, the implementation of the ERP system in many cases has not changed the fact that the production planning itself still takes place in the Excel sheet.

Excel spreadsheet has a wide range of uses in business. It is no different in the field of production planning or services, where - primarily due to its availability, low purchase costs and functionality - it has quickly become the main tool for planning processes in enterprises. The popularity of the use of Excel in enterprises is confirmed by the information obtained from company managers with whom the authors have had a daily contact in the process of teaching IT subjects at practical studies.

According to interviews with company managers, most employees know this tool and use it freely. It enables more advanced users to create an infinite number of algorithms and to manage them thanks to the visualization of results applying manager dashboards. It is the most useful and advanced form of using Excel in enterprises in BI solutions.

A crucial role of managerial dashboards as a tool facilitating the management of manufacturing processes is their use to analyse the company's situation, which allows decision-makers to take necessary actions. At the same time, they constitute a set of information, data analysis and presentation that guide, support the company in carrying out changes, implementing new solutions to contribute both to reducing the existing problems and finding solutions to them.

Traditional forms of conveying information by means of text or numbers turn out to be too slow and not effective enough, as they require too much time from the recipient to read their content. The use of data visualization may turn out to be extremely helpful in solving these difficulties. The conducted research proves that an individual mainly perceives the information delivered to their central nervous system through their eyesight (87%), and 10% through hearing, and only 3% through other channels, such as touch, taste, smell, pain, and heat (Bartos, 2010). The speed of human reading of information written in the form of text, contained in a graphic image and in the verbal form was also examined. It is estimated that the speed of text perception is max. approx. 300 bit/s, while the image perception reaches approx. 10^6 bit/s. (Dudycz, 1998).

The cockpit task is to provide the management staff with immediate information about the base values of indicators and indications of incorrect phenomena occurring in their area of responsibility (Ziuziański, Furmankiewicz, 2014).

To check how the processes of using tools for managing current tasks are carried out and whether the knowledge gained in teaching processes is used for this purpose, pilot studies were carried out in selected facilities.

2. The aim and method of research

The aim of the publication is to diagnose the level and to assess the possibility of using managerial dashboards created in an Excel spreadsheet to supervise management processes in enterprises.

MS Office software has been taught in Poland for many years at the primary, secondary and higher level of the education system. However, the most advanced uses of Excel are only available in technically or field-oriented studies. Therefore, the use of Excel spreadsheet only in its simplest implementations is most often encountered in practice. Regardless of the ERP class management systems used in companies, the practice of supporting decision-making processes with their own algorithms in Excel is frequently implemented by employees.

Object-oriented research in 5 companies was carried out by means of free interviews, targeted at employees participating in the process of organization management at enterprises at various levels, in departments related to the settlement of services with customers, planning, preparation and supervision of the production process, service activities and distribution of services and products. The research was conducted in 2019-2021 in enterprises from the central part of Poland.

3. Managerial dashboards as an analytical tool

The history of managerial dashboards goes back to the 80s and is directly related to the development of Business Intelligence tools. They evolved from the IT systems used at that time to support decision-making, such as: DSS (Decision Support Systems), EIS (Executive Information Systems) or MIS (Management Information Systems). Comprehensive analytical solutions, based on data warehouses and OLAP (OnLine Analytical Processing) real-time data analysis systems, appeared a bit later, only in the 90s. In 1989, Howard Dresner proposed “business intelligence” as an umbrella term to describe “concepts and methods to improve business decision making by using fact-based support systems” (Power, Sharda, 2015).

Business Intelligence is described as a set of techniques and tools to convert data into meaningful information for analysing business by utilizing the use of technology and the Internet (Vercellis, 2009) or as applications and technologies that are used in gathering,

transforming, and analysing data about an enterprise or a concern to provide better decision-making process (Moss, Atre, 2004). The dynamic development of the BI market, as well as the enormous technological progress, contributed to the evolution of dashboards, making them more effective and interactive.

According to Stephen Few's most cited definition, a dashboard is “a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance” (Few, 2009). According to Korczak et al., (2014) a managerial cockpit should meet certain conditions: constitute an analytical and information system supported by management knowledge, facilitate the global supervision of the company's financial situation along with its economic environment, use such architecture and technology which will guarantee further extensions of functionality, ensure ease of integration in the environment of small and medium-sized enterprises, provide users with an intuitive interface, consistent with the best patterns of visual data presentation, gives the opportunity to implement solutions in line with the forecasts and trends in the development of Business Intelligence systems..

BI is to provide simple, personal analytical tools, using an ontology that supports the exploration of data sources, searching for relevant information based on semantic relations and without a priori knowledge of data structures and data access methods.

One of the simplest, but also the most effective forms of information transfer is visualization, as it guarantees proper data understanding by a recipient in the communication system. The most important goal of data visualization is to present them in a way that is readable for a recipient, while explaining the correlations and relationships between them. An unquestionable advantage is the possibility to perform analysis at various levels of detail. Selecting the appropriate form of data visualization, especially in case of extensive data sets or in case of comparing different sets, is a task that requires skills confirmed by experience.

While creating a visualization of information, it is necessary to establish a graphic form that is legible and simple to establish conclusions and to make the best decisions. According to Davenport et al., (2010) data visualisation is important to stay close to data. For example, by looking at a simple graph the decision maker can notice a pattern or relationship. In sales analysis, the technique of line charts is used as the best presenting relationships and trends in subsequent periods. For fast synthesis, bar or line charts would be most appropriate. It is these formats that are most useful for general trends in data placement. However, when the most important task of data visualization is to present a large amount of data that must be easy to read, the best way to do this is to show the values in the form of a table.

According to some studies, a decision-makers typically prefer to look at graphs for trends, but at tables for decisions that required calculation. Presthus and Canales (2015) concluded that a dashboard should contain both data formats if the decision maker's task is complex. When analysing the essence of visualization, the recipient's limitations, education, perception

abilities and the ability to read graphic images are not without significance, because these conditions are the basis of the proper visualization preparation.

The effective managerial dashboard should consist of a reasonable number of elements and does not evoke chaos. Transparency and aesthetics can be achieved using charts, readable formatting numbers, right application of data labels and titles. Successful implementation of the Business Intelligence system is closely connected to the use of its functionality by individual end-users. In practice, this means that the success of the Business Intelligence system implementation is determined by its correspondence with the organization's expectations (Furmankiewicz et al., 2015).

Another important condition in the process of reading information from graphic images is experience. Lack of training with a specific graphic image may result in the inability to properly interpret it. When providing information to employees via the IT system, it is necessary to ensure that they are properly trained in the use of the program, as well as that they accept this form of communication (Ziuziański, Furmankiewicz, 2014).

4. The use of management dashboards in manufacturing companies

Managerial dashboards are a tool that has been used in enterprises for a short time, even though their origins date back to the 90s of the twentieth century, when the first Business Intelligence systems began to appear in manufacturing companies. It is an extremely useful tool in managing a production company and it is certain that in the coming years the number of companies applying such solutions will systematically increase.

One of the dashboard strengths is the ease of presenting data. The excess of information collected in the company very often makes it difficult to have it interpreted, and thanks to data visualization, it can become much easier. The communication of the most important information can be implemented in numerous applications:

- Windows computer desktop – includes icons, the Start button, and the message window;
- Apple Mac Dashboard – provides a handy overview of everyday information such as the local weather forecast, quick notes, and a calculator;
- Filmweb dashboard – allows to personalize the home page of the website and to set appropriate sections and alerts;
- Google Analytics Dashboard – is a web analytics solution that provides a detailed insight into website traffic and the effectiveness of your marketing efforts. This solution allows its user to analyse the above information quickly and correctly, which facilitates making decisions about the analysed website. The user has the full possibility of personalizing the charts, for example, they can set their goals and observe their implementation;

- The panel in mBank – this banking system solution allows not only to configure personal settings, but also to visualize data from the system – account balance, compare expenses, savings, or exchange rates;
- A very good example is COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU), presented by Pisz (2021). It shows both detailed data on cases of infection by a country, a graph of the number of daily cases, as well as the world map with cumulative cases marked.

The dashboard can be used as a tool for analysing the restaurant executives to continuously review menus, activities and promos that have an impact on profits. Through the dashboard, executives can easily make decisions to carry out promotions or activities based on the information displayed. Consumer consumption patterns will continue to change over time; therefore, this pattern needs to be monitored using dashboards. The dashboard allows to calculate the monthly costs incurred by the restaurant, to analyse the most popular menu in the restaurant, to distribute the time of consumer arrivals, to analyse the promotion, etc. (Halim, Halim, 2019).

Another area where dashboards are successfully applied are marketing departments of various companies. It has turned out that the characteristic feature of dashboards, i.e., the use of simplified graphic forms to present data makes it attractive for employees of marketing departments to use this tool to monitor the effectiveness of e-marketing activities. By using dashboards to analyse your web activities, you can leverage the range of key performance indicators available. In case of e-marketing activities, this could, for example, be the average number of visits to a website per hour or the average number of times a particular visitor was visited by a particular identified visitor.

The managerial dashboards used in management accounting focus on supporting decisions related to operational management in the company. The data collected as part of management accounting is to support decision-makers such as top-level managers, directors and managers of sales, procurement, and production in taking the right actions. With the help of a clear graphic form, it is possible to present on managerial dashboards the data that is often difficult for companies to receive. But thanks to a clear interface for management, it is easier to understand the segment analysis of the income statement, it is easier to analyse the break-even point or analyse operational indicators.

It is worth emphasizing that managerial dashboards are highly flexible and can be used in various areas of the company's operations. It can support sales by indicating the number of orders and reservations. It can also be used as technical support and show the number of customers reporting complaints, and how many of the reported problems have been resolved. Another interesting area of application is also the employee affairs department. It may indicate the staff turnover, the number of vacancies a given company manages, and even the employees' satisfaction with their work and working conditions.

5. Findings

5.1. Case study 1

Case 1 is a service company located in the Kujawsko-Pomorskie Voivodeship, employing over 500 people. The company uses the eMedia IT system by LogicSynergy, intended for the water and sewage sector enterprises. The eMedia system has modules fed with data from one common database, based on MS SQL Server. The advantage of the software is the full integration of modules for managing economic, administrative, and technical areas.

The program has been adapted to the needs of each department. It allows to collect readings from devices that enable remote readings in the field, as well as manually enter readings, modify them, issue invoices and corrections, control the information necessary for invoicing and for control purposes (addresses, names, balances, amounts to be paid, overpayments, underpayments). The program is used to perform all basic operations in the enterprise. However, to complete the eMedia system, the data flow is additionally supplemented by the Lotus application that ensures identification, edition, and of document registration.

Generating managerial dashboards is provided by the SmartReporting program integrated with eMedia, which is used to prepare on-line analysis and reports. The research shows that SmartReporting is the basic tool for compiling analytical and managerial data in the examined facility. The tool used does not provide flexibility in changing and unusual situations. Therefore, in the company, employees at various management levels occasionally supplement the analysis with simple Excel implementations. No training concerning improving competences in the use of analytical tools has been planned by the company.

5.2. Case study 2

Case 2 is a company from the eco-energy industry that offers locations, provides documentation development, and provides investment supervision over entrusted projects in the field of construction of photovoltaic farms, agricultural and waste biogas plants, and hybrid solutions. The company employs about 10 people.

In the process of management and supervision, the integrated IT system of ERP class is not applied. The CRM HubSpot program is used for order management, control, and the current report on their status. All data is stored in the data cloud service. Solar farm projects are implemented in ZWCAD, in addition, the Geoportal website, Electronic Land and Mortgage Registers and eBin (power networks) are also used.

The lack of an integrated system results in the episodic creation of statements using a spreadsheet. Employees use the simplest sets and formulas in tables on their own when they need to make decisions. Unlike the direct supervisors, managers show little interest in the more advanced use of Excel licensed by the company. They are also unable to justify the lack of employee training plans in this regard.

5.3. Case study 3

Case 3 is a housing cooperative (HC) in the Kujawsko-Pomorskie voivodship, managing its own real estate and housing cooperatives. The real estate owned and managed by HC is inhabited by tens of thousands of people. In accordance with the adopted Quality Policy, over 130 employees operate under the quality management system EN ISO 9001: 2008.

The use of Papyrus SQL Integrated IT System (IITS) has been recently started, which integrates and streamlines analytical and business processes. The common SQL database is used for the purposes of accounting, billing, media settlements, debt collection, technical service of real estate, creating tax declarations, reporting and communication with contractors.

However, operational data is a subject to a process of multiple input and verification in different places due to the non-adaptation of the new integrated system to all functions in HC. In addition, an older version of the software for servicing the estate administration is run in parallel. Employees at various levels do not have or have very limited access to analytical and managerial tools. The managers indicate a possible improvement of the situation in the perspective of several months, after the planned update and refinement of the new IT system functionality. The inconsistency of the applied solutions is exacerbated by the fact that it is not possible to integrate the IT system with applications for the supervision and redistribution of utilities, e.g., central heating. Consequently, employees settle central heating costs using simple Excel statements, which requires multiple verification and completion of data in the IITS used to generate invoices for tenants. Managers do not feel the need to train employees in the more efficient use of available tools, such as MS Office.

5.4. Case study 4

Case 4 is a company from the fat industry in central Poland, which dominant activity is the production of bottled oils, vegetable fats for bakery and confectionery, and products for the biofuel and fodder industry. The company's activity is based on a fully integrated operating model, containing all the links in the oilseed processing process - from raw material acquisition, through its processing, to the packaging and distribution of products to the end user. This model maintains comprehensive control of the high-quality raw materials used in the production process and the final product.

According to managers, a very important area of managerial dashboard operation is the improvement of decision-making in the analysed organization. The awareness of employees in the field of Business Intelligence is high, because the vast majority believe that BI has a very large impact on improving the decision-making process in the enterprise, as well as on the cooperation of individual departments in the enterprise. One of the most important advantages of BI as tools used in the entire production process is the improvement of cooperation between all participants – departments of a given company, e.g., between the production hall and the maintenance department, or the department responsible for storage, but also the department dealing with company internal logistics. In addition, one of the elements in which management dashboards are widely used is internal and external logistics.

According to the respondents, management dashboards have an impact on the operation of quality control in the company and can contribute to improvement when working with finances and regulating costs of the company, they also have a very large impact on the management of manufacturing processes. The advantage of implementing the tools in question, indicated by managers, is necessary for efficient control of the manufacturing process. In a situation when there is a downtime in the production hall, manager cockpits can be used to efficiently diagnose a problem such as a machine failure, lack of electricity in the production hall, or a sudden lack of required materials. Finding the risk area immediately and neutralizing the problem in an area such as logistics can reduce downtime in the unloading and loading zone, and above all, reduce potential losses for the company, or prevent a similar loss in the future. Employees receive full support in the process of supervision and decision-making based on information from BI systems thanks to the IITS solutions implemented in the company with analytical modules.

Despite the high efficiency of the applied solutions, employees in many situations must use analysis made in a spreadsheet. The extensive scope of analyses and work on data conducted with the use of, for example, MS SQL Reporting Services, integration with various production and logistics subsystems (Quantum Qguar) and occasional reporting in Excel make the managers reluctant to accept such solutions. Therefore, Excel is used often, but in a limited way (without its BI integration capabilities, due to frequent problems resulting from the inability to ensure the consistency of data necessary for audits at different time intervals), and the company does not provide employees with training in this area.

5.5. Case study 5

Case 5 is a wood production company, one of the largest and oldest plants in Poland, employing approximately 240 people. Currently, the company operates in the field of production, processing, refining and sale of wooden products, full range of plywood, phenolic adhesives, foil, and other wooden products. The plant processes from 46,000 to 52,000 m³ of wood per year.

The company uses the SIMPLE ERP class system, which applies accounting and financial modules, fixed assets management, production, warehousing, sales processes and customer service. The solutions used are reporting, not analytical and managerial. The remaining lists, necessary for operational activities, especially those related to the planning and organization of production, are compiled manually. Until recently, they were prepared by the production manager on large sheets of paper, and all calculations were performed on an ordinary calculator. Currently, an Excel spreadsheet is used to a greater extent, in which a management cockpit has been created and appropriate formulas have been prepared, allowing for quick conversion of parameters and data visualization, however, the data for the spreadsheet is not downloaded from any of the existing subsystems, but entered manually.

The knowledge used in this area by the planner was acquired on his own, the company lacks non-production training programs, extending the competences in the field of management or the use of Excel spreadsheet or existing systems to create more advanced statements.

6. Wnioski

The application of management dashboards in the production process can significantly contribute to the success of the companies that use them. It may concern the improvement of many areas of problem solving in enterprises.

Most companies, especially SMEs, collect data manually, using pen and paper, or basic spreadsheets. Business owners are often unaware of the need to implement improvements that can be carried out using their own resources (employees, Office software). Employee training seems in many analysed cases an option, not only not used, but also impossible to apply for various reasons.

The reason for such a situation may be the ongoing investment process adjusting IT systems to the supervision and management of the company. However, practice shows that in many cases such dashboards prepared in the near term, e.g., due to limited financial possibilities, will have to be supplemented with universal tools such as Excel.

It is essential to include the problems that affect enterprises, despite the use of management dashboards. Finding competent employees on the labour market is not an easy task. Only specialists who have extensive knowledge of managing dashboards and efficient detection of problems in the production process can effectively use BI tools.

Unfortunately, the lack of properly trained personnel, and at the same time the lack of plans for training middle-level personnel is the more common situation in enterprises. It seems that the management staff is not aware of the possibility of using Excel and Power BI to create efficient analytical and managerial tools. As a result, employees of lower management levels, due to the lack of system solutions, create their own, often complex algorithms based on office software, but with a significantly different level of functionality from the analytical needs of the enterprise.

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CIESZYN AND ČESKÝ TĚŠÍN MAYORS' MANAGEMENT OF THE PUBLIC COMMUNICATION BETWEEN THE MUNICIPAL AUTHORITIES AND RESIDENTS

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Purpose: To assess the manner and instruments used by the authorities of Cieszyn and Český Těšín for the purpose of managing public communication with residents.

Design/methodology/approach: The research was conducted in the form of an individual in-depth interview with Gabriela Hřebačková, MA, the mayor of Český Těšín (22.09.2021) and Gabriela Staszkiwicz, BSc, the mayor of Cieszyn (28.09.2021).

Findings: Social communication is a multi-layered issue. It can be assessed from the perspective of how it facilitates relaying information to residents and businesses, as well as from the point of view of the effectiveness of the communication between Cieszyn and Český Těšín during the COVID-19 pandemic. The authorities of the cities in question are aware of the challenges they are faced with, and make use of varied forms and instruments of public communication. Their messaging is aimed at various stakeholder groups, including residents, businesses, potential investors and tourists.

Research limitations/implications: The study is worth repeating in the future for the purpose of identifying possible changes in the strategies applied by the authorities of the cities in their communication with residents and other stakeholder groups.

Practical implications: The methods and instruments of social communication, including marketing communication, utilised by the local authorities when communicating with residents, have a significant impact on the image of the cities and their authorities. In addition, during the COVID-19 pandemic, the purpose of communication is to satisfy various vital needs of the residents of Cieszyn/Český Těšín, including healthcare, commuting to schools and work, as well as crossing state borders.

Originality/value: The article illustrates how selected public communication instruments are utilised in Cieszyn and Český Těšín.

Keywords: Public communication in a city, place marketing.

Category of the paper: Research paper.

1. Introduction

The process of communication is analysed by a great many authors from various disciplines. An untold number of its definitions exist, giving rise to differing assessments of how humans communicate with one another as part of society. According to J. Podgórecki, the essence of communication is that it is not a value in and of itself, requiring a receiver to complete and co-create. Its value is incomplete if there is no one to accept, experience and participate in it. This participation is individual and social in nature, and thus individuality combines with generality to shape communication and its perception (Podgórecki, 1998, p. 322).

Communication is also a means of socialisation, enabling individuals with a strong local identity and aliens to familiarise themselves with the environment they are navigating, and if they can communicate, they will be accepted by and integrated into that environment (Heger, 2012, p. 10). Therefore, communication is a determining factor in social integration. In various communication-related situations which occur between people and organisations, it can be noted that it is the form of communication, and not only the relaying of information, which determines whether the act succeeds or fails. Communication skills are also important to public officials and individuals involved in marketing activities. Indeed, society is forced to communicate. The importance of interpersonal and broader social relations cannot be overstated, as they consist in creating, conveying and receiving information. However, we live in a time plagued by an ever-growing paradox: the easier we create and convey increasing amounts of information, the more difficult it becomes to process and understand it. In a time of media proliferation and permanent virtuality, information becomes something external to us, even though we may feel that we are always in control of and benefit from it (Heger, 2012, p. 12).

High-intensity communication may give rise to situations sometimes referred to as information overload. Such situations are commonplace among professionals whose tasks include collecting, verifying, selecting and assessing various information. These include officials, politicians, managers, journalists, scientists and teachers, who, often voluntarily or inadvertently, fall victim to the ease with which excessive public communication can be created and disseminated. In addition, in comparison to a more traditional lifestyle, this phenomenon can be viewed as the entirety of modern civilisation being overloaded (Heger, 2012, p. 21).

The current age is referred to as the age of knowledge and information, and factors which contribute to success include innovation, creativity, mobility and access to information. Moreover, the rapid development of new information technologies has led to profound transformations taking place in the economy, whose manifestations include such terms as the digital, electronic, network and knowledge-based economy (Hajduk, 2019, p. 68). A knowledge-based economy is based on four major pillars:

1. Human capital, which is formed by highly-skilled and well-educated workers who are mobile, are proficient in foreign languages and the use of information technologies, and who are motivated to creatively and effectively contribute to the development of the modern economy;
2. Financial institutions, whose purpose is to provide capital for high-risk economic ventures (i.e. venture capital), which are an inherent feature of an innovation-based economy. These institutions render it possible to commercialise the most promising ideas for innovative products and services;
3. Universities and R&D institutions, without which a modern economy is impossible to build, as they serve as business incubators, constituting the foundations of the economy, able to effectively compete for resources on the global market;
4. ICT infrastructure, which comprises information and communication technologies and the methods used by society and economic entities to adopt them (Ciechomski, 2013, p. 89).

In a knowledge-based economy, the Internet plays a leading role. Its purpose is to build an information society, the main feature of which is the ability to effectively communicate, and thus use a wide spectrum of methods of collecting and processing data and communication tools. In this type of society, computer networks are of tremendous importance, as they provide access to information and opportunities for learning and communicating with an enormous group of users, including institutions and public administration organs. The role of ICT networks and specialised software only grew during the COVID-19 pandemic. During the lockdown period, social communication, including between municipal authorities and residents and as part of the e-learning process in schools and universities, would not have been possible on such a large scale if not for the highly advanced ICT solutions available.

Communication can serve multiple purposes in local governments, including:

- Informational, the purpose of which is to familiarise the addressee with the resources available to the territorial unit, as well as its location and attractions, and consists in conveying information about what the area has to offer;
- Persuading, whose purpose is to convince stakeholders, stimulate particular behaviours, increase the degree to which residents and investors identify with a given destination, and to create desirable attitudes towards the authorities of the territorial unit;
- Promotional, which involves placing the territorial unit's product mix such that it is present in the perception of the addressees of the promotional efforts, and in general also competing for its rightful place, as well as optimal image, in the minds of stakeholders. This issue is analysed in more depth in Szromnik, 2016 (p. 274);
- Educational, which is related to the above functions, while focusing on the learning of expected behaviours by territorial marketing stakeholders;

- Integrating, the purpose of which is to facilitate the relationships between community members – locally, regionally and country-wide;
- Competitive, which refers to the competition between individual territorial units for subsidies, investors, tourists etc. (Kogut-Jaworska, Smalec, 2018, p. 50).

2. Communication in public administration

Modern researchers, economic practitioners and local government members have access to increasing amounts of knowledge and instruments which facilitate the planning and implementation of public and marketing communication. However, the integration of the measures being implemented remains a challenge (Hajduk, 2019, p. 19). The power of local authorities is multiplied thanks to communication, discussions and being aware of their own needs. Social participation, partnerships and mutual engagement become important as a result (Kogut-Jaworska, Smalec, 2018, p. 86). This is because such actions facilitate the identification of resident needs, help create attractive offerings, coordinate the actions of local government staff, satisfy local residents and achieve the goal of developing the city (Kalisiak-Mędelska, Nowak, Król, 2018, p. 29).

Communication is essential for public administration officials, and is an integral part of administrative processes. On the one hand, it provides the information necessary to objectively assess any issues which require solving and make correct decisions, and, on the other hand, it is the primary means of enforcing decisions and influencing and organising residents (Rektořík, Šelešovský, 2002, p. 52). Residents occupy various positions as regards their relationships with the state or local authorities, and the private and public spheres are constantly intertwined in their lives. Political, economic and organisational relationships differ at the state, municipality, city and regional level. These are not only quantitative differences arising from the total area of the territory in question, the number of residents being administered or the size of the office, but also qualitative differences related to the skills, financial and material resources, as well as the means of mutual communications used in everyday life.

In order for communication to be effective, it is necessary to be familiar with the needs, wishes and opinions of residents. It is also necessary to provide them with information about what is happening in the city, to ensure that they are sufficiently informed about the actions and decisions of the administrators. If a resident is not informed about the intentions of the authorities, it is not the fault of that resident, but the authorities. Thus, the latter should opt for content, forms and tools of communication which ensure that it reaches the resident in the right place at the right time, and is intelligible to them (Foret, 2008, p. 370). The resident should know where they can obtain the information they need, and should also know why it is useful. Information relayed by public administrators should be accessible, objective and offer utility in

the decision-making processes of the administrators and regular residents alike. This is contingent upon the access to information offered by the public administration system, the selection of appropriate direct and indirect forms of communication which guarantee that information is distributed in a transparent manner, the monitoring of feedback and ensuring that opinions can be corrected (Institut pro evropskou politiku Europeum [online], 2014).

A range of public administration communication studies were conducted by the Czech Asociace moderně komunikujících občanů a starostů (AMKOS). The institute is a legal entity established to serve as a public utility institution, its main activity being the lay and professional education of society centred around the communication between residents and mayors, primarily in the form of specialised seminars, training sessions and lectures and organising and publishing research and analyses. The name can be translated as the “Association for Modern Communication between Residents and Mayors”. According to a poll conducted by AMKOS and published by Jana Brožková, the majority of Czechs would like to be informed about events happening in their place of residence (Brožková, 2017). As many as 89% of the respondents would prefer it if the city or municipality provided them with information using alternative means, as 80% of them visits the websites of their municipalities less than once per year. Publishing information exclusively on a website or notice board, which meets the legal requirements which apply to mayors, is completely unsatisfactory for residents.

As demonstrated by AMKOS, the connection between residents and municipality and city authorities is paramount. Unfortunately, even in the 21st century, ineffective methods of communication are still in use, and residents must spend time to overcome various obstacles when searching for information on official notice boards, websites and in local bulletins. The majority of the respondents admitted that they did not remember the last time they had visited the website of their city or village, with many respondents reporting never doing it. At the same time, the residents did state that they would like to be informed about what was happening in their municipalities, and that it was important to them.

As far as traditional media are concerned, the residents only regularly perused the bulletin, which was read by 55% of the respondents, while the other 45% never read it. Certain respondents rejected all forms of printed media, either due to ecological reasons or due to the fact that the regular printing and distribution of a bulletin can result in expenses of up to hundreds of thousands of korunas. If given the choice between a printed and an e-mail bulletin, 93% of the respondents would choose the e-mail version, as well as the option of the information being sent to their mobile phones. As many as 79% of the residents stated that they would feel better informed if that was the case.

The residents also emphasised the need to be able to select the type of messages received from their cities and municipalities. Modern communication systems allow for sending messages targeted at selected addressee groups. Residents can select the types of content which they find relevant, and not only in relation to their interests, enabling them to receive messages for dog owners, seniors or families with children, in addition to being able to enter their place

of residence and receive only information pertaining to their area. The residents praised this option primarily because they would be able to receive information about power outages, street renovations, etc. According to the AMKOS study, more than 80% of all respondents would welcome this solution.

It should be noted that, on the one hand, municipalities tend to avoid overburdening the city treasury with resident communication expenses, while simultaneously spending exorbitant sums on local radio stations. A local radio station is not only more expensive, but also less effective considering the lifestyle of young people today, who primarily use social media. In addition, information provided to residents via local radio stations is frequently unavailable in rural areas, and improving radio reception costs hundreds of thousands of korunas. The effectiveness of city notice boards is also limited, especially considering that more than two-thirds of the population commutes to work or school outside of their place of residence, which means that they have limited opportunities to see any announcements. Due to these reasons, residents prefer direct communication which is available in any place and at any time, even during a holiday stay in a different location. According to the respondents, preferred information channels included text messages (64%), as well as electronic municipality bulletins (25%) and smartphone applications (11%). Information deemed valuable included unexpected weather events and other hazards, which could help prevent the loss of life or damage to health or property.

Nearly 90% of the respondents stated that they would like to be included in decision-making processes pertaining to such issues as bus stop renovations, playground construction etc. via mobile phone voting. This demonstrates that programmes facilitating the participation of residents in the management of their city or municipality are held in high regard. Smart cities commonly make use of information and communication technologies to increase the interactivity and efficiency of urban infrastructure and its individual components. In addition, it is important to make constant efforts to raise resident awareness. The idea of smart cities involves rendering urban spaces more amenable to residents, businesses, tourists and the authorities via the implementation of modern digital solutions. Smart cities also emphasise looking after the environment, human capital and businesses. A smart city should operate similar to an effective organism whose individual components work together to ensure harmonious development, leading to increases in functionality and quality of life.

When asked if they would approve of being able to submit civic complaints regarding such issues as illegal waste dumping, wild animals or various other hazards, the majority was in favour of such solutions. This leads to the conclusion that, if local authorities offered residents the ability to participate in improving the quality of life in their communities, treating them as equal partners in solving the problems of their city, then the residents would become more involved in the public life of their little homeland.

3. Information expected by residents

AMKOS expert W. Lukas, in his article “O jaké informace z místa bydliště mají občané největší zájem?”, or “What information from their area are residents most interested in?”, demonstrates that, in general, not all residents are interested in all types of information. Traditional local radio stations frequently broadcast all types of information targeting all audiences, including advertisements and general information which may be irrelevant to residents. Certain residents are satisfied with changes being announced on an official notice board, while others appreciate a new schedule of cultural events, with some residents preferring to join groups centred around hobbies of their choosing, e.g. cycling, angling or regional history. Modern systems enabling direct communication with residents allow for accurately selecting which information and announcements a resident would like to receive. In the aforementioned poll, 647 citizens of the Czech Republic who were interested in receiving information from their municipality to their phone were asked which information was most desirable to them. In line with the expectations, the majority of the respondents, i.e. a staggering 99.5%, would subscribe to receiving emergency information, 88.2% would be interested in being updated on official matters, 80.3% would be interested in cultural events, and more than half (66.6%) of the respondents would appreciate polls and conferences during which they could talk to their councils about certain decisions pertaining to the development of their municipality. In comparison to a traditional referendum, the costs of carrying out a poll or a conference are extremely low.

More than half of all respondents would also be interested in receiving information about events relevant to their interests taking place in the city. As many as 61% of the residents would like to receive information about sports matches and their results. Information for senior citizens was relevant to 60% of the respondents, which completely disproves the stereotype according to which senior citizens are uninterested in modern communication systems due to being unable to use them. Other popular types of messaging included information aimed at families with children, e.g. invitations to exhibitions, fairy tale plays, dragon parades and various other activities. Such information was of interest to 57.5% of all respondents (Lukas, 2016).

4. Public communication from the perspective of the mayors of Cieszyn and Český Těšín

In order to compare the quality of communication in both cities, a field study in the form of an individual in-depth interview was carried out, whereby both mayors were asked a set of identical questions pertaining to the following four topics:

1. Public communication (between the cities and their residents, its forms and tools),
2. Communication between the two cities (Cieszyn and Český Těšín),
3. The quality of public communication management (the instruments used, national projects and programmes to improve quality, assessment of whether the city authorities participated in these programmes),
4. Changes in public communication during the COVID-19 pandemic.

For the purpose of acquiring specific information on the forms and instruments of communication used in these two partnered cities, interviews were conducted with Gabriela Hřebačková, MA, the mayor of Český Těšín (22.09.2021) and Gabriela Staszkievicz, BSc, the mayor of Cieszyn (28.09.2021).

5. Communication between the cities and their residents

The Český Těšín City Hall utilises the local radio to inform its residents about matters relevant to their lives, and also to relay information about cultural events. In addition to this, residents are informed about cultural events via folders sent by mail. A traditional notice board is also still in use. The *Těšínské Listy* monthly magazine is also a rich source of information. More modern sources used by the authorities of Český Těšín include a Facebook profile, websites and cable television, which regularly broadcasts the *Těšínské minuty* programme. The authorities also relay information with the help of the POLAR Moravian-Silesian Regional Television, which broadcasts programmes aimed at specific cities in the Moravian-Silesian Region. Twice every month, it broadcasts programmes for the cities of Karvina and Havířov, which also provide their residents with information about events taking place in Český Těšín. The City Hall also organises discussion forums which can be attended by residents. Two such forums took place in 2019. In 2020, the COVID-19 pandemic rendered it impossible to organise the planned events. This year, however, one such forum took place on 20 September, and was widely considered a success.

As part of the project “Changing Hlavní” (which refers to the altering and modernisation of the city’s main street), polls were distributed among the city’s residents, who were also polled in the streets. The purpose of this was to learn their opinions and involve them in the discussion and decision-making related to the transport-related changes taking place in the city.

In the spring of this year, a poll was conducted as part of what is known as the “Projects from the Drawers” programme. All residents had an opportunity to co-decide which projects should be carried out first. From 1 to 15 April 2021, a joint poll was conducted among the residents of Český Těšín and Cieszyn. The residents of Český Těšín proved to be more involved, with 444 electronic votes cast and 32 paper questionnaires submitted. The winning

project, which received 161 votes, involved expanding a playground to include new equipment for games and entertainment.

Public communication is organised somewhat differently in Cieszyn. The City Office Spokesperson works together with the City Culture Promotion Department, which also comprises the editorial board of the local newspaper, *Wiadomości Ratuszowe*, which is a biweekly publication. The newspaper contains information about current and future events, as well as announcements related to such issues as public consultations, new resolutions, plot sale proposals, and occasionally also recruitment advertisements by the City Office and local businesses. It is a comprehensive source of information on the life of the city and matters which the City Hall deems important for the residents to know about. In recent months, this information has also included announcements related to any vaccinations drives organised in the city.

The city hall also uses more modern forms of communication. It has its own website, as well as a Facebook page, which is titled “Cieszyn robi wrażenie” (Cieszyn leaves an impression). In the past, the city advertised with a similar slogan, “Ciesz się Cieszynem” (Enjoy Cieszyn). The page is primarily focused on cultural events, and is targeted to a greater degree at visitors, particularly tourists. It also contains the *Miasto Cieszyn* folder, which contains information related to transportation, road closures, entertainment and other local events. The mayor of Cieszyn also has her own Facebook page and website. A comprehensive analysis of the communicative, informative and promotional role of websites, as well as the benefits of utilising social media profiles such as Facebook in the electronic communication of city and municipality offices can be found in Kancik-Kořtun, 2017 (p. 165).

The authorities of Cieszyn also organise monthly live streams. Every first Monday of the month at 7 PM, they connect with the residents via the Internet, enabling them to ask questions which are answered by the mayor and her representatives. As a result, the residents can ask for specific information and clear any doubts they may have. The range of questions received by the authorities from the residents is usually extremely vast, primarily pertaining not only to planned and ongoing infrastructural projects, but also the cultural life of the city, social assistance for those in need and various other matters.

6. Communication between Cieszyn and Český Těšín

The two cities are involved in a number of joint projects, which requires effective communication on various levels (Gabryřová, Ciechomski, 2018, p. 97). The most important of these include “Czeski Cieszyn i Cieszyn razem” (Český Těšín and Cieszyn together), the goals of which include developing a shared logo which illustrates the partnered cities' intention to organise joint events. In late September of the current year, the results of the logo

contest were published. The winning entry is a perfect non-verbal depiction of the concept of partnership. Its three colours – white, red and blue, are the national colours of Poland and the Czech Republic.



Another of these projects is aimed at visualising both information centres and ensuring the uniformity of communication related to joint events.

In late 2019, a common strategy was adopted by Cieszyn and Český Těšín. As part of this strategy, six working groups were established, each comprising 7-8 members focusing on various aspects of the partnership, including urban spaces, green areas and safety. Certain groups focus on joint cultural events and other shared projects, in addition to a group tasked with ensuring the quality and accuracy of information relayed to the other city. As an example, if a street is closed for renovation in Polish Cieszyn, this information is relayed to the Czech side so that it can be posted on its Facebook page or in *Těšínskýe Listy*. Another working group is responsible for the marketing efforts of both cities. Traditionally, the Czech and Polish Municipality Councils hold meetings four times a year, in which the working groups report on their activities and achievements. After the official working part is over, the social part begins, the purpose of which is to meet with and better understand the other side.

7. Public communication management quality

The mayor of Cieszyn states that no distinct public communication quality improvement programme aimed at cities and municipalities exists in Poland, however, the city of Cieszyn has been involved in benchmarking for local authorities. The overarching goal of the project is to increase the quality of public services by increasing the effectiveness of existing management systems. The research is conducted by the Silesian Union of Municipalities and Counties. Cieszyn has scored highly in the study, and is among the top performing cities. The efforts of the City Office which benefit the residents are monitored. The Association of Polish Cities, whose membership exceeds 300 towns and cities, also conducted a study on the presence of city and town mayors on Facebook, i.e. what types of messages are published, how many recipients they have etc. Cieszyn compared favourably with other urban centres.

The City Hall is legally obligated to ensure that City Council sessions are available to the public, which is why they are recorded and uploaded to the city's websites. In addition, the authorities strive to reach as broad an audience as possible with regard to public consultations. For this purpose, a project was launched as part of the Norwegian Funds programme, to which Cieszyn applied for participation. Cieszyn was one of the smaller Polish cities to participate, suffering from such major issues as young people leaving for larger cities, an ageing society and other problems which commonly affect provincial areas, including a dire need for rapid infrastructural development. Cieszyn has approx. 35,000 inhabitants, with a relatively large number of senior and disabled residents, as well as individuals who require temporary or regular assistance.

As part of its application process to the Norwegian Funds programme and for the purpose of planning local development, the city authorities launched a wide-ranging consultation project targeting the residents. White tents were set up in the town square in which the mayor and her deputies, as well as the heads of selected departments, including the Municipal Development Strategy Department, the Real Estate Management Department and presidents of city-owned companies, were available at certain hours of the day throughout September, communicating with the residents and gathering ideas pertaining to areas which could potentially be improved in the city, how it could continue to develop, how the residents perceived the authorities' achievements, and what their long and short-term goals should be. These extensive public consultations served as the basis for developing and submitting a project. The project was a success, leading to Cieszyn becoming one of the laureates of the programme. The city received EUR 3.5 million for local development, which is a tremendous success. In addition, Cieszyn is entitled to apply for another EUR 2.5 million to expand its plans.

To ensure the high quality of public communication with stakeholders, the mayor has personally visited key businesses operating in the city in recent months, the purpose being to learn about the problems they are experiencing and their development plans. Over the course of these visits, it was discovered that many businesses find it difficult to recruit new employees. On the other hand, the city features numerous schools, with 4500 children commuting to Cieszyn every day. However, it was determined that upon graduating from secondary school or university, many young people leave the city, which means that the authorities must find ways to demonstrate the potential of Cieszyn to young people, and prove that they can find work in the city as well.

The Czech Republic has implemented its Common Assessment Framework (CAF) programme, which is a total quality management (TQM) instrument developed by the public sector to facilitate quality management. It is utilised to improve the quality of the services and everyday functioning of public sphere organisations, particularly public offices (Oficiální portál Rady kvality ČR). Český Těšín did not participate in this programme, however, and neither does it utilise any quality improvement instruments to aid its operations and communication. Instead, it improves its public communication by ensuring that customers are treated better by the City Office staff.

8. The impact of COVID-19 on public communication

The pandemic has greatly affected the work of the Český Těšín City Office. Its communication with the residents of the city was subject to government restrictions, and was primarily limited to on-line forms. The City Office communicated with its Polish partners regularly once per week, but only remotely. The working groups worked on-line for the entire period, which proved to be less effective, especially in the case of larger group meetings, discussions and in situations when important decisions had to be made.

Polish Cieszyn was among the first cities affected by COVID-19, and was forced to close its schools and certain other institutions. This was an unexpected situation which required completely new forms of communication. From the perspective of the mayor, more frequent communication with the residents was indispensable at the time for the purpose of providing support and assuaging their fears. The flow of information was saturated with inaccurate data on the number of cases, which caused panic among residents. It was very important to explain to them what was happening and what the situation in the city really was. To facilitate this information campaign, for a period of time, the authorities used live streams to communicate weekly with the residents. In addition to this, the city created posters which were placed in every housing block with the help of the Housing Cooperative. The posters offered information on where to acquire face masks and the possibility of food deliveries by the city for those remaining in quarantine who could not rely on a family member to help. Pursuant to applicable law, the city compiled a list of goods which it could help procure during this time. A special hotline with the State Sanitary Inspectorate was established, which offered access to information on the number and names of residents currently in quarantine, and also worked together with the city authorities and the fire department on providing the necessary support. The residents were also informed about the bars, bistros and restaurants which offered food to go or food deliveries. More information on crisis management can be found in Gabryšová and Ciechomski, 2019 (p. 123).

The businesses which were renting their premises from the city were exempted from paying rent. Information regarding the rules of crossing the state border, which bisects Cieszyn into its Polish and Czech parts, was also of great importance during this period. The closure of the border during the pandemic was a painful restriction imposed on the partnership of the two cities, although the collaboration did not cease to function, as the issue of cross-border workers remained to be solved. Voivodeship and state authorities were consulted in this matter. A poll was conducted to help the city authorities determine the scale and nature of the problems affecting those residents of Cieszyn who worked on the Czech side. The authorities communicated frequently with the cross-border workers, and their efforts were viewed favourably as a result.

A new challenge for public communication was organising vaccination drives in the Cieszyn entertainment arena, where 15,000 people were inoculated, including local residents and visitors from the rest of Cieszyn County and other areas.

9. Conclusions

The partnership between the two cities is so advanced that it was not affected even by a change of mayors. “This partnership may become better or worse, but it will continue,” states Gabriela Staszkiwicz, the mayor of Cieszyn. This opinion is shared by the mayor of Český Těšín, Gabriela Hřebačková. The communication styles of the two partnered cities obviously differ in certain respects, especially with regard to the past. In general terms, however, the mayors and the residents alike perceive the Polish and Czech parts of Cieszyn as a unique, single organism, and the lockdown period demonstrated that any restrictions imposed on their mutual relations are detrimental to both parties. This relationship manifested itself in the signs and billboards which appeared during the pandemic on both sides of the River Olza. Written on the billboards was “Stýská se mi po tobě, Čechu”, or “I miss you, Czech”, and, in response, “Chybíte nám Poláci”, or “We miss you, Poles”. During the pandemic, spontaneous initiatives such as this are highly desirable, serving as a symbol of the relationship between the two cities.

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THE ROLE OF INFORMATION IN PLANNING REGIONAL AND LOCAL DEVELOPMENT ON THE EXAMPLE OF DEMOGRAPHIC DATA

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Purpose: The purpose of the analysis is to demonstrate the potential impact of the shortcomings of public statistics collections in the field of application of demographic data to regional and local development planning.

Design/methodology/approach: Taking into account the importance of human capital for the development of modern economies, acquiring information that reflects the demographic reality seems to constitute one of the crucial aspects determining the quality of planning the development of territorial units. The use of indicators relating to the outdated number or structure of the population in the process of diagnosing the baseline situation may lead to incorrect determination of the competitive position of territorial units and to defining development objectives that are an inadequate match to real challenges and needs of the respective territorial unit. This results in the requirement to correct the data on the number of people available in official statistics with data on unregistered emigration or the use of alternative data sets, such as the social insurance records.

Findings: The use of this type of data within the framework of the conducted analysis rendered it possible to identify that the difference between the number of people, as determined on the basis of official registers, and the corrected population status, reaches 2.7-2.9 million people nationwide. Taking this fact into account causes effects in the form of an increase in the value of GDP per capita, both at the nationwide, and at regional scale.

Originality/value: Therefore, it can quite clearly change the assessment of their economic potential, putting them in a more advantageous competitive position compared to other EU regions or member states. Consequently, it creates a different starting point for both defining regional or local development objectives and planning public intervention in line with the theory of change.

Keywords: Regional and local development, strategic planning, theories of change.

Category of the paper: research paper.

Introduction

The importance of access to up-to-date and complete information as a factor preceding decision making connected with planned development is ever more frequently noticed in local government practice. This is evidenced, for example, by the frequent implications of the assumptions of the entrepreneurial discovery process (EDP) in strategic planning processes. Even though this process mainly concerns activities related to planning the development of entrepreneurship and supporting innovative development, as an activity it constitutes a perfect exemplification of the approach consisting in appreciating the importance of knowledge as a factor supporting decision-making. The role of the entrepreneurial discovery concept is to help maximize the entrepreneurial identification of new sources of growth, to ensure systematic observation, identification and evaluation of new business and technology trends, and to encourage companies to share market and technology knowledge with decision-makers (Gródek-Szostak, 2019). This means that the essence of the process is to source the maximum volume of information possible from the environment. At the same time, EDP is an integrative and interactive bottom-up process with participation of representatives from various environments (local government, business, universities, R&D units, social partners), generating information about potential new activities supporting the making or correcting decisions on development directions. This process is a method of conduct directed towards exploiting the potential of many stakeholders in regional development, and the purpose of the implementation of the EDP is to select the most promising areas for the development of the region in the future.

The basis for EDP, apart from the regular and open communication between the stakeholders of the region's economic development, is, however, access to current and, what is equally important, reliable and credible information. Without it, it proves difficult to assess in what direction and whether there are changes at all, foreseen for the respective public intervention. The concept of entrepreneurial discovery is particularly often implemented as part of regional innovation strategies (2030 Lower Silesian Innovation Strategy), but the importance of information manifests itself not only in the EDP. Access thereto is also important from the point of view of assessing the effects of public intervention. The consequence thereof is the inclusion, to the assessment processes of the effects of public intervention, of the concept of "theory-driven evaluation".

The underlying assumption of this model is that any public intervention is based on three types of theory: **base theories, implementation theories, and change theories** (Olejniczak, 2009). The base theories relate to the experience and knowledge of decision makers concerning the mechanisms, paradigms of development and factors causing positive socio-economic change. Based on these premises, they construct their judgment on the direction of the intervention and the rightness of its initiation, and then its implementation in the form of a sequence of technical activities and organization of work within a specific program.

These activities are undertaken with the intention of achieving a specific effect, resulting in the adoption, by the authors of the particular intervention, of a specific assumption about the cause-and-effect mechanism that will be triggered by the designed activities (Ledzion et al., 2014).



Figure 1. General logical diagram of public intervention planned in accordance with the assumptions of the theory of change. Own elaboration.

A manifestation of efforts aimed both at identification of the premises of a given intervention and at verification of the changes that occur as a result of its implementation, is found in the self-government administration taking actions to diagnose the initial or final (desired) situation. Strategic planning is therefore preceded by diagnoses, depending on the scope of the planned intervention, relating to the general socio-economic situation (e.g. for general development strategies) or concerning particular aspects thereof, e.g. innovative potential (for the needs of innovation strategies). The assessment of the effectiveness of an intervention is assessed by identifying changes that take place in the broadly understood socio-economic environment of a given area, including its competitive position. The selection of indicators will depend on the structure of a given intervention and – as the management practice in local government administration demonstrates – they will also be related to its objectives (2030 Lower Silesian Innovation Strategy; Development Strategy of the Greater Poland Voivodeship until 2030). These measures form part of a wider monitoring and evaluation system aimed at providing feedback on the degree of implementation of the actions planned in the respective strategy, the achievement of its goals and the changing needs of intervention.

The objective of the present article is to demonstrate the potential impact of the shortcomings of public statistics collections in the field of application of demographic data to regional and local development planning. Taking into account the importance of human capital for the development of modern economies, acquiring information that reflects the demographic reality seems to constitute one of the crucial aspects determining the quality of planning the development of territorial units. The use of indicators relating to the outdated number or structure of the population in the process of diagnosing the baseline situation may lead to incorrect determination of the competitive position of territorial units and to defining development objectives that are an inadequate match to real challenges and needs of the respective territorial unit.

Strategic planning of local and regional development

The individual towns or regions, based on their resources and needs, enter into competition on various levels, such as: investment attractiveness, development of transport infrastructure or shaping the standard of living of their residents.

In the context of resources it is necessary to recall the approach (Sekuła, 2008) according to which spatial units do not differ from enterprises in certain spheres of their operation. Both are focused on increasing operational efficiency and customer-oriented (this pertains to both internal and external customer) in creation of products and services. They use similar techniques and tools for influencing customers and operate under the conditions of competition. This observation leads to the issue of competitiveness, which – as is well known – has entered practically all areas of activity. This also relates to those areas that are by nature not focused on achieving economic effects, such as healthcare or the activities of non-profit organizations. The latter group also includes territorial units, the functioning of which is also not aimed at generating profits, although their activities, at least to some extent, are also determined by economic calculation¹.

Achieving the set development goals is very broadly conditioned, and the determinants of effectiveness in this area should be perceived both in the environment and the activities (properties) of local government administration. In the first context, the COVID-19 pandemic and the related limitations in economic activity, which significantly contributed to the slowdown in development processes, provide an excellent illustration. While the prospects for economic growth were generally positive until the beginning of 2020, in the subsequent months the situation changed. The progressive development of the SARS-CoV-2 epidemic meant that in many countries around the world the authorities decided to implement the so-called lockdowns, i.e. limitations of the manifestations of socio-economic life. This triggered negative economic effects that also affected the territorial units and their ability to meet previously planned development goals related to, for example, the development of entrepreneurship. Once we add the growing unemployment or a reduction in income to the budgets of local governments from PIT and CIT, which is not only the result of the pandemic, but also of the changes introduced in the tax ordinance (Bazylak et al., 2020) to this general picture, then the prospects for maintaining the effectiveness of local government actions in terms of creating

¹An indication of the importance of the economic calculation for the evaluation of the functioning of local government units is the application of the instrument called **Multiannual financial forecast (WPF)**. For local government units the WPF is an instrument of long-term financial planning. WPF includes the forecast of, among others such budgetary parameters of a local government unit as: *current income and current expenditure of the budget, income from assets and asset expenditure of the budget, budget result with an indication of the allocation of the surplus or the methods for financing the deficit, or budget revenues and expenses, taking into account the debt incurred and planned to be incurred*. Long-term financial forecasts are prepared pursuant to art. 230b of the acts of 27 August 2009 on public finance (Journal of Laws of 2019, item 869, as amended) and the Regulation of the Minister of Finance of 10 January 2013 on the long-term financial forecast for a local government unit (Journal of Laws of 2013, item 86, as amended).

conditions for achieving development goals at the level from the pre-pandemic period seem to be very challenging. The COVID-19 pandemic is evidently not the sole example of the impact of external conditions, but due to its topicality it seems to be an example worth mentioning.

In the context of internal conditions of the functioning of territorial units, it should be undoubtedly emphasized that effective administration takes place through efficient and effective management, which is the ability to respond quickly and effectively to the emerging social and economic challenges and apply the available knowledge and experience (Urbaniak). Such an approach is close to the managerial approach that emphasizes the importance of professional management, which has an impact on the improvement of the effectiveness of the functioning of public administration. In this approach, a qualitative improvement of management may occur through the absorption of market mechanisms and management methods and techniques that are widely applied in the private sector into the public sector, as well as the administration's focus on effectiveness, economic efficiency, quality and results orientation (*New Public Management*) (Młodzik, 2015).

Achievement of this type of effects proves impossible without access to information that reliably describes the socio-economic situation that is subject to activity in form of public intervention. A particularly significant role is played by current statistical data, which, on the one hand, enable planning interventions that are adequate to actual needs, and, on the other one also allow to evaluate its effects. This approach is in line with the assumptions of the increasingly popular approach in the field of *evidence-based policy* (EBP). This approach assists informed decisions about policies, programs and projects by bringing the best available research evidence to the heart of policy making and implementation (Davies, 2004). The context for the establishment of the EBP is the development of the concept of a knowledge-based economy, knowledge management, new public management and evaluation of public policies. All the aforesaid concepts have many common areas and concern the issues of information and knowledge in an organization (Józefowski, 2012).

The significance of demographic data in the application of base theories

The scope of data used both to identify development needs and to assess the impact of an intervention is, as already mentioned, wide and will depend on the scope of the planned intervention. It can refer to economic and social phenomena, but also to environmental protection and infrastructure. Demographic data may play a special role in this regard. Its importance in strategic planning processes results primarily from the fact that they can be applied both at the stage of initial diagnosis, and during verification of the effects of an intervention. In the first context, attention should be paid to the broadly understood role of human capital as a factor determining the competitive potential of regions in the conditions of

knowledge-based economy (KBE). KBE is a new economy based on the comprehensive use of knowledge and information, further characterized by the dominant share of the service sector in generating GDP and employment (Skrzypek, 2011). The role of knowledge and information, and therefore, indirectly, that of human capital, is also indicated by the approach of the Organization for Economic Co-operation and Development (OECD), according to which knowledge-based economy is one directly based on the creation, transfer (distribution) and use of knowledge and information.

Bearing in mind that development towards KBE remains a kind of necessity, the diagnoses in relation to human capital also acquire a basic character. In addition to qualitative diagnoses, related for example to the analysis of broadly understood competences, which are important, e.g., from the point of view of creating conditions for economic development, it is also important, or at least should be treated as such, to identify human capital resources in terms of quantity. This kind of information reflecting the actual condition of the said phenomenon is valuable for the identification of the competitive position, especially in those situations, where the measures are based on references to the population. This applies, for example, to statistical data presenting extracts of economic life conditions per population, such as GDP *per capita* or the number of entities entered in the REGON register (Polish statistical register of enterprises) per 10,000 population.

At this point, it is necessary to stress an important aspect related to the identification of the population number. What is publicly available, and applied to both the baseline diagnoses and evaluation of effects of public information are the data from Statistics Poland (GUS) that are recorded pursuant to official registers and IT systems of public administration. Therefore, they refer to the place of registered residence of a given person, while failing to take into account the actual place of their residence. This has important consequences, as the lack of legal consequences related to the failure to comply with the registration requirement² results in a situation of lack of unambiguous data on the distribution of the population. This can be linked, among others, with the phenomenon of foreign migration. It can be assumed that some people remain abroad for many years, often without plans to return. As long as they are still registered in the population records in Poland, they are included in the official statistics provided by Statistics Poland. As a consequence thereof, they thus appear in all types of registers forming the basis of all kinds of diagnoses undertaken for the purposes of designing (base theories) or

² Pursuant to art. 24 s. 1 of the Population Register Act, a Polish citizen residing on the territory of the Republic of Poland has the so-called registration obligation, which consists in: registering at the place of their permanent or temporary stay, de-registering of the place of permanent or temporary stay or reporting a trip outside the territory of the Republic of Poland and returning from a trip outside the territory of the Republic of Poland (such notification results in de-registration). Furthermore - in accordance with art. 36 of the aforesaid act, a Polish citizen who leaves the country with the intention to reside permanently outside the territory of the Republic of Poland is obliged to report his or her departure, which results in their de-registration from the place of permanent and temporary stay. In the case of departures without the intention of permanent residence, but still for a period longer than 6 months, they are obliged to report both their departure and return (Act of 24 September 2010 on population records, Journal of Laws of 2021 item 510, 1000).

evaluation (theories of change) of public interventions. When we perceive this issue through the prism of the category of building regional or local competitive potential on the basis of realistically available resources, we should remain aware that the use of this type of data carries the risk of incorrect inference about the actual state of the analyzed phenomena in the aforescribed context related to the human resources.

The aforescribed aspect of demographic data can be viewed in the context of population data from both the perspective of entire country and the individual regions. In both cases, the determinants of demographic processes are similar, although in the case of the regional perspective, internal (interregional) migrations play a greater role, whereas in the second, this is taken over by international migrations (apart from issues related to natural movement of the population, of course). Regardless of the spatial perspective, the use of data based on official registers may lead to an underestimation or overestimation of the population. This, in turn, renders a false image of the population potential of the affected area, and then influences the values of related factors, which produce the image of socio-economic life.

Rendering demographic data more realistic as a factor in verifying development potentials

The need for a cautious approach to demographic data and verification of the actual number of inhabitants was also noticed in the practice of regional development management. An example is the 2018-2019 project of the Opolskie Obserwatorium Terytorialne entitled *Programowanie działań minimalizujących skutki depopulacji na przykładzie województw: opolskiego, świętokrzyskiego i warmińsko-mazurskiego* [Programming activities minimizing the effects of depopulation on the example of the following voivodeships: Opolskie, Świętokrzyskie and Warmińsko-Mazurskie]. The project was implemented in partnership with the following voivodeships: Świętokrzyskie and Warmińsko-Mazurskie. Its objective was to outline, plan, estimate, develop and popularize ways to implement solutions (remedial actions) that minimize the effects of depopulation in the following voivodeships: Opolskie, Świętokrzyskie and Warmińsko-Mazurskie, in the perspective of 2030³. The implementation of the project was conditioned by the awareness of voivodeship self-governments – project partners, concerning the depopulation processes that they were at risk of. Therefore, it fitted the context of base theories by providing information required to plan public intervention aimed at counteracting depopulation and its socio-economic consequences. In addition, due to the fact

³ The project was commissioned by Opolskie Obserwatorium. The author of this article was also a participant thereof. The research work resulted in two diagnostic reports and a recommendation report for each of the regions covered by the analysis (voivodeships: Opolskie, Świętokrzyskie, Warmińsko-Mazurskie) – cf. <https://www.opolskie.pl/projekt-partnerski-programowanie-dzialan-minimalizujacych-skutki-depopulacji-na-przykladzie-wojewodztw-opolskiego-swietokrzyskiego-i-warmińsko-mazurskiego/>

that a recommendation component was included in the said study, the project also implemented the assumptions of the implementation theory (Fig. 1).

One of the elements of the study was to outline the initial situation of the regions subject to the analysis, both in terms of the current state and the forecast prospects related to population changes. For this purpose, the validity of forecasts elaborated by the Statistics Poland, with regard to changes in the population number, was verified. This process was carried out in two stages. In the first place, it was typically mathematical in nature and it boiled down to the development of an approach that could be applied at various levels of administration – i.e. at the national, as well as regional and local levels. The second stage, which took the issue of undeclared migration into account, was more significant. The issue of undeclared migration in the context of its significance for the estimation of the population number is dealt with on the basis of research and development (Jończy, 2014, Śleszyński, 2016).

As indicated in the preliminary report II prepared as part of the above-mentioned research project commissioned by the Opolskie Voivodeship, despite great difficulties in calculating the scale of the phenomenon of unregistered migration, it is possible to make estimates based on the results of other studies and supplementary data (e.g. the number of people covered by NHF insurance) (Bukowski et al.). The fact that a large group of people is not deregistered due to foreign emigration and that it is included in the statistics has two effects on the results of the elaborated demographic projections (Śleszyński, 2014). First, the baseline forecasts are overestimated in relation to the actual population. Secondly, the overestimate in population will have a correspondingly negative impact on the number and structure of demographic events in the future.

On the basis of these assumptions, as part of the aforementioned research project, a correction of the method of calculating the population number (including forecasts) was developed. The formula used to determine the adjusted population status at the voivodeship level is presented below:

$$\begin{aligned} \text{Skorygowany stan ludności } w &= \\ &= \text{ludność GUS } w - \frac{\text{liczba ubezpieczonych NFZ}_w - \text{ludność GUS}_w}{\text{liczba ubezpieczonych NFZ} - \text{ludność GUS}} \\ &\quad * \text{ emigracja nierejestrowana} \end{aligned}$$

where:

w – index denoting individual voivodships,

Skorygowany stan ludności w – population size including the phenomenon of unregistered emigration in the voivodeship *in* a given year,

Ludność GUS w – population according to GUS in the voivodeship *in* a given year,

Ludność GUS – population according to GUS in the country *in* a given year,

Liczba ubezpieczonych NFZ w – number of people insured in the National Health Fund in the voivodeship in a given year,

Liczba ubezpieczonych NFZ – the number of people insured in the National Health Fund in the country in a given year,

Unregistered emigration – the number of people staying outside the country for more than 12 months in a given year.

The presented approach to estimating the population is based on the use of two types of data: the number of people insured in the National Health Fund and the number of people staying outside the country for more than 12 months (the scale of the phenomenon of unregistered emigration). Data on international migrations comes from the Labour Force Survey (LFS – Polish acronym BAEL). The following assumptions were made for estimation of its scale:

- some 80% of people staying abroad for more than three months stay there for more than 12 months,
- 65% of this number will remain there permanently,
- we assume the number of 0.75 child per person (or 1.5 children per couple).

The most recent data provided by Statistics Poland on the scale of international migrations comes from 2019. For the purposes of the present analysis, we adopted the time period of 2017-2019, for which the scale of unregistered migration related to foreign migrations was calculated. It made it possible to calculate the population size adjusted for the phenomenon of unregistered emigration (Table 1).

Table 1.

Correction of population of Polish voivodeships, taking into account the phenomenon of unregistered migration

Voivodeship	Population status according to Statistics Poland (thousands)			Population status adjusted for the phenomenon of unregistered emigration (thousands)		
	2017	2018	2019	2017	2018	2019
Dolnośląskie	2902.55	2901.23	2900.16	2650.24	2661.73	2669.08
Kujawsko-pomorskie	2082.94	2077.78	2072.37	1910.34	1907.05	1898.58
Lubelskie	2126.32	2117.62	2108.27	1975.92	1967.92	1955.25
Lubuskie	1016.83	1014.55	1011.59	925.86	926.68	923.49
Łódzkie	2476.32	2466.32	2454.78	2331.24	2327.16	2319.65
Małopolskie	3391.38	3400.58	3410.90	3148.14	3168.43	3185.83
Mazowieckie	5384.62	5403.41	5423.17	5104.91	5142.62	5182.03
Opolskie	990.07	986.51	982.63	876.27	876.44	874.08
Podkarpackie	2129.14	2129.02	2127.16	1945.31	1947.06	1945.05
Podlaskie	1184.55	1181.53	1178.35	1079.72	1079.60	1076.84
Pomorskie	2324.25	2333.52	2343.93	2123.74	2141.80	2158.27
Śląskie	4548.18	4533.57	4517.64	4223.49	4216.62	4203.41
Świętokrzyskie	1247.73	1241.55	1233.96	1149.83	1145.01	1136.47
Warmińsko-mazurskie	1433.95	1428.98	1422.74	1288.54	1283.38	1274.82
Wielkopolskie	3489.21	3493.97	3498.73	3281.48	3296.86	3305.32
Zachodniopomorskie	1705.53	1701.03	1696.19	1529.53	1529.80	1527.40
Poland	38 433.57	38 411.17	38 382.6	35 544.56	35 618.16	35 635.58

Source: own elaboration based on the data of Statistics Poland and NFZ.

As can be seen, there is difference between the number of people determined on the basis of official registers and the population adjusted for the phenomenon of unregistered emigration, and this difference amounts to 2.7-2.9 million people nationwide. Obviously, unregistered emigration does not exhaust the spectrum of factors affecting regional differences between the actual population and the number determined on the basis of official registers. What is also significant in this context, are the unregistered interregional migrations, which significantly modify the number of people in the respective regions. The data on registered migration provided by Statistics Poland (GUS) show that the directions of interregional population flows are related to economic issues – migration flows are most strongly affected by relative wages, and outflow by the relative unemployment rate (Szczepaniak, Tokarski, 2018). We assume that we deal with similar conditions in the case of unregistered migration, as a result of which economically stronger regions will be characterized by a population greater than that indicated in official statistics, as well as adjusted population levels.

Consequences of the verified demographic situation for planning local and regional development

The effects of making the number of people living in a given area more realistic should be perceived very broadly. The socio-economic consequences that may occur depending on the changes in the population number can be traced in various development areas, such as:

- **labour market** – as migrations are currently one of the important factors of population decline/increase, therefore the areas experiencing the outflow of population are largely losing people of working age, which is accompanied by a rapid decline in the number of young people and a rapid increase in the percentage of seniors in the population structure, which in turn affects other areas, such as the healthcare system;
- **healthcare** – the main consequence of the processes of population decline and the accompanying changes in the age structure of the population is the need to change the profile of medical services provided in connection with the changing epidemiological situation, which is the result of the growing demand for health services related to the aging of the population;
- **social and family policies** – the main issues in the field of social and family policies, particularly in the areas experiencing an influx of new inhabitants in the result of migration, include the issues of access to educational (nurseries and kindergartens) and care infrastructure;

- **senior policy/silver economy** – linked with the outflow of people of working age towards more economically developed regions, results in the need to reshape the economic system towards the so-called silver economy. It takes into account the special consumption and lifestyle patterns of older generations;
- **education and higher education** – in this case the greatest impact of the outflow on the functioning of education and higher education in the case of the source areas for economic migrations will occur in relation to financial and organizational areas (e.g. resulting in the need to maintain school facilities with a decreasing number of children);
- **quality of life** – this is a very broadly interpreted aspect. Changes in the population size affect the consumption potential of an area, the attractiveness of the respective market for suppliers of certain specific goods and services, or the potential of the real estate market. They also require actions with regard to public transport connections (their liquidation or creation) or the availability of public services (educational, health and cultural establishments) (Bukowski et al.).

Each of the above-mentioned areas may be the subject of influence in the processes of regional or local development planning. The starting point for planning interventions in particular scopes remains, however, striving to identify real states in terms of demographic data (base theories – see Fig. 1). Apart from the applications in the area of regional or local potential diagnosis, the adjusted demographic data can also be used to assess the competitive position of the respective area. As aforementioned, it is particularly important in cases where the indicators are based on references to the population.

For the purposes of this article, we adopted the measure of gross domestic product per capita (GDP per capita). For this purpose, first, we recalculated the values of GDP per capita for the population adjusted for the phenomenon of unregistered emigration. As shown in Table 2, the value of this indicator increased by approximately EUR 800-900, which translated into an increase by one position in the ranking of EU countries. It is worth emphasizing, however, that in the case of the remaining countries, no adjustments were made to their populations. We should bear in mind that the migration processes are governed by similar rules as those referred to in the case of Polish regions. As a result, a significant part of the EU member states are migration destinations, being more economically attractive. In the result, their population may be actually larger than it results from official statistics, which may additionally lower the value of GDP per capita.

Table 2.

Value of GDP per capita for Poland, depending on the method of counting the population, and its ranking position among EU member states

	GDP per capita (euro)			Poland's position among the EU member states		
	2017	2018	2019	2017	2018	2019
For the population according to GUS data	12 309	13 109	14 052	24	24	24
For the population adjusted for the phenomenon of unregistered emigration	13 150	13 977	14 974	23	23	23

Source: own elaboration based on Eurostat data.

Table 3.

Ranking of voivodeships among EU regions according to per capita value of GDP

	prior to correction of their population		after population correction	
	2017	2018	2017	2018
Dolnośląskie	194	192	184	186
Kujawsko-pomorskie	218	218	217	217
Lubelskie	230	231	226	229
Lubuskie	216	217	214	213
Łódzkie	210	208	203	205
Małopolskie	212	209	204	206
Mazowieckie	162	160	156	156
Opolskie	219	219	215	214
Podkarpackie	229	228	223	224
Podlaskie	225	226	220	221
Pomorskie	207	204	197	197
Śląskie	198	197	195	193
Świętokrzyskie	227	225	222	222
Warmińsko-mazurskie	228	230	221	225
Wielkopolskie	195	194	190	192
Zachodniopomorskie	215	215	212	210

Source: own elaboration based on Eurostat data.

A similar procedure of determining the competitive position according to the value of GDP per capita was also performed in relation to Polish regions. Due to the relation of the GDP value to the corrected population number, their ranking position improved depending on the year and the voivodeship by up to 10 positions. Evidently we should bear in mind, again, that the population adjustment was made only in relation to Polish regions, nevertheless it demonstrates that it can quite clearly change the assessment of the economic potential of regions, putting them in a more favourable competitive position, and consequently creating a different starting point for planning public intervention.

Conclusions

The conducted analysis demonstrated that the issues of modifying the approach to population determination are or may be of significant importance in the context of regional and local development planning. Relying on official registers carries the consequences of underestimating or overestimating the number of people actually living in a given area (base theories), and this in turn causes errors in the development planning process, both in terms of tools for influencing socio-economic phenomena and processes (implementation theories), and the expected results (theories of change). Relying on official statistics is, nevertheless, treated as an obvious necessity, if only due to the availability of data. In doing so we should bear in mind that administration has tools available to make the data concerning the actual number of residents more realistic.

One of the possibilities is the approach proposed in this article based on the number of people insured in the National Health Fund and data on foreign migrations. This approach may be applied not only at the national or regional level, but also at the local level. In this case, the correction of the base population number for individual municipalities or poviats is performed in a proportional manner (weighted by the number of inhabitants in individual municipalities according to the Statistics Poland) (Bukowski et al.). Although these data do not take into account the effects of interregional migrations or – what is also significant at the level of municipalities and poviats – intra-regional migrations, they still render a more realistic picture of the demographic situation. Another method is to use the ZUS data concerning the number of insured persons (Śleszyński, 2011) or the registers of the National Electoral Commission (Bijak et al., 2007).

The aforementioned adjustment of the demographic situation is important in the context of development planning. The aspects of the impact of the population on the socio-economic life mentioned in the article (and it is worth adding that the presented set is not exhaustive) constitute potential areas that may be affected by public intervention. However, in order for this influence to be effective, it becomes indispensable to acquire knowledge that reflects the real picture of the initial situation. Only this renders it possible to define real directions of change and propose ways to achieve them.

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THE ATTITUDES OF YOUNG POLISH CONSUMERS TOWARDS ENERGY COSTS OF SMART PRODUCTS

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Purpose: The attitudes of young Poles towards smart products and their relationship with the costs of energy supplying smart products are the main research objects in this paper. The smart products market is developing very dynamically, including both simple everyday utility products and durable goods with a significant unit value. The authors point out the existence of a cognitive gap regarding the connection between attitudes towards smart products and attitudes towards using electricity. The authors emphasize that the use of smart products requires universal access to the possibility of topping up these products.

Design/Methodology/Approach: The research was conducted on a group of young Poles in 2021 as online questionnaire. The study aims to diagnose the attitudes of young Poles towards the location of power sources for smart products and the formalization of access to this power (determining the payer), which will allow in the future to conduct educational activities in the field of optimizing the use of natural resources (energy) as well as marketing activities of smart product suppliers.

Findings: The results indicate disproportions in the knowledge and attitudes of young Poles towards costs of energy supplying smart products. Research hypotheses were positively verified. Young consumers do not see energy for smart products as “something” that has a price and must be paid for (access to it).

Practical Implications: The conducted research shows that young buyers are not conscious energy buyers and are not aware of the costs of purchasing energy. Moreover, according to the respondents, both now and in the future, access to electricity (sources of energy) that allow powering smart products should be free and universal. Electricity is a product that has a price, and most likely the cost of energy will increase. Hence, it is important to conduct campaigns to make young consumers aware of the cost of energy and the relationship between the use of smart products and energy costs.

Originality/Value: The presented results refer to pilot study in Poland. According to the authors, they have a high level of originality, as there are no previous studies in this area known. In turn, the social and economic problems related to the amount of energy consumed and its costs is a civilization challenge across the world.

Keywords: energy costs, smart products, young consumers, Poland.

Category of the paper: Research paper.

1. Introduction

Smartphones, i.e. multifunctional devices that have replaced traditional telephones, are an example of a new product category called smart products. This category, as will be discussed later in this paper, covers a wide range of products, but the common feature that is the focus of this paper is that they require the use of electricity. Electricity is a market product that has a price, but access to this product is specific - it is "invisible". Plug the cable into the socket and it's done!

Since in the process of socialization a person gets used to the market behavior, according to which receiving a product or service requires paying for it, a person (including young customers who are in the center of interest in this paper) is aware of the costs of obtaining products that meet his needs. The authors of the presented study put a question:

"Are young people aware of the costs of obtaining energy?"

At the same time, electricity is a product related to environmental protection issues, hence the next research question is:

"Do young customers perceive a relationship between the use of smart products (requiring electricity) and environmental protection issues"?

The issue of pro-ecological customer attitudes in various age groups has been of interest for many years. There are also several studies on the pro-ecological attitudes of young buyers. The research focuses mainly on waste segregation, the use of disposable packaging (mainly plastic bottles), and supporting the development of renewable energy.

Analyzing the literature, no studies dedicated solely to the attitude of young buyers to electricity were identified, including the costs of using energy in a household, the costs of using energy as an element of product use. In this context, the authors intend to try to fill the research gap in this area.

The research aims to diagnose the attitude of young Polish consumers to the costs of electricity, in particular, to identify the perception of the costs of energy supplying smart products. In this research project, the authors present these attitudes as an element of purchasing attitudes and analyze them in connection with the pro-ecological attitudes of young consumers in Poland.

The conducted research shows that young buyers are not conscious energy buyers and are not aware of the costs of purchasing energy. Moreover, according to the respondents, both now and in the future, access to electricity (sources of energy) that allow powering smart products should be free and universal.

In addition, the research results allowed the formulation of methodological recommendations for future research on the relationship between smart products and electricity. According to the authors, this will allow for the development of future research in this area and the formulation of practical recommendations supporting the development of smart products.

2. Smart products

The term “smart product” has become popular in everyday life among technology experts, scientists, also politicians. As the idea of smart products is interdisciplinary, the concept itself develops in close relation to the terms like the Internet, the Internet of things, new technologies. In general terms, a smart product is linked to the Internet and it allows the exchange of information about its users, environment, and about the product itself. The group of products that are called smart is very broad: from industrial equipment, home appliances, medical equipment, motor vehicles, to even smart packaging that can report on the location and condition of the product it protects (e.g. RFID systems used in retailing). The popularization of the use of products that we have defined as smart prompted researchers to scientific interest in this product category. The term "smart" is also used differently, e.g. "smart city". At the same time, the smart city fits in the broadly understood context of our research, because it is a concept about the use of information and communication technologies to increase the efficiency of urban infrastructure.

As Porter and Heppelmann (2014) defined, smart, connected products have three core elements: physical components, “smart” components, and connectivity components. Physical components comprise the product’s mechanical and electrical parts. Smart components comprise the sensors, microprocessors, data storage, controls, software, and, typically, an embedded operating system and enhanced user interface. In many products, software replaces some hardware components or enables a single physical device to perform at a variety of levels. Connectivity components comprise the ports, antennae, and protocols enabling wired or wireless connections with the product.

Raff, Wentzel, Obwegeser (2020) have made a comprehensive conceptualization of smart products and, in addition to a broad review of the subject literature, they presented four distinct archetypes: 1/ digital, 2/ connected, 3/ responsive, 4/ intelligent. The mentioned authors emphasized that smart products are cyber-physical products that not only possess software-based capabilities but have a distinct material nature.

It is not the purpose of this paper to analyze smart products as such. Although the topic is very interesting, it will not be discussed further. Interest in these products results from the dynamic development of this category and its entry into areas of life that were diametrically different in the past (not related to the use of modern technologies). Smart, connected products are emerging across all manufacturing sectors. What is of particular interest to the authors of this paper, these products have one thing in common – the need for the use of electricity. These products do not exist without access to energy. And this is the main focus of this study. The authors additionally pay attention not so much to the connection with the use of energy, but to the fact that the possibility of using these products depends on access to energy. Therefore

we underline that the common feature of all these products is the addiction to access to electricity.

Additionally, according to the authors of this study, an important feature of smart products is the combined physical and non-material form of the product, connection with software as an inseparable element enabling the use of the product, connection to the Internet (more and more smart products require constant access to the Internet; many smart products can also function in offline mode).

And regardless of whether the smart product is a "regular" phone – a smartphone, an electric scooter that can be rented freely in the city, an electric bicycle, a pressure monitoring wristband, a Thermomix cooking device, credit card, or a different cashless payment system, a complicated smart home system or navigation, allowing you to quickly find the right way to your destination, all these products have one thing in common – using them requires power – energy. They need to be charged, plugged in. Some of these products have their power source, allowing them to function autonomously (battery), but even in this case, the time of its operation is limited and the battery after discharging requires replacement or (more often) recharging. To sum up: smart products depend on access to energy. There are no products on the market that would "charge themselves" and work as a kind of perpetual motion machine. Energy, in the sense of electricity, has become an inherent element of using smart products.

Therefore, as mentioned earlier in the paper, the general question posed by the authors is: are the users of smart products aware of the connection between the use of smart products and energy costs?

An important argument for researching smart products is their importance for the young generation. Behavior and consumption habits change with each generation. The currently observed trend is not only the dynamic increase in the importance of technology products related to IT and the Internet (i.e. "smart products"). The age at which children initiate the use of IT technologies is decreasing. According to research conducted in Poland in 2021, 41% of children started using a mobile phone at the age of 7-8, and 11% at the age of 5-6 (Report: *Badanie...*, 2021). In turn, in 2019 research was carried out in Polish schools of various types, from primary schools (including children from 6 years of age) to secondary schools (young people up to 19 years old), indicating that almost 94% of young people use a smartphone. Young people spend an average of 4.2 hours a day using the Internet (Report: *Nastolatki 3.0*, 2019). The youth from secondary schools (15-19 years old) attended on average 4.5 hours and younger children, from primary schools (6-14 years old) – 4 hours on average. So it is visible that the young generation is brought up in the company of constant access to the Internet, of which 65% declared that they listen to music in this way, 62% - watch movies, 61% - contact friends and family, 59% use the media social networks and over 50% do their homework.

Since children are brought up today with constant access to the Internet, they are surrounded by products that are directly related to this access, and as young adults, they will also represent such behaviors.

Once again, however, we return to the question already posed: are the young users of smart products aware of the connection between the use of smart products and energy costs? Are young people using smart products aware of their dependence on access to energy and do they understand that energy is the same product as food that must be paid for? Without electricity, the Internet (and related products) will not work.

3. Customer behavior

When talking about products or services, we also talk about the processes of their acquisition. They can be delivered to users in the processes of commodity-for-commodity exchange or the classical processes of market exchange: commodity for money. Users can also receive access to products and services as part of public services, free of charge. Examples include medical services that can be accessed on the market (private health care) or through public health care (publicly funded). Regardless of how products and services are accessed, their users represent specific purchasing behavior.

Consumer behavior significantly shapes their attitudes, which can be positive, negative, or neutral. Expressing one of these attitudes is very individual and conditioned by the respondent's situation and relationship with the object (Rudnicki, 2012).

Attitude, according to the definition taken from social psychology, is understood as the permanent attitude of an individual towards someone or something. This attitude includes three components: cognitive, affective, and behavioral (Lindzey, Aronson, 1985), with the above-mentioned elements interacting with each other.

Attitudes are built by cognitive and emotional processes as well as behavioral tendencies (DeLamater, 2014). Getting to know them is important because attitudes are difficult to change, and they make people who like or dislike something, strive for something or avoid it (Armstrong, Kotler, 2016).

The customers' behavior results from innate and acquired (still modified) needs and aspirations, the satisfaction of which is a combination of conscious and unconscious processes and emotional factors (Gracz, Ostrowska, 2014).

To understand the impact of attitudes on customers' behavior, Ajzen, Fishbein, Lohmann, and Albarracín (2019) additionally made a distinction between attitudes toward physical objects, or groups of people, institutions, policies, events, or other general targets and the second type – attitudes toward performing specific behaviors concerning an object or target (using the physical object). These attitudes will be referred to as "attitudes toward a behavior."

This distinction is interesting for the research reported in this paper. What is the attitude of young Polish customers to access electricity (i.e. to a physical product)? What is the ratio of young Polish customers to paying for the use of electricity (attitudes toward a behavior)?

The analysis of the literature on the subject indicates the existence of a research gap in the field of understanding the customer attitudes towards smart products, including the attitude of young consumers to smart products which issue is completely unrecognized.

Zied and Chouk (2016) concentrated on the resistance to smart products. Priporas (2020) investigated the influence of smart technologies on the decision-making process. The relatively wide interest of researchers is attracted by the behavior of smartphone buyers. Of course, smartphones are one (and main) example of smart products, but there are many products in this category. Guan, et. al (2021) presented research results with insights into the diffusion of innovation theory and provides retailers launching smart products (research based on a smartwatch) with a better understanding of their target young customers' purchasing behavior. Won-Jun et al. (2018) underlined that there is a lack of understanding about consumers who buy and use smart products. They concentrate their research on smartphones and underlined that adaptability and multi-functionality have a significant influence on perceived product smartness and consumer satisfaction.

Among the multithreaded research problem undertaken in this paper, it was decided during the brainstorming session that, for this research, three dimensions of attitudes of young consumers towards smart products were adopted:

- cognitive – the tested element of which was the respondent's knowledge of energy costs, its consumption, and saving,
- affective, the manifestation of which in this study was the assessment of the possibility of using and supplying smart products,
- behavioral, which was examined through the declared behavior regarding the daily use of smart products recharging and the validity of the energy consumption criteria in the case of the purchase of smart products.

Additionally, when designing research tools, an important element of the analysis was the distinction introduced by Ajzen, et al. (2019) into the attitude to the physical product (electricity) and the attitude towards using this product (in our case: bearing the costs of using electricity).

4. Pro-ecological attitudes of young Polish customers

As has been emphasized many times in this paper, the issue of using smart products is related to the use of another product - energy. Energy is the same market product, traded on the market, buy and sell transactions, it has its value (price) and specific access conditions.

Why are we interested in energy (electricity)? The issues of interdependence between various products are of research interest from various disciplines. In the case of the research presented here, the interest in energy stems from the dependence of modern society on access

to energy. As a "product" it has become a very important element of international trade. It is obtained from various sources and used in various forms. The issue of natural resources that are a source of energy is also a critical issue of modern civilization. In this article, we are interested, on the one hand, in energy, understood as electricity, and, on the other, in linking energy use with the natural environment. There is a widespread discussion in society on the need to protect the natural environment, and the issue of the depletion of natural resources, especially energy resources, is also widely discussed. Do we represent pro-ecological attitudes by developing purchasing behavior that makes society dependent on electricity (and these are smart products)? This provocative question is not the subject of research directly in this paper, but the authors attempt to analyze the pro-ecological attitudes of young customers. And they ask whether young customers, as promoters of smart products, are aware of their dependence on electricity? Do they understand that without access to energy, they are not able to meet the needs that they satisfy today with smart products? If there is a shortage of natural energy sources, or – in a less catastrophic dimension, the society will have to significantly limit the use of energy due to its shortages (depletion of natural resources), the use of smart products may (hypothetically) be subject to limitations. The authors' question is whether young consumers see a relationship between environmental protection and the use of products that require electricity?

The pro-ecological attitude is the result of acquiring knowledge and ecological sensitivity of a conscious man (Jarosz, Brol, Jarzębska, Nowińska, Przewoźnik, 2014). The main components of environmental awareness are precisely defined contents, attitudes, and emotions about the natural environment (Kwiatek, Skiba, 2017). These attitudes are shaped throughout life and can change over time. However, their beginning is derived from the process of socialization that the individual goes through from an early age in the family. And then with the knowledge that he develops in the process of training education. Summing up, we can observe pro-ecological attitudes in various age groups, including young people.

In Poland, research has been conducted on the environmental awareness of its inhabitants for many years. They mainly come down to the areas of knowledge and attitude to the natural environment, its protection, waste management, i.e. behaviors and attitudes related to how Poles get rid of waste (waste segregation), how they save energy in households, what is their attitude towards renewable energy sources, how they manage water (methods of saving water in households). Many studies refer to purchasing attitudes and behaviors towards food (preferences for organic products) as well as concerning packaging (plastic bottles, additional product packaging) (Report: Badanie..., 2020; Radzymińska, Jakubowska, Mozelewski, 2015).

The studies, conducted periodically by the Ministry since 2011 (Report: Badanie..., 2020), indicate a growing social awareness in the field of environmental protection. Actions in the field of waste segregation policy and optimization of water consumption in households should also be assessed positively. The importance of pro-ecological activities in Polish society is evidenced by the fact that among the three areas in which, in their opinion, the country has the

most problems to be solved, the respondents by the Ministry mention environmental protection (as indicated by as many as 52% of respondents).

Despite the observed growing pro-ecological attitudes, they are not satisfactory and we cannot say that we are dealing with the great concern of Poles for the natural environment. Many research results indicate the lack of optimal attitudes and pro-environmental behavior of Poles (Stefaniuk, 2021; Report: Green Generation 2.0, 2021; Report: Postawy..., 2020; Report: Barometr..., 2020).

In the context of the research conducted in this paper, we are primarily interested in the pro-ecological attitudes of young Poles, especially in the context of energy. When it comes to the attitudes of young Poles, interesting results can be found in the study by Kwiatek and Skiba (2017). In their research, Kwiatek and Skiba verified the specific attitudes and behaviors of young Poles. They most often repeated statements about saving water (turning off the tap when brushing your teeth, shower instead of bathing, even watering the plants previously collected rainwater, etc.) and electricity (switching off the lights in unoccupied rooms, chargers, or other devices electric). The surveyed youth also declare that they are active in the field of waste management and waste segregation (very often and often (65%).

The pro-ecological attitudes of Polish youth were investigated by Gajewski (2007). The results of these studies indicate pro-ecological behavior (e.g. saving water) declared by young Poles. However, an in-depth analysis of the results shows that young Poles do not see and do not understand the relationship between your action and the environment. This is due to the low-level practical knowledge, unaware of the consequences of one's behavior, the materialistic paradigm of existence, and the thoughtless satisfaction of one's own consumption needs.

As the literature review showed, relatively few empirical studies have been conducted to identify the attitude of young people to the use of electricity, as well as the relationship between the use of smart products and the use of energy and bearing the costs of its use. In this context, the authors emphasize that the conducted research, although currently of a pilot nature, fills the cognitive gap. They will contribute to a better understanding of buyers' attitudes and behaviors and cross-relationships between products (smart products vs. energy).

5. Research method

As a result of the literature analysis, review of available research results, brainstorming and expert discussions (a group consisting of educators and management practitioners from waste management companies), two research hypotheses were formulated:

H1: For young consumers, energy (as access to power from smart products) is something natural. At the same time, when we mean "natural", we do not refer to the origin of the natural environment, but the perception of the right to accessibility and universality of this accessibility. Just as oxygen for humans is essential for life and it is obvious for people that it is widely available to everyone, for young people access to energy/power is something obvious, common.

H2: Young consumers do not see energy as a product/service that has a price and must be paid for (access to it).

The study was conducted in two phases. Phase 1 was designed to pre-test the questionnaire. Phase 2 consisted of a study designed to collect and analyze information gathered from students' responses.

The idea of the questionnaire used in the research was modeled on the questionnaire and the scale of Vitell and Muncy (Vitell, Muncy, 2005). These studies on ethics in the behavior of young people (students) were also used in the studies by Grzesiuk and Wanat (2010). Ultimately, the questionnaire used in the research project on the perception of energy costs reported in this article consists of 25 questions, including 3 metric questions (gender, year of birth, field of study). The respondents were asked to indicate their answers on a 5-point scale, where "1" meant strongly disagree and "5" – strongly agree. The questions relate to three spheres that define the attitude of young consumers to energy: knowledge, attitudes, and behavior.

The questionnaire was prepared online on the docs.google.com platform. The research was conducted in the first half of 2021.

In phase 2, the questionnaires were made available to the students during their classes (classes were online; questionnaires also online). The research was deliberate and participation was voluntary and anonymous. In total: 201 completed questionnaires were collected, including 151 filled in by students of economic faculties and 50 filled in by students of other faculties. The results were analyzed in two categories: 1/data collected among students of economics and 2/ among students of other fields of study (mainly pedagogy and law).

Assuming that the order of magnitude of the success probability p is not known, the minimum number of units was 201 with the following assumptions: significance level = 0.01, the maximum error of the estimate $d = 5\%$ ($u = 2.7434$).

Students represent the generation of young people born in the 1990s and at the beginning of the 21st century. In both groups of students, the majority were women: 75% among students of economics and 74% among students of other faculties. Among Polish students in general, women also predominate – ca. 58% (GUS: płeć studentów, 2020; Szkolnictwo wyższe..., 2020).

The authors of the research project are aware that the students do not fully represent the generation of young consumers. This generation, like other age groups, is diverse. It is possible that the results of the research are influenced by the place of residence of the respondents (students are mainly residents of large cities) and the level of education, and thus, probably,

the pro-ecological awareness of the respondents. The educational profile of the surveyed group may also be important. However, the discussed research results are not analyzed as a representative sample. The authors are developing a wide research project in the area of the use of smart products by young consumers. In further research, the experience from the reported surveys will be used.

After the research was conducted, its results were compiled and analyzed, and conclusions were formulated. Basic statistical tools were used, i.e. mean, standard deviation, median, mode, they use an Excel spreadsheet.

6. Research results

The questions asked to the respondents referred to specific situations, using examples of smart products (e-bike, laptop, smartphone), potentially used by young people. Additionally, questions with an example of an electric kettle were included. Although this product does not belong to the group of smart products, its use requires an electrical connection. It was used in the research questionnaire as a kind of reference product, allowing for the verification of energy consumption attitudes and behavior.

To verify the H1 hypothesis, two questions related to the respondents' knowledge, five questions allowing to characterize their attitudes, and four describing the respondents' behavior related to powering smart products with energy were used.

More than half of the surveyed students of economic faculties (64%) know the number of electricity bills in their homes, but at the same time every fourth of them admitted that they did not have such knowledge. Therefore, it cannot be unequivocally stated that they are conscious energy buyers, which is confirmed by the average rating of 3,5 with the standard deviation of the sample 1,41. The respondents' housing status was not taken into account in the analyzed research project. According to Eurostat data (Eurostat, 2019), 75 percent of young Poles aged 16-29 live with their parents. And according to the research of the Educational Research Institute (Herbst, Sobotka, 2014) from 2014, more than half of the students in Poland lived with their parents in the last year of their studies. The fact of living with parents who are likely to bear the main burden of the cost of maintaining the apartment may lower respondents' awareness of the cost of utilities in the apartment. This issue will be considered in future research.

The survey shows that young Poles do not know about new solutions that will save them money/reduce expenses. It is possible that due to the low popularity of innovative solutions, an example of which was e-bike, almost 75% of respondents could not assess the relationship between the cost of using an electric bike and the price of a public transport ticket. At the same time, however, they rather agree with the statement that in the future the use of these devices

will be widespread. The e-bike results are surprising because respondents were students, usually living in cities where such solutions are available.

According to the respondents, both now and in the future, access to energy sources that allow powering smart products should be free and universal. Only about 14% of the respondents do not agree with this opinion.

Such opinions of young Poles are unambiguous, additionally verified by a reverse question (charging a smartphone in a public place should be paid).

The respondents do not use the option of charging their smartphones in public transport for fear of being discharged or because of a lower price. On the other hand, half of them recharge their devices at universities/at work, and almost 70% are aware that they do not bear any financial costs.

To verify the H2 hypothesis, six questions related to the respondents' knowledge were used, one question characterizing their attitudes, and four describing the respondents' behaviors related to powering smart products with energy.

Smartphones are the most popular type of smart product with Internet access among young people in Poland (Eurostat, 2021). And having a smartphone is common in the group of young people (over 94% in 2018). Therefore, the obtained results concerning this type of solution are not surprising. Most of the respondents indicated that they know exactly what fees they pay per month (75%) and what their Internet limit is (78%). These reviews received the highest average score (4.0).

The respondents do not have such knowledge concerning other smart products. In the case of a laptop, 69% do not know the monthly cost of electricity with the dominant rating of 1 for the entire group. An additional question checking the respondents' knowledge of the level of electricity consumption by home furnishings that they use daily was the question about the electric kettle. A definite answer was given by every fourth respondent, but less than a third of them marked it correctly.

The questionnaire also included questions about energy saving daily, which were formulated in the form of affirmative and negative. The distribution of answers and the dominant ratings allow us to state that about half of the surveyed students of economic faculties are aware of the need to save energy and pay attention to it daily. However, over 68% disagree with the statement that there should be charges for using the power supply of mobile devices offered in public places. The standard deviation is one of the lowest, which would mean high consistency of the answers provided. At the same time, with an average grade of 2, it can be stated that the surveyed students are against it or, possibly, have no opinion, which means that people ready to pay for energy supplied in this way are in a clear minority.

The declared attitudes of the respondents do not indicate that they are highly aware of energy consumption, and thus its cost. More than half of them do not turn off the devices when they are not using them (mainly at night), and during their last purchases of smart products less often than every fifth student of economics took into account its energy efficiency. Based on

the obtained results, it cannot be clearly stated whether the respondents are aware of the cost of energy consumption by performing daily, simple activities such as boiling water. The answers are fairly even on the "agree and disagree" side ($M = 3$).

The results presented above concern students of economic faculties. The results of the conducted research do not indicate the existence of differences in attitudes towards smart products and the use of electricity between students of economic faculties and non-economic faculties (mainly law and pedagogy).

The responses of non-economists represent very similar attitudes to students of the economic faculties, except for the answer to the question about the cost of using public top-up/top-up sites. In this case, respondents are more cautious/hesitant than respondents of economic faculties. They also showed somewhat less certainty in assessing the future use of urban e-bikes.

Regarding H2, responses of non-economists differed on one point in the area of knowledge (they are more confident in their knowledge of the limit they have in smartphones (average = 4.24, $D = 5$) and in almost all in the area of attitudes, although these differences, apart from using an electric kettle, they are small. However, there were no differences in the area of attitudes.

The lack of differentiation in the knowledge of respondents from individual groups regarding energy costs is in contradiction with the adopted hypothesis. The authors assumed that students of economic faculties would represent more mature attitudes (and knowledge) regarding the prices/costs of products purchased on the market. However, this preliminary assumption has not been positively verified.

7. Discussion and Conclusions

The results show, on the one hand, that young Poles declare that they know the energy costs incurred by their households, and on the other hand, they believe that in public places it should be possible to power laptops and smartphones free of charge.

The results, apart from the cognitive values, also allow for the formulation of methodological recommendations and will allow for the conceptualization of future research in the area of connections between the use of smart products and energy.

In terms of methodology, we propose to group factors in the "knowledge" category:

- Group 1: direct costs, identifiable costs related to the use of smart products (including the cost of purchasing a physical product, the cost of purchasing software, the cost of Internet access),
- Group 2: household electricity costs (cost of powering smart products).

Additionally, we propose two cross-sections of Group 1 and Group 2 analysis:

- Dimension 1: Costs incurred directly by young Poles,
- Dimension 2: Household costs (electricity).

The attitude of young Poles to smart products and their relationship to energy access and charging/power costs should also be analyzed in the future concerning the development of electromobility (electric cars, electric buses). According to the data of the Electromobility Meter (Report: Electromobility Meter, 2021), at the end of the first quarter of 2021, a total of 22,291 electric cars were registered in Poland. Although the number is not impressive, in Q1 2021 the number increased by 3,555 vehicles, which is an increase of 107%. compared to the same period in 2020. The group of respondents included in the discussed research will probably make decisions about buying a car soon. The attitude of these future buyers to electric cars will largely determine the development of this market and, more broadly, the transformation of social mobility.

As customers constantly gain new knowledge about the market, their definition of value keeps changing. Today young Poles grow up and become mature consumers (also with age). Their needs and attitudes towards products are changing. It can therefore be assumed that along with gaining new knowledge about smart products, the value they will represent for (currently) young Poles will change over time. In a sense, these products will grow with the young consumers surveyed today.

This is important cognitively and in the context of business recommendations. Today we are researching young consumers who use a smart product. In the future, these young Poles will become adult market participants and - probably - potential users of advanced smart products such as electric cars. According to the authors, producers of electric cars should be particularly interested in the attitude of young Poles to electricity. The availability of smart products charging/power stations, charging ports, sockets, connectors, plugs, and their spatial arrangement in the field is one of the critical elements of the development of electric cars. According to the authors, parallel to this accessibility, one should also observe the attitude of young Poles to the costs (fees) for using this energy made available. The presented research results indicate that concerning the smart products currently used by young Poles (i.e. smartphones, laptops), they believe that it should be possible to power these devices free of charge in public places.

During the implementation of the pilot research, we also formulated a proposal of directions for further research related to the attitudes of buyers vs energy cost. The direction of research in the area of smart cities and the attitudes of young people towards the cost of living in a smart city seems particularly interesting. The experience of many products available on the market bearing the "eco-products" logo shows that the costs of such products are usually higher. Are young consumers willing to pay higher living costs in the name of being eco-friendly? E-bike, which was used in research as one of the examples of smart products, is a product that is relatively unknown and unknown outside large cities. But the electric bicycle is a product

that has been on the market for several years. What are the attitudes of young buyers towards such products? An electric bicycle requires interaction with energy. The cost of energy to use the product and pro-ecological attitudes reappear – you can reduce energy consumption by using a classic bicycle. Are young buyers aware of the consequences of the home bidet and environmental consequences of the development of products such as an electric bicycle?

Summing up, young consumers do not represent homogeneous attitudes towards smart products and their awareness of energy costs and the connection between smart products and the costs of acquiring access to energy is very low. According to the authors, this is an important and interesting direction of research, both in the context of eco-friendly attitudes and the development of new product categories.

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TOURIST ASPECTS OF THE LUBUSKIE VOIVODESHIP – THE REGION'S DEVELOPMENT POTENTIAL

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Purpose: The publication presents the tourist aspects of the Lubuskie voivodeship, which are of great importance for regional development in terms of tourism, supra-regional and national.

Design/methodology/approach: The method of statistical data analysis and source materials was used in the work.

Findings: In the analysis of the relationship between tourist attractiveness and the development of the competitiveness of the Lubuskie voivodeship, the presence of the market process of interaction between tourist traffic and the number of entities from the tourism sector was noticed. The Lubuskie voivodeship has many tourist attractions, which constitute the region's great potential. It should be added that the Lubuskie voivodeship, as one of the few regions in Poland, can offer ecotourism as an attraction.

Originality/value: The analysis carried out in the article is aimed at people interested in regional policy in terms of the impact of tourism on the development and competitiveness of Polish regions.

Keywords: regional development, region, tourism, competitiveness.

1. Introduction

Tourism has become a widely recognized factor in regional economic development. The effects are visible especially in areas with tourist attractions that attract visitors. Inviting destinations generate tourist traffic, which translates into an increase in expenditure stimulating the creation and development of economic entities related to tourism and local economy. The above processes are dynamic and changeable because the tourism market is evolving. The source of changes is, among other things, the increase in the income of society, which contributes to the increased demand for tourist products providing new experiences as well as the search for new destinations (Kozak, 2009, pp. 125-126). As a consequence, maintaining competitiveness becomes a strategic challenge for the region and leads to constant competition for tourists. Its key element is the activities of local administrative authorities

aimed at improving transport accessibility and the development and improvement of tourism infrastructure at the level of international standards, as well as the supply of new tourism products by private entities (Gołembski, 2015, p. 8).

The aim of the study is to analyse the tourist attractiveness of the Lubuskie voivodeship and the scale of using the region's development potential in this regard. For this purpose, the statistical data published by the Central Statistical Office and the Development Strategy of the Lubuskie Voivodeship 2030 were used. The analysis was carried out at the voivodeship level on the basis of the latest available publications.

2. Tourist attractiveness of a destination – terminological explanations

According to A. Rapacz, the factor stimulating the development of the tourism economy is tourism traffic, which has a fundamental impact on the development of the tourism function in areas with an appropriate tourism potential (Rapacz, Jaremen, 2015, p. 134). In the literature, the tourism function is defined in various ways. One of the definitions is the statement that the tourist function is a socio-economic activity aimed at serving tourists and which a town or area meets in the national economy system (Miazek, 2020, p. 7).

The development of the tourist function is defined by local resources (natural, landscape and cultural). According to G. Gołembski, the presence of tourist values in a particular area determines the development of tourism, but the strength of attracting tourists is determined by the degree of tourist attractiveness of the region (Gołembski, 2006, p. 7). As M. Źemła writes, an attractive tourist destination “can attract visitors by producing and providing them with higher value for the buyer than the competitive area” (Źemła, 2011, p. 39). Thus, the attractiveness of the destination encourages tourists to come, spend time and expenses in a particular place.

In the literature, the concepts of tourist attractiveness and competitiveness are sometimes used interchangeably. Most often, however, tourist attractiveness is treated as a component of competitiveness. Although there is no generally accepted definition of tourism attractiveness, it is a key factor influencing consumer decision (Gorączko, 2020, p. 41). This is due to the fact that, as G. Gołembski writes, tourist attractiveness is a concept that integrates tourist values with the conditions for satisfying tourist needs and contains many different subjective elements (Gołembski, 2006, p. 8).

The tourist attractiveness of a destination is a subjective measure, the value of which depends on the perception of buyers – tourists. It is assumed that the basis of tourist attractiveness is the assessment of tourist values, tourism development and transport accessibility (Kurek, 2008, p. 24; Kozak, 2009, pp. 191-194). Additionally, tourist attractiveness is shaped by the media image of the destination. As M. Kozak points out,

the lack of an unequivocally adopted definition of the attractiveness of a destination causes problems in its assessment.

The factor that has a significant impact on the attractiveness of a destination is the saturation of space with the number of tourist attractions. The accumulation of attractions creates a synergy effect, which in turn contributes to the perception of the destination as more attractive than the value of its individual elements would suggest. This creates a cluster effect. It can be deepened by the diversity and complementarity of attractions, which makes it possible to meet the individual needs of tourists (Borkowska-Niszczota, 2015, p. 39).

3. Characteristics of the Lubuskie voivodeship

The Lubuskie voivodeship is located in western Poland (Figure 1). It was established in 1999 as a result of an administrative reform in most territories of the former provinces: Zielona Góra, Gorzów and a small part of Leszno. The seat of the voivode is in Gorzów Wielkopolski, and the authorities of the voivodeship self-government – in Zielona Góra (www.polska.travel...).



Figure 1. Location of the Lubuskie voivodeship on the map of Poland. Source: Regiony i miasta, <https://www.polska.travel/pl/regiony/lubuskie>, 10.11.2021.

As shown in Figure 1, the Lubuskie voivodeship borders from the north with the West Pomerania voivodeship, from the south with the Lower Silesia voivodeship, from the east with the Greater Poland voivodeship, and from the west – with Germany (Saxony and Brandenburg).

The name of the voivodeship comes from the historical land – the Lubuska land. It includes the former lands of Lower Lusatia, Lower Silesia, Lubuskie and Greater Poland. There are two city counties (poviats) in the voivodeship, 12 counties, 9 urban communes, 34 urban-rural communes and 39 rural communes. The administrative division of the voivodeship is shown in Figure 2. According to information from the Central Statistical Office of Poland, at the end of 2019, the area of the Lubuskie voivodeship was 13 987,93 km², and the data at the end of 2020

indicates that the population was 1 007 145 million inhabitants, which was second only to the Opole voivodeship in terms of the least numerous voivodeship in Poland. The average salary in 2021 increased compared to the previous year and amounted to PLN 5 145,11. On the other hand, the interest rate decreased and in August 2021 it amounted to 5,4% (zielonagora.stat.gov.pl...). The administrative division of the voivodeship is shown in Figure 2.



Figure 2. Administrative division of the Lubuskie voivodeship Source: Regiony i miasta, <https://www.polska.travel/pl/regiony/lubuskie>, 10.11.2021.

The most important cities in the Lubuskie voivodeship include Gorzów Wielkopolski with a population of over 100 000 and Zielona Góra. Significant cities are also: Żagań, Nowa Sól and Żary. The distance from Warsaw is approx. 450 kilometres, and the capital of Germany – Berlin – 182 km from Zielona Góra and 134 km from Gorzów Wielkopolski, respectively. In the described voivodeship, trade and services are very well developed, the recreational offer and hotel base are increasing every year as well as the industry is developing. Many international entities invest here, creating a large base of jobs. The most important trade partner of the Lubuskie voivodeship is the Federal Republic of Germany. Almost 50% of goods and services exported by Lubuskie companies go to the German market (www.investinlubuskie.pl...).

4. Tourism in the Lubuskie voivodeship

Tourism means the activities of visitors who travel to a principal destination outside their usual surroundings for a period of less than one year for any principal purpose, including business, leisure or other personal purpose other than employment by a local entity for the place visited (GUS, 2020, p. 16). The participants of tourism are visitors, who can be divided into (Wiśniewski, 2013, p. 134):

- tourists (i.e. visitors who have stayed at the visited location for at least one night),
- one-day (no-night) visitors.

The values of tourist traffic provided by the Central Statistical Office (GUS) cover only a part of the actual tourist traffic.

The Lubuskie voivodeship is constantly investing in the development of tourist infrastructure. This happens, among other things, through the implementation of the “Lubuska Tourist Base” program, which is an initiative aimed at creating conditions for the development of tourism infrastructure. As part of the project, support for investment tasks is financed, which contributes to the development of the tourist potential of the voivodeship (www.lubuskie.pl...).

Lubuskie is the most forested region in comparison to other voivodships in Poland, it is rich in numerous natural attractions, among which the national park (“Mouth of the Warta”) stands out. Tourists are also attracted by other post-military attractions (Międzyrzecki Fortified Region) and historic attractions (e.g. Castle in Łagów). In the analysed area there is also an object entered on the UNESCO list, i.e. the Muskauer Park. The forests abound in mushrooms and berries, and large rivers such as Odra, Nysa, Warta, Obra and Bóbr flow through the voivodeship, as well as many smaller ones, perfect for canoeists and anglers. Of the 500 lakes, the largest (830 ha) is the “Silesian Sea”, i.e. the Sławskie lakes – its name is to come from a water girl, Witosława, kidnapped by nymphs (www.polska.travel...).

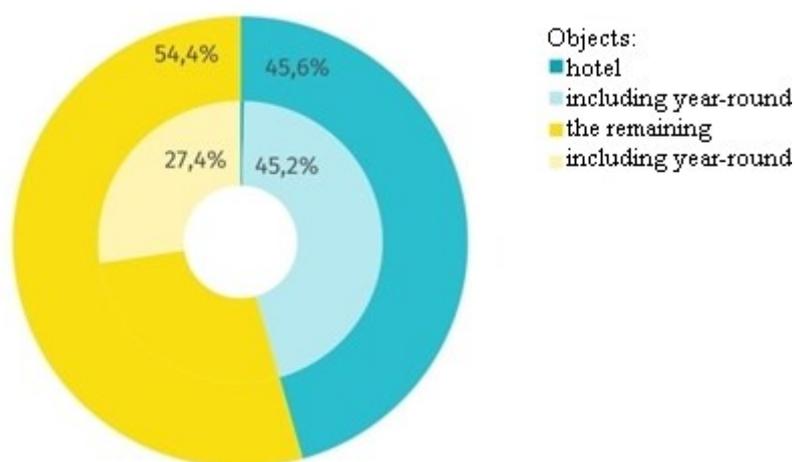


Figure 3. The structure of tourist accommodation facilities by type in 2020. Source: GUS (2021). *Turystyka w województwie lubuskim w 2020 r. Informacje Sygnalne*, p. 2.

According to data from the Central Statistical Office of Poland, at the end of July 2020, there were 281 tourist facilities offering accommodation services in the Lubuskie voivodeship¹, including 204 facilities offering year-round accommodation. In total, 3722 rooms were waiting for tourists, of which 98,8% were equipped with a bathroom and toilet, and 2,2% were adapted to accommodate people with mobility impairments. There were 18,0 thousand bed places in the above-mentioned facilities, i.e. 2,3% of the total number of bed places in Poland.

Table 1.
Tourist accommodation facilities – As of the end of July

DESCRIPTION	Facilities			Accommodation			Accommodation for 1 facility		
	2019	2020	2019=100	2019	2020	2019=100	2019	2020	2019=100
IN TOTAL	302	281	93,0	19818	18038	91,0	66	64	97,0
including year-round	219	204	93,2	11595	11002	94,9	53	54	101,9
Hotel facilities	134	128	95,5	7801	7572	97,1	58	59	101,7
Hotels	70	67	95,7	5196	5113	98,4	74	76	102,7
Motels	13	12	92,3	549	513	93,4	42	43	102,4
Guesthouses	13	13	100,0	698	711	101,9	54	55	101,9
Other hotel facilities	38	36	94,7	1358	1235	90,9	36	34	94,4
Other facilities	168	153	91,1	12017	10466	87,1	72	68	94,4
Youth hostels and school youth hostels	7	7	100,0	461	416	90,2	66	59	89,4
Holiday centres	26	25	96,2	2965	2833	95,5	114	113	99,1
Camp centres	4	4	100,0	561	436	77,7	140	109	77,9
Training and recreation centres	23	22	95,7	2397	2214	92,4	104	101	97,1
Tourist cottage complexes	22	19	86,4	1277	1136	89,0	58	60	103,4
Campsites	5	6	120,0	805	874	108,6	161	146	90,7
Camping fields	9	9	100,0	1402	1035	73,8	156	115	73,7
Hostels	3	3	100,0	171	171	100,0	57	57	100,0
Guest rooms	21	19	90,5	436	289	66,3	21	15	71,4
Agritourism accommodation	27	22	81,5	500	421	84,2	19	19	100,0
Other facilities	21	17	81,0	1042	641	61,5	50	38	76,0

Source: GUS (2021). *Turystyka w województwie lubuskim w 2020 r. Informacje Sygnalne*, p. 3.

The data from the Central Statistical Office indicate that on average, there were two accommodation establishments per 100 km² of the Lubuskie region (three in the entire country). On the other hand, there were 18 beds per 1000 inhabitants of the voivodeship (compared to the whole of Poland – in Poland it was 20 beds per 1000 inhabitants). When analysing the data from 2020 and 2019, a decrease in the number of accommodation facilities can be observed by 21 units, which accounted for 7% of all facilities. Three hotels and two other hotel facilities were closed² and one motel. Table 1 shows the number of tourist accommodation establishments at the end of July 2020 in the Lubuskie voivodeship.

¹ With 10 and more accommodation places.

² This group includes hotels, motels and guesthouses, which have not been assigned any category, as well as facilities that provide hotel services – guesthouses, villas, castles and roadside inns. Hotel services include, among others, making beds daily, cleaning rooms and washing sanitary facilities.

The accommodation base in Lubuskie voivodeship included a total of 128 hotel establishments, the remaining facilities were 153. The largest group, as in previous years, were hotels – there were 67 of them, fewer other hotel establishments were recorded in 2020 (36 establishments). Among the remaining facilities, the most numerous were holiday centres in the number of 25, as well as training and recreation centres and agritourism accommodation (22 in total). The average tourist facility offered 64 beds (two less than in the previous year). Figure 3 shows the Central Statistical Office data presenting the structure of accommodation facilities by type in 2020 (GUS, 2021, p. 1).

The enterprises that, according to the valuation of companies, were most severely affected by the COVID-19 crisis, operate in the field of raw material extraction, tourism, recreation, air transport, metal processing, insurance, banking, household goods, cars and utilities. The restrictions introduced in mid-March 2020 relating to the movement of people and, from the beginning of April 2020, to operating activities related to hotel services, resulted in a significant decrease in the number of people using overnight stays in tourist accommodation establishments compared to the previous year. After removing these restrictions in May, some accommodation facilities did not resume operations and despite the gradual increase in the number of tourists using the accommodation facilities, the use of facilities did not reach the level of the same periods last year (Stradomski, Schmidt, 2020, pp. 199-200).

In Poland, the months with the peak of the tourist season are July and August. Then, nearly 1/4 of all tourists who come to the Lubuskie voivodeship during the year use the tourist facilities. In the previous years, the data relating to the utilization status of accommodation facilities was almost twice as large as in the winter months. In 2020, the COVID-19 pandemic changed the way people travel, stay overnight, and visit tourist attractions. The use of tourist accommodation facilities is shown in Table 2.

Table 2.
Use of tourist accommodation facilities

DESCRIPTION	Beneficiaries			Accommodation granted		
	2019	2020	2019=100	2019	2020	2019=100
IN TOTAL	720799	399845	55,5	1480010	934056	63,1
including year-round	647288	341297	52,7	1180328	721012	61,1
Hotel facilities	564401	297355	52,7	897037	534610	59,6
Hotels	419999	221941	52,8	648781	394657	60,8
Motels	40028	19732	49,3	54640	28786	52,7
Guesthouses	37854	24235	64,0	72870	48668	66,8
Other hotel facilities	66520	31447	47,3	120746	62499	51,8
Other facilities	156398	102490	65,5	582973	399446	68,5
Youth hostels and school youth hostels	3329	1387	41,7	20920	14363	68,7
Holiday centres	44456	33207	74,7	168226	137706	81,9
Camp centres	2788	1687	60,5	17652	11529	65,3
Training and recreation centres	42958	24553	57,2	143318	78859	55,0
Tourist cottage complexes	14336	8883	62,0	54015	30834	57,1
Campsites	8034	8780	109,3	30884	27156	87,9
Camping fields	6979	7863	112,7	34899	17448	50,0

Cont. table 2

Hostels	1812	1178	65,0	13512	21645	160,2
Guest rooms	11699	4737	40,5	32173	16922	52,6
Agritourism accommodation	7599	4219	55,5	25285	17016	67,3
Other facilities	12408	5996	48,3	42089	25968	61,7

Source: GUS (2021). *Turystyka w województwie lubuskim w 2020 r. Informacje Sygnalne*, p. 5-6.

According to the GUS data, 399,8 thousand people stayed in tourist accommodation establishments located in the Lubuskie voivodeship in 2020, i.e. as much as 44,5% less than in 2019. Tourists were granted 934,1 thousand places compared to 2019, a decrease of 36,9% was noticed.

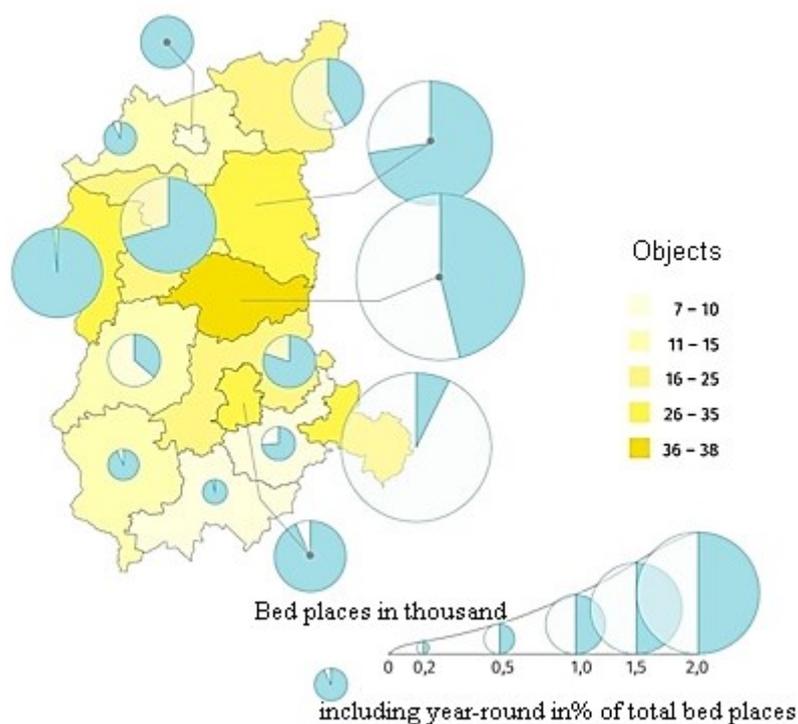


Figure 4. Accommodation facilities and places by counties in 2019 Source: GUS (2021). *Turystyka w województwie lubuskim w 2020 r. Informacje Sygnalne*, p. 8.

Among the total number of people visiting the Lubuskie voivodeship, 326,7 thousand were domestic tourists (81,7%) and 73,2 thousand foreign tourists (18,3%). As in previous years, travellers most willingly stayed in hotels (55,5%), where 394,7 thousand accommodation places were granted. Fewer people opted for (GUS, 2021, p. 8):

- holiday centres (8,3%),
- other hotel facilities (villas, inns, castles – 7,9%),
- training and recreation centres, guesthouses (6,1%),
- motels (4,9%).

The number of people who used the accommodation decreased significantly. The largest (nearly 60%) decrease took place among people staying in guest rooms, and the smallest in holiday centres (a decrease by 25,3%). More tourists stayed at camping fields and campsites – by 12,7% and 9,3%, respectively (GUS, 2021, p. 9).

The Lubuskie voivodeship is heterogeneous in terms of the development of tourist infrastructure – it is characterized by a significant degree of spatial concentration (Figure 4). Most (about 60%) tourist accommodation establishments operate in the northern and central part of the voivodeship (with the exception of Wschowa county). In July 2020 (with an average number of 20 facilities per county), the largest number of tourist accommodation establishments was located in the county of (GUS, 2021, p. 10):

- Świebodzin (38),
- Międzyrzecz (35),
- Zielona Góra city and Wschowa (29 facility each),
- Słubice (27),
- Sulęcín (24),
- Żagań (7 facilities).

Counties with the largest number of accommodation facilities concentrated a total of 12,4 thousand bed places (68,7% of the total number of beds in the voivodeship). The most numerous accommodation places among the counties of the Lubuskie voivodeship were offered by establishments located in the Świebodzin county (18,3% of all beds in the voivodeship) and in the Wschowa and Międzyrzecz counties (15,3% and 11,8%). The highest values of the accommodation density indicator were distinguished by county cities – Gorzów Wlkp. (979 beds per 100 km²) and Zielona Góra – (475), as well as counties: Wschowa (443) and Świebodzin (353 beds per 100 km²) (GUS, 2021, p. 11).

5. Conclusions

The degree of tourist attractiveness of a particular town or region is determined by: tourist values, tourist development and tourist accessibility (Lubuskie... Part II program, p. 77). The natural environment is one of the main values that determine the tourist attractiveness of a particular place. In view of the complexity of the issue, it is impossible to demonstrate exactly the motives behind tourist traffic without a detailed analysis. Assuming, however, that tourist traffic is the final measure of the attractiveness of a tourist destination, its relationship with economic development can be examined. The most attractive tourist destinations are characterized by the highest tourist traffic due to the synergistic effects that cause the phenomenon of accumulation.

The Lubuskie voivodeship has many tourist attractions, which constitute the great potential of the region, and the proximity to Germany provides additional opportunities for attracting foreign visitors. Accommodation and catering services turned out to be particularly sensitive to the scale of tourist traffic. The number of entities in the field of accommodation and catering business turned out to be the most correlated with the number of tourists compared to the other

sections. The accommodation base and the gastronomic base are well-developed components of the tourist attractiveness of the Lubuskie voivodeship. The quantitative specification of the accommodation base, in particular in terms of the number of inhabitants of the region to the number of beds in the voivodeship, allows determining the development of the accommodation base as more than satisfactory (Lubuskie... Part I audit and analytical, p. 69). A thorough examination of the scale of economic benefits from tourism requires an analysis of the structure of entities from the tourism sector located in a particular region and their links with other sectors and households. For this purpose, detailed statistical data, such as the size and types of tourists' expenses, are used. The obtained results are an incentive to verify them and to deepen the analysis through further research.

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ANALYSIS OF VIRTUAL EVENT MARKETING OPPORTUNITIES

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Purpose: Analysis of the marketing opportunities in the virtual world, on the example of events.

Design/methodology/approach: The article entails a literature review of the definitions as well as categorization and evolution of events, in the context of the pandemic and the digitalization trend.

Findings: The notion of the concept of events became the background for the considerations. The concept of an event is discussed. Analysis of the existing typology of events forced the selection of events for in-depth analysis, including the use of events in the virtual world.

Research limitations/implications: The text refers to a limited number of studies. The issues presented in the article require empirical confirmation, using more examples.

Practical implications: The literature analysis conducted allows a conclusion that the concept of events has evolved, while the trends and the digital tools supporting events facilitate more accurate achievement of the marketing goals desired.

Originality/value: The conclusions presented in this work constitute an extension of the themes present in the literature on the subject, pointing to the interrelationships the online, offline (face to face), and hybrid (live events with simultaneous online streaming, allowing remote participation) events form in marketing objective building.

Keywords: event, digital event, promotion, pandemic.

Category of the paper: The article is a literature-based review.

Introduction

Events were very popular in the pre-pandemic period. Many organizations were keen on using this form of promotion. The Covid-19 pandemic and the fact that offline events were restricted, due to the sanitation regime, influenced the growth of events organized via online channels. Event organizers have moved events to the virtual space. There are many indications that this is not a one-time investment, because even if traditional events do return, the prospect of staying in the virtual environment will remain.

1. The concept of an event

The first definition of an *event* was formulated by D. Getz and J.J. Goldblatt in the early 1990s. They defined an event as something special, exceptional, unique, beyond everyday experience, something that distinguishes a given time from other, more routine activities, such as work (Getz, 2008, pp. 403-428). Goldblatt referred to an event as "a unique moment in time, defined with ceremony and ritual to satisfy specific needs" (Bowdin, McPherson, 2006). Getz, on the other hand, noted that it involves "an opportunity for leisure, social or cultural experience outside the normal range of choices or beyond everyday experience" (Getz, 2013, p. 4). These authors point to the fact that an event consists of both physical (ceremony, ritual) and psychological (need, experience) aspects.

According to O. Nickel, events are staged events whose [...] main objective is to provide specific experience to participants and to evoke emotions which will positively contribute to implementation of a marketing strategy, i.e., fostering the values promoted by an enterprise or a brand (Nickel, 1998, p. 7). The definition proposed strongly emphasizes the experiential-emotional component. A more detailed definition of the concept analyzed is presented by M. Pfadenhauer, who indicates its most specific features, describing it as a mass spectacle [...], a specific target group, funding, communication of a specific message, presentation of a product in the absence of competition, staging of the world of experiences and sensations (Pfadenhauer, 2008, p. 222).

Ph. Kotler defines events as undertakings whose purpose is to communicate specific information to particular target groups (Kotler, 2001, p. 122). An event should thus be understood as a tool – a carrier of communication (similar to television, radio or press advertising). Events are considered a modern form of brand and product promotion, which help reach new customers and create a positive image of a given place. The notion of an event is connected with the fact that a great number of people participate in it.

Events are thus deliberately planned in advance undertakings, often involving enormous financial and technical outlays, in order to influence specific audiences. They constitute a specific staging, during which a reality very different from that of the addressees' everyday life is presented (Berrige, 2007, p. 6). They are intended to arouse intense emotions in the participants as well as invoke the belief that they are taking part in something extraordinary, worthy of attention and remembrance (Bączek, 2011, p. 13). Such events are characterized by rich symbolism, combining various ways of communication, tailored to the needs and expectations of the audience and taking their way of thinking, feeling and perception of reality into account. Summing up the reflections on the notion of an *event*, one should acknowledge what U. Holzbaaur claimed, namely that the term event does not describe an objectively measurable feature; in fact, the event-like nature of a specific affair or incidence is subjective: an event is created in the mind of every person who experiences that event (Holzbaaur, 2005, p. 6).

2. Categorization of events in the light of the subject literature

Despite the existence of a range of very diverse events designed for promotion purposes, the literature on the subject does not provide a clear classification of events. The *Encyclopedia of tourism*, edited by J. Jafari, introduces a two-phase division of events. The author distinguishes main types of events, dividing them into three categories. The main types of events are presented in Table 1.

Table 1.

The main types of events distinguished in the Encyclopedia of Tourism

Event type	Events within a given type set
1. Cultural	Festivals, carnival, celebrations, religious events
2. Business and trade	Business meetings, conferences, trade fairs and expositions, customer and trade shows
3. Arts and leisure	Concerts, festivals, galas, award ceremonies
4. Education and science	Scientific conferences, seminars, lectures and interpretative events
5. Political	VIP visits, political summits, political conventions, royal events, gatherings of political organization members
6. Sports and recreation	Olympic Games, world and continental championship finals in professional and amateur sports, recreational games and entertainment
7. Private	Weddings, parties, family events, social gatherings

Source: J. Jafari, *Encyclopedia of Tourism*, Routledge World Reference, 2000, pp. 209-210.

Apart from the above types of events, J. Jafari classifies events according to three categories (Jafari, 2000, pp. 209-210):

1. Special events – events having significant meaning for the organizers or participants; usually one-time events, not deviating in nature from the participants' daily routine;
2. Hallmark events – events distinguished by the place, the function or the special organization thereof;
3. Mega events – events planned on a large scale, attracting audiences from all over the world, having impact on the economy; an event of this type is closely related to national (or international) media involvement (e.g., the Oscar Gala).

Another typology of planned events was identified by D. Getz, who divided events into four main categories, in terms of venue/facility use (Getz, 2013, p. 34). Getz listed four main types of planned events and proposed a division into four categories, based on the scale and effect of event impact. The case discussed is presented in Figure 1.

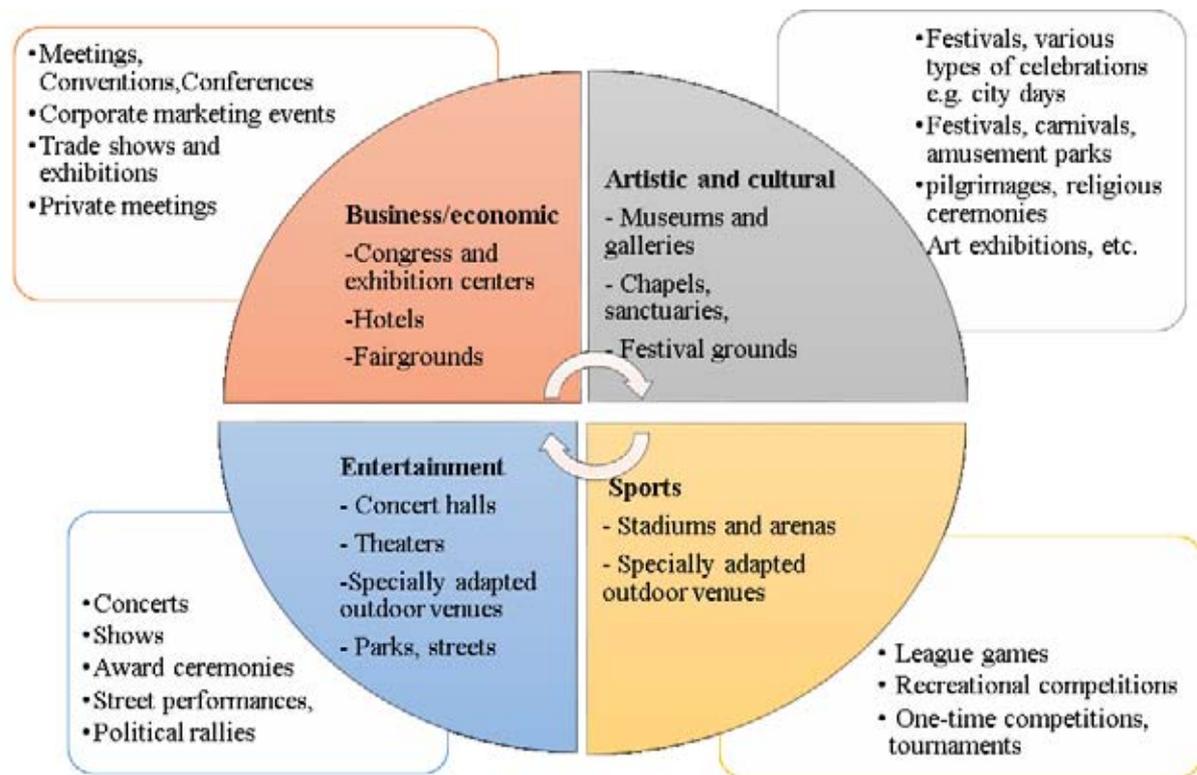


Figure 1. Main types of planned events, as per D. Getz; Adapted from: D. Getz, *Event Tourism: Concepts, International Case Studies, and Research*, Cognizant Communication Corporation, New York 2013, p. 34.

Within the dimension of event impact scale and effect, D. Getz distinguished four types of events (Getz, 2007, p. 19), the first of which are the so-called mega events. According to M. Roche, these are "large-scale cultural (including commercial or sporting) events which have a dramatic character, mass popular appeal and international significance" (Roche, 2000, p. 17). He also noted that such events have significant consequences for the host city, region or country and generate media interest. Getz consolidated the definition provided by Roche, adding that mega events are events whose "volume should exceed one million visitors, their capital cost should at least \$500 million, and their reputation should be of a must-see event" (Getz, 1997, p. 57). Such events include the Olympic and Paralympic Games, FIFA World Cup, UEFA Euro Cup, the Expo Trade Fairs.

Another type of events are the so-called hallmark events, identified with the spirit of a given city or region, considered an inseparable part of both the cities and their inhabitants, contributing to multi-fold increases in the cities' income from tourism many times over.

Major events is another type of events distinguished by D. Getz. Because of their scale and media attention, these events attract a significant number of visitors. They also contribute to the resultant financial benefits and appropriate amount of media coverage. For an event to be considered significant, it must attract public interest, both national and international, owing to the participants and viewers who are present at the venue as well as those watching the media coverage. Important events exert decisive impact on the schedules of international competitions

in a given sport. This category of events includes, inter alia, the World League volleyball competition, or the Formula 1 race at the Silverstone Circuit.

Local/community events include all events that cover a community of one region only (communes, housing estates, cities).

Due to the large scale of this phenomenon, it is difficult to organize events into a clear categorization. They are into different categories, nevertheless, they all focus on planning and organizing an event that brings people together, at a specific time and place, for a specific purpose. Along with the growing popularity of events, another typology has been proposed as part of an educational project *The International Event Management Body of Knowledge*¹, which reviewed and grouped the types of events accordingly (Silvers). The case discussed is summarized in Table 2.

Table 2.

Types of events distinguished by The International Event Management Body of Knowledge

Event type	Description
Business and corporate	Events supporting an organization's business goals (management, communication, training, marketing, PR, motivation, interpersonal relations, customer relations).
'Socially involved' and charity-related	Events organized for or by charities or socially engaged organizations in order to raise funds, support activities or raise public awareness on a given issue.
Trade fairs and exhibitions	Events that bring buyers and sellers and other interested persons together, to present or sell products and services (organized for a specific industry or a wide audience).
Entertainment and recreational	One-time or cyclical free or ticketed performances, concerts, exhibitions, award ceremonies and other entertainment events.
Cultural events	Secular or religious events organized by and/or for the public (festivals, carnivals, religious ceremonies, parades, anniversary celebrations).
Governmental and civil	Meetings organized by, by or for political parties, communities, local and governmental institutions.
Marketing	Events facilitating contacts between sellers and buyers or build awareness of brands, products and services (road shows and others).
Meetings and conferences	Gathering a group of people for educational purposes, information exchange, a debate or a discussion, an agreement reaching or a decision making, relationship building.
Social or Life Cycle related	Private meetings, by invitation, to celebrate or commemorate an occasion (cultural, religious, community, social, family); anniversaries.
Sports	Purely spectacular or active participation recreational activities or sports competitions.

Source: own elaboration based on: <http://www.juliasilvers.com/embok.htm>, accessed: 20.04.2019.

An example of Polish classification of marketing events can be found in the article by D. Kolberg, published at the Marketing Communication Agency website, which provides professional marketing communication and communication tool assistance to practitioners (see Table 3) (Kolber).

¹ This project presents a knowledge domain structure as a captured and therefore explicit starting point for a multi-national and multi-disciplinary discussion on a global Event Management Body of Knowledge (EMBOK).

Table 3.
D. Kolberg's event classification

Criterion	Event type
1. Places	- connected with/related to (unambiguously associated with a place) - itinerant - stationary
2. Time	- single-day - multiday - staged/phased
3. Recurrence	- one-time - multiple time/recurrent - cyclical
4. Audience	- internal (for employees) - external
5. Availability	- closed (ticketed, by invitation) - open
6. Reach	- private/cameral - group - mass ² - global
7. Purpose	- image (brand, policy) - pro-sale - non-profit (charity, ecological, religious) - as a pretext (to publicize a product whose advertising is limited) - guerrilla (achieving maximum publicity with a scandal)
8. Area of activity	- online/multimedia - offline
9. Interaction with audience	- active - passive
10. Customer loyalty to the event	- permanent, (Procom Open, athletics events in Żywiec) - random
11. Publicity	- media - focused on direct participants only
12. Corporate commitment	- sponsoring - own
13. Main benefits for participants	celebrities, freebies, competitions, rivalries, artistic experiences, entertainment experiences, spectacles, shows, feasts
14. Industry, types/forms of events, music events	sports, recreation, picnic, spectacular, extreme, visual, multimedia, installations, performing, light and sound shows, pyrotechnic shows, shows for children, fairs, festivals, galas, theme shows, film shows, anniversaries, feasts, games, happenings, etc.

Source: D. Kolber, *Event marketing – organizacja imprez, czy coś więcej?* <http://www.epr.pl/event-marketing-organizacja-imprez-czy-cos-wiecej,event-pr,1226,2.html>, 18.12.2021.

² Pursuant to the provisions of the Polish Act of 20 May 2009 on mass event safety (Journal of Laws of 2013, item 611, as amended), mass events are artistic, entertainment and sports events, including soccer matches. Recognition of an event as a mass event depends on its nature, the venue of the event, and the number of participants:

- an artistic and entertainment event is a mass event, if the number of the places/seats reserved for participants is not less than 1000 in a stadium or an open area venue, and 500 in a sports hall or other venue/building;
- in the case of sports events, the number of seats is not less than 1000 in a stadium or other open area venue, and 300 in a sports hall or other venue/building;
- due to special principles of event organization and safety assurance, soccer matches, where the number of the seats available to spectators is no less than 1000, are also considered mass events.

In sum, it should be noted that the event classification can be expanded, depending on the event nature and the goals set by the organizers. Due to the fact that event marketing is interdisciplinary in nature and is shaped by individual viewpoints and particular situations, anyone can develop one's own proper event classification.

3. Evolution of the concept of an event

The COVID-19 infectious disease caused by the SARS-CoV-2 coronavirus, declared a pandemic by the World Health Organization (WHO) on the 11th of March 2020, has irreversibly remodeled both processes and business relationships. The global spread of COVID-19 has prompted many countries to close their borders, partially or completely. This has resulted in a significantly reduced cross-border passenger traffic. According to the World Tourism Organization (UNWTO), the number of international tourists in 2020 decreased by 74%, compared to 2019. The largest decrease in the number of the people traveling abroad was recorded in April – by as much as 97%, compared to the same month a year earlier³.

The coronavirus pandemic has almost completely shut off the meeting industry. It is estimated that the meeting industry will be one of the last industries to return to normality. The situation which the event organizers found themselves in caused a transformation of traditional events. Events began to be organized in virtual reality, which became everyday reality for most people and for almost each of the target groups the organizers want to reach with an event. Meetings and events have changed in their nature – today it is difficult to imagine any business interaction without the use of online channels.

The demand for new technology has caused people to experience their lives in the real world and in digital reality simultaneously, both of which have become commonplace. Increasingly often events are moving into the virtual world, nevertheless, this does not change the fact that they still remain events, with all their features. They are still live events, attended by people who are just as real and emotional. In the era of progressive digitalization and the changing reality in which the world has found itself, events should also be considered from the perspective of the activity areas in which they are organized.

The first such area is Event 1.0 (live events), which involves any type of event during which participants meet at a designated location. Depending on the target group, it serves different purposes: educational, communication, engagement building, brand awareness, employer branding, business and corporate. This was the most popular form before the COVID-19 pandemic. Offline contact, in the real world, brings people together and allows them to get acquainted better with one another. Face-to-face meetings can serve many marketing functions:

³ International tourism and COVID-19, <https://www.unwto.org/international-tourism-and-covid-19>, 2021-02-10.

brands strengthen their expert position during trainings, information events are aimed at branding, but also at sales and leads⁴ acquisition, in the case of product or service promotion. Live event strengths principally include the participant involvement.

Event 2.0 (online event) is an event or a meeting, during which participants connect via the Internet. It can be conducted in a form of a training, a meetup, a workshop or a conference directed by the company to its clients, employees or partners. It differs from a webinar, which is performed as one-way communication - it engages the participants, almost as much as Event 1.0. Different types of such events can be indicated, inter alia, e.g.: webcasts and slidecasts, audiocasts, virtual fairs (for products, services, work), webinars, virtual conferences and meetings. The strengths of online meetings undeniably include the reach and convenience, as the participants can join in from almost anywhere in the world. Their cost can be lower, owing to the limited catering or conference room expenses. Online events do not require the tedious task of checking multiple locations or traveling. Such events eliminate the borders in the world, increasing the potential number of event participants and providing easier access.

Event 3.0 (hybrid event) is a combination of an online and offline event. Part of the group invited to the event is engaged in online participation (from their home office or office), while the others arrive at a given venue. In this case, the organizer takes care of the interests of both groups and provides the same access to interaction with speakers and other participants as well as the same forms of engagement and feedback. With the growing popularity and cost-effectiveness of online meetings, hybrid events have become a popular way to increase participation in traditional events, at a relatively low cost. Such events also allow participation of those, who may not be able to physically attend an event, due to travel or time zone restrictions. During hybrid events, the online attendees can access live audio or video streaming of presentations and materials as well as ask questions via video calls or chats. Event content can also be recorded and shared online, so as to support further post-event discussion, enabling a knowledge portal for the attendees, and helping promote the next year's edition of the event, by sharing the highlights from the current year. Hybrid events are intended for all those, who cannot be present on the site. They enable incredible reach, which can be directed exactly where the target audience is. Properly selected digital tools allow effective promotion of events and the building of an event engaged community.

⁴ Lead generation in marketing entails the generation of interest or inquiries for product and service offers. Leads can be created to build lists of potential customers, acquire newsletter subscribers, or as sales leads.

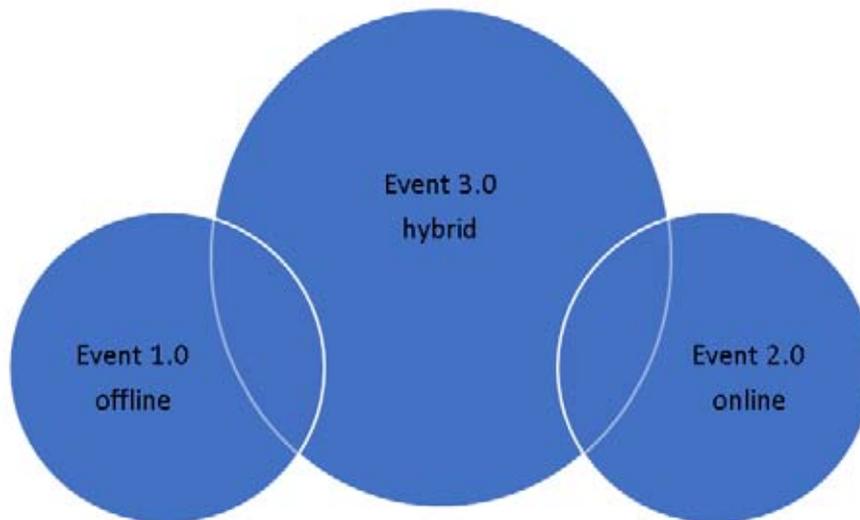


Figure 2. Event concept evolution. Source: own elaboration.

Virtual (Digital) events (online and hybrid) are supported by the social network expansion. Such events can have global reach, through live streaming, while users can participate virtually, via the social media, even if a given event is physically taking place at a remote location. This can increase the organizers' international visibility. The planning process for virtual and hybrid events initially resembles traditional offline event planning. It is important to begin social media communications well in advance.

In addition to building and carrying out an event, the organizing company also acquires any data about the event participants, which allows to measure its effectiveness, compare it to others, and verify whether it is worth investing in an event of such formula in the future. Organization of virtual events allows perfect measurement of their effectiveness, owing to such elements as the event websites and mobile applications, the registration/ticket sale process, the e-mail or text message reminders and notifications, surveys, chats.

4. Event trends

Technology is starting to become not only an important part, but also the backbone of communication and interpersonal relationships. Not only the way of participating, but also the manner of interacting with the event as a whole is therefore changing. In the era of progressive digitalization, the role of e.g., mobile applications, which allow the sharing of the activity during events, is appreciated more than traditional gadgets. Among the main trends in events, the following can be principally included:

- Precise marketing – digital technologies allow precise adjustment of the event offer. User activity tracking facilitates development of personalized content. Mobile applications allow the participants to interact with one another, generating even more mobile traffic.
- Influencer marketing – the use of event support from popular people, celebrities, and opinion leaders has been favored for years, especially during event promotion.
- Multimedia – generate traffic before, after and during the event. Multimedia libraries, which can be disseminated and used online, enable constant access to knowledge via video content sharing (owing to self-sharing and online recommendation).
- Live streaming – live broadcasts and video content sharing are extremely popular on social media. They generate more user engagement, which results in extended event life or in outward video execution. It enables virtual meetings for people who cannot attend a given event in real time.
- Artificial Intelligence (AI) – the availability of bots and their success enable improvement of their performance in increasingly complex areas of human interaction. AI also excels in events, as an ideal way to offer digital and personalized consumer experience. It entails content tailored to consumer interests, better group segmenting, and relationship building with consumers, on their terms.
- Mobile first – is a trend that has been developing for several years. Mobile technology has become inevitable in events, i.e., an event must be accessible on mobile devices. The decision to attend an event is often made while browsing the social media, therefore, recipients must be able to register and learn the details right away.
- Virtual and Augmented Reality Technology – augmented reality is a technology developed for entertainment. Just as artificial intelligence, augmented reality is increasingly used in the meeting and event industry, enjoying tremendous potential in providing the consumers with engaging experiences, in which they can actively participate and interact in the event space. As such it increases the likelihood of developing an emotional connection between the customer and the brand being promoted.
- Digital Experience – the user experience when using a website or a mobile app during an event can be crucial when making purchasing decisions. New digital experiences must entail even higher user engagement.
- Transparency – access to information is easy nowadays. It does not require much involvement on the part of the user. Transparency policies have become a real trend among event organizers, as they strengthen trust and build brand loyalty.
- Micro-moments – are a novelty in the perception of the customers' purchasing process. Such instances are understood as a few seconds, when Internet users expect answers to the needs that have arisen in a given moment. Micro-moments are ideal for events, since consumers strive to get relevant content from companies and brands immediately.

5. Conclusions

The time of the pandemic has not only been a time of traditional meeting freezing and blockage, but also a time of dynamic changes. From today's perspective, it can undeniably be stated that it also entails development of virtual channel events. Not long ago, most of us were feared virtual events, but nowadays, they seem completely natural. Along with the development of technology, when people have become accustomed to mass use of the Internet, event marketing has gained a new meaning and another dimension. For the majority of users, participation in events, despite the detachment from the online world, still entails a search for sensational experience. Everyone strives for interesting, unforgettable experiences and unique moments. New technologies are now becoming a key event element, whether at the stage of activity planning, promotion, or monitoring. Online and offline events can be one of the most effective ways to achieve marketing goals. Today's digital marketing capabilities enable registration of more venues, building of more hype, and chatting with a more targeted audience than ever before.

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MODEL TEACHER TRAINING SCHOOLS IN POLAND – DIAGNOSIS OF TEACHERS' NEEDS IN THE LIGHT OF THE RESEARCH

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Purpose: The aim of the article is to present model Teacher Training Schools in Poland and to demonstrate conclusions from the diagnosis of needs of supported schools in order to specify the forms of support for teachers included in the project.

Design/methodology/approach: The article presents the assumptions of the Teacher Training School Model as an innovative system of supporting teachers' competences, which can be financed from EU funds. Selected aspects of the Teacher Training School functioning were presented for an exemplary project: "Teacher Training School in the commune of Barcin", implemented in the period from January 01, 2021 until July 31, 2022. The conclusions from the diagnostic research (CAWI and CATI) of 7 supported schools, 65 teachers and 10 principals and deputy principals, in terms of their expectations for the forms of support planned in the project, were indicated.

Findings: The results of the diagnosis of needs of supported schools allow to specify the forms of support for teachers and principals affected by the newly established Teacher Training School in the commune of Barcin.

Research limitations/implications: The assessment of the effectiveness of the impact of the Teacher Training School in the commune of Barcin presented in the article will be possible after the completion of the project.

Practical implications: The results of diagnostic tests, including the expectations of teachers and managers, allow for detailed planning of workshops and cooperation networks in the project "Teacher Training School in the commune of Barcin". At the same time, the results may constitute recommendations for the process of training and practical improvement of teachers in the field of developing key competences for students.

Social implications: The priority of educational policy in Poland is to ensure an effective system of education and continuous professional development of teachers which will respond to real needs of a school and will allow teachers to improve their professional competences and develop their workshop.

Originality/value: The implementation of the model Teacher Training Schools in Poland will have a social dimension directly affecting teachers' and indirectly pupils' key competences.

Keywords: diagnosis of needs, teachers, competences, project, training, workshops.

1. Introduction

The aim of the article is to present model Teacher Training Schools in Poland and to demonstrate conclusions from the diagnosis of needs of supported schools in order to specify the forms of support for teachers included in the project. The article presents the assumptions of the Teacher Training School Model as an innovative system of supporting teachers' competences, which can be financed from EU funds. Selected aspects of the Teacher Training School functioning were presented for an exemplary project: "Teacher Training School in the commune of Barcin", implemented in the period from January 01, 2021 until July 31, 2022. The conclusions from the diagnostic research (CAWI and CATI) of 7 supported schools, 65 teachers and 10 principals and deputy principals, in terms of their expectations for the forms of support planned in the project, were indicated.

The priority of educational policy in Poland is to ensure an effective system of education and continuous professional development of teachers which will respond to real needs of a school and will allow teachers to improve their professional competences and develop their workshop. Schools, as well as teacher training institutions, should develop towards learning organizations, and by undergoing permanent evaluation, improve their development (Hajdukiewicz, Wysocka, 2016, p. 7). At the same time, it is important to promote the self-education system of teachers (Fila, Matuszczak Rybińska, 2015, p. 43), and the principals of these institutions should play a key role in such education and training (Fischer, Taylor, 2012, p. 235; Kordziński, 2010, p. 10).

Professional development is a process of increasing employee qualifications, the knowledge of which must be constantly supplemented, developed and modernized at the workplace. The improvement of employees' workshop will serve to strengthen their competences more if it is of practical nature, based on observation and exchange of experiences among teachers (Wysocka, Hajdukiewicz, 2015, p. 2). The research results clearly show that high efficiency is built by a teacher not only through participation in training, but also through cooperation with other teachers and the opportunity to participate in joint projects at school (Main results of the research TALIS, 2013). In Polish schools, however, such activities are rarely undertaken on the school premises (Hernik, Malinowska, Piwowarski, 2014, p. 5).

The possibilities of co-financing the teacher education system from EU funds allowed for the formulation of a recommendation by the Ministry of National Education (MEN) in Warsaw for the needs of initiating a modern system of teacher education within the model Teacher Training Schools (Teacher Training School Model, 2019).

The authorities running schools may apply within the competitions announced by the Ministry of National Education and receive funds from the European Social Fund (ESF) for the implementation of projects within which Teacher Training Schools may be established based on the Model developed by the Education Development Center (<https://www.ore.edu.pl/2017/10/o-projekcie/>).

2. Assumptions of the Teacher Training School

The Teacher Training School according to the model is: “a set of planned activities of schools (training schools and cooperating schools) and institutions supporting the learning process of teachers and students (...), “a school where future teachers will experience practical verification of the theory learned during their studies, and working teachers can improve their work techniques in cooperation with other teachers (...), “in the training school, a student under the guidance of the teacher will face educational practice in areas of education and upbringing, and teachers will develop their workshop and share their ideas with other teachers” (Model szkoły ćwiczeń/Teacher Training School Model, 2019, p. 4).

The Teacher Training School cooperates with specialists and effectively uses the institutional resources of the local education environment (*Zasady współpracy szkoły ćwiczeń/Principles of training school cooperation*, 2019, p. 2):

- leading authorities (local governments),
- support centers (psychological and pedagogical counseling center, pedagogical library, teacher training center),
- universities (teaching schools).

The model Teacher Training School is a place for disseminating innovative activities supporting the development of students' key competences, with particular emphasis on teaching foreign languages, mathematics, science, information and communication technologies and sharing knowledge and skills by teachers. The principals and teachers of Training Schools are obliged to promote and implement the use of innovative didactics in other schools, as well as organizational and educational solutions in the scope of activities supporting the development of students' key competences.

The establishment of Teacher Training Schools depends on the involvement of the leading authorities because local governments together with teacher training institutions, pedagogical libraries, psychological and pedagogical counseling centers, and universities, initiate cooperation and plan joint projects for the development of local education (Gołowska, Soćko, 2015, p. 43).

Currently (31st December, 2021), 42 Training Schools across Poland were founded and financed from the European Social Fund as part of two competitions announced by the Ministry of National Education (MEN, POWR.02.10.00-IP.02-00-005/18; MEN, POWR.02.10.00-IP.02-00-003/19).

Activities that can be financed within the competition are (Competition regulations POWR.02.10.00-IP.02-00-003/19):

- diagnosis of needs of supported schools which will be affected by the established Training School,
- workshops for trainers (teachers) and teaching staff of Training Schools in the field of methods and forms of didactic work,
- conducting activities in the Training School, including training and practical development for professionally active teachers in the field of developing key competences for students; practical training of students from pedagogical studies with the use of didactic and methodological materials supporting the professional development of teachers; practical preparation of students within training schools and evaluation of undertaken activities in order to verify the goals and determine next possible actions.

The concept of an exemplary project within which the Training School was established is presented in the next section.

3. Support for schools and teachers in the project – a case study

Within the project "Teacher Training School in the commune of Barcin", the Jan Brzechwa No. 2 Primary School in Barcin acts as a Training School and carries out tasks in the field of professional development and teacher education, including the process of supporting 7 cooperating schools.

Teacher Training School, in accordance with the model, cooperates with local educational units, which is a significant manifestation of the regional policy initiated by the local government unit (Project Beneficiary) in order to create new forms of cooperation between primary schools and representatives of teacher training institutions and universities. Such cooperation is shown in the figure below (Figure 1).

As part of the project "Teacher Training School in the commune of Barcin", a number of activities have been planned, leading to the achievement of the main goal: "Improving the functioning of the school support system in the development of key competences and universal skills in the labor market by preparing, supporting and granting the status of a Training School – No. 2 Primary School in Barcin (...)". The key elements of the project are presented in the following table (Table 1).

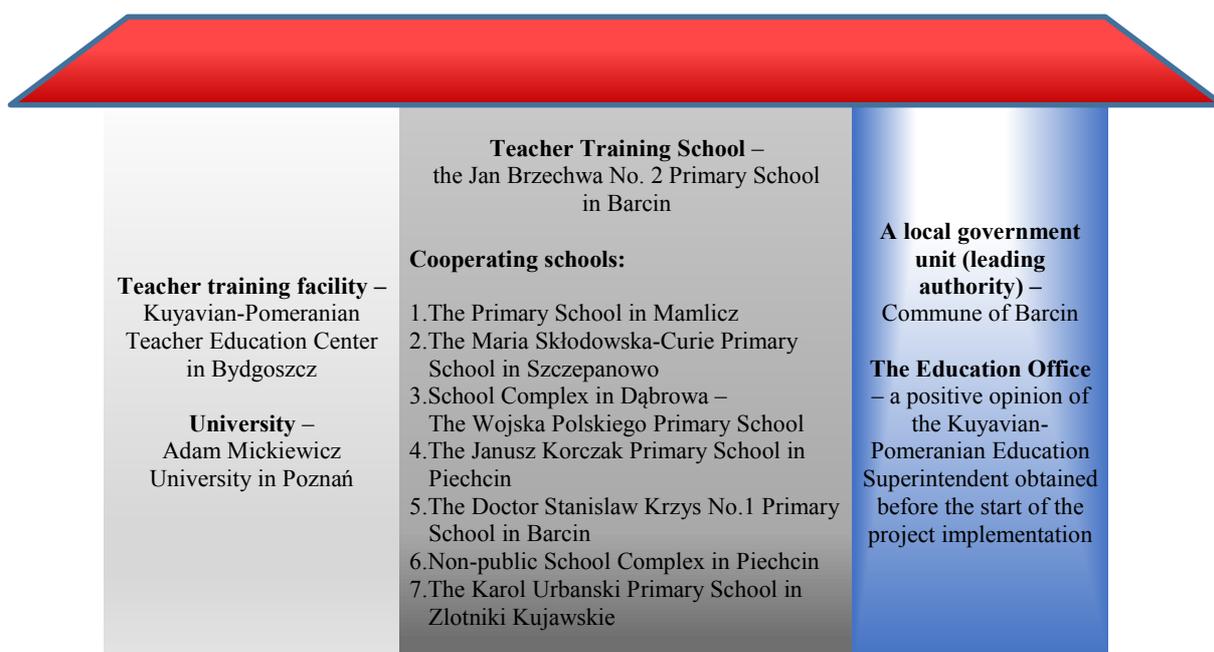


Figure 1. List of entities cooperating within the Teacher Training School. Source: own study based on the application for co-financing of the project "Teacher Training School in the commune of Barcin".

Table 1.

Characteristics of the selected EU project "Teacher Training School in the commune of Barcin"

No.	Description	Characteristics
	Operational Programme	Operational Programme Knowledge Education Development
	Priority Axis	Priority Axis II "Effective public policies for the labor market, economy and education"
	Action	Actions 2.10 "High-quality education system"
	Competition	POWR.02.10.00-IP.02-00-003/19
	Beneficiary	the commune of Barcin
	Partner	Euro Innowacje sp. z o.o.
	Task 1: Retrofitting subject laboratories with teaching equipment and teaching aids for the needs and functioning of the Training School	Retrofitting the didactic base of the Training School with teaching equipment and teaching aids for the purpose of conducting model demonstration lessons, methodological workshops and the organization of cooperation networks in subject laboratories: mathematics, ICT, natural science, biological, chemical, physical, geographic, linguistic (English and German).
	Task 2: Strengthening the competences of the staff and supporting the forms and methods of work of the Training School adopted for implementation	Support for 28 teachers of the Training School (trainers) in the scope of: <ul style="list-style-type: none"> – coaching trainings for the Training School principals, – workshop trainings for trainers of the Training School – substantive development of 8 sets of training materials for teachers, students and internship supervisors

Cont. table 1

	Task 3: Conducting activities in accordance with the diagnosed needs of supported schools in selected forms and methods of work of the Training School	Support for 50 teachers of supported schools in the field of: <ul style="list-style-type: none"> – diagnosis of needs of principals and teachers of 7 supported schools – coaching trainings of 14 principals – methodology conference for 50 teachers – substantive development of 8 sets of teaching materials for teachers, students and internship supervisors – production of 16 films complementary to teaching materials – creating 4 networks of cooperation and self-education (teaching mathematics, ICT, science and foreign languages) – methodological workshops for teachers on developing key competences – developing 96 lesson plans for demonstration lessons – conducting 96 hours of demonstration lessons – evaluation of activities undertaken in the project
	Budżet projektu (100% wkład EFS) Project budget (100% European Social Fund contribution)	Direct (task-related) costs - PLN 1,101,872 Task 1 - PLN 347,666 Task 2 - PLN 158 572 Task 3 - PLN 595,634 Indirect costs - PLN 220,374 Project value (direct + indirect costs) - PLN 1,322,246

Source: own study based on the application for co-financing of the project "Teacher Training School in the commune of Barcin".

The concept of supporting schools and teachers has been planned as part of three complementary tasks. The first task is to equip 9 subject laboratories in the Training School with modern equipment and teaching aids for the purpose of conducting model lessons. The next task is to strengthen the professional competences of the teachers (trainers) of the Training School as part of coaching sessions and workshop trainings, and to prepare model teaching materials for educators. The last, key task is to conduct activities in the Training School to support teachers of cooperating (supported) schools.

The nature of the planned forms of support, in accordance with the Model, must be preceded by a diagnosis of needs of supported schools, the results of which are presented in the next section.

4. The results of the diagnosis of cooperating schools for the purpose of detailing the planned forms of support in the project

For cooperating schools, the diagnosis of needs is preceded by participation in planned forms of support in the project. The intention of the project initiator was to provide adequate support, "tailored" in accordance with the diagnosed needs of schools.

The aim of the diagnosis carried out in the period from June to August 2021 was to identify the need for additional education of teachers of supported schools, in particular to specify and detail the planned forms of support:

- thematic ranges for two 6-hour classroom methodology workshops on developing key competences of students, using methodological and didactic materials supporting professional development,
- issues raised during the cooperation network and self-education for the teaching staff of the Training School and supported schools, within each of the 4 areas of education,
- identifying the conditions for maintaining the effectiveness of the changes introduced and strengthening the effects achieved within the project.

According to the concept of diagnosis, the study covered: 100% of school management (principal and deputy principal) and 70% of teachers in the subject areas: mathematics (mathematics), science (nature, biology, chemistry, geography, physics), ICT/(IT) and language (English, German). The diagnosis did not cover teachers from the humanities because, according to the competition regulations, they were not allowed to participate in the project.

Two methods and diagnostic tools were used in the diagnosis process CAWI survey – on-line survey consisting in completing an electronic questionnaire by teachers using the Microsoft Forms tools, and CATI survey – computer-assisted telephone interview conducted with the management according to a predefined script conversation.

The results of the research carried out on a group of 64 teachers (55 women and 9 men) employed in cooperating schools and 10 principals and deputy principals of these institutions allowed for the formulation of conclusions and recommendations for the needs of organizing forms of support in the project.

Teachers are interested in learning the following methods and techniques supporting the learning processes (ranked from the most to the least frequently mentioned): TOC (Theory of Constraints), Creative Thinking Techniques, Supervision, Formative Assessment, Neurodidactics, Visual Thinking in Education – Ruling, The Method of Developing Movement by W. Sherborne, The Project Method, peer to peer learning, IBSE Method, The Good Start Method by M. Bogdanowicz, Design Thinking Method, CLIL Method, Art Therapy Method, Beti Strauss Active Listening Method, Genius Hour, Drama.

Teachers indicated the willingness to learn the following tools and technical means supporting the learning processes (ranked from the most to the least frequently mentioned): virtual whiteboards, interactive whiteboard, e-textbooks/digital textbooks, on-line educational multimedia games, 3D printer, applications for sharing files, creating tests, games, quizzes, applications for creating multimedia presentations, infographics, movies and moving slides, applications for visual work, distance learning, 3D modeling, on-line surveys and tests.

Among all the forms of support assumed in the Teacher Training School Model, the surveyed teachers recommended the following: individual and group consultations, didactic materials, cooperation networks and self-education, and methodological workshops. The school management indicated: individual and group consultations, didactic materials, on-line work on the platform doskonaleniewsieci.pl, and methodology workshops.

In addition, the management staff indicated the following expectations and needs to maintain the effectiveness of the changes and to strengthen the effects achieved in the project:

- the support process must result from the needs indicated by teachers,
- it is necessary to integrate teachers' community allowing the involvement of all teachers in the project,
- support should be based on the practical application of new methods and tools that can be used directly in everyday professional work,
- training and cooperation networks should be conducted within unified groups of teachers teaching similar subjects, which will enable the exchange of experiences and improve the process of sharing knowledge between teachers from a given subject area,
- the trainer should establish a good rapport with participants, be an expert and authority in their field, which will have a positive impact on teachers' perception regarding the content of training,
- cooperation networks should encourage teachers to reflect and provide inspiration for further cooperation on the platform: doskonaleniewsieci.pl.

The following responses were indicated as concerns or barriers related to the participation of the teaching staff in the project:

- interference of forms of support with teachers' working hours, the schedule and hours of support for teachers should be provided in advance and adjusted to their preferences,
- the COVID-19 pandemic may prevent a stationary form of support, hence a hybrid formula should be considered.

5. Summary

The results of the research provided valuable information on teachers' expectations in terms of acquiring practical skills in the use of modern methods and techniques supporting learning processes, as well as tools and technical means supporting learning processes. At the same time, teachers' concerns and barriers related to participation in the project were recognized and the expectations and needs of the management staff necessary to maintain the effectiveness of the support were verified.

Assessment of the effectiveness of the created Teacher Training School in Barcin on other cooperating schools, with the use of integrated resources of local institutions will be possible only after the completion of the project. The planned evaluations of the newly-established school will allow to verify long-term effects, including the effectiveness, relevance and durability of the changes introduced in the process of professional development and teacher education.

The establishment of Teacher Training Schools across Poland should contribute to the change of the existing system of teacher education and training, as part of three functions of the regional policy:

- educational, understood as presenting students (as part of education) and teachers (as part of professional development) with effective forms and methods of working with pupils/students,
- promotional, by indicating exemplary solutions in the field of educational and organizational tasks in the local educational environment,
- integrative, implemented through the fusion of resources (knowledge, competences and activities) of institutions established to support the work of the school and teacher education.

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THE IMPORTANCE OF THE SERVQUAL METHOD IN THE MANAGEMENT PROCESS OF AN ECOLOGICAL ENTERPRISE IN THE ASPECT OF THE COVID-19 PANDEMIC

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Purpose: The aim of the publication was to determine the significance of the Servqual method in the management process of an ecological enterprise in the aspect of Covid-19 pandemic.

Design/methodology/approach: The research was carried out in specialist stores with organic food using the mystery shopper method from July to September 2021. The scope of the research was nationwide.

Findings: The calculated indicators of Servqual unweighted (SQnw) and weighted (SQww) show that the fully satisfactory condition was achieved for the customer.

Research limitations/implications: Another important piece of information, which was obtained during the research, is that there is a large rotation of specialist organic stores and a problem with creating the database.

Practical implications: The worst ranked, although positively assessed dimension, was "reacting", and after taking into account the weight of dimensions – "empathy. These are the areas that can be further improved by entrepreneurs.

Originality/value: The market of organic products in Poland is undergoing dynamic transformations in the era of the Covid 19 pandemic and the electronic economy of the 21st century. New participants enter the market and put traditional, specialist organic food stores, under increased pressure from competition. Hence, there is an even greater need to improve the services they provide through the use of modern methods and quality tools. In relation to the ecological industry, there are no scientific reports on use the Servqual method.

Keywords: Management, Organic Food, Specialty Shops, Servqual Method, Customer service.

Category of the paper: Research paper.

1. Introduction

The market of ecological products in Poland is undergoing dynamic transformations in the era of the pandemic and electronic economy. With more and more market entrants, specialist organic food stores can experience increased competitive pressure. Hence, there is an even greater need to take care of the high-quality assortment offered to customer (Szczepanek, Prus,

Knapowski, 2018) and improve the services by using modern methods and quality tools. One such method is the Servqual method. This method allows the measurement of service quality by means of scoring and identification of strengths and weaknesses in the process of providing the service (Michalska-Ćwiek, 2015). Although it is used as a method, as indicated by both national publications (Woźniak, Zimon, 2016; Gontarczyk, Kijek, Zelkowski, 2017; Mazur et al., 2017; Midor, 2017; Nieżurawski, Sobków, Michalak, 2017; Stajniak, Konecka, Szopik-Depczyńska, 2017; Woźniak, 2017; Jakubowski, Królczyk, 2018; Przybytniowski, 2018a; 2018b; Dudek-Burlikowska, 2019; Gajewska, 2019; Kowalik, Klimecka-Tatar, 2019; Majchrzak, 2019; Rodzeń, Stoma 2019; Wrukowska, 2019; Strumiłło, Jagodzińska, 2020), and foreign publications (Cardona et al., 2018; Pekkaya, Öznur, Pulat, İmamoğlu, Koca, 2019; Behdioğlu, Acar, Arda, Burhan, 2019; Nguyen, 2021) in relation to the ecological industry, there are no scientific reports on its use.

The aim of the publication was to determine the significance of the Servqual method in the management process of an ecological enterprise in the aspect of Covid-19 pandemic.

2. Servqual Method

The Servqual method was developed in the 1980s by a team of American researchers: A. Parasurama, V. Zeithaml and L. Berry. It can be used to objectively test the quality of all types of services (Stoma, 2015).

The formula for calculating the Servqual index is as follows:

$$S = P - O$$

where: S – the result of the Servqual method,

P – customer perception of the service,

O – customer expectations from the service, whereby:

$P = O$ – desired condition: customers are fully satisfied with the service,

$P > O$ – perfect condition: customer perception of the service significantly goes beyond their expectations,

$P < O$ – conditional state: customer expectations for the service have not been fully met.

The authors of the Servqual method have identified five areas of quality (Parasuraman, Zeithaml, Berry 1988; Trawnicka, 1997; Stasiak-Betlejewska, Borkowski, 2010):

1. materiality – the external appearance of the facility, equipment and staff appearance,
2. reliability – the ability to perform services reliably and accurately,
3. responsiveness – desire to assist customers and ensure prompt service,
4. certainty – having the required skills and knowledge necessary to perform the service,
5. empathy – paying attention, feeling the client's needs.

3. Material and methods of research

The survey was carried out in several steps. In the first step, the literature on the subject was reviewed. Basic concepts were explained. In the next phase of the research, the sampling frame was prepared. A list of service companies was created, numbered and entities were selected basing on the generated random numbers in Excel (function rand). Simple random selection was used in the research. The sample size was determined basing on the sample size calculator. While compiling the list, the Panorama Firm enterprise catalog was used. A total of 376 points were separated according to the slogan of organic food stores. In selected stores, the research was carried out using the mystery shopper method from July to September 2021. A telephone interview was used. The choice of such a method of conducting research was dictated by the current pandemic situation and the reduction of research costs. This method is used for this type of research (Mazurkiewicz-Pizło, Pizło, 2018). During the survey, a measuring instrument was also prepared - an interview scenario - verified in the pilot studies. The focus was put on selected aspects enabling assessment of the quality of customer service in terms of information provided by the employee of a specialist store based on the adaptation of the Servqual method. The survey took into account four of the five dimensions used in this method, i.e. reliability, responsiveness, confidence, empathy. In total, 12 selected elements were assessed, three for each area. The area defined as materiality was neglected due to the nature of the research and the inability to assess this element. The analysis of the obtained results was based on the methods of descriptive statistics. Out of the group of 376 generated stores, those that were nationwide chain stores were rejected due to the fact that such entities operate in a different way. The remaining group of 300 stores became the basis for a draw. In the course of the research, 168 randomly selected organic food shops were contacted. Unfortunately, it turned out that some of them had already changed their profile or stopped trading in organic food. In some cases, it was not possible to contact the stores. Therefore, the presented results concern only forty-four points of sale. However, the interviews provided additional information on the reasons why some specialist stores had been closed, what was the impact of the pandemic on organic food store functioning and what changes were planned in the quality of services provided, as well as how the information included in enterprise databases was used by customers.

4. Results

Own research was carried out in specialist organic food stores. The interview was conducted over the phone (mystery shopper). Thanks to this form of communication, the information service on sales provided in stores was assessed.

The table below presents the four dimensions of quality, along with the adopted statements in the scenario.

Table 1.
Dimensions of service quality

Dimension	Questions/Statements
Reliability	<ol style="list-style-type: none"> 1. Accuracy of information 2. Reliability of information 3. Connection quality
Responsiveness	<ol style="list-style-type: none"> 1. Answering the phone 2. Time of waiting for connection 3. Speed of response to questions
Certainty	<ol style="list-style-type: none"> 1. Competence of personnel 2. Courtesy and friendliness of the staff 3. A trustworthy manner of conversation
Empathy	<ol style="list-style-type: none"> 1. Individual approach to the client 2. Full attention to the customer 3. Identification of customer needs

Source: own research.

The obtained research results are summarized in the Sevqual sheet. It can be observed that most of the assessed elements obtained a positive assessment (Table 2).

Table 2.
Servqual sheet

No	The quality dimension	Questions/Statements	Customer expectations	Customer observations	Arithmetic difference
1	Reliability	Accuracy of information	4.0	4.75	0.75
2		Reliability of information	4.0	4.70	0.70
3		Connection quality	4.0	4.89	0.89
4	Responsiveness	Answering the phone	5.0	4.91	-0.09
5		Time of waiting for connection	4.0	4.86	0.86
6		Speed of response to questions	4.0	4.77	0.77
7	Certainty	Competence of personnel	4.0	4.66	0.66
8		Courtesy and friendliness of the staff	4.0	4.77	0.77
9		A trustworthy manner of conversation	4.0	4.77	0.77
10	Empathy	Individual approach to the client	4.0	4.77	0.77
11		Full attention to the customer	4.0	4.68	0.68
12		Identification of customer needs	4.0	4.70	0.70

Source: own research.

In the next stage of the research, the qualitative features were ordered from the worst to the best (Table 3). The weakest element was "Answering the phone", where the assessment was negative, though close to zero, still consistent with the right standard of service quality. The remaining features of quality meet the expectations of customers regarding the service provided, although there are some differences that may be an indication for optimization of work.

Table 3.
Quality features of the examined service

The quality dimension	Questions/Statements	Arithmetic difference
Responsiveness	Answering the phone	-0,09
Certainty	Competence of personnel	0,66
Empathy	Full attention to the customer	0,68
Reliability	Reliability of information	0,70
Empathy	Identification of customer needs	0,70
Reliability	Accuracy of information	0,75
Responsiveness	Speed of response to questions	0,77
Certainty	Courtesy and friendliness of the staff	0,77
Certainty	A trustworthy manner of conversation	0,77
Empathy	Individual approach to the client	0,77
Responsiveness	Connection waiting time	0,86
Reliability	Connection quality	0,89

Source: own research.

In the next stage of the research, the importance of individual quality dimensions was determined (Table 4). The most important dimension was "responsiveness", followed by "reliability", "confidence" and "empathy".

Table 4.
Importance of quality dimensions

The quality dimension	Importance
Reliability	25
Responsiveness	30
Certainty	24
Empathy	21

Source: own research.

Then, the weighted arithmetic difference was calculated for individual quality features (Table 5). The obtained results indicate that "answering the phone" was the worst-rated element. Giving importance to individual dimensions has not changed the fact that it is still the weakest quality trait.

Table 5.*Weighted arithmetic difference for individual quality characteristics*

No	Quality Criterion	Questions/ Statements	Arithmetic difference	Weight	Weighted arithmetic difference
1	Reliability	Accuracy of information	0.75	25	18.75
2		Reliability of information	0.70		17.61364
3		Connection quality	0.89		22.15909
4	Responsiveness	Answering the phone	-0.09	30	-2.72727
5		Time of waiting for connection	0.86		25.90909
6		Speed of response to questions	0.77		23.18182
7	Certainty	Competence of personnel	0.66	24	15.81818
8		Courtesy and friendliness of the staff	0.77		18.54545
9		A trustworthy manner of conversation	0.77		18.54545
10	Empathy	Individual approach to the client	0.77	21	16.22727
11		Full attention to the customer	0.68		14.31818
12		Identification of customer needs	0.70		14.79545

Source: own research.

Then, the unweighted (SQnw) and weighted (SQww) Servqual index was calculated for each quality feature as assessed by the customer (Table 6). The obtained general results indicate that the ideal state has been achieved ($P > O$). The worst assessed, though positively dimensioned, was "reacting", and after taking into account the weight of dimensions – "empathy". These are areas that can be further improved. The obtained results are similar to the previous results of research carried out with other methods (Smoluk, 2011; Koreleska, Chwal, 2016; Koreleska, 2019).

Table 6.*Servqual indicator unweighted (SQnw) and weighted (SQww) for individual quality dimensions as assessed by customers*

The quality dimension	SQnw	SQww
Reliability	0.780303	19.50758
Responsiveness	0.515152	15.45455
Certainty	0.734848	17.63636
Empathy	0.719697	15.11364
Indicator	Arithmetic overall average measure: SQn = 0.6875	Weighted overall average measure: SQw = 16.92803

Source: own research.

5. Discussion

In addition to the assessment of the quality of services according to Servqual, additional information was obtained regarding, reasons for closing down some of the business entities. One of them was found to be the Covid pandemic. In addition, the reasons for closing stores, according to entrepreneurs, were also: greater availability and lower prices of organic food in

hypermarkets, chains, e.g. in Auchana, Tesco or Rossman, logistics problems, e.g. with the availability of parking spaces for customers, etc.

When asked how the situation changed during the pandemic, 44% of entrepreneurs who answered this question indicated that the number of customers in the store did not change, the same number of entrepreneurs said that more people buy organic food from them. Every tenth point declared that the number of people making purchases decreased during the Covid-19 pandemic.

Another important piece of information, which was obtained during the research, is that there is a large rotation of specialist organic stores. The database that was used, turned out to be largely out of date. The list included companies that have ceased to operate in this industry or are planning to undertake it. Some of the information presented in business cards in the databases is free of charge, so entrepreneurs do not have to rush to remove it. The problem with the list of organic food retailers is also due to the fact that retail outlets are not subject to additional specialized control and certification, such as organic farms, processing plants or wholesalers that introduce organic products to the market. In addition, the lists created, e.g. according to the Polish Classification of Activities, have a much wider scope and are not limited only to organic food, and may not even include it at all (PKD 47.29.Z Retail sale of other food in specialized stores).

6. Summary

The obtained assessment of the quality of services means that the expectations of service users in the surveyed entities have been met. The defined difference between the expected and perceived quality indicates that the customer's satisfaction has been achieved. The worst ranked, although positively assessed dimension, was "reacting", and after taking into account the weight of dimensions – "empathy". These are areas that can be further improved by entrepreneurs.

In conclusion, it can be said that Servqual method is of great importance in optimizing the management process activities in the studied traditional organic enterprises, especially in the era of Covid-19 pandemic and should be widely used.

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ECOLOGY IN MARKETING OF THE CITY AND ATTACHMENT OF RESIDENTS – BASED ON SELECTED CITY

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Purpose: The cognitive article purpose was to indicate significance of pro-ecological actions in a city for creation of a city attachment. The research purpose was to define a significance and perception of ecology in a city among different inhabitant groups.

Design/methodology/approach: The inquiry sounding method was applied for this research, using a direct or internet questionnaire sent by e-mail, carried out among Sosnowiec city inhabitants. The sample was selected non-random and purposeful. The research was attended by all the people registered in the city, in the age from 18 to 86 years, divided to 5 age-groups.

Findings: Majority of respondents declare that the pro-ecological city image is important for them, but they rarely look by themselves for information about ecological actions taken in the city. They notice best the pro-ecological city's actions in the ecological city's communication area. Inter-generation differences are visible in case of a city attachment declaration. Weakest city attachment is declared by a group of young people for whom also improvement of environment status has a small importance.

Research limitations/implications: Research was carried among inhabitants of one city. Therefore, research conclusions can be generalized to no other interested group or city. Future research may be developed both in direction of larger city number and wider target groups: tourists, business representatives or City Council workers.

Practical implications: Research results indicate that the important aspect of city marketing, the authorities should especially take into consideration, is a communication with inhabitants. Majority of respondents don't look by themselves for information about ecological actions in a city and they cannot evaluate city authority information policy.

Originality/value: Green marketing is a quite strongly explored research area in the business subject aspect, while significantly less publications relate to the city's ecological marketing. This article includes problems relating to a city image, greens affecting its perception or issues relating to attachment to a domicile. This elaboration is directed to all the people interested in ecology problems in the city and to authorities of other cities, responsible for marketing policy, including ecology.

Keywords: ecology, green marketing, city image, city attachment.

Category of the paper: research paper, literature review.

Introduction

Approach to the ecology problem becomes today one of the most important aspects of a city image shaping. City image carefulness became, within last years, important territory marketing element. City as a marketing subject is a combination of material and immaterial, human and objective resources, arranged and governed, aimed for performance of defined tasks, products or services in order to meet both its own and receiver's needs (Rurański, Niemczyk, 2013). One of the strategic marketing aims of any territorial unit is shaping of the expected image in receiver's consciousness. A. Szromnik says that „the city image is the whole of subjective reality image, performed inside human minds, due to perception, mass-media transfer influence as well as informal information transfers. Image – the mental city image, its internal reflection in minds of different units or social groups, therefore it's just only filtered, mental representation of a city's reality” (Szromnik, 2016, p. 134). Next, as the directional aims of a spatial unit marketing, there may be used a/o: shaping of a positive image of territorial units and adjoining areas, increase of the unit's attractiveness and competitiveness as compared to other ones, proper shaping and consolidation of so called „public services”, using of which is impeded for inhabitants or economic subjects (Szromnik, 2016). It should be taken into account that the image as a reflection shaped in human mind, has a subjective character. This image, for inhabitants, depends on among the others demographic and social features (Niemczyk, 2018). Shaping of a city image isn't a simple thing, because it's a complicated network process, where many actors are involved. Territorial marketing essences, aims and tasks on a city level show that its implementation requires different communication forms (Wiatrak, 2017). However, communication is only one of important city image creation aspects. According to H. Meffert the city image may be created basing on its identity. Meffert believes that the city's identity consists of three components: visual city identity, communication system and city's culture (Meffert, 1989). Visual identification system includes elements connected with all the symbols: logos, city arms, flags, colors, typography of the official and advertising materials, etc. System of communication with inhabitants and external interested bodies relates to information management, public relation communication and promotion. From the aspect of communication connected with shaping of the city's pro-ecological actions, this is an important element, modeling attitude of inhabitants and other adjacent groups and informing about city authorities' actions. However, the city culture is more complicated, consisting of local customs, traditions, standards or values, memory places, behaviors typical for given city, including values and behaviors connected with ecological attitude. The element, most difficult for definition and being a challenge for the city problems researchers, is a city culture.

City's image and mark are shaped also by city's architects, who significantly influence city's space visualization (Kizielewicz, 2013). City legibility (urbanistic space) is, acc. to K. Lynch, important condition of a good city's perception. He mentions several important aspects of urbanistic planning. City's space is created by pathways, borders, junctions, accents, which affect its image. It's important to plan such elements so that the city is legible, properly perceived and understood by users and it should create a place consciousness (Lynch, 2011). Such planning aspects are also the city's green forms. Moreover, the city perception process is strongly affected by sounds, aromas, structures to be sensed by touching, weather conditions, existence or lack of wind, rain or sun, air clarity or smog, calmness, relax possibilities (Dąbrowska-Budziło, 2002). Perception of the above mentioned conditions depends on a proper shaping of city's green. Unfortunately, very often city spaces deliver to users no positive esthetic feelings and do not meet their need (Loegler, 2011). A. Zachariasz notices that the city image is also evaluated by its green structure, and especially by different parks and green areas. For example, linear parks improve an urban landscape quality, join the green system elements, create ecological corridors, foster city urbanization. Small width causes that they are seen as safe ones, are easily accessible and encourage to recreation. City parks build a positive city image and are places for events, concerts, etc. Quarter or settlement parks are places for inhabitant meetings and integration, foster entering into social contacts. Thanks to their individuality and specifics they are the quarter distinguishing elements, causing this way an increase of a community identity with its domicile (Zachariasz, 2006).

Ecology in a city marketing and attachment to a domicile

The city image is more and more influenced by, represented by city's authorities, attitude to ecology question and its communication ways, which are shown in actions defined as ecological (environmental) marketing. Ecological marketing (green, environmental, eco-marketing) inscribes into a social and balanced marketing concept, which indicates a necessity of taking into account a whole society needs, not only those of business subjects or territorial units. The balanced marketing includes integrated environmental, economic or social and culture aims and is adjusted for building better present and future (Zaremba-Warnke, 2009). In the balanced development context, special attention is paid to a need of taking into account to a public space quality attributes, connected with quality of the natural environment elements such as water, air, flora & fauna, micro-climate or acoustic values inside city's spaces (Januchta-Szostak, 2011). The ecological marketing task, for a city is not only response to pro-ecological needs, but also shaping attitudes relating to a responsible use of natural resources and their protection in a city – care for fresh air, waste segregation, energy saving, green areas care, etc.

City marketing includes a wide range of tasks, and this is a long-term process the aim of which is to hold and attract the three city' target groups (Goovaerts et al., 2014). City marketing is directed to – first of all – inhabitants, investors and tourists. Inhabitants are the most important recipients of marketing actions taken by local authorities, which should create a territorial unit image as an attractive domicile, and this way shaping local identity amongst the inhabitants (Glińska, 2011). Especially ecological city marketing should be directed – first of all – to inhabitants because it relates directly their domicile, where they live and realize everyday activities, but also because inhabitants are significant group deciding the social city capital, transferring into a symbolic capital. J. Bartkowski notices that the social capital is a multidimensional and complex phenomenon. Its influence is wide-spread and not exactly uniform. However, it's a factor with great significance for local or regional development (Bartkowski, 2007). Also G. Gorzelak emphasizes a social capital significance – ability of cooperation, confidence, citizen society – for development of given region and other territorial units (Gorzelak, 2004). Disclosure of the social capital role opens prospects of designing new development strategies based on a human and social capital (Kotarski, 2013). City's social capital is one part of a symbolic capital. In turn the city's symbolic capital is a sum of social, economic, political, cultural and creative ones, affecting its success obtaining ability (Lis, Szerenos, 2009). P. Bourdieu, describing the basic capital types, made a particular distinguishing of a symbolic capital – as a highest form (Bourdieu, Wacquant, 2001). Symbolic capital is an ability to use the city achievements within its development areas, in such initiatives as, first of all: attracting of human capital, business, negotiating of its position within connection networks. City development strategies based on, in a large scale, social (human) capital require the city authorities to cooperate and encourage for “grass-roots” initiatives. Cooperation and consciousness of common responsibility for a city requires a confidence. City's social capital allows to use other capital forms and create relations, build connections, which lead to creation of a confidence. Therefore, social capital has large significance also during promotion of pro-ecological behaviors and city's ecological image.

Ecological consciousness of inhabitants and their attitude to the city decide its development. It must be treated as friendly one for external interested body well-being. Ch. Landry treats people like assets and pays special attention to a causative power of creative society combined with creative policy of city authorities. Greens in a city is the area, within which private initiatives are clearly visible. In no other city life branch appears so intensively visible private initiatives, e.g. flowers in windows and balconies or privately arranged and kept gardens next to houses or flats. Moreover Ch. Landry emphasizes influence of city policy on inhabitants creativity and innovativeness (Landry, 2013). Thus the technological solutions relating to environment protection in a city must be accompanied by inhabitant education. Similarly, even the most advanced “Smart City” shall not meet its purpose, if there's no “Smart Citizen and Education” function (Lacinák, Ristvej, 2017). The more so, as emphasized by L. Mierzejewska, some green areas located in the city centers disappear (Mierzejewska, 2001). More widely such

a problem is shown by J. Mencwel describing not only cementation of city markets, but also other areas (ravines, park lanes, etc.), which negatively affects both environment and people (Menclew, 2020). Increasing inhabitant care about environment, development of ecological identity mark ensures to city a possible enlarging of its competitiveness (Hui-Ju Wang, 2019). Different works emphasize influence of green areas in a city to a life quality of its inhabitants, resulting in a postulate of integration of dwelling and green areas, mainly by planting greenery inside dwelling areas. Green forms in a city are not only elements helping space orientation and deciding about the city public space value, but they also affect inter-personal relations and fulfil social functions. Social functions, in turn, affect attachment to a domicile (city). Attachment to a domicile is much more than a positive attitude to it; it's deriving a safety feeling and satisfaction from habitation in such place or from such possibility (Giuliani, 2003). As indicated by M. Lewicka, so far no uniform theory has been built relating to attachment to a domicile, following definitions are used interchangeably: place attachment, place identity, sense of place, place dependence, insideness, rootedness, belongingness, residence satisfaction, place identity and others (Lewicka, 2012). The „attachment” term itself was first defined by Daniel Stokols and Sally Shumaker as a „positive emotional bond between people and their inhabitation places” (Stokols, Shumaker, 1981). This is one-dimensional formula, next to which other, multi-dimensional ones exist. Lewicka defines, as the most popular, the two-dimensional attachment concept, including emotional attachment (place identity) and dependence on a domicile, thus instrumental attachment (place dependence) (Lewicka, 2012). David M. Hummon basing on primary research, defined 5 place attachment types:

- Everyday attachment (everyday rootedness) – specific for people born in given place, not considering its “pros and cons” and planning no removal.
- Active attachment (ideological rootedness) – specific for people inhabiting and working in given place, engaged in different actions for it, interested in its peculiarity and development, planning no removal.
- Territory relativity (place relativity) – specific for people born in given place, living their lives in several different places, being mobile and wanting to acquaint with new places.
- Alienation – specific for people who removed to given place from other region and who never accepted this place and will remove, if such opportunity exists.
- No place feeling (placelessness) – specific for people indifferent for their domicile, treating it just the same as any other place, similarly good for living (Hummon, 1992).

The three last types show their unattachment to a place (non-attached).

A. Bańka believes that it's worthy to invest in building connections between people and place, because positive bonds to a place are a condition of proper development in their lifetime cycles. Place attachment delivers to any individual a stability feeling amongst changes. Moreover, strong and positive bonds with a place are a condition of environment development, i.e. high accord between life quality in given environment and the environment needs (Bańka,

2014). Cultural unification of a western world fosters decreasing inclination of individuals for identification with given place or preferences for building identity basing on elements other than birthplace or actual inhabitation place (Lewicka, 2012). At present, the young generation shall, during its lifetime, probably change work many times, and consequently also inhabitation places. Similar functions fulfill still growing tourist industry, enabling removal between cities, countries or continents, which may add to become mentally independent from stable inhabitation. In result, such processes may find their mirroring in people's attitude to a place (Brzeziński, 2016). Frequent changing of living places may lead to shaping of, as defined by A. Trąbka, „nomadic approach to a space”, he says however, that even very intensive mobility not always leads to „unplacement” and total lack of a place attachment, but only to a shaping of an attachment types called “ideological” or “relativized” ones (Trąbka, 2018).

In the context of a problem connected with depopulation process relating to a large part of Polish cities within last years, depopulation stopping and increase of satisfaction level due to a given city becomes an important strategic actions element. In connection with such concepts of balanced development, social responsibility, green marketing, creation of pro-ecological city image becomes an important area of city's marketing actions.

Characteristics of Sosnowiec city

Depopulation problem is clearly visible in Polish cities, which they experience not only due to a low increase of population or external emigration, but also due to a people's migration from cities to countries (Zańko). Sosnowiec is one of the cities that suffer the decreasing population problem. This city belongs to Zagłębie Dąbrowskie region and precisely it's the eastern part of Silesian Voivodeship. It adjoins to Katowice, Będzin, Czeladź, Dąbrowa Górnicza, Sławków, Jaworzno and Mysłowice. The territorial surrounding of Sosnowiec city significantly affects conditions of its functioning because these cities create strongly industrialized city centers (Local Sosnowiec city revitalization program).

From beginning of the 1990-ties of XX century a permanent decrease of Sosnowiec city inhabitants number occurs. In the 1990 the inhabitant number was circa 260 thousand. From this time a permanent city depopulation occurs, resulting from a negative birth-rate and a negative migration balance.

The Sosnowiec Registry Office statistics data show that the children birth number in the 2020, as compared to 2019, decreased, while the demise number increased. The migration balance is still negative.

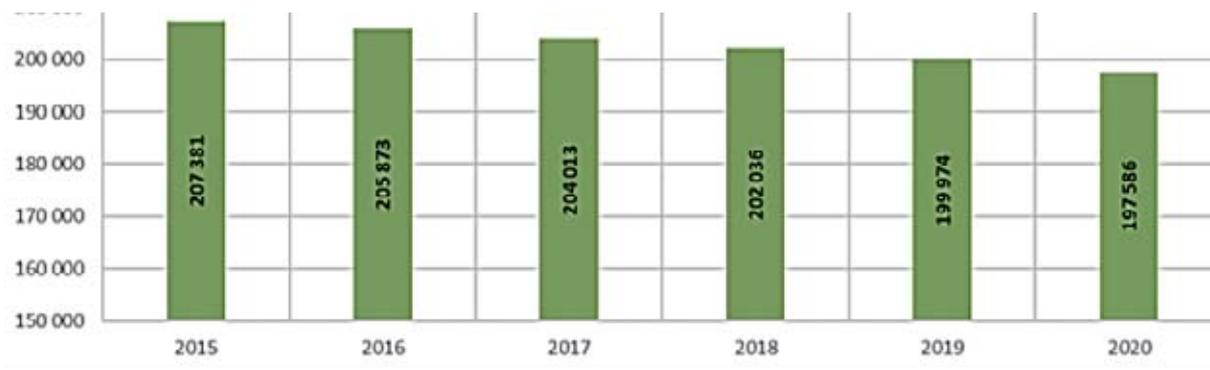


Figure 1. Sosnowiec city inhabitant number within the years 2015-2020 acc. to GUS. Source: Sosnowiec commune status report for the year 2020, [http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20\(31.05.2021\).pdf](http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20(31.05.2021).pdf).

Table 1.

Births, demises and migration balance in 2019 & 2020 in Sosnowiec city

Year	Births	Demises	Migration balance
2019	1.087	2.586	- 810
2020	931	2.953	- 744

Source: Sosnowiec commune status report for the year 2020, [http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20\(31.05.2021\).pdf](http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20(31.05.2021).pdf).

Inhabitant structure also shows that demographically this is a senescent city. The largest Sosnowiec inhabitant group are women in the age of 60-69 and 35-44 years, while in men the domination group is 35-44 years old and second largest group is 60-69 years old. Inhabitants of the unproductive age, for 100 people in a productive age was 73,4 people in the 2019 (Urząd Statystyczny w Katowicach).

Sosnowiec is a city with a relatively good economic situation. Beside the extinguishing economic specializations such as logistics or automotive sector, there are different branch enterprises existing on city's area: services, trade or production ones. General number of subjects registered within the Sosnowiec city area is over 20.000 (Raport o stanie gminy Sosnowiec).

What concerns the ecology, the most important challenge to be faced by Sosnowiec city is an air quality. The largest problem within the city area is, especially within the heating season, over-standard concentrations of suspended dust PM10, PM2,5, benzopyrene or nitric oxides. The pollution emission sources are solid fuels burned in house stoves or boilers as well as transport means and industry. Thus, it's necessary to take widespread actions aimed for limitation of low emission (Raport o stanie gminy Sosnowiec). For years Sosnowiec dedicates and expends large sums of money for modernization of heating systems.

Table 2.

Purpose subventions from Sosnowiec city budget for modernization of heating systems and installing systems using renewable energy sources within years 2016-2020

Subvention year	Quantity of financial means planned in a budget (PLN)	Quantity of expended financial means (PLN)	Quantity of rendered subventions	Quantity of liquidated coal burners
2016	78 673	538 070	162	282
2017	2 298 307	1 748 067	456	584
2018	3 011 293	2 471 612	358	687
2019	2 592 457	2 304 995	423	680
2020	2 610 487	2 096 820	352	568

Source: Sosnowiec commune status report for the year 2020, [http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20\(31.05.2021\).pdf](http://www.sosnowiec.pl/_upload/Raport%20o%20Stanie%20Gminy%202020%20(31.05.2021).pdf).

Beside the investments connected with improvement of air quality, the city takes also other initiatives aimed for improvement of natural environment or inhabitant life quality.

In frames of city investments within the year 2020, an adjudication was carried out for erection of Ecological Education Centre, Egzotarium in Sosnowiec and at present works are continued - investment to be completed till the end of 2022 (Raport o stanie Gminy Sosnowiec).

The pro-ecological actions taken by the city are a/o:

- Extension of pedestrian and bicycle paths.
- Extension of the public bike-hiring system.
- Revitalization of green areas.
- Investment into recreation parks.
- Enlarging of ecological, low-emission, electric or hybrid buses fleet (purchased thanks to participation in the project titled: "Clean Air over Zagłębie – purchase of electric buses together with loading infrastructure" realized in frames of Infrastructure and Environment Operation Program for the years 2014-2020).
- Purchase of 16 hybrid type plug-in buses, within the year 2021.
- Modernization and extension of new tram lines.
- Improvement of a road system capacity and this way improvement of traffic safety, decrease of negative influence and arduousness of road traffic (especially transit traffic), which means decrease of a fume volume in the city.
- Land development of city areas to the housing estate greens, performance of new pedestrian paths, planting of many trees, bushes and perennial plants.
- Assembly of nesting boxes for birds, bats or insects, revitalization of wet areas, Rów Kalny water basin.
- Revitalization of the Przemsza and Brynica river valley functioning area by extension of green areas.

In the year 2019 works were started, connected with preparation and elaboration of Commune Revitalization Program, which shall replace the present obligatory Local Revitalization Program for Sosnowiec City. They elaborated a delimitation of degraded and

revitalization areas in Sosnowiec. City's analysis was elaborated in the social, technical and economic aspects. In the year 2020 works on a Commune Revitalization Program have to be continued, but the social consultation carrying plan and inquiry research analysis were made impossible by pandemic. Therefore, work on Commune Revitalization Program was stopped (Raport o stanie Gminy Sosnowiec).

Sosnowiec city authorities try to encourage new people to inhabit the city. The New Inhabitant Card is issued. Each person, registered as a regular inhabitant of Sosnowiec, shall obtain a special card ensuring reduced prices for many city's institutions, both cultural and sport ones. Over 5,8 thousand of the New Habitant Cards were issued from the 2016 and 941 in the year 2020 itself (Raport o stanie Gminy Sosnowiec). The city also inform inhabitants about taken ecological initiatives, a/o such information is placed in city's internet sites, in city status reports or in reports about the condition of the city.

Ecology perception by city's inhabitants – research method and results

Important aspects affecting inhabitant identification with the city is a natural environment status and city authorities' approach to ecological problems. The elaboration presents part of sounding results, which best mirror attitude of inhabitants to this problem. The sounding purpose was to find how Sosnowiec inhabitants perceive its city in ecology categories and what attachment to the city they declare. The detailed purpose range allows finding:

- How important for inhabitants is the city's pro-ecological image?
- How they evaluate the city's authority information policy relating to a natural environment protection?
- In what areas they notice mainly pro-ecological actions taken in the city?
- What attachment to the city is declared by inhabitants?
- Can the improvement of natural environment status increase attachment to the city?

The research was carried out by inquiry method, using a direct questionnaire or internet one, sent by e-mail. Selection of a sample was non-random intentional – the responding population were adult people, registered in Sosnowiec. The research sample was 382, assumed maximum fault – 5%, confidence interval – 95%. The research was attended by people in the age between 18 and 86 years, divided to 5 age groups, with different habiting periods. All the data are shown in percentage and rounded to the whole. Among the respondets 39% lives in Sosnowiec from a birth, 37% very long – from several up to tens of years, 17% several years, 7% shortly (less than 3 years). Splitting to sexes – women – 53%, men 47%. Age structure of the inquired is shown in the Figure 2.

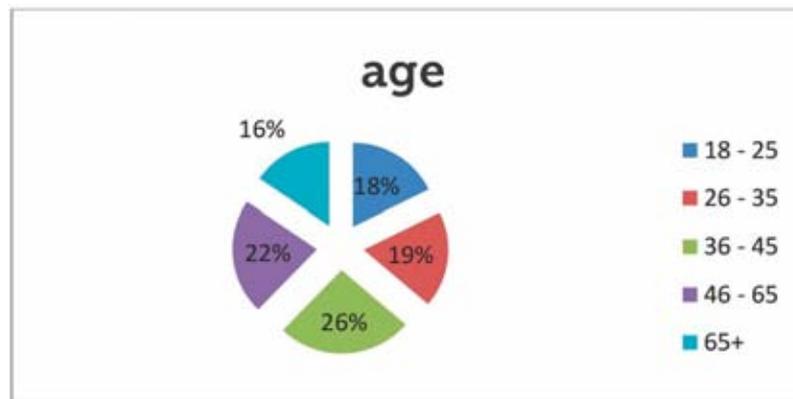


Figure 2. Age of the inquired. Source: own research.

Respondents were asked if they would define its city as an ecological one (carrying about environment)? Large part of them, from each age category, couldn't define if the city can be defined as ecological one (Figure 3). The most difficult was this question for people in the age of 65+ (38% - "hard to say"). Also, rarely extreme answers were selected – "absolutely yes" or "absolutely no". The group, which in maximum percentage describes the city in positive categories, are people in the age of 36-50 years, most negative answers did indicate the 26-35 years group (Figure 3).

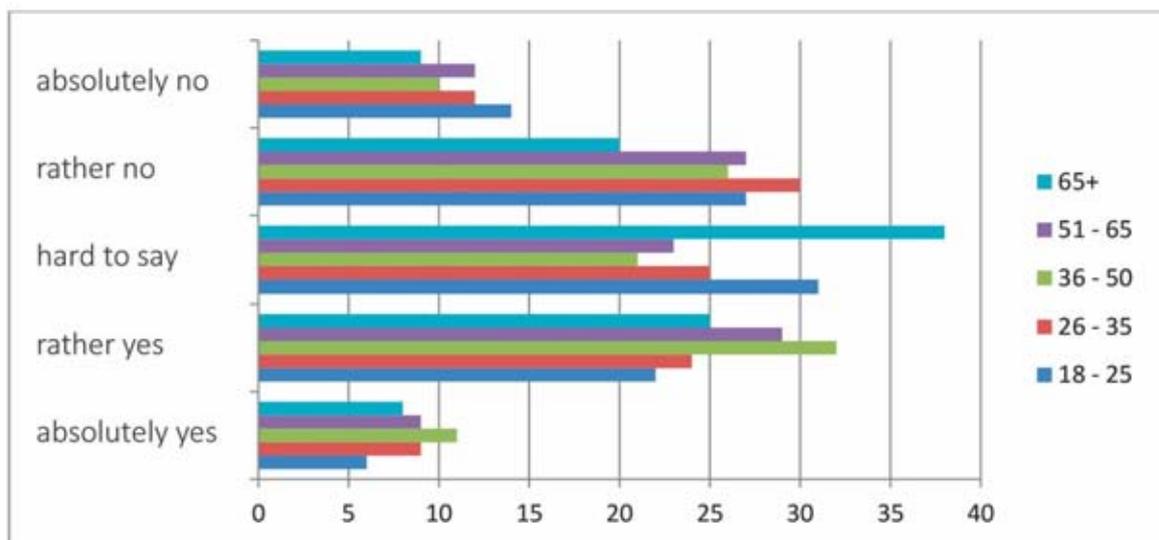


Figure 3. Would you define your city as ecological city (carrying about environment)? Source: own research.

Respondents were weakly interested in information relating to pro-ecological actions in the city. The group most interested in seeking information in this matter are people in the age between 36-50 or 51-65 lat. In each age category the „rather no” or „absolutely no” answers dominate (Figure 4).

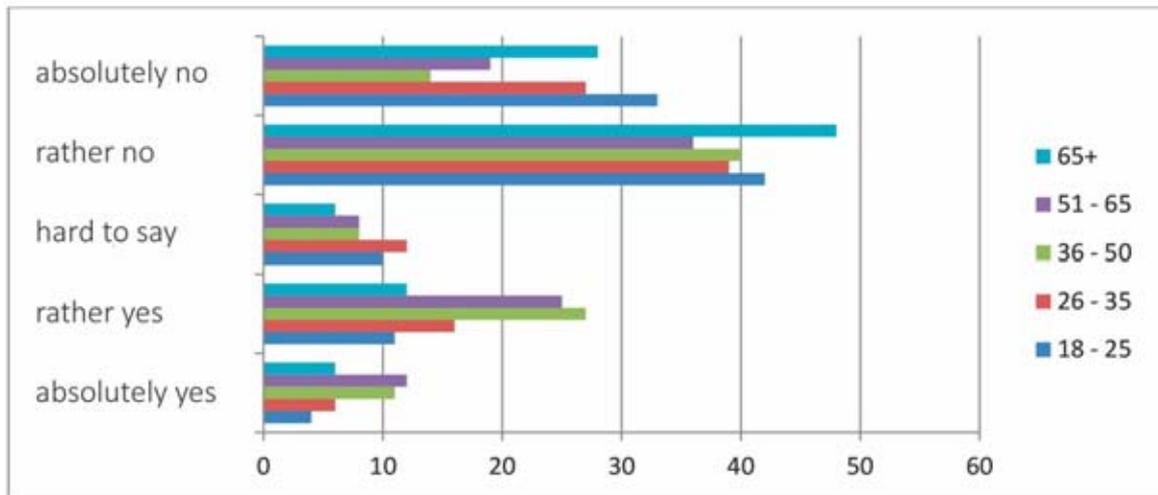


Figure 4. Are you personally interested (e.g. seeking information, reading news) in pro-ecological actions carried by the city authority? Source: own research.

Lack of active seeking an information about environment protection actions in the city results in a fact that majority of the inquired had no opinion about information policy of city authority in this range and they cannot define it. In average each third of respondents could not define the information policy and in the group of oldest people this part was up to 42%, while amongst the youngest it was 34%, (Figure 5) when they gave an evaluation, then most frequently it was quite safe answer „on the average” – dominating in each age group. The authority’s information policy was best evaluated by people in the age between 51 and 65 years.

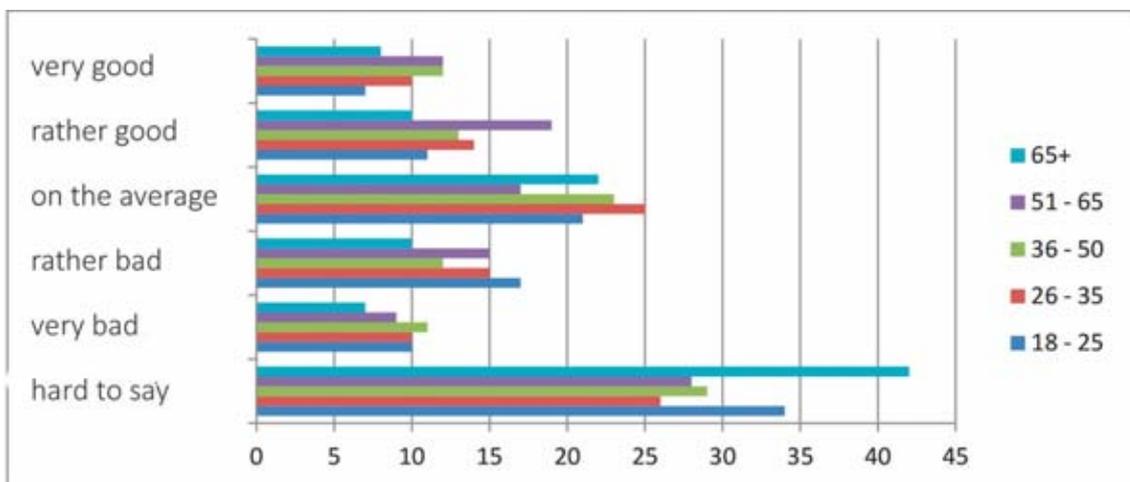


Figure 5. How do you evaluate city authority information policy relating to pro-ecological actions taken in the city? Source: own research.

Also in the city’s natural environment aspect, it was most frequently defined as “on the average”. The most difficult was this answer for young people in the age between 18 and 25 years, each third from this group (29%) selected the answer “Hard to say”.

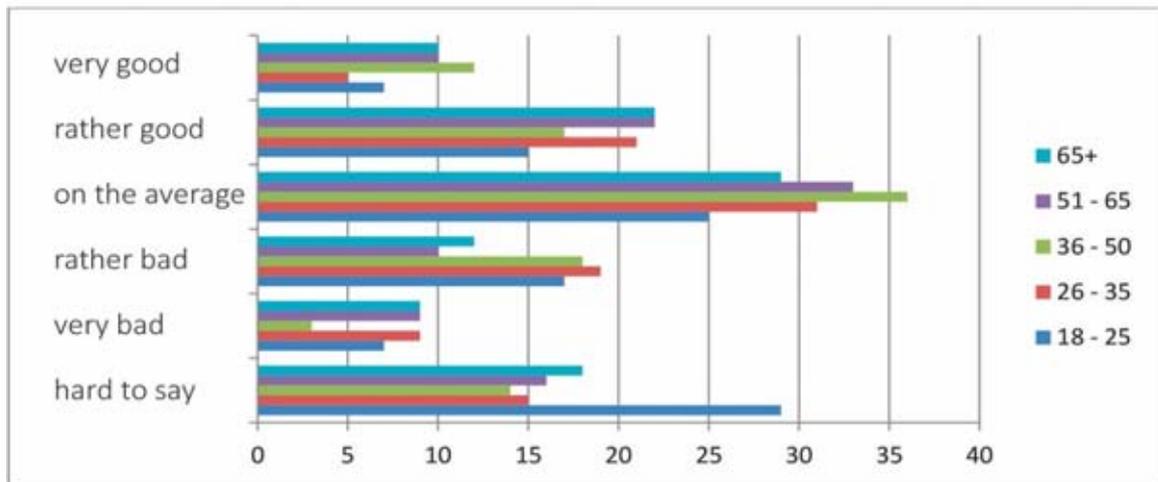


Figure 6. How could you generally evaluate the city's natural environment status? Source: own research.

Respondents could much better indicate pro-ecological action areas (selection from a list), 7% only selected answer "hard to say". What concerns to the most visible pro-ecological actions in the city, indicated by inhabitants, no significant difference was seen for particular age-groups. According to respondents the pro-ecological actions in the city are visible within the city transport development area (77%). Electric or hybrid buses are distinguished with a color, thus they are easily visible, moreover a lot of information can be found about development of ecological transport in the city. The second action, indicated by respondents, was upgrading of recreation parks (68%), next development of bike paths (54%) and city's bike hiring stations (44%), next revitalization of greens inside housing estates (37%) and greens planting (35%). More rarely (27%) respondents did indicate actions in the range of air quality improvement by surcharges to replacing the old stoves with the more ecological ones. These actions relate to a much smaller group of people and therefore it may result in much lower number of indications (Figure 7). Among the other actions, indicated by respondents themselves, waste segregation, creation of bus-passes, development of tram line, reconstruction of road in order to unload the traffic in the downtown and in housing estates or renovation of the Egzotarium were indicated most frequently.

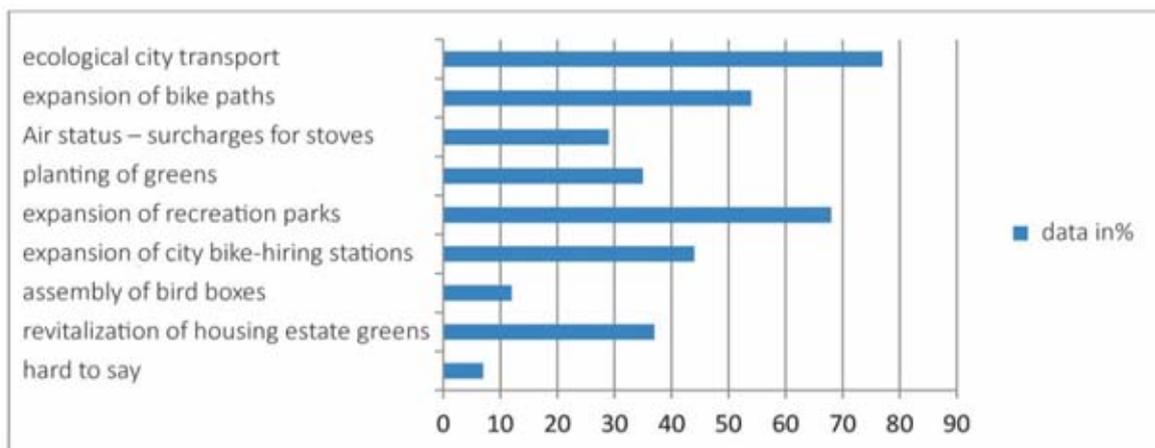


Figure 7. In which area the city's pro-ecological actions are best visible? Source: own research.

Declaration of respondents indicate that majority of them would like their city to have an ecological image. Groups, to which it is indifferent, are mainly the oldest (24%) and youngest people (21%) (Figure 8).

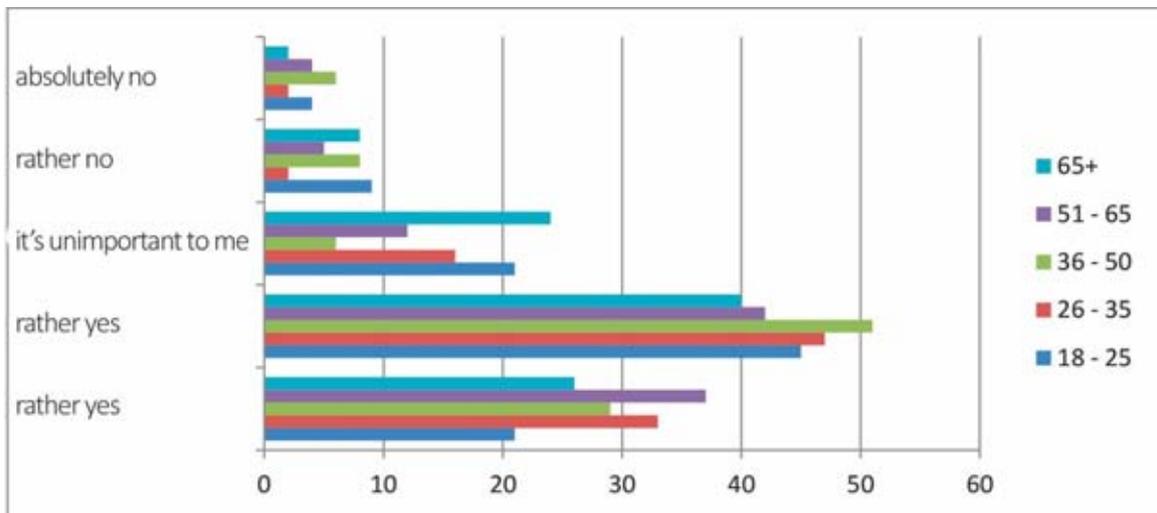


Figure 8. Would you like your city to have an ecological place image? Source: own research.

Large difference between respondents from different age groups, are visible in the city attachment question. The most difficult was this question for the youngest people, almost each third respondents from this age group (29%) did indicate answer “hard to say”. The strongest city attachment is declared by the eldest people, “very strong” and “rather strong” was indicated by 46% (Figure 9). Weakest attachment is seen in the declarations of young people, „very strong” was indicated only by 14%. This may result from higher mobility and openness to the world by younger generations of Poles, who have no families yet, study in other cities and their professional plans aren’t connected with this city. It may be said that it’s a generation, which has weakest “roots” in the city.

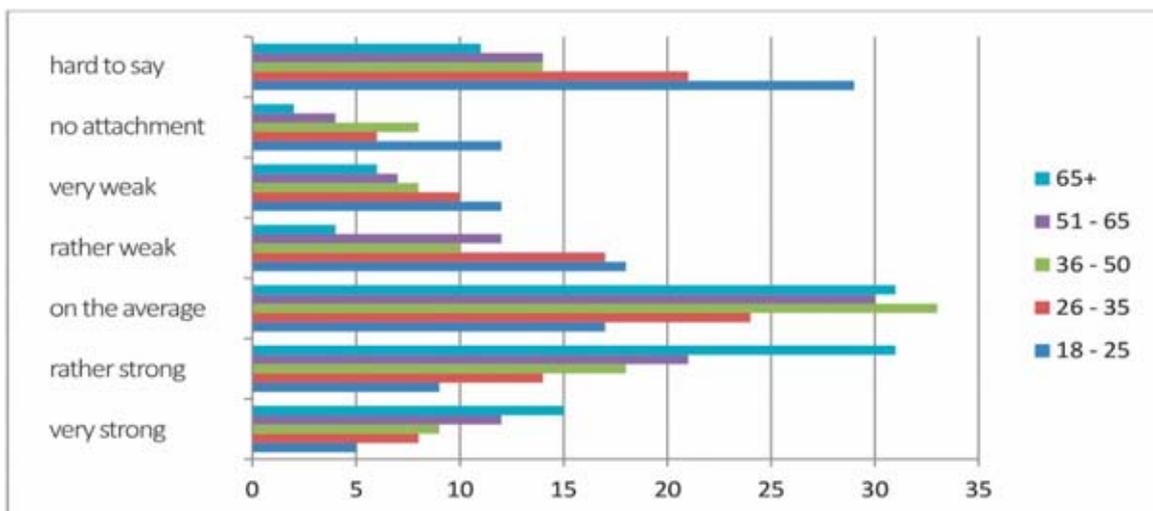


Figure 9. How would you define your attachment to the city (bonds with the city)? Source: own research.

Access to the green or recreation areas appears to be very important for identification with a city, for all respondent age groups (Figures 10). Largest differences occur for other factors. Young respondents indicate large importance of accessibility to a city's communication or to gastronomic premises (restaurants, pubs, cafes) and amusement as well as jobs and tenement accessibility. The group of eldest people absolutely indicate factors relating to safety in the streets (68%) or air quality in the city (54%). The eldest are also the group, which most frequently among the respondents indicate the questions of multi-generation rooting in the city as a factor of identification with the city (29%). Air quality is also the most important factor for the age groups between 36-50 or 51-65, while for the youngest group this factor has a relatively low importance.

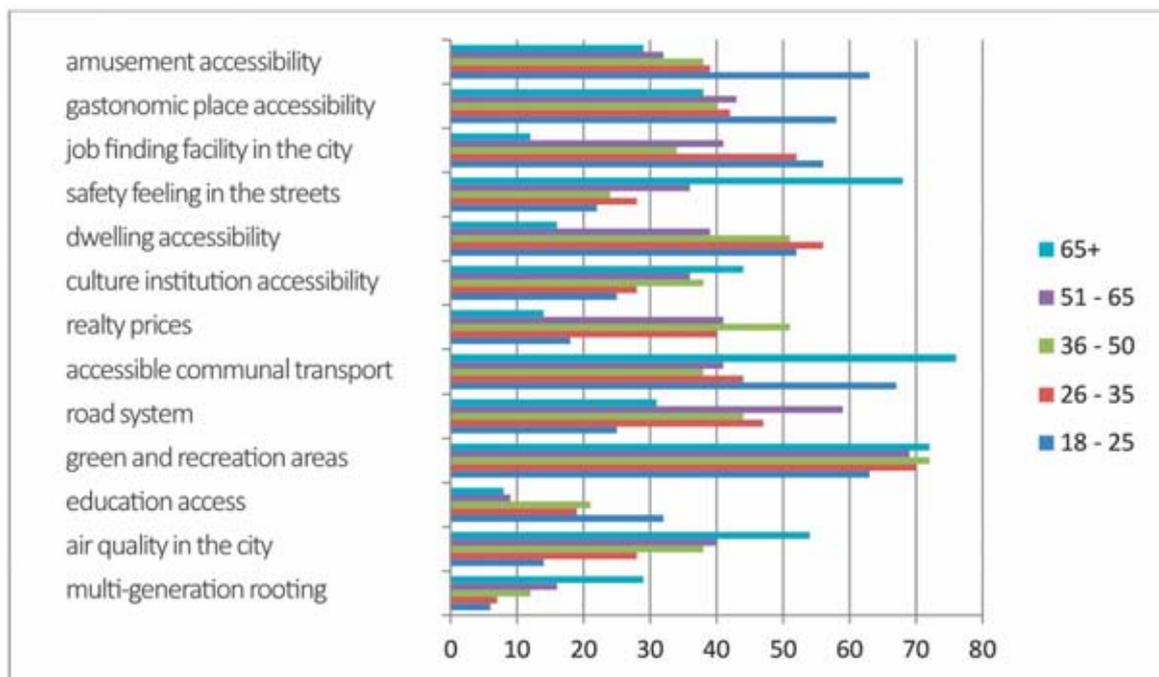


Figure 10. What factors are most important for your identification (feeling of satisfaction due to a city) with the city? (indicate 5 most important maximum). Source: own research.

The question of dependence between improvement of environment status and their attachment to the city, majority of respondents found impossible to answer. Each third from the youngest respondent group (32%) did indicate that the air quality would rather not affect their attachment to the city (Figure 11). There was also a group, for which the air quality has a weak importance for their identification with the city (Figure 10). However, people from the age group 51-65 and 36-50 most frequently, among the respondents, did declare that improvement of natural environment would positively affect increase of city attachment. Among the older people 38% did declare that „rather no” or „absolutely no”, but it should be kept in mind that it's a group, among which was the larger part of declaring the strong attachment.

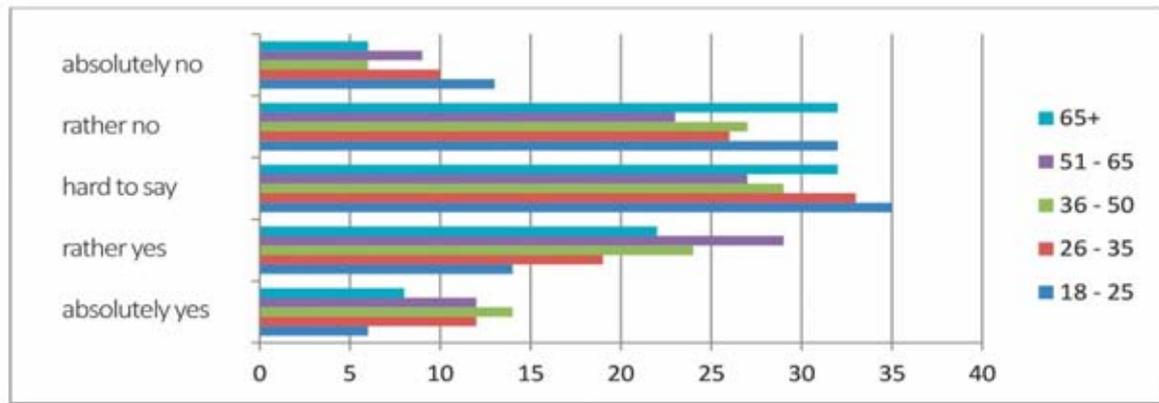


Figure 11. Would the improvement of the city's natural environment status increase your attachment to the city? Source: own research.

Conclusions

Inhabitants are important group from the city's marketing actions point of view, because strong inhabitant local identity positively affects city's development, creates its symbolic capital and transforms into its image among external surrounding. Different age groups will look differently the city's ecology problem. It should be clearly known that it affects a series of factors, independent from the city. Majority of respondents declare that the pro-ecological city image is important for them. They, on a small scale, look by themselves for information about ecological actions taken in the city. Simultaneously, disregarding the age, they can indicate areas, in which ecological actions in the city are most visible. Differences between generations are visible in case of city attachment declaration or in case the question if the improvement of natural environment would positively affect their city attachment? Young people are the group littlest attached to the city and for them improvement of environment status has a small influence for their attachment. This may result from a fact that they are the most mobile people, foreign language speaking, aware that during their lives, they shall change their jobs, travel and they are also the most open for a world, other cultures and living places and they do not identify so strongly. Lack of deepened reflection over ecology problems in the city among young people isn't a surprising thing, because in this age other priorities prevail, connected with finding a job, dwelling or accessibility of amusement or gastronomic services. Taking into account the ecological problems in the city, authority's marketing actions are important questions due to a several reasons. Improvement of a natural environment status requires long-term actions. Ecology affects inhabitant life quality and their satisfaction from the city (especially in older age groups), which is important in the context of depopulation and ageing of a city population. The city identity and satisfaction due to living in it is affected by access to greens or recreation areas, allowing realization of everyday people activities, which is indicated by all the age groups. Inhabitants would like their city to be perceived as ecological one. Low activity in the

range of individual seeking information relating to pro-ecological authority actions, show how important for inhabitants is information and communication policy.

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THE ROLE OF EDUCATIONAL PROJECTS IN BUILDING AN ECOSYSTEM OF UNIVERSITY STARTUPS

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Purpose: The purpose of this article is to analyze the prospects of cooperation between universities and the business world on the example of training courses implemented within the framework of a project funded by the Ministry of Science and Higher Education (MNiSW). The paper presents the objectives, nature, and importance of business education projects that affect the form of university-business cooperation.

Design/methodology/approach: The article presents the barriers and advantages, that is, the factors determining the cooperation between the university and business. The study is based on the results of a survey of the target group participating in training courses, a literature review and focus interviews.

Findings: The conducted research allowed to analyze the main barriers to cooperation between universities and businesses and identify measures to improve the efficiency of technology transfer and commercialization of innovations within educational projects.

Research limitations/implications: The results of this work can become an incentive to undertake further research on the cooperation between universities and business. The study has certain limitations, resulting mainly from a small research group (32 people), however, it provides valuable feedback on the benefits of cooperation for recipients.

Practical implications: The results can be used to develop educational activities aimed at forming an academic ecosystem of startups and increasing the effectiveness of cooperation between universities and business in the framework of scientific projects.

Social implications: The implementation of research results will contribute to improving the level of education and employment of the population.

Originality/value: As a result of the research, it was found that the implementation of business education projects can become a driver for the development of university startups and increase the interest of university employees in cooperation with business.

Keywords: startups, education, economics, universities, university-business cooperation.

Category of the paper: Research paper.

1. Introduction

In an era of globalization and a changing market environment, companies are forced to compete more aggressively, and academic units (universities) have to adapt to changes in reforms in the higher education system, because effectively maintained advantage determines how an institution is managed and introduces innovative solutions related to its core business. Therefore, nowadays most universities strive for obtaining funds from various sources, to establish cooperation between universities and companies. The implementation of projects (grants) should be economically advantageous for both sides, universities and entrepreneurs.

The European Union and the Polish Government provide universities with a large budget to support the development of science for business and the development of higher education

The financial resources obtained enable institutions to conducting new scientific research and joint projects on the transfer and commercialization of innovations with business representatives.

It should be noted, however, that not every written and submitted application for funding is assessed positively by the examination committee and receives funding to achieve its objectives. Similarly, not every ongoing project needs to be successful and achieve the desired results, as there are a number of unfulfilled activities that need to be closely linked. In this case, one can only wonder how any project will be implemented. The benefits and barriers necessary to maintain the university-business cooperation are crucial. The aim of the article is to discuss the cooperation between the university and the business using the example of the training courses that were conducted within the project financed by the Ministry of Science and Higher Education (MNiSW) on the basis of the responses of the respondents, and the author's own experience. The aim of the study is to identify the reserves of economic benefits for both parties participating in scientific projects between universities and businesses. The research shows that there are many economic benefits for university staff participating in university science projects, including gaining new information and expanding knowledge, the possibility of scientific advancement, team cooperation, certificates, future experience, entry into CV, work with companies. With simultaneous satisfaction of the participants, the project team achieves satisfaction with the implementation of the adopted project objectives and the fulfilment of the project indicators (scientific and economic), which in turn leads to the correct execution of the project. For the public university, on the other hand, the important goal is to develop the competencies of the employees and academic entrepreneurship by participating in scientific projects.

2. Literature background

Many definitions of the project can be found in the subject literature. However, it is also important to distinguish between the project and project management. In his dissertation, K. Kacuga explains from a management perspective that "the project is a planned framework of activities within a certain period of time in order to achieve a defined goal (...) the project is a problem for which a solution has been planned" (Kacuga, 2008, p. 13) The project is the creation of something innovative or different, which will distinguish it from the rest of the teams and people applying for funding. The most important is to plan its beginning and its end, assuming that all planned activities are spread out over time, to create a unique result or product or service. Therefore, the project is unique because it consists of scheduled and interrelated activities that aim to achieve high quality results within a variety of resources and defined costs (Black, 2009). While B. Grucza insists that, in addition to its uniqueness, a fixed timeframe, a fixed beginning and end, and the involvement of limited financial resources, the project is also highly complex because it is carried out by a project team of qualified specialists from various scientific fields and thus involves organizational, technical and economic risks, while the implementation and preparation of the project itself requires knowledge, time, willingness and special methods (Grucza, 2012, p. 36).

In general, the project is a series of activities characterized by such features as (Kuck, 2014, p. 4):

- have a predefined beginning and end,
- are linked in a complex way,
- aim to achieve a goal by creating something unique (a product, service or result),
- organized sequences of human activities,
- aiming to achieve the desired result,
- usually implemented as a team.

Burton and Michael consider that project management is the process by which the project manager should plan and manage all the tasks within the project using the resources provided by the organization for the implementation of the project (Burton, Michael, 1999, p. 20). The authors also state that project management is the skillful use of available techniques to achieve the intended results, which are in line with the standards set within a given time and budget. Project management is also defined as an area of management that deals with the applicability of available knowledge, skills, methods and tools with the aim of achieving the project objectives, i.e. the quality of the intended result within a certain time and cost frame (Brilman, 2002, p. 50). Whereas the Project Management Institute (PMI) defines project management as the application of skills, knowledge, tools and techniques to satisfy and even exceed the expectations and needs of the stakeholders involved in the project (Mingus, 2009, p. 21). It is noticeable that a more extensive interpretation of project management presented by

the Project Management Institute concerns various types of projects, which include educational, research and scientific projects, and implementation or business projects. In addition to defining all the objectives of a given project, it is also essential to manage the necessary resources in an efficient and effective manner (Pawlak, 2006). Project management and applying for funding from external sources requires extensive interdisciplinary knowledge, management skills, creativity and organizational excellence from the beneficiaries. However, the most important issue is how the project is managed, as it depends on three important parameters including time, resources and quality (Webster, Knutson, 2005, pp. 2-3). Therefore, project management is a continuous process in which the person in charge of the project carries out targeted control and planning of the tasks within the project and allocates funds accordingly, using the appropriate methods to achieve the desired objectives at the set costs (Jędrych, Pietras, Szczepanczyk, 2012, p. 11). From the perspective of the social sciences, J. Zieleniewski is of the opinion that a truly effective activity leads to the minimum effect of the intended objective, whereas the extent of achievement of the objective is considered the measure of effectiveness (Zieleniewski, 1981, p. 225). Thus, when referring to projects, effectiveness is gradual, due to the gradual nature of the objectives and the principle of milestones towards the main objective. In his study, M. Bielski takes the view that effectiveness should be assessed by the achievement of the intended objectives (as it corresponds to the English term effectiveness), and then the level of using all possible resources (as it corresponds to the English term efficiency). Hence, the concept of effectiveness in Polish literature is often replaced by the concept of efficiency (Bielski, 1997). Concluding, Zieleniewski believes that efficiency means the parallel occurrence of effectiveness, efficiency and cost-effectiveness. From her experience, the author is of the opinion that the project should first of all have a title, to which the main objective, specific objectives and the whole concept should be adjusted; the appropriate staff should also be selected to manage the project, giving the managerial functions accordingly; and it is also necessary to create a team of people who will support and add value to the project. Besides the objectives, it is crucial to assess the effectiveness of the project, which is possible through the development of both output and performance indicators. Usually, output indicators refer to all the outputs that are produced during the project implementation that should not exceed the adopted deadlines for the implementation of the project. Performance indicators, however, relate to the effects of activities that should be visible upon completion of a given project. The performance indicators should be presented after the output indicators, as the performance must be coherent and logically linked to the output. Developing an innovative solution allows the applicant to stand out from the competition and additionally has a positive impact on the promotion of the entity that implements the project. It is crucial that the project has a properly selected management and the team, as all persons actively participating in the implementation of the planned activities, must have predefined and specified tasks to perform. The project is more effective when it is carried out as teamwork, because each person can support the other through their experience. The most important aspect to achieve the project aim is the target

group, i.e. determining a number of people to whom the project offer will be addressed, assuming that the number will be achieved as the final result. Each project should lead to an exceptional and unique success and should generate profit for the unit, and it should also result in the implementation of new changes in the daily behavior of employees. The changes should have a direct impact on the economic indicators and allow obtaining specific, measurable and additional business value for the organization (Wysocki, 2013, p. 73).

3. Barriers and Benefits to University-Business Cooperation

As a result of the scientific discussion about the role of the university in the modern economy, B.R. Clark (Clark, 1998) and J. Wissema (Wissema, 2009) introduced the concepts of "entrepreneurial university" and "University 3.0", describing an improved model of a research (Humboldt) university in which, along with education and scientific research, a mission appears to transfer new knowledge from universities in order to further commercialize them and achieve economic growth.

The constructive interpretation of the "entrepreneurial university" harmoniously correlates with the terms of the "Triple Helix Theory" proposed by H. Etzkowitz and L. Leydesdorff (Etzkowitz, Leydesdorff, 1995), the core of which is close interaction between universities, business and the state from the position of "equal partners" at all stages of the innovation process. The development of the theory of entrepreneurial universities required the main actors (universities, business, the state) to move from closed innovation processes to cooperation and joint implementation of knowledge-intensive projects.

A key role in this process was played by the research of the American economist G. Chesbro, who at the beginning of the XXI century interpreted the essence of the Bayh-Dole Act (1980) and the Stevenson-Weidler Technology Transfer Act (1980) and justified a new theory of "open innovation" to create and benefit from the sharing of technologies.

It should be noted that a university or a company that opens its scientific developments to others increases the speed of their commercialization, but loses full control over the innovation process and bears the risks associated with the disclosure of trade secrets. Nevertheless, H. Chesbrough explains the inevitability of changing the model of "closed" innovations to the model of "open" innovations by market trends, according to which the life cycle of both goods and services is getting smaller, and the speed and frequency of bringing a new product to market will be the main advantage (Chesbrough, 2003). This point of view is shared by H. Etzkowitz, who believes that the problem is no longer how to invent advanced technology, but how to quickly turn it into a company that is a world leader in the industry (Etzkowitz, 2011).

Cooperation between universities and business makes it possible to apply the theory of open innovation in practice and use the effects of synergy for the benefit of both the private and public sectors.

An important point is also the fact that in the Polish literature about universities in the process of regional development is mentioned quite often. K. Pawłowski considers individual entrepreneurship, innovation capacity of enterprises, education of citizens, scientific research and knowledge and technology transfer as the main determinants of regional growth (Pawłowski, 2007, pp. 17-33). It is worth mentioning that no less than four of them depend on the quality of universities and research institutions. In Poland, however, there are still a number of barriers to the cooperation between universities and businesses, as shown in Table 1 below.

Table 1.
Barriers to university-business cooperation

Source of barriers	Barriers to university-business cooperation
Universities and businesses	<ul style="list-style-type: none"> – no interest in cooperation, – no patterns of cooperation, – complex procedures that accompany the establishment of cooperation and bureaucracy, – a misunderstanding of the nature and functioning of partners, – issues related to intellectual property rights management, – lack of adequate infrastructure and financial resources.
Businesses	<ul style="list-style-type: none"> – confidentiality, – problems in valuing the added value of cooperation, – no capacity to incur heavy expenditure on R&D projects, – no integration between cooperation and the current activity of companies, – weakness of intermediaries, – no knowledge of models and standards of cooperation, – low propensity to undertake innovative activities, – unfavorable company culture, – discouragement due to unsatisfactory previous cooperation.
Universities	<ul style="list-style-type: none"> – disadvantageous impact on employees and/or students, – conflict of interest and commitments, – procedures and bureaucracy, – offering identical courses of study at different faculties, – reluctance of employees and/or students to cooperate, – negative image effect, – shortage of financial resources, traditions and institutional facilities to support cooperation, – financial risk, – concerns about being accused of favoring or promoting technical solutions from companies or deriving private benefits from working with the company, – burdening employees with research and/or teaching activities.

Note. Adapted from: „Klasyfikacja barier podejmowania współpracy z otoczeniem gospodarczym przez uczelnie wyższe”, Bryła P., Jurczyk T., Domański T., 2013, Łódź: Rynek i Marketing № 5, p. 10-16.

As can be seen from the information contained in the table, the authors distinguish between the handicaps attributable to the entity in question, i.e. universities and companies, universities, companies. Relatively common problems, both from the experience of the author of the paper and from the content resulting from Table 1, are complicated bureaucracy and complex procedures and conflicts of interest. Companies usually do not decide to cooperate for strategic and financial reasons. On the other hand, universities are also largely concerned about starting a collaboration due to lack of financial resources or because of the financial risk.

Table 2.
Benefits from the university-business cooperation

Universities	Entrepreneurs
<ul style="list-style-type: none"> – adjustment of programs and educational results to the expectations of the recipients of the educational services offered, improvement of the quality of education, – limiting the effects of the demographic decline by recruiting for ordered faculties, – the possibility to use technological and intellectual resources of the partner, – attracting specialists-practitioners, sharing knowledge and experience, – establishing research centers at the university, popularizing new findings and research achievements, – development of university entrepreneurship, increasing staff mobility, – obtaining financial support for research, development and education 	<ul style="list-style-type: none"> – improving the qualifications of staff by co-organizing specialized courses, post-graduate studies or faculties, – hiring graduates that have been trained during the student internship, – the possibility to use intellectual resources of academic staff, – the possibility to use the infrastructure and facilities of university research, influencing the faculty and access to scientific research, – building the right image and brand of the company.

Note. Adapted from: „Synergia wartości i usług edukacyjnych we współpracy uczelni wyższej z partnerem komercyjnym – studium przypadku”, Pietrzyk, A., 2015. *Studia Ekonomiczne, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, No 225, p. 146-155.

In contrast to Bryła, P. and the other authors, Pietrzyk A. breaks down the advantages resulting from the university's cooperation with companies according to the entity concerned, i.e. companies and universities. The first unit can at least improve the qualifications of its employees thanks to the cooperation with the university, while the second entity receives funds for complex scientific research and at the same time develops academic entrepreneurship (Pietrzyk, 2015, p. 146-155).

The development of the entrepreneurial function at the university largely depends on the effectiveness of the academic ecosystem of startups that is created for the commercialization of scientific developments. A properly organized startup brings innovative products and services to the market faster, has a more flexible business model, and shows faster growth compared to corporations. The state participates in building the ecosystem for startups and invests in infrastructure for their development (transfer centers, business incubators, technology parks). Startups, as a rule, need additional resources for rapid growth. Therefore, corporations provide startups with the opportunity to receive venture capital investments for the development of the company in exchange for a share in a new business (Savaneviciene et al., 2015).

The existing international experience shows that in order to reduce the implementation time of innovative projects, startups participate in business incubation and business acceleration programs, where they receive mentoring assistance, as well as new knowledge and skills of serial entrepreneurs. One of the conditions for participation in such programs is often the transfer of a share in a new business to the accelerator. Thus, as a result of the project, the startup transfers minority shares of the new business to venture investors, accelerators and other infrastructure participants in exchange for investments, resources and knowledge.

At the same time, the management of a startup usually remains the majority owner and independently carries out the project and operational activities of its business.

It should be noted that the use of modern organizational forms in the form of startups and the creation of conditions for their financing is not always the key to success (77% of corporate venture initiatives do not achieve their goals) (Prats et al., 2018).

An in-depth analysis of startups in the European Union (U28) (according to the data of the authoritative resource Crunchbase) revealed the following patterns: (1) Nine out of ten startups fail; (2) Accelerators (education, mentoring) do not have a significant impact on the success of a startup; (3) The effectiveness of corporate acceleration programs (education, investment, consulting, market access, etc.) has not been proven (Mahr, 2020). Even with venture backing, a staggering three-quarters of startups fail according of Harvard Business School (Gage, 2012).

Despite participation in the acceleration programs and full financing of startups in the initial rounds, in reality, entrepreneurs from the academic environment are not always able to effectively manage the resources received and their projects due to the lack of knowledge and experience to conduct entrepreneurial activities. This leads to the fact that the startup team, instead of developing an innovative idea on a daily basis and increasing its value for consumers, has to spend a lot of time on in-depth study of project management, business process modeling and preparation of financial statements, strategies and plans. As a result, the implementation period of such projects is delayed, teams break up, and startups are closed (CB Insights Research, 2021; Autopsy, 2021; Fielden et al., 2000; Bruneel et al., 2010)

A study of 18 startup centers in Europe showed that only 32% of startups have problems accessing financing and 45% said they have "easy" access to financing for their company (PwC European Start-up Survey, 2018). At the same time, startups indicate as challenges and threats Customer acquisition & sales and Competition (Table 3).

Our research shows that the foundation of a successful academic innovation project is not financial resources, but a professional project team. The initiators of a startup should understand that in order to commercialize their idea, they must not only engage in science and minimum viable product (MVP) testing, but also understand the management of human and financial resources, as well as be able to develop an effective marketing strategy. Preparation of potential participants of such a startup can be carried out with the help of corporate business education programs.

Table 3.*Challenges and threats to the future development of startups in Europe*

Challenges		Threats	
rating	answers	rating	answers
1	Customer acquisition & sales	1	Competition
2	Attracting and retaining talent	2	Rapid changes in market condition
3	Product development & innovation	3	Domestic regulation and bureaucracy
4	Cash-flow and liquidity management	4	Lack of access to finance
5	Managing growth	5	Lack of talents
6	Internationalization	6	IT security and cyber
7	Optimizing profit margins	7	Regulation and bureaucracy in EU
8	Improving processes and internal operations	8	Knowledge theft
9	Regulation	9	Digitalization
10	Balancing social impact with profit making	10	Other
11	Other		

Note. Adapted from: „A research study of 18 start-up hubs in Europe”, PwC European Start-up Survey, 2018, Available online <https://www.pwc.com/gx/en/services/assets/pwc-european-start-up-survey.pdf>.

4. Research results and discussion

The University of Szczecin is carrying out a project entitled "Improving the quality of scientific research in economic sciences with special emphasis on the service sector" within the framework of the program of the Minister of Science and Higher Education entitled "Regional Initiative of Excellence", announced on 19 January 2018. (M.P. item 120) (Agreement No. 001/RID/2018/19 dated 28.12.2018). The project is scheduled to run from 1 January 2019 to 31 December 2022.

Within the framework of project tasks to be achieved is the number of employees of the Faculty of Economics, Finance and Management who have participated in the training to improve the skills of working in project teams.

The author's intended action was to implement two soft training courses for 32 research staff members (a specific group of people). One training course could be attended by 16 participants due to the limited number of places. The first training course was held under the title: "Creativity and innovation in the establishment and work of research teams", the second was dedicated to the topic: "Creative methods to support the work and results of research teams". Both trainings were conducted by an external company based in Szczecin, West Pomeranian Voivodeship. Experienced trainers from the business community were invited to conduct training courses.

The aim of the study is to evaluate the prospects of cooperation between university and business using the example of training courses within the project financed by the Ministry of Science and Higher Education, based on the answers of the respondents and the author's own experience. The data for the evaluation were collected using a questionnaire form and focus interviews. It is important to select the number of participants in the focus group correctly,

and usually it depends on the subject of the study and the total number of focus groups participating in a particular research project. E. Babbi states in his work that the number of people taking part in an interview should be correlated with the subject of the study and can be between 12 and 15 people (Babbi, 2005, p. 330). Therefore, the group interview was conducted with a representative group of scientists who participated in the project. The training courses were completed in 2019, and the current research has been carried out on their basis. Moreover, there is a willingness to create cyclical initiatives in the coming years based on the methodology already developed. The aim of the qualitative research was to broaden the knowledge of the university's past cooperation with the business community and plans for the future to create similar ventures. The project participants answered questions about the skills they would like to improve or acquire and which would be necessary for their professional growth. Out of 32 people who participated in the study, 30 indicated that soft skills, e.g. interaction between peers from different centers, making new acquaintances, cooperation and team work, are a helpful factor in motivating further action. A total of 32 people (100%) replied that they would like to continue the training cycle in the future, as it would enable them to develop further joint innovative activities leading to scientific work or new scholarships. The characteristics of the research sample are shown in Table 4. The respondents answered all the questions in the questionnaire, but for the sake of clarity, only the most important information was presented in the diagrams.

Table 4.
Study group structure

Indicators	Structure, %
Sex	Woman – 93.7; Man – 6.3
Age	26-30 y/o – 6.3; Over 35 – 93.7
Education	University – 100
Place of residence	Large city (over 400k) – 81.3; Rural areas (village) – 18.7

Note. own study.

A total of 32 persons, 2 men and 30 women, took part in the study. As can be seen, the gender proportions in a particular study group are not evenly distributed, as the predominance of women is clearly noticeable. The analysis of the target group shows that most of the persons were over 35 (93.7%), all participants have a higher education, and that the vast majority of people live in a city with more than 400 thousand inhabitants.

Most important question raised in the survey was what made the researcher decide to take part in a training course conducted by business representatives. The respondents had the opportunity to express their opinion by marking the answer that would best define their choice (Table 5).

As can be seen from the above, the vast majority of participants (31.25%) were motivated by the fact that they acquired their knowledge free of charge. The second argument in favor of the participation in the training, in terms of the number of responses (18.75%), was the use of the knowledge acquired in the training courses to work with students. The third argument

related to the integration of staff, as a lunch break in the form of a hot meal and coffee was provided during the sessions, and this may have been the reason for the respondents to give this answer. Other opinions, i.e.: interest in interaction with other people during the training, interest in the content of the training, getting to know with the trainer for further personal cooperation and the assessment of the trainer's level received 9.38% votes each.

Table 5.
Opinions on the participation in the training courses

Answers	Structure, %
Gaining knowledge free of charge	31.25
The use of the knowledge acquired in the training courses to work with students	18.75
Integration of staff	12.48
Interest in interaction with other people during the training	9.38
Interest in the content of the training	9.38
Getting to know with the trainer for further personal cooperation	9.38
The assessment of the trainer's level	9.38

Note. own study.

The study also covered the issue of the benefits of cooperation between university and business for trainees (Table 6). The table below shows the values in the order chosen by the respondents in terms of the number of their answers, from the highest to the lowest.

Table 6.
Benefits from university-business cooperation

Answers	Rating	
	№	%
Broadening knowledge and gaining new information	1	93.75
Scientific experience	2	75.00
Job experience with enterprises	3	68.75
Research team building	4	62.50
Team-work	5	59.38
Opportunity to be promoted	6	15.63
Getting the certificate of the course completion	7	15.63
Lack of classes with students during the training course	8	3.13

Note. own study.

As the figure above shows, the highest value in terms of the benefits from cooperation between the university and business for the participants is broadening of knowledge and the acquisition of new information (93.75 %). Another equally important aspect for researchers, chosen by 75% of all participants, is gaining experience to be used in the future. A statement relating to the benefits from working with entrepreneurs is ranked important – 68.75%. Slightly less, 62.5% respondents focus on teamwork, especially on building research teams, as there is a possibility to share tasks and cooperate more effectively. More than 59% (19 people) consider teamwork an important asset as it can bring further mutual results, through scientific publications, conferences or work on creating new projects and obtaining funding.

5. Conclusions

The authors verified the accuracy of the hypothesis through their research. As a result of the answers received, the goal of the article was achieved. Analyzing the target group, it can be stated that the representativeness of the research sample is low, however, these are strictly defined assumptions of the task to be financed under the Regional Initiative of Excellence project (RID). The results of the survey show that, in the opinion of the target group, the cooperation between university and business is a result of mutual benefit and that it is worthwhile to participate in such initiatives, both because of personal and professional development. Training courses to improve soft skills and business competencies are indispensable in team research and project work, as the importance of team and group work in research projects and academic startups is currently increasing, which in turn affects cooperation with entrepreneurs. The implementation of training courses has significantly improved the quality of team research, the cooperation with the local community (cooperation between science and business) and the relationships in the establishment of research teams. The focus interviews show that the target group finds soft skills and business competencies helpful in areas such as interaction between people from different centers, making new acquaintances, working together or in groups, and motivation for further commercialization of the results of scientific research.

In the world of science and business, there is a constant search for new initiatives that create opportunities to broaden horizons, break down barriers and create common innovative solutions. Work and mutual support should benefit both parties. Paradoxically, the undeniable advantages of cooperation between the university and business representatives do not always lead to the mass implementation of joint projects in practice. The answer to this question can be found by referring to the "Triple Helix Theory". According to this theory, each of the parties (state, business, university) should partially accept the role of the other party in interaction with all the others, while maintaining its main role and separate identity. Thus, universities should develop academic entrepreneurship, and businesses should actively share their knowledge and competencies with external stakeholders. The state should not only regulate innovation activities and finance university research, but also work as a venture capitalist, investing in high-risk high-tech startups.

In practice, we see that the exchange of roles and information does not occur according to the theories described above. At the same time, the existing "The Triple Helix" is characterized by the following features:

1. University teachers and students are not always ready to manage the business processes of their own innovative projects, even if venture funds are available. The research results confirm the interest of this group in obtaining new knowledge and business competencies directly from experienced entrepreneurs.

2. Corporate entrepreneurial education programs organized by business have an internal nature and are aimed at training the personnel reserve for their companies (HR). Such programs are not aimed at developing competencies for managing business processes of innovative projects for external stakeholders.
3. The state very rarely finances venture university startups due to their low "survival rate" and prefers to invest in the creation of innovative infrastructure (laboratories, business incubators, technology parks, etc.). Our research has shown that in order to reduce the risks of public financing, it is necessary to actively implement projects aimed at improving the business competencies of potential academic entrepreneurs. This will make it possible to effectively use the infrastructure already created by the state and increase the "survival rate" of university startups.

The results of the presented study can be an incentive to carry out subsequent research on university-business cooperation on a group of researchers in order to further explore knowledge. The study has certain limitations, mainly resulting from a small research group (32 persons), but provides valuable feedback to the audience on the benefits from university-business cooperation.

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THE USE OF RENEWABLE ENERGY SOURCES AND THEIR INFLUENCE ON THE NATURAL ENVIRONMENT IN SELECTED EUROPEAN STATES

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Purpose: The aim of the article is to evaluate and characterize the use of renewable energy sources and their impact on the environment in selected European countries.

Design/methodology/approach: relying on renewable energy sources is one of the fundamental goals of the European Union, which is constantly striving to improve the quality of life of societies, and to secure the welfare of present and future generations. The authors performed an analysis of energy consumption in 2010-2020 based on statistical data obtained from the European Statistical Office "EUROSTAT". Numerous statistical analyzes, including data composition and decomposition, have been carried out. The authors relied on the analysis of change dynamics technique. The article presents indexes with a variable base (chain) and relative increments with a constant base.

Findings: It has been established that the use of renewable energy in the following analyzed sectors such as electricity, transport, heating and cooling is diversified, with the highest use being noted in the field of heating and cooling. The most developed country in Europe in terms of the use of renewable energy sources is Iceland, followed by Norway and Sweden. The countries with the lowest use of renewable energy are Malta, the Netherlands and Luxembourg although these countries are exhibiting a growing tendency towards using renewable energy sources.

Originality/value: The article presents the results of data composition regarding the use of renewable energy and its impact on the natural environment. Due to the analyzes used, it may be regarded as an interesting overview of the use of renewable energy sources.

Keywords: renewable energy sources (RES), environmental protection, analysis of the dynamics of change.

Category of the paper: Research paper.

Introduction

One of the key requirements for renewable energy sources is their ability to provide sufficient amount of energy to meet the basic demands such as starting cars, heating houses or powering cities with energy (Bieńkowska-Gołas, 2017). It is also important to consider how these resources could be used in the long term, and what impact they exert on the natural environment. There are numerous resources that are theoretically inexhaustible, and therefore regarded as renewable (Guła, Paruch, Gałusza, 2008). Such resources are used to produce clean energy, they generate less pollution or greenhouse gas emissions, which are one of the major contributors to climate change.

For many years, the state of the natural environment has become a very important issue in Poland and Europe (Jabłoński, Wnuk, 2009). The environment is an inseparable element of life on Earth as it provides all living organisms with natural resources. Its effective protection and management will help to maintain the natural environment at an appropriate level. However, due to the current model of living, we are facing numerous environmental problems that require intense action (Graczyk, 2011). Having said that, it seems highly important to increase the use of renewable resources in order to enrich the natural environment instead of causing it burden, such as contamination of surface waters or exceeding the air pollution norms (Bień, 2010). One of the most important challenges is the elimination of emissions, which are created by the municipal and housing sector. Numerous buildings still rely on low-quality coal and waste incineration for heating purposes. Another important aspect are urbanized areas located in the vicinity of roads with high traffic (Kowalski, Zajdel, Michalcewicz-Kaniowska, 2014). Air pollution safety norms in these areas are exceeded by too high emissions from transportation. In the process of combustion, harmful elements such as carbon dioxide, nitrogen oxide, hydrocarbons, sulfur oxide and carbon monoxide penetrate the atmosphere and have a detrimental effect on human health (Janka, 2013). Another important reason is the increasing development of road infrastructure and buildings, which happens at the cost of green areas. (Wójcik, 2005) Their depletion leads to the deterioration of the quality of life and climatic conditions. They adversely affect the ability to restore oxygen and water resources.

Renewable Energy Sources (RES)

The use of energy has been an important element of human life for centuries. Today power outages could cause huge losses (e.g. shutting down production lines powered by electricity) and general chaos (e.g. trains losing power, traffic lights failures) (Michalcewicz-Kaniowska, Zajdel, 2013). Modern societies are dependent on electricity and ensuring its continuity is of

paramount importance. Primary energy sources can be classified as conventional (non-renewable) or renewable (wind, water, sun, biomass and sea waves). Today's economy is largely based on fossil fuels such as natural gas, oil and coal, which provide about 80% of all energy. These resources are very efficient and easily stored. Currently, large emissions of dust, heavy metal residue, damage related to oil or coal extraction, traffic accidents, geopolitical problems and increased carbon dioxide emissions are the key factors responsible for such serious side effects as shifting climatic zones, and even extinction of the whole species inhabiting the planet (Sonbierajska, Starzomska, Piotrska, 2009). Therefore, the logical alternative to using conventional energy sources based on fossil fuels are renewable energy sources obtained from such inexhaustible resources as sea waves, solar power, and wind (Lasota, 2013). As opposed to the conventional energy sources, the use of renewable energy sources does not lead to irreversible losses and deficits of this type of energy in the environment. These are resources cannot be exhausted and are constantly replenishing. What is more, the replenishment process is spontaneous and independent from human labor. Renewable energy sources can be used to obtain not only electricity, but also heat, cold as well as biocomponents (biogas, oil used to power vehicles, vegetable oil). The use of renewable energy sources contributes to the improvement of the environment (by reducing water and air pollution and reducing the amount of waste produced) and to saving energy resources. In the nineties, there has been a significant increase in interest in this type of energy.

In the coming years, one should expect increased interest in using renewable energy sources due to their benefits (both ecological and local, increasing energy security and creating new jobs). This increase can be also attributed to the rapid economic development and the growing awareness of the society about pollution (Michalcewicz-Kaniowska, Zajdel, 2017). The energy balance in municipal and even provincial areas is changing. It is estimated that the largest energy consumers are agriculture, housing, transportation, and industry. The role of agriculture in production and use of renewable energy can be growing crops in contaminated areas and using the harvest in production of biofuels (Ligus, 2010).

Methodology

The aim of the article is to assess and characterize the use of renewable energy sources and its impact on the environment in selected European countries.

In the article, the authors presented the state of use of renewable energy sources, which is also one of the basic goals of the European Union, which constantly strives to improve the quality of life of societies and the welfare of present and future generations. This target will be based on the analysis of energy consumption in 2010-2020. The EU has a unified and coherent strategy for renewables, which sets out how the EU will be able to effectively meet the

challenges that come with this. Climate and energy changes have been evident over the past years, despite certain signs of improvement in some indicators.

The survey was carried out over eleven years (2010-2020), and the data was obtained from the website of the European Statistical Office (Eurostat, 2021). "EUROSTAT" is the Office of the European Commission, established in 1972 by the European Parliament and has its seat in Luxembourg.

The authors used numerous statistical analyzes involving data composition and decomposition. They used the analysis of change dynamic as well as indexes with a variable base (chain) and relative increments with a constant base.

Research results and discussion of results

For more than 25 years, the scope of use of renewable energy sources has been determined by the European Union. It was assumed that by 2010, 12% of all energy would come from renewable energy sources and would satisfy 22% of the total demand for electricity (Nelson, Starcher, 2016). These are the average numbers for European countries, and each country-specific target is written in a separate directive (Springer, 2020). After 2010, the EU extended the legal framework as there was no progress towards achieving the goals. After eight years, another revised Renewable Energy Directive came into force, which included the "Clean Energy for All Europeans" package. The aim of the EU remains in maintaining its leading position as the enforcer of the changes, and to meet the emission reduction goals as set by the Paris Treaty (Cenian, Pietrzykowski, 2018). The "Clean Energy for All Europeans" package has set the following target: 32% of all energy produced in the EU, and 14% of energy used in transport must be obtained from renewable energy sources by 2030. It is different from the original version of the directive, which assumed that as much as 20% of energy in the EU would be obtained from RES by the year 2020 (Chelminak, 2021). What is more, all Member States were obliged to enforce a 10% RES fuel share in transport. Apart from setting the new goals, the Directive also offers guidelines on how member states should meet these objectives, namely by co-operation between countries, energy origin guarantee, support systems, joint projects, and establishing criteria for the production of biofuels. The directive includes two regulatory systems. They assess the use of renewable energy sources across European countries and take into account their RES potential. For example, in the case of Malta, it equals 10%, while as much as 49% for Sweden. The member states set targets and agree on an action plan. Progress towards achieving the targets is measured every 2 years and therefore European countries publish biennial progress reports on renewable energy over this period.

As part of spreading the Clean Energy for Europeans strategy, a proposal has been made to recast the existing directive on the promotion and use of energy from renewable sources. The following six areas are being promoted: further development of renewable sources in the field of electricity, introduction of energy from renewable sources to the heating and cooling sector, strengthening the position of customers and increased information transfer in the field of renewable energy sources, reduction of emissions and diversification of the transport sector, establishing a timely and binding target, and strengthening bioenergy criteria (Cenian, Pietrzykowski, 2018). The targets for biofuels are, firstly, to achieve a 10% share of all fuels in transport (target by 2020), and secondly, to reduce the intensity greenhouse gases emissions by six percent (2020 target). The document "Policy framework for climate and energy for the period 2020-2030" proposed to deviate from the above targets as it is currently uncertain how to reduce the impact of indirect factor emissions that result from land use change caused by the production of biofuels (Den Boer 2018). The directive relating to the quality of fuels is aimed at reducing their negative impact on the natural environment and include fuels produced from sugar, oil, grain and other high-starch crops. This is due to a change in land use methods and related gas emissions. The reduction introduced in final energy consumption relating to the transport sector amounts to 7% in the EU countries. As part of the review of offshore wind energy and ocean energy, the Communication "Offshore Wind Energy: Actions Necessary to Achieve Energy Policy Objectives for 2020 and Beyond" was issued to support the development of areas outlined in the Communication from European countries. In the following years, goals for the development of energy-using fluids and waves, energy conversion, and the use of water salinity and energy production were revealed. The potential inputs of offshore energy sources are currently being assessed. Table 1 presents the use of renewable energy sources in European countries.

Table 1.

The use of RES across European states (kWh)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Electricity	408,2	532,3	702,1	841,5	1 053,8	1 404,7	1 412,8	1 652,9	1 826,5	1 854,1	1 856,5
Heating and cooling	3 931,0	4 027,4	4 189,5	4 641,6	4 917,1	5 060,8	5 278,0	4 963,7	5 116,7	5 452,3	5 579,9
Transportation	143,6	483,9	680,4	916,2	969,7	861,5	806,4	766,1	721,2	535,0	687,3
Total use	4 482,9	5 043,6	5 572,0	6 399,3	6 940,7	7 327,0	7 497,2	7 382,7	7 664,4	7 841,4	8 123,6

Source: own research based on data from Eurostat.

The production of electricity amounted to 408.2 kWh in the whole energy consumption in 2010-2019, while in 2020 the figure increased to 1856.5 kWh. A slight slowdown in this consumption can be noted in 2015 and 2016, but after 2016 it started to increase again. However, in terms of heating and cooling, the initial energy consumption in 2010 is much higher and amounts to 3,931, and in the last year of the analysis it is 5,579.9 kWh. The difference indicates an increase of about 1648.9 kWh. The last category is the use of energy in transport, and so from 2010 to 2014 an upward trend can be observed, starting from the consumption of 143.6 kWh to 969.7 kWh in 2014. However, from this year a downward trend

can be observed until 2019, where consumption was 535.0 kWh, and in the last analyzed year 2020 - 687.3 kWh. The highest use of this energy occurred in 2014.

The next analysis presents the use of renewable energy sources according to its production methods (solar, water, wind, biofuels and other) (table 2).

Hydropower is one of the oldest methods of obtaining energy from renewable sources and has been in use for thousands of years (Bujakiewicz-Grabowska, 2009). Hydroelectric power plants are designed to use the flow of rivers and streams and, at the same time, to rotate a turbine, the purpose of which is to power a generator that produces electricity.

Another type of RES is geothermal energy, which is obtained from the depths of the Earth's core. Geothermal reservoirs are usually located on the boundaries of tectonic plates, near volcanic eruption zones or deep underground (Cappetti, 2004). Geothermal energy is obtained by drilling wells to pump hot water or steam into the power plant. This energy is most often used for heating or generating electricity.

Wind turbines make use of wind energy in order to produce electricity. The wind pushes blades of the turbine, which are connected to the generator, which in turn converts mechanical energy into electricity (Taubman, 2016). Electricity produced in this way is typically used to supply homes and other buildings, but its great advantage is that it can be stored in the power grid.

Another type of RES is the solar radiation (Tytko, 2021). Photovoltaic cells make use of solar power to create electricity. Although while used individually, these cells can only produce enough energy to power a calculator, it is when they are combined into larger circuits, they can provide more electricity.

Table 2.

The use of energy in 2010-2020 (kWh)

Energy source	water	wind	solar	solid biofuels	other
2010	29 269,3	8 219,0	324,6	4 098,7	3 183,1
2011	29 252,6	9 612,2	639,5	4 572,5	3 533,7
2012	29 350,1	11 025,2	1 212,7	4 930,9	3 944,7
2013	29 684,2	12 492,0	1 996,9	5 581,0	4 525,3
2014	29 682,8	14 009,4	4 066,1	5 772,4	5 014,7
2015	29 552,9	15 604,6	6 034,1	6 197,4	5 742,7
2016	29 714,7	17 308,2	7 231,7	6 063,3	6 420,7
2017	29 642,1	19 010,7	8 097,1	6 081,8	6 902,3
2018	29 682,0	21 450,4	8 672,2	6 196,8	7 260,9
2019	29 601,1	23 379,4	8 687,4	6 224,7	7 393,4
2020	29 460,7	25 705,9	9 279,9	6 383,4	7 462,2
max	29 714,7	25 705,9	9 279,9	6 383,4	7 462,2
min	29 252,6	8 219,0	324,6	4 098,7	3 183,1

Source: own research based on data from Eurostat.

Table 2 shows the use of energy from individual renewable energy sources. The largest growth can be observed in the wind, solar, biofuel and other energy sectors. While energy produced by hydropower plants remains static, the consumption of its energy is the highest. The next table presents the analysis of the dynamics of changes in the characterized factors.

Only selected analyzes are presented in the paper. Chain indexes have been presented in Table 3.

Table 3.
The Analysis of Change Dynamics – chain indexes

Chain indexes	water	wind	solar	solid biofuels	other
2010	1	1.17	1.97	1.12	1.11
2011	1	1.15	1.9	1.08	1.12
2012	1.01	1.13	1.65	1.13	1.15
2013	1	1.12	2.04	1.03	1.11
2014	1	1.11	1.48	1.87	1.15
2015	1.01	1.11	1.2	0.98	1.12
2016	1	1.1	1.12	1	1.08
2017	1	1.13	1.07	1.02	1.05
2018	1	1.09	1	1	1.02
2019	1	1.1	1.07	1.03	1.01
2020	1.01	1	1	1	1

Source: own research based on data from Eurostat.

The conducted analysis shows that the use of hydropower has not changed over the years, which is confirmed by the value of the index (1.0), while the remaining resources are used to a greater extent in subsequent years, as evidenced by the increasing index values.

The next presented analysis concerns energy consumption for selected European countries over the years. Table 4 presents only selected countries due to the large volume of the analysis, as all European countries were assessed.

Table 4.
The Analysis of Change Dynamics – relative increases based on 2010 constant

Relative increase	Malta	Poland	Cyprus	Denmark	Germany
2010	0,00%	0,00%	0,00%	0,00	0,00
2011	10,17%	11,27%	28,22%	4,49%	0,33%
2012	24,86%	25,53%	47,98%	12,40%	8,09%
2013	453,11%	34,20%	54,17%	23,33%	16,22%
2014	945,20%	49,41%	56,37%	31,79%	24,05%
2015	1516,95%	58,30%	78,25%	43,49%	34,90%
2016	2024,29%	65,41%	111,19%	53,11%	37,07%
2017	2580,23%	67,59%	129,10%	65,22%	43,29%
2018	2792,09%	71,54%	147,98%	73,91%	48,48%
2019	3407,34%	64,50%	146,23%	80,59%	48,31%
2020	3978,53%	60,42%	162,31%	95,39%	54,16%

Source: own research based on data from Eurostat.

Table 4 shows the increases on a fixed basis (2010), the highest increase was observed in Malta (almost 4,000%) and in Cyprus (an increase by 163%), however, similar trends are observed in all European countries. A detailed analysis of energy consumption showed that the highest increase was in Denmark in 2020 and amounted to 16.93 kWh, while the lowest in 2011 in Romania – it was -3.87 kWh.

To sum up, the shortcoming of using renewable resources to produce energy is that it depends on weather conditions while non-renewable resources do not. However, scientists are constantly searching for new ways to improve the reliability of using renewable resources.

Conclusions

The use of renewable energy in the following sectors: electricity, transport, heating and cooling is diversified. The highest recorded use is for heating and cooling purposes, which means that using renewable energy sources is becoming more and more popular and translates into lower costs. Electricity comes second in the field of energy use. As in the case of heating and cooling, the use has also grown from year to year, which means that people living in European countries are increasingly using electricity produced from renewable energy sources. The last sector that was analyzed is transport. Energy use in this sector grew until 2015 after which it dropped until 2019. The reason behind changing to electric transport is aimed at reducing CO₂ emissions.

The most developed country in Europe in terms of the use of renewable energy sources is Iceland, followed by Norway and Sweden. The countries with the lowest use of renewable energy are Malta, the Netherlands and Luxembourg. As shown by the research, despite the lowest use, they showed a growing tendency.

Replacing fossil-fuel based energy with clean energy obtained from renewable sources can be observed from year to year. This trend is evolving with different intensity in different parts of the European continent. Poland also shows a growing tendency and, compared to other European countries, ranks 28th in terms of the use of energy from renewable sources. Although Poland did not experience such a fundamental modernization as Iceland until 2020, the growing tendency indicates an increasing interest in renewable energy. There are many benefits to this transformation, such as: reducing environmental impact, economic gains, climate protection, energy security.

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TRENDS OF CHANGE IN THE DEVELOPMENT OF SUSTAINABLE CITIES AND COMMUNITIES IN POLAND IN COMPARISON WITH EUROPEAN UNION COUNTRIES

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Purpose: The main purpose of this paper is to present the diversity and trends of changes taking place in cities and communities in Poland and in other European Union countries with respect of implementation of the 2030 Agenda for Sustainable Development.

Design/methodology/approach: The indicators included in Eurostat, which are collected to analyse the implementation of Objective 11: Sustainable cities and communities, have been used to assess the problem. 10 indicators and 27 European Union countries were analysed. The research period was 2010-2019 and the data was statistically analysed. Variations and distances between countries, trends in the changes taking place, ranking of countries, and relationships between the analysed indicators and the scale of their changes were calculated.

Findings: EU Member States (27) are significantly differentiated in terms of household living conditions, environmental conditions, and safety at home. In Poland, dwellings are overcrowded but in relatively good condition. The Polish population is more often exposed to noise and air pollution, and they are at a higher risk of dying in a traffic accident, but they are less likely to report the occurrence of crime and vandalism. The results of the study confirmed important trends towards the development of sustainable cities and communities in Poland and in other EU countries.

Research limitations/implications: The study resulted in a confirmation of the hypothesis that sustainable cities and communities have developed in EU countries in the last decade. There has been an improvement in the living conditions, safety, and environment of the population, especially in those countries where 10 years ago the variables describing sustainable cities and communities were the lowest. One of the countries where sustainable development was a priority was Poland, where the dynamics of improvement of almost every indicator was higher than the EU average.

Practical implications: The conclusions may be useful for managers of economic entities for making more effective decisions regarding allocation of financial resources and making investments in social and technical infrastructure or safety regarding sustainable development of cities and communities.

Social implications: The paper provides useful information for city and community managers and citizens of EU countries and cities about living conditions, quality of life, and safety of inhabitants.

Originality/value: The article presents the latest information regarding the conditions of cities and communities in EU countries and compares that data with indicators from previous years. The value of the article lies in identifying and recognising the significance of differences between EU countries and in verifying whether any positive changes towards sustainable development of cities and communities are occurring.

Keywords: cities, communities, sustainable development, trends, indicators, EU countries (27).

Category of the paper: research paper.

1. Introduction

Rapid urbanisation is one of the most prominent challenges of the 21st century (Zhang, 2016; McGranahan, Satterthwaite, 2014). Over the last two decades Poland has also experienced a process of urbanisation and urban expansion, albeit it has slowed down somewhat in recent years. Currently, the urbanisation rate is 60% and 65% of the Polish population lives in urban and intermediate areas (BDL GUS, 2021). The development of cities and the communities located in them contributes to economic growth. Cities concentrate most economic activity, including production of goods and energy, transport services, and intensive land use, which creates a number of benefits on the one hand. On the other hand, the development of urbanization influences the devastation of the environment and the deterioration of living conditions and the health of the inhabitants, through the negative impact of the city on the air, climate, soil, and fauna and flora, or the overexploitation of natural resources (McKinney, 2008; Lewandowska, 2015; Rzeńca, 2016).

If the cities want to maintain the balance between the level, quality, comfort, and safety of life of the inhabitants and, on the other hand, the protection of the natural environment in the place of residence and health of the urban population, they must try to eliminate those problems or at least reduce their impact. It is important that the dynamic development of cities should disturb valuable natural resources to the least degree, but above all that it should not cause visible differences in the conditions, level and quality of life and health of city dwellers (Kuddus et al., 2020).

To be effective in action, it is useful to be guided by the principles of prevention and forethought (Mega, 1996), which is why managing the urban environment in a sustainable way is probably one of the most important and difficult tasks for years to come (Hens, 2010). This difficulty stems from the fact that a city is a unit composed of many elements between which there are different relationships (McMichael, 2000). The basic components of the territorial social system of a city include the social layer, i.e. the community of people with their needs, goals, and life aspirations, and the material substrate layer with all natural and artificial elements in the form of infrastructural elements. As Mierzejewska (2015) points out, it is important to maintain a relative balance between the layers, which is not an easy task.

Matters of environmental protection are only one of the components of sustainable development, with social and economic issues being of equal importance.

Paszkowski (2011) adds that an ideal sustainable city is a city that uses environmental resources to the extent that it can renew them and the development of which is gradual, thoughtful, and purposeful. According to Mierzejewska (2008, p. 57), a city, in order to be defined as sustainable, must "recognise the needs of all people, not only those living within the city boundaries, but also outside them, and not only the present, but also future generations, and reduce the demand for certain resources and increase the environmental capacity on a local, regional, and global scale, and thus the capacity of the natural environment to absorb and neutralise the external effects of human activity".

The concept of a sustainable city is inherent to the idea of new urbanism, which promotes a slower pace of life for residents, the creation of spaces conducive to pedestrianisation, and jobs for local people (Wróblewski, 2016; Overstreet, 2021; Ghorbi, Mohammadi, 2017). The literary sources also sometimes equate sustainable cities with *smart cities* (Stratigea et al., 2017; Morelli et al., 2013; Caragliu et al., 2009), as smart behaviour can add value and influence the sustainability of cities and communities. Smart cities, thanks to information and communication technologies, make more efficient use of available resources in order to improve the quality of life in the city and ensure its sustainability. A city that successfully implements the assumptions of the smart city concept is Vienna which is currently the leader of many rankings regarding the key areas of development of this idea (Jankowska, 2015).

The literature on the development of sustainable cities and communities is vast due to the importance of this issue in the modern world. These issues have been addressed, in addition to those previously mentioned, by authors such as Blassingame (2019), He, Lin et al. (2020), Linan et al. (2004), Satterthwaite (1997), Hanna and Comin (2021), Jenks and Jones (2010). In the publications, the authors point out the importance, complexity, and ambiguity of this problem, and sometimes even the contradictions between some issues, which is why attempts to systematize knowledge on the development of sustainable cities and communities can pose quite a challenge.

It is well known that sustainable development can stimulate positive changes in the functioning of cities and the living conditions of their inhabitants and the quality of the environment in which they live. Objective 11 "Sustainable cities and communities" of the 2030 Agenda for Sustainable Development (UN 2015, OECD 2017) recommends making cities and human settlements safe, stable, sustainable, and inclusive. In various countries and also in Poland, the National Urban Policy 2023 (2015) was developed in 2015. It is a location-specific development policy for Polish cities indicating assumptions and ways to implement strategic and specific objectives towards sustainable development of Polish cities and communities. In line with the Agenda's objectives, cities in all EU countries, including Poland, must, inter alia, provide better and affordable housing, make safe transport systems available to all, raise the level of road safety, and reduce the adverse rate of the city's negative impact on the

environment, paying particular attention to air quality, management of municipal waste, and other pollutants (OECD, 2017; MiR, 2019).

These are ambitious and difficult goals to achieve, especially since more than 50% of the world's population already lives in cities – a number that will go up to 66% by the middle of the 21st century (UN, 2016). The problems associated with intense urbanisation will progress fastest in developing countries. By contrast, in developed countries, population ageing or urban shrinkage will increasingly pose an issue. Nevertheless, for all cities and communities, the greatest challenges will be the increasing polarisation of households in terms of living conditions and quality of life, excessive energy consumption, air pollution, the problem of post-consumer waste, feeling of insecurity, and population health issues. In the face of these challenges, it is advisable to monitor indicators describing these problems in all countries in order to make more effective decisions on actions towards the development of sustainable cities and communities.

2. Research methodology and process

Monitoring perspectives related to the development of sustainable cities and communities is important from the point of view of the quality of life of future generations and requires detailed and regular analyses of the implementation of the 2030 Agenda for Sustainable Development in the context of the changing environmental conditions. Therefore, the main aim of this article is to identify trends in changes taking place in cities and communities in the countries of the European Union, with particular emphasis on Poland. The specific objectives include, **firstly**, an analysis of the values of indicators describing the sustainable development of cities and communities in Poland and other EU countries, such as overcrowding and living conditions in urban households, road safety and feeling of safety at home, access to public transport, noise exposure, and air pollution, **secondly**, an assessment of the diversity of the EU Member States in terms of the examined indicators; **thirdly**, an analysis the trends of changes occurring in 2010-2019 in the EU countries and in Poland in particular, on the basis of the absolute increase/decrease P_A index; and, **fourthly**, an investigation on whether there is a relationship between the level of the analysed indicators in 2010 and their increase or decrease in 2010-2019. The realisation of the aim of the paper was to verify the hypothesis assuming that the last decade saw the development of sustainable cities and communities in the EU countries (27), which was evidenced by the improvement of living conditions, safety, and environment of the population, especially in those countries where ten years ago the indicators were the lowest, and one of the countries in which the development of sustainable cities and communities was a priority and where it actually occurred was Poland.

Indicators provided by the European Statistical Office EUROSTAT extracted and collected to analyse the implementation of Objective 11: Sustainable cities and communities were used to assess the problem. 10 indicators (variables) and 27 EU countries (cases) were examined. Due to missing data for individual years and countries and for technical reasons, the research period was ultimately set to span the 2010-2019 period. Consequently, a database was prepared consisting of indicators characterising: living conditions of households (X_{01} , X_{04}), environmental/infrastructure conditions (X_{02} , X_{03} , X_{05} , X_{07} , X_{08} , X_{09}), and population's life security (X_{06} , X_{10}). The variables are denoted as stimulants S or destimulants D of the investigated phenomenon. An increase in the stimulant S leads to the development of sustainable cities and communities, while an increase in the destimulant D leads to a decrease (Table 1).

Table 1.

Indicators considered for assessing diversity and trends in the development of sustainable cities and communities in EU countries (27)

Variable symbol	Variable name	Data from years	Data source	Last data update	Influence of variable*
X_{01}	Overcrowding rate in %	2003-2020	Eurostat (ILC_LVHO05)	27.10.2021	D
X_{02}	Settlement area per capita in m ² per capita	2009,2012, 2015,2018	Eurostat (LAN_SETTL)	08.02.2021	S
X_{03}	Population living in households perceived to suffer from noise, by poverty status in %	2003-2020	Eurostat (ILC_MDDW01)	27.10.2021	D
X_{04}	Population living in a dwelling with a leaking roof, damp walls, floors, or foundations or rotting window frames, floor in %	2003-2020	Eurostat (ILC_MDHO01)	27.10.2021	D
X_{05}	Population connected to at least secondary waste water treatment in %	2000-2018	Eurostat (ENV_WW_CON)	08.02.2021	S
X_{06}	Road traffic fatalities on urban roads per 100 000 persons	2000-2019	DG MOVE (SDG_11_40)	05.07.2021	D
X_{07}	Share of buses and trains in total passenger transport in %	2000-2019	Eurostat (TRAN_HV_PSMOD)	07.07.2021	S
X_{08}	Exposure to air pollution by particles < 10 μm - annual average concentration	2000-2019	EEA (SDG_11_50)	08.02.2021	D
X_{09}	Municipal waste recycling rate in %	2000-2019	Eurostat (ENV_WASMUN)	17.05.2021	S
X_{10}	Population reporting incidence of crime, violence, or vandalism in their area w%	2003-2020	Eurostat (ILC_MDDW03)	27.10.2021	D

Key: S-stimulant, D-destimulant.

Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

In the descriptive and graphical analysis of the survey results, the abbreviations of the names of the European Union member states were used according to the ISO 3166 Alpha-2 code developed by the International Organization for Standardization (ISO 2019). The data were subjected to statistical analysis (c.f. Wysocki, Lira, 2005; Luszczewicz, Słaby, 2003). Among others, the absolute indexes of the increase or decrease of the P_A values of the indicators between 2010 and 2019 (base year = 2010), the coefficients of variation V_s , the measures of distance D and variation R between countries, the correlation coefficients r_{xy} and the determination coefficients R^2 were calculated. Using the correlation coefficient r_{xy} , an attempt was made to test whether there are significant correlations between the study variables X and the indices of their absolute changes P_A over the last decade.

3. Assessment of the diversity of development of sustainable cities and communities in EU countries and Poland and the trends and scale of change from 2010 to 2019 – results and discussion

Based on the analysis of the indicators taken into account in the study of the development of sustainable cities and communities in EU countries, and in particular in Poland, some interesting trends have been observed and insights made (Table 2).

Table 2.

Values, variation, and absolute increases/decreases of variables considered for the study on the development of sustainable cities and communities in Poland and other EU countries (27) from 2010 to 2019

Variable	EU (27)	<i>min</i>	<i>max</i>	PL	V_s	D	R	P_A EU (27)	P_A PL
	2019							P_A absolute growth for 2019 (base year = 2010)	
X ₀₁	29.1	5.4 CY	56.9 SK	45.2	52.7	10.5	51.5	-3.1	-20.4
X ₀₂	703.4	201.4 MT	2447.6 FI	633.7	58.7	12.2	2246.2	-	39.8
X ₀₃	17.3	8.2 HR	28.3 MT	12.6	36.0	3.5	20.1	-3.3	-3.6
X ₀₄	12.7	4.1 FI	31.1 CY	10.8	44.1	7.6	27.0	-3.6	-4.8
X ₀₅	79.6	36.9 HR	99.8 AT	74.0	21.4	2.7	62.9	9.0	9.5
X ₀₆	5.1	2.2 SE	9.6 RO	7.7	35.8	4.4	7.4	-1.6	-2.6
X ₀₇	17.2	9.4 LT	28.4 HU	19.3	23.6	3.0	19.0	0.2	-4.6
X ₀₈	20.5	10.2 FI	30.9 HR	27.0	27.5	3.0	20.7	-6.7	-12.7
X ₀₉	47.7	8.9 MT	66.7 DE	34.1	37.5	7.5	57.8	9.7	17.8
X ₁₀	11	2.7 HR	20.2 BG	4.4	45.0	7.5	17.5	-2.1	-2.1

Key: *min* – minimum value for the country, *max* – maximum value for the country, V_s – coefficient variation in %, D – distance (max/min), R – range (max-min), P_A – absolute increase/decrease for 2019 (X_{2019} minus X_{2010}) (base year = 2010).

Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

The differentiation of EU countries in terms of various aspects of economic and social life and sustainable development has been analysed by many authors (e.g. Zielenkiewicz, 2020; Leruth et al., 2019; Winzen, Schimmelfennig, 2016), and the scale of this differentiation influences the opportunities or threats to the level and quality of life in the society. Also in this study, significant heterogeneity among EU countries was demonstrated (27). This was confirmed by the coefficients of variation V_s , D and R calculated for the analysed variables. The relatively largest differences between countries are found in terms of living conditions in households (X_{01} , X_{04}), while slightly smaller differences are found in terms of safety conditions (X_{06} , X_{10}) and environment/infrastructure conditions (X_{02} , X_{05} , X_{07} , X_{08} , X_{09}) (Table 2).

Adequate household living conditions are among the most important determinants for the development of sustainable cities and communities. This has also been pointed out by other authors in their studies (Oyebanjia et al., 2017, Dixon and Woodcraft, 2016). One of the measures indicative of living conditions is the overcrowding index (X_{01}). It is found that in EU countries (27) in 2019, as many as 29.1% of people lived in overcrowded households, where there is not at least one room for the whole household and a room for a couple, for every single person over 18 years old, for a pair of teenagers (12-17 years old) of the same sex, for every teenager of a different sex, and for a pair of children (under 12 years old). The highest overcrowding rates are in Slovakia (56.9%) and Romania (54.4%), and the lowest in Cyprus (5.4%), Ireland (5.9%), and Malta (6.6%). In the ranking of countries, Poland still ranks unfavourably above the EU average, where X_{01} is at 45.2%, despite the fact that the absolute decrease compared to 2010 was one of the highest in the EU (27) ($P_A = -20.4\%$) (Table 2 and Figure 1).

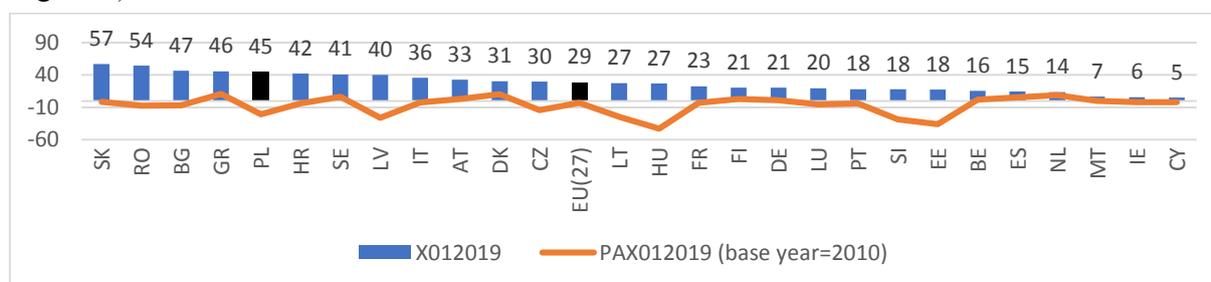


Figure 1. Overcrowding index X_{01} in 2019 and its absolute increase/decrease $P_{AX_{01}}$ in 2019 (base year = 2010) – example of an indicator characterising sustainable living conditions of cities and communities in EU countries (27). Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

Significant differences can also be observed in the percentage of the population living in dwellings with a leaking roof, damp walls, floors, or foundations or rotting window frames on the floor (X_{04}). In fact, 12.7% of the EU population lives in such unfavourable conditions. The situation is worst in Cyprus (31.1%) and Portugal (24.4%), while it is best in Finland (4.1%) and Slovakia (5.7%). In Poland, the percentage of the population living in unfavourable housing conditions was 10.8% in 2019 and was below the EU average, and it decreased further by $P_A = -4.8\%$ in the analysed decade. This shows that the dwellings in Poland, despite being

relatively small and cramped when compared to those of other European countries, are in relatively good condition.

Among indicators describing environmental/infrastructure conditions (X_{02} , X_{03} , X_{05} , X_{07} , X_{08} , X_{09}) indicating the sustainability of cities and communities, those with the highest variation values deserve most attention. EU countries are the most diverse in terms of settlement area per capita (X_{02}) and this diversity remains at a similar level, exceeding $V_s = 50\%$. On average in the EU there is 703.4 m^2 per capita of built-up area used for buildings, industrial and commercial areas, infrastructure, and sports grounds, with the highest in Finland (2447.6 m^2) and the lowest in Malta (201.4 m^2). In Poland, the settlement area is slightly smaller than the EU average at 633.7 m^2 and has increased in the last decade.

An important indicator of the quality of the environment in which EU citizens live that allows to assess the development of sustainable cities and communities is the proportion of the population living in households that claim they suffer from noise (X_{03}). It turns out that as much as 17.3% of the resident population in the EU suffers from noise pollution, with a variation between countries in this regard being high at of $V_s = 36.0\%$. The highest proportion of people exposed to noise is found in Malta (28.3%), the Netherlands (27%), and Germany (26%), while the lowest is found in Croatia, Ireland, and Estonia (8% each). In Poland, the percentage of people suffering from noise in 2019 stood at 12.6% and was almost 5 percentage points lower than the EU average. In the analysed decade, the absolute decrease of this indicator for Poland was close to the EU average and amounted to $P_A = -3.6$. As highlighted in the literature, environmental noise is an important risk factor for a number of short- and long-term adverse health effects (Nitschke et al., 2014). This risk mainly affects communities living in cities, and an increase in noise exposure will destimulate their sustainable development.

The sustainability of cities and communities is also evidenced by the provision of households with the necessary technical and social infrastructure (Wear, 2016). One of the analysed indicators is the percentage of population connected to sewage treatment systems (X_{05}). The importance of the development of wastewater infrastructure in Poland in economic and environmental terms was pointed out by Marszelewski and Piasecki (2014). According to data from 2018, on average 79.6% of the EU resident population is connected to such systems, the least in Croatia (36.9%) and Romania (48.1%) and the most in Austria (99.8%), the Netherlands (99.5%), Latvia (98.7%), and Luxembourg (97.0%). In Poland this percentage amounted to 74.0% and was slightly lower than the EU average, highlighting the importance of further improvement in the provision of households with basic technical infrastructure. This increase occurred for Poland in the last decade and, at the rate of $P_A = 9.5\%$, was close to the EU average.

Another indicator of sustainable cities and communities is the willingness of people to use public transport such as buses, trolleybuses, trams, or trains. Urban transport sustainability plays a key role in environmental and transport policies, as highlighted by many authors in their research (Da Silva et al., 2008; Cisowski, Szymanek, 2006; Strulak-Wójcikiewicz, Lemke,

2019; Colville et al., 2004; Qureshi, Huapu, 2007). The shift of consumers from private to public transport will definitely reduce emissions of pollutants and greenhouse gases produced by vehicles. The share of buses and trains in total passenger transport (X_{07}) on average in the EU was negligible at 17.2%, the highest in Hungary (28.4%), the Czech Republic (26.2%), and Slovakia (26.2%), and the lowest in Lithuania (9.4%), Portugal (11.7%), and Slovenia (13.4%). In Poland, this share is only slightly higher than the EU average and is 19.3% as of 2019, with the decrease of this indicator between 2010 and 2019 ($P_A = -4.6\%$) which is an unfavourable trend for Poland, hindering the implementation of sustainable development related to environmental protection.

Another major concern for the inhabitants of EU cities is pollution of the environment, and in particular of the air they breathe. Therefore, an important indicator used to assess the development of sustainable cities and communities is the exposure to particulate air pollution (X_{08}) (compare also studies Zgłobicki et al., 2019; Jasiński et al., 2021). The index measures population-weighted annual average concentrations of particulate matter at stations measuring background urban pollution levels in agglomerations. Fine and coarse particles (PM₁₀), i.e. particles with a diameter of less than 10 micrometres, can enter deeply into the lungs, where they can cause inflammation and worsen conditions for people with heart and lung disease. The average annual concentration of particulate matter < 10 μm in EU countries was 20.5 in 2019, the highest being in Croatia (30.9), Bulgaria (30.4), Greece (27.5), and Poland (27.0) and the lowest in Finland (10.2), Estonia (10.8), Sweden (12.3), and Ireland (12.7). Poland, despite the reduction of the value of that index in the last decade by $P_A = -12.7\%$, is still in the lead of the "biggest polluters", therefore, together with other countries with the biggest air pollution, it should implement measures reducing the concentration of harmful dusts as soon as possible (Figure 2).

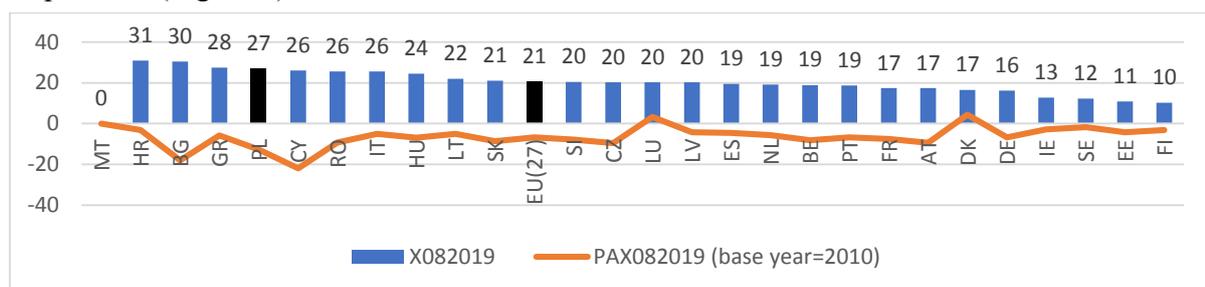


Figure 2. Air pollution exposure of particulate matter < 10 μm (X_{08}) in 2019 and its absolute increment/decrement P_{AX08} in 2019. (base year=2010) – example of an indicator characterising the sustainable environment/environment/infrastructure of cities and communities in EU countries (27). Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

An important action of cities and communities towards their sustainable and responsible operation is the recycling of municipal waste. According to the 2019 data, on average, member states recycled 47.7% of municipal waste in total, with the least recycling in Malta (8.9%), Romania (11.5%), and Cyprus (15.0%) and the highest in Germany (66.7%), Slovenia (59.2%), and Austria (58.2%). In Poland, in spite of significant increase in the absolute recycling rate of

municipal waste at $P_A = 17.8\%$, still much less waste undergoes this process than on average in the EU at only 34.1%.

In terms of assessing the development of sustainable cities and communities, in addition to analysing the living conditions of households and the conditions of their surrounding environment, an assessment of the level and sense of security among the population should also be included. An important aspect is the feeling of safety during among the population when travelling. Therefore, one of the indicators assessed is the number of traffic accident fatalities per 100 000 people (X_{06}). On average in the EU, there are 5.1 fatalities per 100 000 inhabitants, the highest in Romania (9.6), Bulgaria (9.0), Poland (7.7) and Croatia (7.3) and the lowest in Sweden (2.2), and Ireland (2.8). Poland unfortunately continues to be in the forefront of countries with the highest annual number of fatalities due to traffic accidents, despite a decrease in the value of this indicator in the last decade ($P_A = -2.6$).

No less important is the indicator representing the share of the population reporting the occurrence of crime, violence, or vandalism in their area (X_{10}). On average, one in 10 people in the EU reported such issues in 2019, with the highest number of such people living in Bulgaria (20.2%), Greece (16.9%), the Netherlands (16.3%), and France (14.7%), and the lowest reporting in countries such as Croatia (2.7%), Lithuania (3.2%), Poland (4.4), Hungary (5.3%), and Slovakia (5.6%). In terms of this indicator, Poland ranks favourably in the ranking of countries also due to the fact that over the last decade there has been a decrease in the percentage of the population reporting safety issues ($P_A = -2.1\%$) (Figure 3).

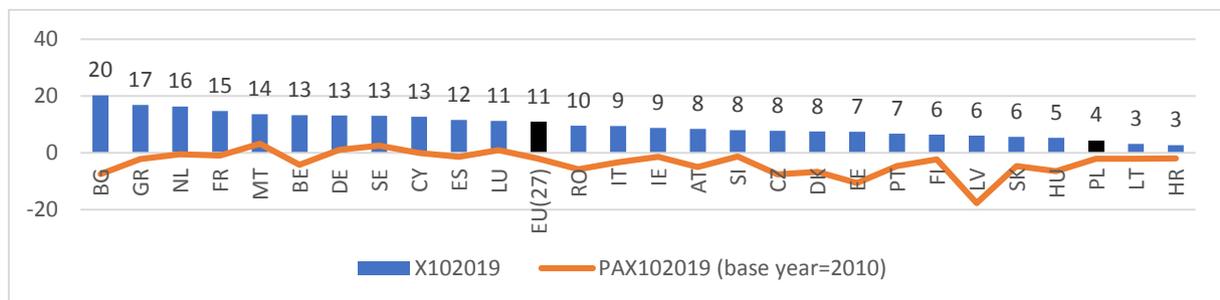


Figure 3. Share of population reporting the occurrence of crime, violence, or vandalism in their area in % (X_{10}) in 2019 and its increase/decrease in absolute $P_{AX_{10}}$ in 2019 (base year=2010) – example of an indicator characterising sustainable urban and community safety in EU countries (27). Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

The indicators that were analysed were the stimulants S or the destimulants D of the increase of sustainable development of cities and communities in EU countries. An increase in the value of stimulants indicates an increase in the level of the phenomenon under study, while an increase in the value of destimulants indicates a decrease in it. The stimulants of sustainable development of cities and communities were the variables X_{02} , X_{05} , X_{07} and X_{09} . It was assumed that if there is a larger settlement area per capita in a country, relatively more households are connected to sewage treatment plants, there is a larger share of buses and trains in total

passenger transport, and there is a higher rate of municipal waste recycling, then it can be concluded that cities and communities in these countries are relatively more sustainable.

In terms of achieving the aim of the study, it is important to know whether in the last decade (2010-2019) there was an increase in the values of the analysed stimulants which would indicate the development of sustainable cities and communities in EU countries. As can be observed in Figure 4, in most countries there has been an absolute increase in P_A values of stimulants X_{05} and X_{09} in 2019 as compared to 2010. The highest sustainable development of wastewater treatment systems and waste recycling can be observed in countries such as Lithuania, Latvia, Slovenia, Slovakia, Czech Republic, Hungary, Poland, and Bulgaria. Unfortunately, these countries cannot tout of an increase in the indicator/stimulant of sustainability X_{07} , where it is the countries mentioned earlier, such as Bulgaria, Latvia, Poland, and Hungary that have experienced the relatively largest decrease in the share of buses and trains in total passenger transport in the last decade at almost 10% decrease. A deepening of this trend in the next years will not be conducive to the development of sustainable cities and communities in these countries.

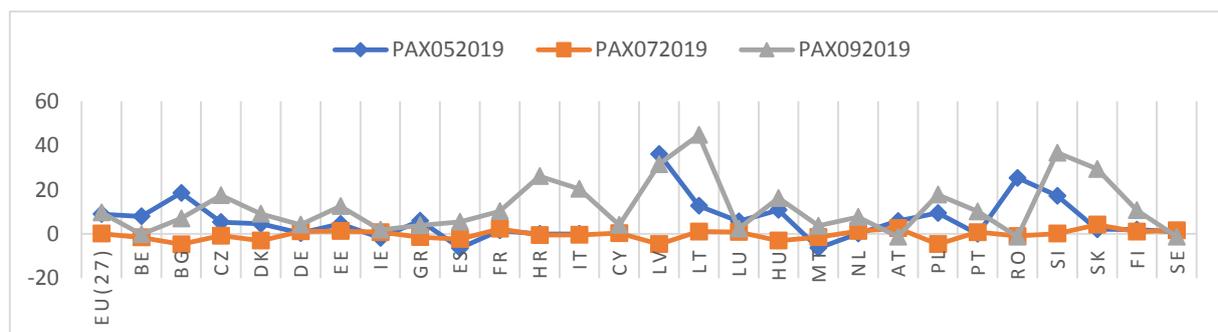


Figure 4. Absolute P_A increases/decreases in 2019 compared to 2010 in the value of indicators that are stimulants of sustainable urban and community development in EU countries (27). Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

The indicators X_{01} , X_{03} , X_{04} , X_{06} , X_{08} , X_{10} are the destimulants of sustainability of the studied phenomenon (Figure 5). If countries have a relatively higher rate of overcrowding and a higher proportion of people living in poor conditions, suffering from noise, and exposed to air pollution, as well as a lower sense of safety on the roads and in the area where they live, then it should be concluded that cities and communities in these countries are relatively less sustainable.

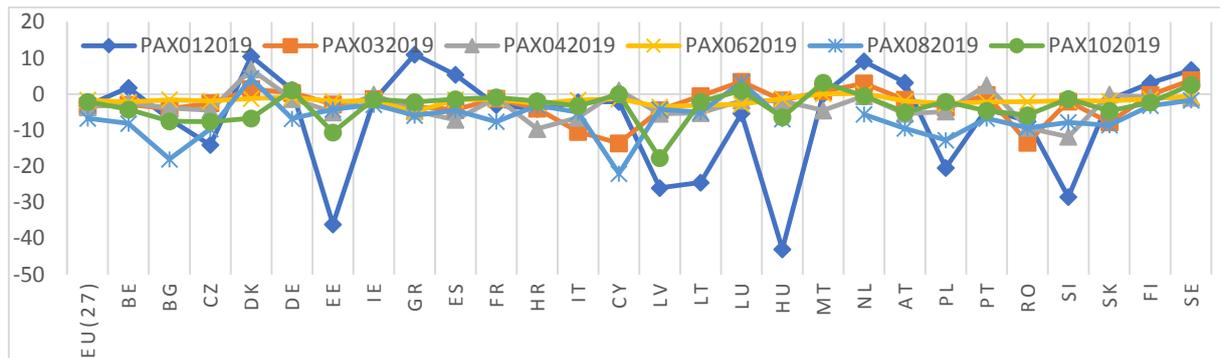


Figure 4. Absolute P_A increases/decreases in 2019 compared to 2010 in the values of indicators that are destimulants of sustainable urban and community development in EU countries (27). Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

An increase in the value of destimulants indicates a decrease and a decrease indicates an increase in the level or development of the investigated phenomenon. Due to the fact that the analysed indicators are destimulants it can be observed that in most countries there has been an absolute decrease in P_A of their values in 2019 compared to 2010. This trend indicates the development of sustainable cities and communities in EU countries. The largest decrease in the values of the destimulants in the analysed decade 2010-2019 can be observed in countries such as the Czech Republic, Estonia, Lithuania, Latvia, Hungary, Poland, and Slovenia, which is a positive trend for these countries and if it continues it will show that these countries are effectively implementing the goal 11 of the 2030 Agenda for Sustainable Development. On the other hand, an unfavourable trend towards unsustainable cities and communities is formed in the analysed decade in countries such as Denmark, Finland, the Netherlands, Luxembourg, Sweden, and Malta (Figure 4).

The above considerations were confirmed by the results of the analyses of the relationship r_{xy} between the values of stimulants or destimulants describing sustainable development of cities and communities and their absolute growth P_A in 2010-2019. There are significant negative relationships between almost all analysed variables (except X_{02} and X_{05}). This means that if the value of the analysed stimulants, such as X_{07} (share of buses and trains in total passenger transport) and X_{09} (municipal waste recycling rate), was lower in a given EU country in 2010, there was a higher absolute growth in the value of this indicator between 2010 and 2019. This trend indicates the development of sustainable cities and communities. In the case of the two other analysed stimulants, that is the variables X_{02} and X_{05} , no significant correlations with the absolute growth of P_A were found, which means no significant changes in the direction of sustainable development of cities and communities of EU countries in terms of the formation of settlement space and the provision of wastewater treatment systems (Table 3).

Table 3.

Relationships r_{xy} between the value of indicators – stimulants or destimulants describing sustainable development of cities and communities in 2010 and their absolute increases/decreases P_A in 2019 (base year = 2010) in EU countries (27)

Variable X & Variable Y	r(X,Y)	R²	t	p	Important
X ₀₁ 2010:P _{AX01} 2019	-0.707	0.500	-4.997	0.000	27
X ₀₂ 2010:P _{AX02} 2019	0.247	0.061	1.250	0.223	26
X ₀₃ 2010:P _{AX03} 2019	-0.396	0.156	-2.154	0.041	27
X ₀₄ 2010:P _{AX04} 2019	-0.451	0.204	-2.528	0.018	27
X ₀₅ 2010:P _{AX05} 2019	-0.283	0.080	-1.448	0.161	26
X ₀₆ 2010:P _{AX06} 2019	-0.767	0.588	-5.977	0.000	27
X ₀₇ 2010:P _{AX07} 2019	-0.470	0.221	-2.663	0.013	27
X ₀₈ 2010:P _{AX08} 2019	-0.854	0.729	-8.042	0.000	26
X ₀₉ 2010:P _{AX09} 2019	-0.554	0.307	-3.327	0.003	27
X ₁₀ 2010:P _{AX10} 2019	-0.584	0.341	-3.595	0.001	27

Source: own work based on Eurostat (2021). Database, Available online <https://ec.europa.eu/eurostat/data/database>, 3.11.2021.

The analyses showed significant negative correlations between all analysed destimulants of sustainable development of cities and communities and their changes in 2010-2019. This means that if the value of a particular destimulant was higher in a given country, then there was a significantly greater decrease in the value of the analysed variable in those countries. Thus, in countries with the highest household overcrowding (X₀₁), poor housing conditions (X₀₄), with significantly more people exposed to noise (X₀₃) and air pollution (X₀₈), and with relatively more residents exposed to traffic danger (X₀₆) and crime in their neighbourhood of residence (X₁₀), there was a proportionately largest significant decrease in the values of these destimulants in the analysed period of 2010-2019. In contrast, in countries with relatively better household living conditions, less air pollution and noise exposure, and greater life safety, the decline was significantly smaller. These relationships clearly demonstrate the development of sustainable cities and communities over the last decade in EU countries (Table 3).

4. Summary

Sustainable development of cities and communities has become a priority for EU countries (27), which is why for years they have been monitoring indicators to assess the occurring changes. However, the activities of the countries are not equally intensive, and the results of the calculations have led to some interesting observations. Summarising the results of the conducted survey, it should be stated that the EU Member States (27) are significantly differentiated in terms of household living conditions, environment/infrastructure, and safety at home, and this differentiation has remained at a similar level for years.

Currently, almost one in three EU citizens live in overcrowded households (most in Slovakia and Romania) and one in eight live in very poor housing conditions (most in Cyprus and Portugal). One in five EU citizens indicate that they are exposed to noise and air pollution (most in Malta and the Netherlands), and one in nine do not feel safe in their place of residence (most in Bulgaria, Greece, and the Netherlands). In comparison to other EU countries, Poland fares better only in the case of some indicators. For example, more than 45% of Polish residents live in overcrowded dwellings, although, compared to the EU average, these dwellings are relatively more often in good condition. Much more of the Polish population, as compared to other EU countries, is exposed to death in traffic accidents and to air pollution harmful to health and life. Relatively fewer Polish city dwellers are exposed to noise and danger from crime or violence. Invariably, the lack household sewage treatment systems and municipal waste recycling in Poland remains an issue.

The value of these indicators would be even less desirable for both Poland and other EU countries if positive changes towards the development of sustainable cities and communities had not taken place between 2010 and 2019. The results of the conducted study confirmed positive trends in the last decade in almost all analysed aspects. There was an increase in the value of the stimulants of development of sustainable cities and communities that were investigated in the study, and a decrease in the case of the destimulants. The results of the calculations made it possible to confirm the initial hypothesis that the last decade witnessed the development of sustainable cities and communities in the EU countries, which was evidenced by the improvement in living conditions of households, the quality of the environment/infrastructure in the place of residence, and life safety of the population, especially in those countries where a decade ago the indicators describing sustainable cities and communities were the lowest. One such country, where sustainable cities and communities were a priority, was Poland, where the rate of improvement in almost every respect was higher than the EU average (27).

Effective implementation of Goal 11 "Sustainable cities and communities" is crucial to achieving the core objectives of the 2030 Agenda for Sustainable Development. In EU countries, people's living conditions and their safety at home have improved, as well as the quality of the household environment, but not necessarily at a satisfactory level. The paper provides a plethora of useful information that should be known by city and community managers and residents of EU countries and cities. The results and conclusions may be useful for managers of economic entities, cities, and communities to make more effective decisions on how to allocate financial resources and make investments in social and technical infrastructure, safety, and environmental protection in order to develop sustainable cities and communities. It is also advisable to continue to analyse these indicators on a regular basis in order to monitor whether the disparity between EU Member States is narrowing and whether there are positive developments towards sustainable development.

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FACTORS SHAPING JOB SATISFACTION OF EMPLOYEES

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Purpose: The present paper aims at determining the hierarchy of factors influencing job satisfaction.

Design/methodology/approach: The empirical section of the paper presents the results of the authors' own research in Henkell & Co and FoodCare companies.

Findings: In the research section we are trying to answer the question of what determines job satisfaction of the group of selected respondents and thus what factors and to what extent shape it in the organisations under study.

Practical implications: A high level of job satisfaction of employees allows to achieve business objectives.

Originality/value: The value of the article is the confirmation that keeping the job satisfaction in organization is important in order to keep work engagement. Originality of the article arises from that job satisfaction is shaped by factors not only including salary, professional development, relations with the supervisor and colleagues, cooperation between departments, but also business ethics.

Keywords: job satisfaction, stakeholder, employee

Category of the paper: Research paper

1. Introduction

The organization cares for the preservation of a positive image, which is largely created by the internal client. In this connection, a continuous investment in the improvement of competences and in the areas related to the development and satisfaction of the most precious company resource – the employee – is not without significance for the firm's growth and its position held on the market. The process of human resources management is basically a never-ending complex of mutually related operations. The implementation of the mission, vision, strategy of the enterprise and the processes offered to the client requires a proper engagement of the employed. It is therefore essential to examine this group of company stakeholders.

The lack of adequate solutions in human capital management may lead to the loss of image, brand, clients, profits and, finally, to the bankruptcy of the enterprise. In such a situation the principles of quality management contained in the ISO norms, such as client-directed orientation, leadership, stakeholders' engagement, decisions based on facts, process approach, cooperation with suppliers and continuous improvement, are becoming growingly important (Armstrong, Taylor, 2020, pp. 168-180). The group of internal stakeholders should include the employee engaged in relations with the employer (stakeholder engagement). The set of related and performed by the employee activities in the pursuit of the intended result is the implementation of the principle of a process approach. The goals that the employee wants to achieve are set by the leadership (leadership principle). The leaders should aim at such a shaping of the organisation's strategies that it becomes at the same time a way of meeting its employees' needs. The knowledge of the factors important for the employees, of their expectations and desires, seems therefore indispensable. Therefore, one of the actions addressed to the employee should be, among others, research on its satisfaction and management decisions on the basis of the results of the conducted research (factual decisions). The studies of satisfaction may also serve as a way of creating a broader policy of the firm. Determining the actions correcting and improving the human resources management process after the research allows for the implementation of the principle of continuous improvement. In this way, application for the majority of the above mentioned seven principles of quality management can be found. In literature the authors indicate different factors influencing job satisfaction, however they should be still actualized because of the social and economic changes that is why they constitute the **research gap**.

The main aim of the present paper is diagnose the employee job satisfaction in the firms under study. The presented results are based on the analysis of the factors shaping employee' job satisfaction and they indicate the directions of improvements in the studied companies and some possible directions of research in this area. The presented factors influencing job satisfaction include salary, professional development, relations with the supervisor and colleagues, cooperation between departments, as well as business ethics (Armstrong, 2020).

2. Importance of human capital in organisation's growth

Human capital is certainly one of the most important factors determining the competitive advantage of an enterprise. It is the basic driving force of the firm and has an important influence on its competitive position. According to A. Lis and A. Sudolska (2014), the basic resource is human capital coupled with the possibility of developing and maintaining intangible assets in the enterprise, thanks to which its competitive position on the market can be adequately modified (Lis, Sudolska, 2014). Even the most technologically advanced machines require at

least a sparkle of human creation in order to be useful. Machines and computers duplicate their work and perform it in a much more perfect manner than humans, and yet they do not possess any capability allowing for creation and self-improvement of knowledge (Żmigala, 2008, pp. 17). And therefore, possession of modern technologies – high investment capital – is important, but without a qualified personnel it will not bring optimal profits. The consequence of the actions of human capital is the achievement of competitive advantage of a given organisation or a decrease of its value on the market. And therefore the quality of human capital becomes an exceptionally important element of growth of any enterprise because it constitutes an element of intellectual capital, understood as non-material resources or their transformations, which are under the control of the organisation and which increase its value (Ross et al., 1997). Man's intellectual capital is a combination of his experiences, life attitudes, education, upbringing, psychical capabilities, and his talent. It is, among others, the quality of knowledge, the practical skills, the experiences of the employees and the intangible assets (the owners of which are the employees, not the firm) which allow the firm to achieve a competitive advantage (Edvinsson, 2000). In order to illustrate the essence of the human capital, G. Roos and J. Roos (1997, pp. 413-414) considered a hypothetical case of departure of the 50 most important programmers of Microsoft corporation, which would result in a dramatic decline in the value shares of this company as a result of „intellectual bankruptcy”. Orientation on quality means, among others, the organization's striving to achieve customer satisfaction through an integrated system of methods, techniques and tools that enables improvement in the area of cooperation of an individual with their co-workers, company departments, of client location and treatment as well as of the process of communication and its impact on the environment (Armstrong, Taylor, 2020, pp. 168-180). And therefore, there is an employee in the center of values who is responsible for co-creating and implementing goals, values, beliefs, a culture of quality, attitudes and building a system of inter-penetrating technical, social and management systems (Arciniega, et al., 2005). It becomes important for the employee to experience satisfaction, a pleasant and positive emotional state resulting from the self-assessment of their work and the experiences connected with it (Locke, 1976). Niezurawska-Zajac (2020) emphasises that the necessary condition in human resources management is the positive attitude of the employee towards their organisational unit and supervisors as well as their satisfaction with the performed work. On the other hand, according to Armstrong (2009, p. 123) the engagement of the employed persons manifests itself in their honest interest and absorption with their work and their treatment of it as a hobby or research has suggested that small talk may have important consequences for employees (Methot et al., 2020). Yet, The notion and meaning of job satisfaction.

In order to know what to improve and which processes are not sufficiently effective, a diagnosis of the organisation is indispensable. The examination of its employees' satisfaction may be its good source of information.

In the literature of the subject there exist many definitions of job satisfaction. It is the estimated difference between what an individual expects and what they get at work (Drenth et al., 1998). Satisfaction is undoubtedly a positive feeling, but it is also subjective. It may occur in one person and not – in another since it is composed of and shaped by many elements and many factors alternatively assessed by various persons. Therefore, it may be added to the above definition that satisfaction is a positive attitude of the employed persons towards the duties they have been entrusted with, their job environment and their co-operators (Vroom, 1964). According to Makin, Cooper and Cox job satisfaction should be understood as „a pleasant or positive emotional state resulting from the assessment of one's own work or work experiences” (Makin, Cooper, Cox, 2000, p. 82) or simply a positive attitude of the employed to the duties entrusted to them, their work environment and co-workers” (Locke, 1976). Job satisfaction is also defined as positive and negative feelings and attitudes connected with the professional duties realised by the employees (Schulz, Schulz, 2002), (Schulz, Schulz, 2002, p. 296). B. Bajcar perceives job satisfaction as emotional reflection of the joy and sorrow which appear in connection with the execution of the established tasks (Bajcar et al., 2011). Also Bańka defines it as „emotional reaction of pleasure and displeasure experienced in connection with the execution of the particular tasks, functions and roles (Bańka, 2002, p. 329). And therefore, job satisfaction is a higher level of being happy with work, which must create intellectual challenges, opportunities to employ one's skills, sense of success, the joy connected with professional development and self-realisation that is a full identification with the performed work and with the organisation. Summing up, job satisfaction can be defined as set of feelings and attitudes of the employed with respect to work (Wexlej, Youkl, 1984).

Satisfaction is definitely related to the difference between the expectations and perception of the situation (Locke, 1976, p. 1319) A lack of difference means satisfaction, a better evaluation of the situation with respect to the surroundings means enthusiasm and loyalty, whereas the expectations higher than the evaluation of the situation signal discontentment. E.A. Locke (1976, p. 1319) defines job satisfaction as the result of perceiving one's own work as such that enables achievement of some important values, provided that these values are compatible with human needs or help in their realisation (Locke, 1976, p. 1319). Job satisfaction is also precisely characterised by the definitions related to its sources, where satisfaction is termed as the difference between this what an individual expects (what he thinks he should have) and this what he experiences at work (from his subjective perspective) (Drenth et al., 1998).

The actions aimed at perfection in business, including the employee satisfaction, is popularised in the model of the European Foundation of Quality Management. The ninth pillar of the model is the index of adjustment to the customers' expectations. According to its underlying philosophy, only satisfied employees can render services of high quality. Hence, in order to get to know the current situation, its perfection, the testing of the employees' job satisfaction, regularly conducted by the enterprise, are indispensable. Besides, the results of

such an examination constitute realisation of one of the principles of quality management i.e. decision-making based on facts. They illustrate the feelings of the employees concerning the manner of operation of the organisation and become an important element of the complex quality management (Doeleman, Have, Ahaus, 2014, pp. 439-460).

The knowledge of the factors meaningful to the employees is important. The studies of satisfaction can therefore serve as a method of creating the assumptions of a wider policy of the organisation, starting with the improvement of the human resources management process and ending with the specification of the strategical objectives and creation of the organisational culture. Such research allows to obtain unique information on the reception of the organization's activities, consistency and reality of its plans (Armstrong, Taylor, 2020, pp. 168-180). It should be noted that the view of employees from various levels of the organization can play an important role in making decisions by the Management Board, which, absorbed in the implementation of strategic plans, the far-reaching actions, can completely overlook the details visible only at the operational level. Besides, job satisfaction is perceived as an element supporting the effectiveness of the system of motivation and allows for its strengthening (Armstrong, Taylor, 2020, pp. 168-180). Increasing the level of the employee professional satisfaction also makes way for change of behaviours. It results from the fact that the employees who are happier with their work identify more with the objectives of the enterprise, resist less to changes, are more ready to cooperate with others, are more loyal and involved in the job; they take greater care of the quality of work (Niezurawska-Zajac, 2020).

Lack of job satisfaction may result in a whole bunch of actions undertaken by the employees, which have a negative impact on the functioning of the enterprise. These actions are called counterproductive behaviours (Spector, Fox, 2005). The following forms of behaviour can be regarded as counterproductive: wasting materials and raw materials belonging to the firm, destruction of the equipment, prolonging breaks, leaving work earlier, refusal to fulfil orders or complete tasks, blackening of the firm, withholding information (Robinson, Greenberg, 1998). On the other hand, the studies on satisfaction may indicate the assets of the organisation which are not noticed or are undervalued by the decision-makers. Sometimes these are areas to which the management board may not pay any particular attention, and yet for some workers they are important factors strengthening their further professional correlation with the employer e.g. flexible working hours. The research facilitates therefore carrying out the diagnosis of strong and weak points of the organisation, which is invaluable when making strategical plans. The information about the level of the satisfaction, attitudes and opinions of the staff is an indispensable source of managerial decisions.

Job satisfaction may turn out an important indicator of the measure of effectiveness of the management of the company. The persistent state of dissatisfaction or dissatisfaction may mean that according to its employees the enterprise has no success. The reason may be, of course, the real situation and the unfavourable conditions in the environment. Very often, however, it is that the official results of the enterprise make the top management happy, but it does not

go hand in hand with the satisfaction of the lower level employees. It may mean ineffective management, wrong or unjust system of motivation (Armstrong, Taylor, 2020, pp. 168-180). The perception of the system as fair by the staff is the key element, without which any satisfaction cannot appear. Persistence of the state of dissatisfaction a long time may lead to a revolutionary outburst. Employee satisfaction surveys allow for the implementation of corrective and preventive actions at an appropriate time. It constitutes therefore an exquisite warning measure allowing you to prevent such an uncontrolled outbreak.

Job satisfaction enables to get to know the employees' motivation and to decide which actions undertaken by the management of the organisation have impact on the staff's conduct (Kopertyńska, 2008). While analysing attitudes, the results of this sort of research also contribute to a better understanding of the organisation's culture, just being formed, changing or already existing. The leader of the organisation has, of course, the greatest influence on the formation of culture; nevertheless, it does not arise in separation from the behaviours and attitudes of the other employees (Schein, 1987).

Taking into consideration the principle of orientation on a customer, mentioned at the beginning of this article, the research on job satisfaction also indicates a positive correlation between the employees' job satisfaction and the customer satisfaction of a given firm (Hellriegel, Slocum, 2007). Hence the frequent situations when an employee leaving the organization "entails" behind him a group of clients with whom he has been cooperating so far. Then a firm, serving them so far, becomes less important for a client than the relations created between them and a worker on the leave.

Organisations of 21st century should be aware of the present job situation. Every generation is characterised by separate, specific features, which should be taken into consideration when creating the system of motivation and remuneration.

3. Description of the respondents and the research method

The research results were based on the primary data obtained during the survey process, which was conducted in two enterprises of prestige on the Polish and international food industry market. The choice of the subject of research was dependent on obtaining the consent of the enterprises to transfer the questionnaires to their employees. The employees of both enterprises, regardless their gender or age, were accepted for the study population.

In order to obtain data, a survey based on a questionnaire specially constructed for this purpose was used. The factors qualified to the survey were selected on the basis of the Armstrong's research (Armstrong, Taylor, 2020, pp. 168-180). The questionnaire consisted of 28 statements grouped into the following areas:

- interesting work (components of job satisfaction),
- focus on business,
- employee involvement and impact on the implementation of their work,
- motivating system,
- professional career development,
- relations with the supervisor,
- business ethics,
- relationships with colleagues,
- cooperation between departments.

Within each of the above-mentioned areas, three out to four statements were specified. The respondents assigned weight to each of these areas. The person giving the answer could admit from 1 to 4 points depending on the degree of satisfaction in the area. The questionnaire submitted to the employee made it possible to verify the level of satisfaction with the above-mentioned areas where 1 means lack of job satisfaction, 2 means low job satisfaction, 3 means medium job satisfaction and 4 means high level of satisfaction.

4. The degree of employee satisfaction

The research results discussed in this paper make it possible to obtain the information on the employee satisfaction in the two enterprises: **Henkel** and **FoodCare** under study with regard to the incentive system, professional growth, relationships with the supervisor and colleagues, inter-departmental cooperation and also business ethics in these companies.

Henkel was established in Mainz in 1832. Twenty – five years later, they commissioned the construction of a “champagne factory” on Walpodenstrasse in Mainz, making themselves one of the first enterprises in Germany to master the technology of producing sparkling wine Vinpol Sp. z o.o. (Poland), where the research was conducted, belongs to the Henkell & Co group of consolidated companies.

FoodCare is a company that started as a family confectionary enterprise and later developed the production of ready-made cake additives, etc., building a production plant in Zabierzów in 1997. In 2003, the plant launched the production of Tiger Energy Drink, the sale of which multiplied the company’s revenue. Tiger has become the most recognizable brand of the company. In 2009 the company opened a new plant in Niepołomice near Cracow, focusing mainly on the development of the production of the Black drink, and a new product – dietary muesli – Fitelli (Henkel, 2021)

The research was carried out in 2019 at Henkel and Food Care. All administrative and office employees were invited to the research, as a result, 52 correctly filled in questionnaires were obtained.

In order to determine the level of satisfaction with the *incentive system*, the authors accepted the respondents' feelings expressed in the answers to the three closed questions:

- “my effort and commitment are appreciated by the employer”,
- “my earnings are adequate to the scope of my tasks, my contribution and the effects of my work”,
- “I am satisfied with the additional benefits (e.g. social package, etc.)”.

The obtained results point out to a positive opinion of the employees of the surveyed enterprises concerning the satisfaction experienced by them with respect to the incentive system. In company “A” the average ratings in positive statements range from 3.15 to 2.26 on a four-level scale, while in enterprise “B” from 3.61 to 2.26. The results are therefore very similar. Most positive answers were assigned in both companies to the first statement: “my effort and commitment are appreciated by the employer”.

Another factor determining job satisfaction is the *professional growth* of the employees. In this field, the employees of both enterprises evaluated the highest the possibility of using their knowledge and skills (88.2% and 88.9%) and the opportunities and support necessary in the development of their own competencies (79.4% and 83.3%). Only half of the workers participate in the courses and trainings improving their skills and competences.

The relations with supervisors have a large impact on job satisfaction. The employees of both companies stress in particular good relations with their superiors (88.2% and 100%) as well as the right message of what their supervisor expects from them (82.4 and 100%).

In the surveyed enterprises, *the relationships with colleagues* were rated very positively as well. It can be presumed that this factor is one of the most important values affecting job satisfaction. Mutually awarded assistance (94.1% and 100%) and the open and direct atmosphere (91.2 100%) are rated the highest.

As a part of cooperation between departments, employees of both companies perceived good *cooperation between departments* in the first place (85.3% and 83.3%) and the ease of obtaining the necessary information from other departments in the second place (79.4% and 72.2%).

The last studied factor affecting satisfaction was *business ethics*. It is a positive thing that in the respondents' opinion, the company's activities towards the natural environment are correct (91.2% and 88.9%).

According to the research, there are six main factors that have an impact on administrative and office employees' job satisfaction in Henkel and Food Care companies. The most important factor for the respondents both in Henkel and Food Care is the relationship with their supervisor. Moreover, a sense of fair remuneration has a significant influence on their job satisfaction. In the respondents' understanding the fairness of their remuneration is dependent on the effort

they put in – the more effort they give to the company, the higher remuneration they expect (figure 1).

The lower impact on the job satisfaction have employment security and relationships with colleagues. In both Henkel and Food Care company work atmosphere is important but the importance of employment security is a bit lower in Food Care company, which may mean that the additional benefits provided by Henkel have more meaning to the employees in the area of employment security (figure 1).

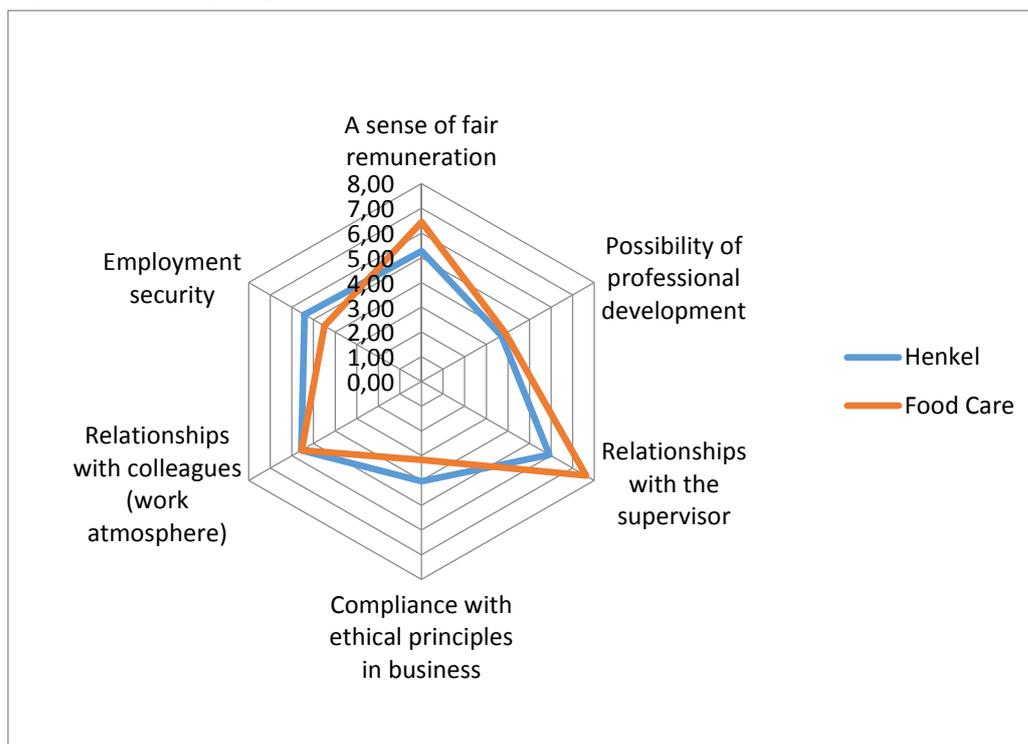


Figure 1. Job satisfaction in the area of incentive system among the employees of Food Care and Henkel companies. Source: The author's own study based on the conducted questionnaires.

The lowest impact on job satisfaction in both companies has the possibility of professional development. This result is quite unexpected but it could mean that administrative and office workers don't see the dependence between the level of their remuneration and their professional qualifications (figure 1).

5. Conclusion

In the theoretical part of the article, the importance of the job satisfaction plays a significant role in the development and competitiveness of an enterprise is presented. The employees' feelings about the way the company operates are an important element of the comprehensive quality management. Employee satisfaction surveys can be used as a way of creating assumptions for a broader company's policy, starting with the improvement of the human resources management process and ending with defining strategic objectives and creating

an organizational culture. It should be emphasized that job satisfaction affects the company's organizational culture, the formation of which takes many years. Besides, it is perceived as an element supporting the operation of the motivation system and it allows for its strengthening, which has also been confirmed by the research results.

The conducted research shows that the employee satisfaction of a selected group of respondents is determined, among others, by such factors as the motivational system used in the organization, professional development of the employee, relations with the supervisor and colleagues as well as relations with other departments, and also the business ethics.

The highest-rated factor stimulating employee satisfaction among the surveyed employees of companies Food Care and Henkel are relationships with colleagues. In particular, the respondents emphasize the importance of mutual help and open and direct atmosphere at work. The conducted analysis allows to emphasize that in the surveyed enterprises the employees assess positively also the professional development. In this area, the respondents rated the most the possibility to use their knowledge and skills as well as the opportunities and support necessary to develop their own competences. However, only half of the employees participate in courses and trainings thus raising their qualifications.

However, the respondents are not fully satisfied with the cooperation between departments. The obtained results should become the basis for undertaking improvement actions in the mentioned area.

It is worth to emphasise that employee satisfaction surveys are a valuable diagnostic tool in many situations occurring in modern business organizations. As has been found in this publication, in order to know the current situation and undertake efforts towards its improvement, regular enterprise-conducted employee satisfaction surveys are indispensable. Moreover, it is certainly important to know how such a research should proceed. In order to ensure objectivity and, at the same time, a comparative value, it should apply to the entire organization, all its employees. In large enterprises this is sometimes a significant problem because of the scope of such research. Only then is the sufficient detail and objectivity guaranteed. Unfortunately, sample selection is associated with additional errors, and besides, it does not allow for the analysis of satisfaction in the particular, often small, units of the enterprise.

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MUSIC IN THE AWARENESS OF RETAIL TRADE CUSTOMERS

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Purpose: The aim of this study is to assess the state of customer awareness regarding the use of sensory marketing tools by companies operating in the area of the retail market.

Methodology: The study uses secondary sources obtained by means of a measuring instrument prepared for the purposes of this study in the form of an online questionnaire. The study is a pilot and was conducted on a group of Facebook users dedicated to surveys. The survey was conducted on a representative research group of 277 respondents (both women and men) in different age categories. The data was analyzed using statistical methods.

Findings: The results of the study show that music stimulates the way customers behave in shopping. In addition, the study focuses on audio marketing, which is still an underestimated area in Poland.

Originality: The following article shows the opinions of customers on the use of music in commercial units for marketing purposes, allows you to see the importance of such treatments, among others in the pre-Christmas periods. This paper is addressed to owner's retail stores.

Keywords: audiomarketing, sensory marketing, buyer behavior.

Category of the paper: Research paper.

Introduction

Currently, the concept of creation of customer satisfaction is of key importance in the theory and practice of marketing. Nowadays, under the conditions of competitiveness, it is not enough to place a product on the shelf, hanger or display. Increasing competition in the trade sector and customer behavior changes make operation of trade companies more difficult. Subsequently, they undertake numerous actions to encourage clients to buy their products and provide their businesses with measurable profits. Elements such as atmosphere – conscious creation (design) of the store brand are of big importance in achievement of set goals (Kolasińska-Morawska, 2011). Sensory marketing, also referred to as marketing of five senses, is a concept based on: hearing, taste, sight, smell and touch. Its major goal is to enhance perception of the offered

product so as to trigger positive emotions and persuade customers to make the purchase (Pabian, 2011, p. 2). The aim of this study is to assess the state of customer awareness regarding the use of sensory marketing tools by companies operating in the area of the retail market.

The essence of audio marketing

Sound based marketing (audio marketing) is a sensory marketing tool which affects customers' senses by evoking their emotions and associations. According to M. Książek, audio marketing appeals to customers and develops their purchasing behavior by means of the power of music (Książek, 2014). Audio marketing is used for creation of good atmosphere in stores and promotion of the brands. It can be encountered, among others, in grocery, clothing or cosmetic stores. This is a popular method used by the United Airlines to persuade a consumer to make a purchase. The United Airlines have been using music to create pleasant atmosphere and put their customers in a good mood. Rhapsody in Blue by George Gershwin is played in commercial spots, on the phone while booking the flight as well as onboard before a flight (Schmitt, Simonson, 1999). Audio marketing involves creating unique, positive climate by playing appropriately selected pieces of music completed with suitable information such as advertising announcements which are supposed to motivate customers to make a purchase. It often includes information on the offered products and promotions (Deluga, 2018, p. 38-41). Appropriately selected audio background gives a place character, distinguishes the brand and strengthens its image. Use of audio marketing in a retail store can make the customers stay longer and encourages them to come again. A positive impact on customers' senses can persuade them to have a look at and buy some products. New experiences can enhance and individualize sensation of the brand and increase customer satisfaction. Such actions are supposed to create a unique atmosphere by employing the sense of sight (lighting, shapes, colors, size), sense of smell (feeling of freshness, fragrance), sense of touch (softness, smoothness, temperature), sense of hearing (pitch, volume (Zielińska, Koy, 2017). The customer behavior aims at consumption, that is, fulfilment of their needs. This involves a sequence of reactions in response to concrete stimuli – emotions and instincts which make people satisfy their needs. One of the methods for impacting the shopping decisions of customers through emotions is to create an appropriate shopping atmosphere at the point of sale by using music. According to numerous studies 'two thirds of consumers' decisions are made during shopping' (Zielińska, Koy, 2017, p. 173). This means that the shopping list is likely to change with 66.66% probability, be extended or sometimes shortened. Moreover, French melodies played in the wine department translate into an increase in sales of French wine (to the disadvantage of German wines), whereas German music in the background has a negative influence on sales of both German and French wines. Another study shows that

consumers buy more expensive wines to the accompaniment of classical music as compared to popular hits (Skworek, 2014, p. 100). Iwińska-Knp, K., Sławińska, M studied the issues of sensory marketing in chain stores from the perspective of the customer. The survey was carried out in the years 2015-2016 on a sample of 200 random respondents – chain store customers. According to the results, music kinds preferred by the customers were techno, house, dance and hip hop. Besides, the respondents indicated that popular pieces of music boost purchasing on condition they are properly amplified, songs with a melody line require less volume, whereas unknown music need to be moderately quiet. The study by A. Rybowska shows that in 68% of music played in chain stores is properly chosen and the respondents agreed that the type and volume of music needs to be consistent with the customers' preferences. (Rybowska, 2014). According to this, it is identification of the target group which is of key importance.

The subject of this study is sensory marketing which involves the sense of hearing. This area focuses on sound management within chain stores. There can be foreground and background music whose conscious selection makes it possible to provide an enjoyable atmosphere in restaurants and department stores. Foreground music usually includes words and differs in terms of tempo, frequency, and volume. The background music, however, is of instrumental character with small variability of the above features. (Hulten, Broweus, van Dijk, 2011, p. 77). It needs to be stressed that capturing attention of the hearing organ can also be used to increase productivity of the business personnel. This is well illustrated by IKEA, a Swedish chain store, whose employees were enquired about the most frequent questions asked by customers in order to improve the quality of customer service. The survey showed that the most frequently asked question was about the location of shopping carts. To meet the customer demand, they decided to use the sound of hitting shopping carts near the place they are kept. (Hulten, Broweus, van Dijk, 2011, p. 78-79). Audio marketing finds application mostly in medium area stores, usually in cloth stores, and in large area, multi branch stores, rather than in small area stores (Zalewska, 2014, p. 48). Thus, a question arises: how do shops use music to attract clients and what is the opinion of customers on this subject?

Audiomarketing in the consciousness of retail store customers – survey results

The study uses secondary sources obtained by means of an online questionnaire prepared for the purposes of this study. The study is a pilot and was conducted on a group of Facebook users dedicated to surveys. The online questionnaire consisted of 12 questions consisting of three single-choice imprint questions, two multiple-choice questions, five single-choice questions and two single-choice scale questions. The survey was conducted on a representative research group of 277 respondents. In this group, 68.59% of respondents were women and

31.40% were men. The age of the respondents was divided into ranges of 18-25 years, 26-40 years, 41-55 years, over 55 years of age. The survey was conducted on 12.03-15.04.2021. The data was analyzed using statistical methods.

The first thing that we see upon entering a store are products arranged on the shelves; we can feel spreading smell and examine the articles by watching and touching them. These activities are often accompanied by music which by 59.9% of respondents was associated by with a music program on TV or on the radio, 53.1 % thought about a concert hall. Having heard the sounds of music nearly half of the respondents thought about a disco (45.5%), whereas 32.5% associated the music with a social meeting. Every fourth person imagined a ball, only 2.2% of the respondent's associated music with a state ceremony. Due to the fact that the majority of respondents (50.54%) come from cities over 50,000. of residents and are young at an age (87.73%) it can be concluded that demographic data have a large impact on the associations of respondents here. When analyzing the chart below (figure 1), it should be noted that the question was conjunctive.

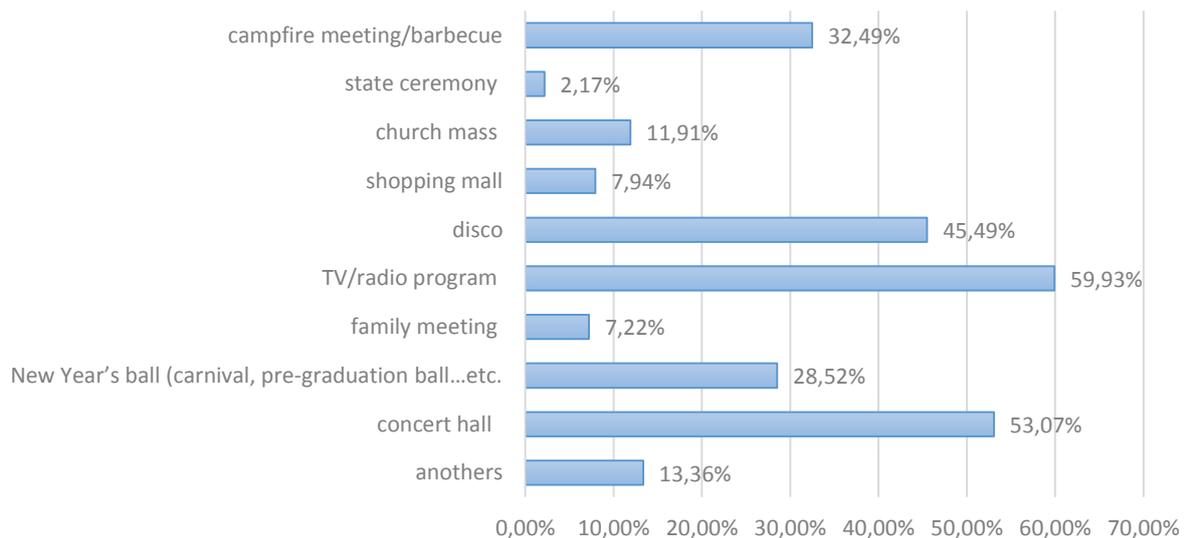


Figure 1. Presentation of respondents' associations upon hearing music/singing [%]. Source: own research.

The respondents associate music/singing with a TV/radio program. This answer was chosen out of nine which accounted for 24% of all the answers provided. This percentage shows this is a TV/radio program that comes to the mind of every fourth respondent while hearing music/singing in a store. These responses were given mostly by women (71%). As many as 21% of respondents associate music with a concert hall which comes right after a TV/radio program. In this case, the number of women was also prevailing – 71%. The third position was attributed to a disco, where again women definitely dominated – 75%. Interestingly, as regards associating music with a state ceremony, the opinions were divided 50/50, this response, however accounted for only 1% of all the responses.

In an open version of this question the respondents said they associated music with something pleasant "relax", "walking on a rainy night", "freedom", "peace and quiet", fun such as "theater", "music festival" as well as with something which makes every day activities including driving or cleaning more enjoyable. These answers were provided mainly by young people - 88%, aged 18-25. In this age group, the most frequent associations were successively: a TV/radio music program, concert hall and a campfire/ barbecue meeting. Respondents aged 26-40 associated music with a concert hall, whereas respondents aged 41-55 with a TV/radio program, those aged above 55 thoughts about a mass in a church (figure 2).

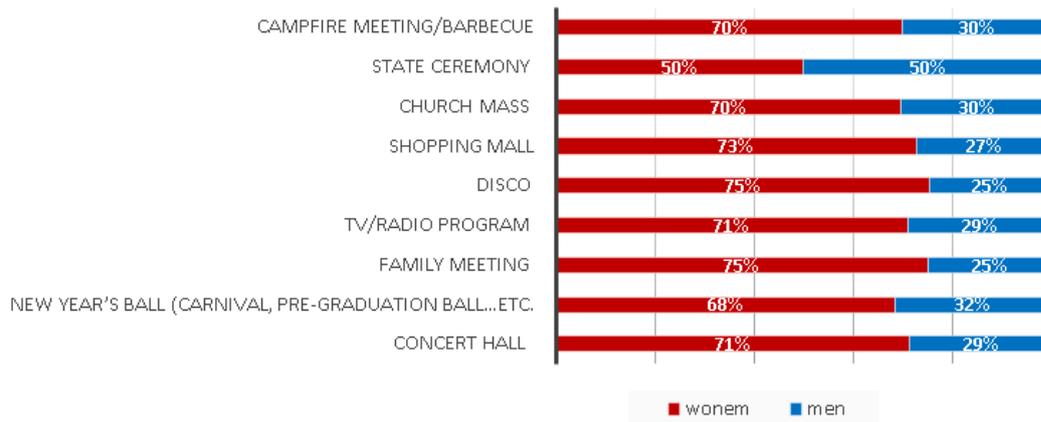


Figure 2. Presentation of what the respondents associate with music /singing according to gender [%]. Source: own study.

According to the respondents, audio marketing can achieve its goals and is necessary in department stores (multi branch shopping centers), boutiques and household equipment stores. The survey participants aged 18-25 provided the biggest number of responses (88% of the respondents), their responses were the same as in the first and the third case, whereas boutiques were indicated on the second position. When analyzing (figure 3), one should be aware that the question was of a conjunctive nature.

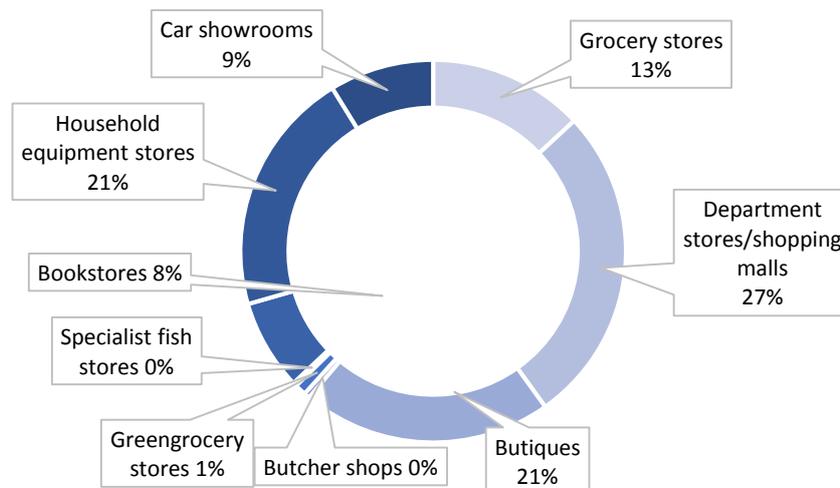


Figure 3. Respondents' opinions about where audio marketing is likely to achieve its goals and where it is necessary [%]. Source: own study.

The most numerous groups of respondents were residents of big cities with the population of more than 50 thousand inhabitants, that is, 140 respondents which accounts for 51% of all the respondents. In response to the questions, they indicated department stores (multi branch shopping centers), household equipment stores and grocery shops which appear for the first time as an example of stores where sound marketing can achieve its goals. It can be concluded that due to a big number of both medium and large area stores, basing on their own experiences, big city residents marked the below presented answers. Nine persons provided an answer to the open question, seven of whom belonged to the group aged 28-25. Interestingly, this time it was the male point of view that prevailed – 78%. Three male respondents were against using music in stores, however only one of them was guided by sensory preferences, the remaining two were against because of inappropriately chosen music base (figure 4).

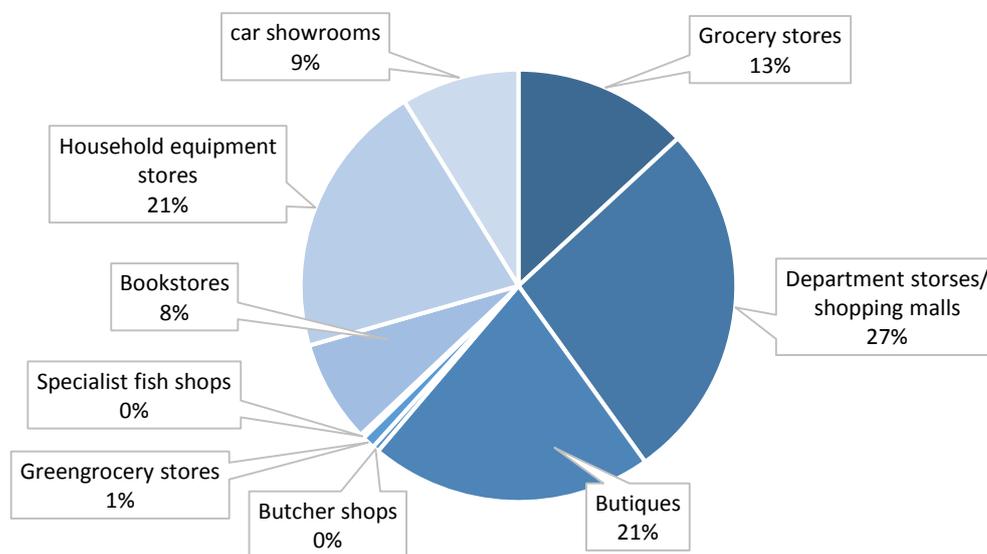


Figure 4. Respondents' indications as to what kinds of stores audio marketing is necessary and is most likely to achieve its goals [%]. Source: own study.

Persons aged 18-25, 26-40, 41-55 'rather' like music during shopping, whereas those aged over 55 have no opinion on this subject (66.67%) and 33.33% of the respondents say 'rather no' to music in stores. The 'rather yes' answer is directly followed by 'definitely yes' 18.24% (18-25 years), 24.00% (26-40 years), 16.67% (41-55 years). Interestingly, the data shows preferences concerning music during shopping for people aged over 55 (figure 5).

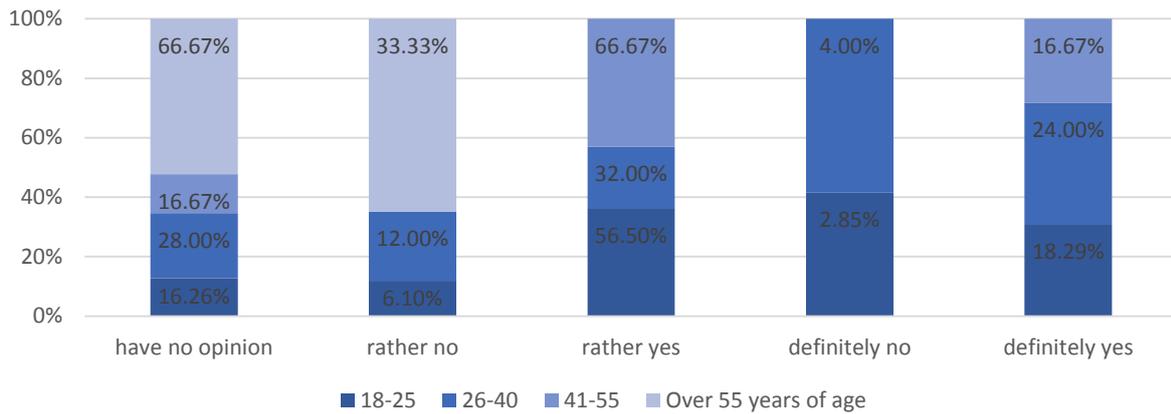


Figure 5. Opinions of respondents in different age ranges about background music while shopping [%]. Source: own study.

Respondents aged 18-25 and 26-40 said that if they could they would choose melodies with moderately slow tempo. The respondents’ opinions are divided. Those aged 41-55 prefer melodies with moderate to slow tempo. However, those over 55 prefer slow, moderate, and fast tempo in the same percentage (33.33%) (figure 6). With the intention of appealing to the largest possible group of retail store customers, the most accurate is the choice of a moderate pace, which in each of the age groups is in the leading position. It is worth mentioning that the moderate pace of music was most often the choice of rural area inhabitants and dwellers of big cities with population over 50 000. Slow tempo was chosen 50% less frequently. The least preferred is a fast melody, however in the country and in cities with population over 50 000 it is a more frequent choice than in towns with population up to 20 000 and those with population between 20-50 000.



Figure 6. Respondents’ preferences regarding the pace of music accompanying customers during shopping in points of sale according to age [%]. Source: own study.

The chart below shows to what extent it is important for the respondents to build an atmosphere when shopping in the pre-Holiday periods on the specified holidays (figure 7). As you can see, the dominant answer is Christmas. This result may be due to the special time that is associated with this holiday and its numerous traditions and customs. The presented graphic form of the answers given is a kind of introduction to the following analysis with a distinction between the age of respondents. Persons aged 18-25 (34.16%) consider creation of a positive atmosphere during New Year shopping as important, whereas those aged 26-40 (36.36%) as medium important. Respondents aged 41-55 (65.22%) and over 55 (45.45%) think that generating the atmosphere is of big importance. Similarly, the relationship in the first two age ranges in the case of Valentine's Day is formed, which means: persons aged 18-25 (33.98%) and 26-40 (32.81%) think that creation of atmosphere during Valentine's Day shopping is of medium importance. Respondents aged 41-55 (40.00%) consider creation of this atmosphere as important, whereas those over 55 (50.00%) as very important. The age range of 41-55 years (88.24%) thinks quite differently in the case of Easter. These persons and aged 26-40 (42.25%) think that creation of welcoming atmosphere during Easter shopping is of medium importance. In turn, respondents 18-25 years old (34.33%) assess the construction of this atmosphere as important, over 55 years of age (50.00%) as very important. Looking at the Christmas holiday, you can see that all age groups consider it very important to build an atmosphere when shopping on this day. This time persons aged 18-25 (33.74%) and 26-40 (50.85%) in All Saints' Day, as in the case of the New Year, Valentine's Day and Easter, they consider it moderately important to create the right atmosphere when shopping. In the case of respondents 41-55 years old (30.77%), opinions were divided between unimportant and important. However, the group over 55 years old (50.00%) thought the atmosphere while shopping on the occasion of this day was very important. Turning to the pre-Christmas periods associated with the holidays of loved ones, it can be noted that persons aged 18-25 (32.87%) and 26-40 (43.55%) consider building atmosphere during Grandma Day as medium important. Respondents at the age of 41-55 (40.00%) think that building atmosphere during this day is little important, whereas people aged over 55 (45.45%) say it is very important. On Grandfather's Day, respondents aged 18-25 (32.87%) and 26-40 (33.97%) believe that building atmosphere on Grandpa Day shopping is medium important. Respondents aged 41-55 (57.14%) are of the opinion that creation of atmosphere on that day is little important, whereas those who are over 55 (41.67%) say that it is very important. On Women's Day respondents aged 18-25 (36.36%) consider building atmosphere during Woman's Day to be important, whereas persons aged 26-40 (54.17%) are of the opinion that it is of medium importance. The opinions of respondents aged 41-55 (37.50%) were divided into little important and medium important. The group of respondents over 55 years old (50.00%) thought it was very important. These answers depend primarily on the age of the subjects. However, as mentioned earlier, the most important period where the use of sound marketing is important for the respondents is Christmas.

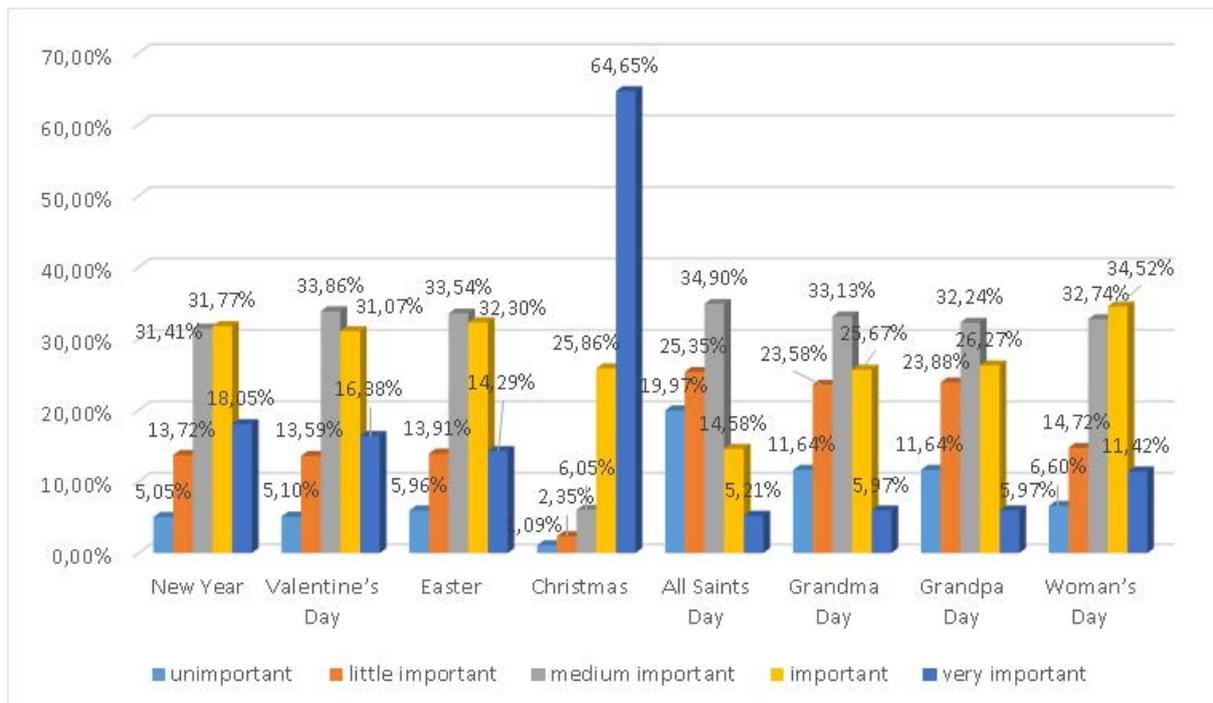


Figure 7. Respondents' opinion on the importance of building atmosphere during shopping in the pre-holiday periods [%]. Source: own study.

During Christmas shopping majority of the respondents (68.79%) did not feel a sudden impulse to buy gifts upon hearing sounds of music which was supposed to make them purchase more products (figure 8).

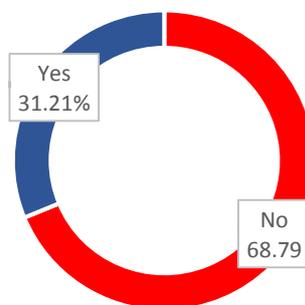


Figure 8. Respondents' opinions on the subject whether music boosts sales in the period prior to Christmas [%]. Source: own study.

As many as 66.66% of the respondents from the group aged 41-55 said 'no'. Whereas those over 55 did not happen to buy more products in a pre-holiday period under the influence of music (figure 9).

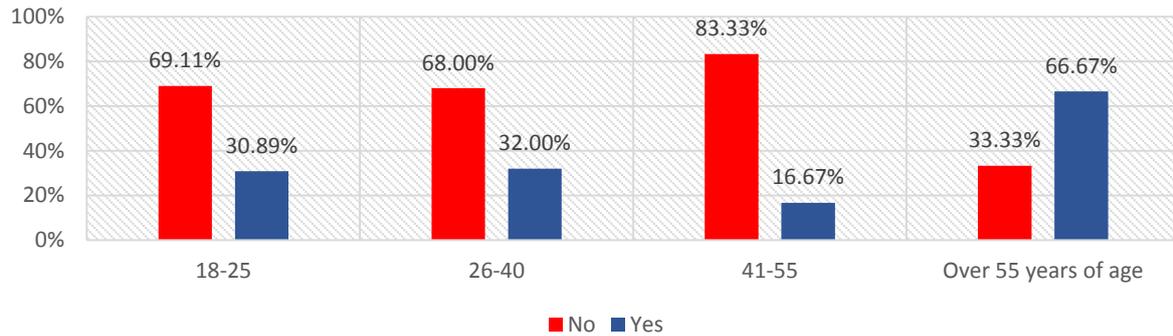


Figure 9. Presentation of respondents' answers to a question whether music increases sales in the pre-holiday period according to age [%]. Source: own study.

73.05% out of 277 respondents said they had never lost track of time due to the pace of music broadcast in stores (figure 10). Such information allows you to define two different conclusions. The first of them is that the respondents were not aware of the loss of time and the second that audio marketing was not properly selected and therefore did not fulfill its task.

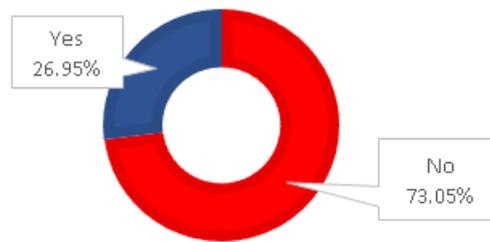


Figure 10. Respondents' answers to the question whether tempo of music made them lose track time while shopping [%]. Source: own study.

As compared to women (29.32%) fewer men (22.47%) lost track of time under the influence of music tempo during shopping (figure 11).

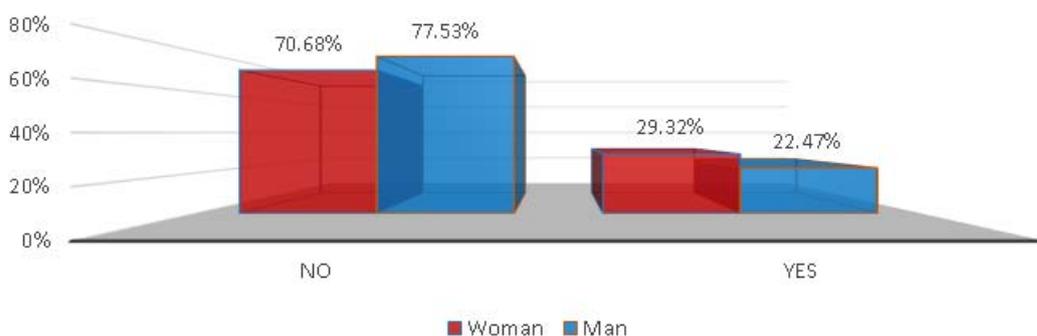


Figure 11. Respondents' answers to the question whether tempo of music played during shopping made respondents lose track of time according to gender [%]. Source: own study.

Merely 37.23% of the respondents said that they would return to the store because of music. More than a half of the respondents (62.77%) did not confirm such a dependence (figure 12).

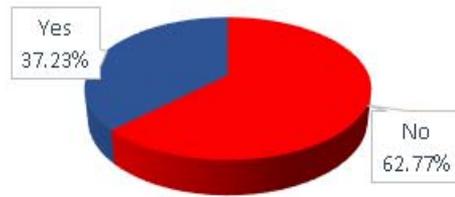


Figure 12. Respondents’ answer to the question whether satisfying music makes them come back to a given store [%]. Source: own study.

Neither women (59.16%) nor men (70.79%) notice a connection between music and their being willing to revisit a given store (figure 13).

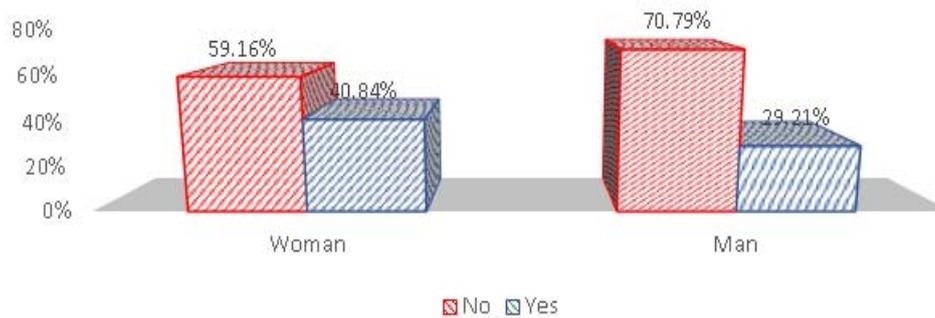


Figure 13. Respondents’ answers to the question whether satisfying music makes them come back to a given store according to age [%]. Source: own research.

The group of 41–55-year-old respondents do notice (83.33%) a link between appropriately chosen music base with willingness to visit the store again. The remaining groups, however, do not observe such a connection (figure 14).

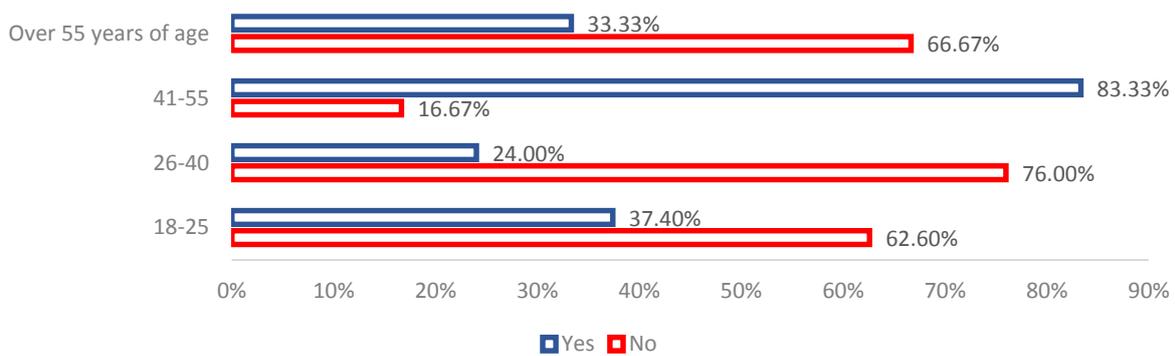


Figure 14. Respondents’ answers to the question whether satisfying music makes them come back to a given store according to age [%]. Source: own study.

Conclusions

The survey results show that music does not necessarily associate with something solemn, but rather with joy, relax and recreation, and therefore it finds perfect application in audiomarketing. Music evokes emotions and positive feelings; it makes people feel relaxed so they more willingly engage in shopping without looking at the watch. Is obvious though that to achieve its goal it needs to be appropriately selected. Therefore, having a music base well matched to the needs of customers is of key importance as it can either make them stay longer or leave sooner.

The above presented results show that when choosing to use music in a store one should offer appropriate music base, otherwise clients are likely to leave the store sooner. This can lead to a decrease in sales and, subsequently revenues – being in a hurry consumers focus only on necessary products and stick to the shopping list overlooking the remaining ones and are likely to visit other shops where they can feel better and more relaxed.

Use of audio marketing in the pre-holiday period - New Year, Valentine's Day, Easter, All Saints' Day, Grandma Day, Grandpa Day is thought by the respondents to be medium and even very important. These answers largely depend on the respondents' age. The most important period, however, when application of audiomarketing is most appreciated is Christmas time.

In the light of the above-mentioned results of the survey, it can be noted that not all areas of audiomarketing are well developed in Poland. Negative answers of the respondents to the question whether sounds of music encourage them to buy more gifts in the pre-Christmas period show that current efforts fail to persuade customers to buy extra products. The same conclusion can be drawn for the question about losing track of time because of the tempo of music played in a store, where almost $\frac{3}{4}$ of the respondents gave negative answers. Slightly more than one third of the respondents said that they were revisiting a store where they could hear music/songs they liked. Slightly more than half of the respondents did not make such an observation. This area of marketing is either poorly known on the Polish market or inappropriately managed. It should be emphasized though that retail stores which use audiomarketing in the form of music should give preference to its moderate or slow tempo.

The above study should be treated as an introduction to further research in the area of audiomarketing. Further research could be based on the example of specific commercial units and focus on the effectiveness of using audiomarketing tools.

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CONVENTIONAL OR ORGANIC WINE PRODUCTION? ESTABLISHING THE HIERARCHY OF VALUES IN THE PRODUCER'S DECISION-MAKING MODEL

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Purpose: The aim of this article is to understand how Polish winemakers make decisions about the type of production; to identify barriers of implementation of organic practices organic, to understand the values that are behind the decision-making process in the context of the three areas of sustainable development and present recommendations in relation to the conclusions.

Design/methodology/approach: Methodological approach is based on Analytical Hierarchical Process (AHP). The study included 18 values grouped according to belonging to the environmental, social and economic area. The importance of each value was compared by the respondents with the other values, which allowed to understand the course of the decision-making process in the context of the goals and importance of environmental, social and economic values represented by organic and conventional winemakers.

Findings: The research revealed significant differences in the approach to the environmental and economic values. Conventional and organic winemakers differ in the hierarchy of values in the context of the triad of sustainable development (economy, society, environment), and the key values taken into account by conventional winemakers are pecuniary values, in contrast to organic winemakers, for whom non-economic values are key, in particular from the area of environmental issues. Organic production is perceived by the surveyed winemakers in ideological rather than business terms. Conventional winemakers see the organic production as more complicated and problematic.

Practical implications: This is a significant problem showing the lack of education and awareness in relation to the theory and practice of an organic production. This situation should be alarming for agricultural advisory institutions and the entities of administration responsible for the implementation of sustainable development assumptions.

Originality/value: This paper fills a gap in literature science, by the Authors' knowledge, this is the first article to use the AHP method to determine how winemakers make decisions about the type of production.

Keywords: organic wine, decision-making process, Analytical Hierarchical Process (AHP), value hierarchy, winemaking, organic production, Polish wine.

1. Introduction

In a world where biological survival has been put at risk, it is a matter of key importance to limit the negative impact of human activity on the ecosystem. Loss of biodiversity, disrupted biogeochemical cycles of nitrogen and phosphorus (biogeochemical flows), land system change, limitations on access to freshwater – all of the aforementioned problems (Steffen et al., 2015) are, to a large extent, related to the conventional mass production of food. One course of action that leads to limitation of the negative impact of humans on the environment is to implement organic farming principles. Many studies show that organic farming is more sustainable. According to Pimentel et al. (Pimentel et al., 2005), this type of production is associated with a higher level of organic matter in the soil (higher levels of carbon and nitrogen); higher levels of soil organic matter prove to be important in the conservation of soil and water resources during periods of drought; fossil energy inputs were around 30% lower for organic crop production than for conventional production; crop rotations and cover cropping used in organic agriculture reduce soil erosion, and also limit pest problems and pesticide use; the use of manure as fertilizer reduces pollution; and increases biodiversity. In comparative studies of conventional and organic systems, with reference to environmental phenomena, attention is drawn above all to the better condition of soil in organic farming, (Gomiero et al., 2008; Reganold et al., 1987; Reilly et al., 2013) the higher biodiversity associated therewith (Hole et al., 2005), and energy savings (Dalgaard et al., 2001; Smith et al., 2015). With reference to socio-economic aspects, studies cite the developing market for organic products worldwide, while pointing out that price premiums or subsidies are not only making organic systems profitable in many developed and developing countries, but are even spurring rural revitalization (Shennan et al., 2017). Organic production may also be related to a higher level of satisfaction with life and work among organic farmers (Mzoughi, 2014; Nauta et al., 2006). From an economic point of view, organic farms are generally found to have a lower efficiency of yield, though, at the same time, there are studies which suggest that this effect may be reduced based on economic considerations, thanks to the lower inputs of organic farming, less need for labor, premium prices on the market (Cisilino, Madau, 2007; Sgroi et al., 2015) and, in the case of the European Union, the possibility of obtaining subsidies (Naglova, Vlasticova, 2016). The benefits resulting from organic farming explain the growth in the popularity of that method among farmers, including winemakers in most countries of the

European Union. Table 1 shows the changing trend in the share of land farmed organically in EU countries and a Figure 1 shows area dedicated to organic farming in individual EU countries.

Table 1.

Organic farming area in selected EU countries, 2012-2019

	2012	2013	2014	2015	2016	2017	2018	2019	2012-2019 % change
Belgium	4,48	4,67	5,00	5,17	5,80	6,28	6,56	6,85	55,9
Bulgaria	0,76	1,13	0,96	2,37	3,20	2,72	2,56	2,34	200,9
Czechia	13,29	13,47	13,44	13,68	14,00	14,09	14,76	15,19	14,2
Denmark	7,31	6,44	6,25	6,33	7,81	8,60	9,75	11,09	46,6
Germany	5,76	6,04	6,18	6,34	6,82	6,82	7,34	7,75	34,5
Estonia	14,86	15,65	15,96	15,68	18,02	20,01	20,98	22,33	55,4
Ireland	1,16	1,20	1,16	1,65	1,72	1,66	1,65	1,63	40,1
Greece	9,01	7,36	6,71	7,69	6,51	7,96	9,32	10,26	14,3
Spain	7,49	6,85	7,26	8,24	8,48	8,73	9,28	9,66	34,1
France	3,55	3,66	3,87	4,54	5,29	5,99	7,01	7,72	117,4
Croatia	2,40	3,13	4,03	4,94	6,05	6,46	6,94	7,19	238,9
Italy	9,30	10,60	10,91	11,79	13,99	14,67	15,17	15,16	70,7
Cyprus	3,38	4,03	3,63	3,72	4,94	4,61	4,55	4,98	59,1
Latvia	10,63	9,89	10,86	12,29	13,42	13,92	14,47	14,79	48,1
Lithuania	5,51	5,74	5,57	7,11	7,50	7,98	8,13	8,14	54,7
Luxembourg	3,14	3,39	3,43	3,21	3,47	4,15	4,39	4,42	40,8
Hungary	2,45	2,45	2,34	2,43	3,48	3,73	3,92	5,71	132,1
Malta	0,32	0,06	0,29	0,25	0,21	0,35	0,41	0,47	48,6
Netherlands	2,61	2,65	2,67	2,67	3,03	3,31	3,50	3,75	41,7
Austria	18,62	18,40	19,35	20,30	21,25	23,37	24,08	25,33	26,0
Poland	4,51	4,65	4,56	4,03	3,72	3,41	3,33	3,49	-22,6
Portugal	5,48	5,31	5,74	6,53	6,74	7,04	5,93	8,16	46,0
Romania	2,10	2,06	2,09	1,77	1,67	1,93	2,43	2,86	37,1
Slovenia	7,32	8,07	8,55	8,85	9,12	9,60	10,01	10,35	41,4
Slovakia	8,53	8,18	9,37	9,47	9,75	9,90	9,85	10,31	20,2
Finland	8,65	9,07	9,29	9,91	10,47	11,41	13,09	13,48	55,0
Sweden	15,76	16,50	16,53	17,14	18,30	19,16	20,29	20,43	28,5
United Kingdom	3,41	3,24	3,02	2,89	2,82	2,85	2,64	2,62	-22,2

Source: ec.europa.eu/Eurostat, 21.05.2021.

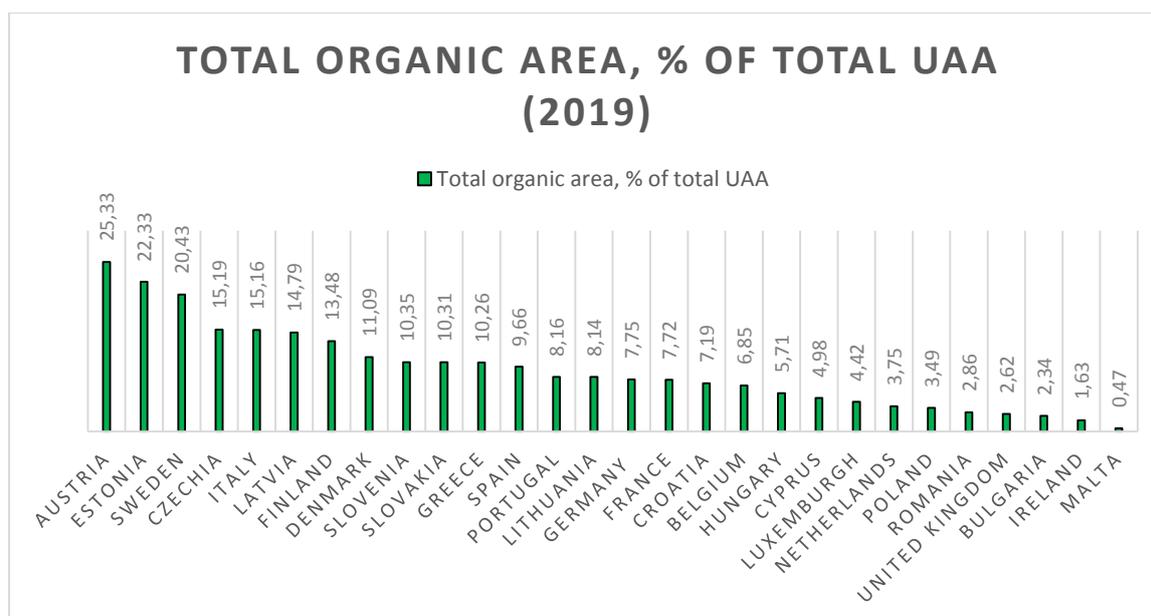


Figure 1. Total organic area (including in conversion area), % of total UAA. Source: ec.europa.eu/Eurostat, 21.05.2021.

In almost all countries of the European Union, in the period from 2012 to 2019, there was an increase in areas farmed organically. The only country in which that process went in the opposite direction, and where the area farmed organically actually shrank, was Poland and UK.

In the context of the above, the aims of this article are as follows:

- Construction of a decision-making model to understand making a choice process between conventional or organic production.
- Indication of the factors conditioning the decision-making process of pioneers in Polish winemaking regarding production method.
- Indication of barriers to the implementation of principles of organic production, in the context of values and beliefs based on the example of Polish winemakers.

The research question are:

- Why is organic wine production not very popular, despite growing popularity of organic wine?
- On what values is the winemakers decision-making process based?
- What are barriers and motivators of conversion into organic wine production?
- What actions can be taken to support the conversion towards organic production?

2. Organic Wine and Winemaking

A wine can be defined ‘organic’ when it is produced to the Regulation of the European Commission (EC) 203/2012. The principles of organic wine production apply to activities both in the vineyard and in the winery. According to the European Commission's definition, organic

production is an overall system of farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preference of certain consumers for products produced using natural substances and processes. The organic production method thus plays a dual societal role, where it on the one hand provides for a specific market responding to a consumer demand for organic products, and on the other hand delivers public goods contributing to the protection of the environment and animal welfare, as well as to rural development (EU, 2007). The basic rules for the organic cultivation of vineyards are:

- Ban on use of synthetic chemicals and GMOs.
- Prophylactic measures to lower the sensitivity of crops to pest attacks prior to any use of natural plant protection or biological control products.
- Use of agronomic treatments: cultivation by hand, mulching, weeding, etc.
- Use of only natural fertilizers, such as green manure or compost.

The following principles then apply in the winery:

- 100% of all ingredients of agricultural origin used must be certified organic.
- Limits or ban on use of certain physical procedures (e.g. dealcoholization, electrodialysis, filtration).
- Limited list of permitted oenological additives and processing aids.
- Limits on the amount of SO₂. (IFOAM EU Group, EU Rules for Organic Wine Production: Background, Evaluation and Further Sector Development).

One organic product for which the market is systematically growing is wine. In 2019, the global organic wine market was worth \$ 334.5 million, compared to \$ 341.31 million in 2020, and the coming years are expected to see continuing dynamic growth up to the level of \$ 416.23 million in 2024 (Technavio, 2020). Just in case of organic still wine increase by 48.3% during the period from 2012 to 2017 was noted (IWSR, 2018). It is expected one billion bottles of organic wine to be consumed around the world by 2023, in compare with 441 million bottles recorded in 2013. According to 'Organic Wine Market by Product, Distribution Channel, and Geography - Forecast and Analysis 2020-2024' the organic wine market is expected to grow by USD 5.23 billion in 2020-2024, reaching the compound annual growth rate at the level of 8% in the forecast period The market is fueled by the growing trend of organic wine tourism and growing demand from millennials (TechNavio, 2020). These forecasts seem to be realistic in the context of the dynamically growing amount of organic vineyards and their predicted ongoing growth worldwide (cf. Fig. 2).

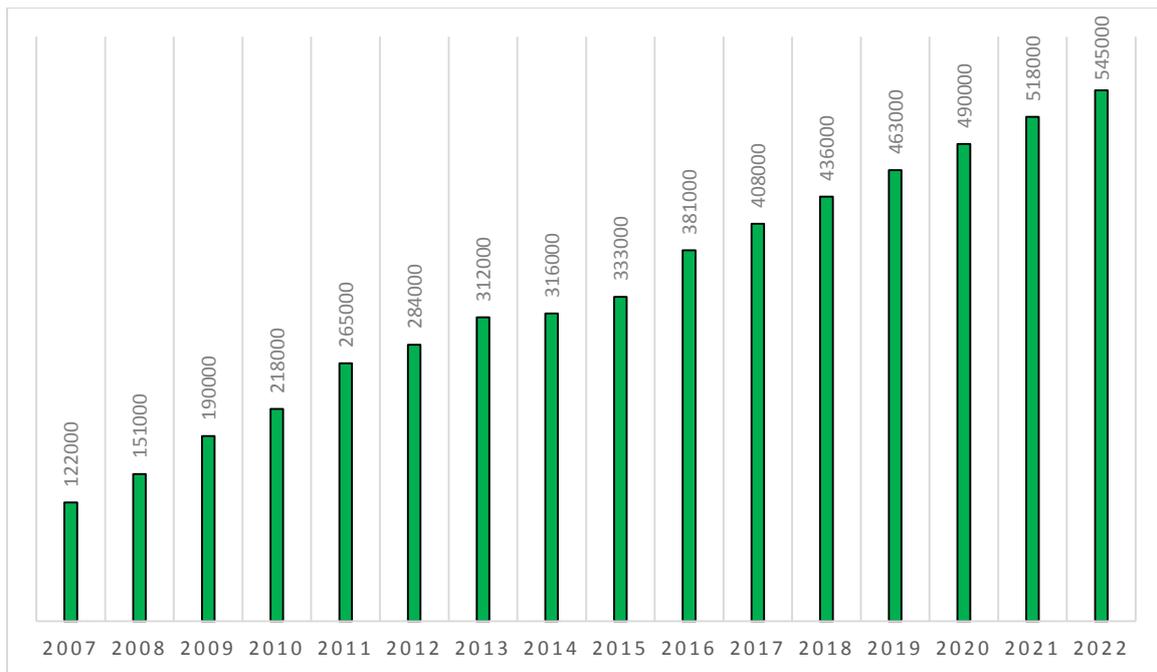


Figure 2. Organic vineyards worldwide, 2007-2022 (forecast). Source: (MillesimeBio, 2019).

This process is clearly visible in the European Union. A common trend in traditional winemaking countries of the EU is a stabilization in total vineyard area accompanied by growth in the share of organically farmed areas, a phenomenon which is illustrated based on the example of selected traditional winemaking countries in Table 2.

Table 2.

Total vineyard area compared to area of organic vineyards in selected EU countries

Spain			France			Italy			Austria		
Vineyard area/organic vineyard area (ha)											
2016	2017	2018	2014	2015	2018	2016	2017	2018	2015	2016	2018
775000/ 106509	968000/ 106529	969000/ 113098	789 000/ 64610	785000/ 68579	793000/ 94020	693000/ 101289	699000/ 103,207	705000/ 106447	45000/ 4626	46000/ 5088	49000/ 6000

Source: own elaboration based on: FiBL (2018); MillesimeBio (2019).

The increase in organic wine production is related to the growing demand. The research of organic wine consumers clearly shows their specific hierarchy of values. Organic wine is the product of choice for environmentally conscious consumers, for whom environmental responsibility is one of the key drivers (Brugarolas et al., 2005; Olsen et al., 2012; Schäufole, Hamm, 2017; Galati et al., 2019; Rabadán, Bernabéu, 2021). Sensitivity to environmental issues is confirmed by the willingness to pay higher price for organically produced wine (Wiedmann et al., 2014; Ay et al., 2014; Galati et al., 2019). Nevertheless, the organoleptic features (Pagliarini, 2013; Wiedmann et al., 2014; Kim, Bonn, 2015) and the belief in health (Mann et al., 2012; Bonn, 2016) values also remain an important criterion. Di Vita et al. (2019) indicate the importance of consumer curiosity. Therefore, we are dealing with a growing market and quite precise knowledge about consumer expectations. The sense of organic production, including wine is confirmed by many studies: the organic winemakers are obtaining premium

prices, they have lower costs, higher level of capitalization, better general economic situation compared to conventional winemakers (Dainelli, Daddi, 2019; Vlasticova, Naglova, 2015).

3. Poland as a wine country

Poland has a tradition of viticulture that stretches back to the 10th century and is associated with the adoption of Christianity. In the early Middle Ages, vineyards stretched from Kraków in the south to Pomerania in the north and from the Subcarpathian region in the east across the Vistula River Gorge [*Przełom Wisły*] to the area of Zielona Góra in the west. The development of trade routes and competition from other countries combined with the effects of the Little Ice Age, the phylloxera epidemic, and finally also Poland's unstable situation led to this tradition of winemaking becoming forgotten. The situation started to change at the end of the 20th century. By 2000, there were 16 wineries in operation in Poland (Pink, 2015). At the beginning of 2021, according to the internet portal for Polish winegrowers winogrodnicy.pl¹, there were nearly 530 wineries producing wine in Poland, though not all owners register their wineries and sell wine commercially, whereby it should be emphasized that, in many cases, these are garage wineries, where wine is offered as a product only as part of agritourism activities. According to data from the Polish National Support Centre for Agriculture [*Krajowy Ośrodek Wsparcia Rolnictwa – KOWR*], in 2020, there were 330 registered producers in operation, growing vines over an area covering 551 ha. The vineyard area and number of winemakers are relatively low. However, if one takes the dynamics of the trend into consideration, viticulture and the production of wine in Poland give grounds to consider the emerging winemaking sector as a phenomenon with important potential in the development of rural areas and changes in alcohol consumption habits in Poland. In 1999, the vineyard area in wine-producing countries was 3,400,567 ha, while in 2009, it was 3,196,597 ha, and in 2015 – 3,230,241 ha (Eurostat, 2017), which means that there has been a slight contraction in total vineyard area. In contrast, in the period from 2009 to 2020, the total vineyard area in Poland has experienced dynamic growth at an average rate over the period of 30% per year (Fig. 3), while the number of persons deciding to operate wineries has grown at a similar rate (Fig. 4).

¹ This is a database concerning winemaking in Poland created by grassroots users. Information about wineries and wine production are provided by winemakers, who can add their own project themselves.

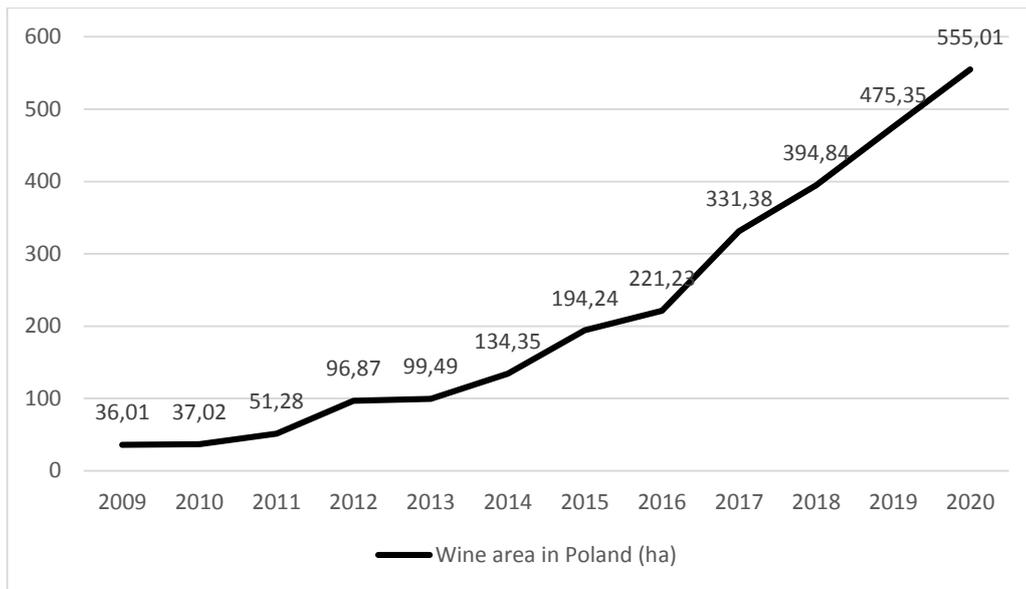


Figure 3. Vineyard area in Poland, 2009-2020. Source: (Krajowy Ośrodek Wsparcia Rolnictwa, 2020).

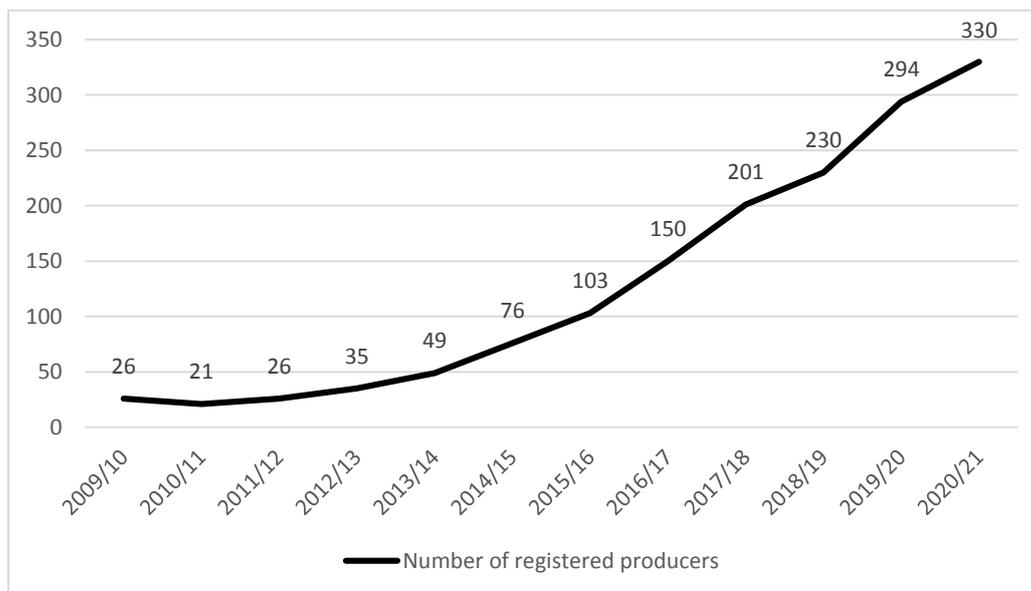


Figure 4. Number of registered winemakers, 2009/10-2020/21. Source: (Krajowy Ośrodek Wsparcia Rolnictwa, 2020).

It is worth underlining that, among several hundred producers, there are only 10 which have organic or in conversion vineyards, which, in the context of trends in adaptation to organic farming in Poland hardly comes as any surprise, though it does raise questions about what premises Polish agricultural producers base their decisions on when choosing their method of production.

4. Materials and Methods

4.1. Research Process

The research instrument was an AHP questionnaire in the form of a 30-minute telephone interview conducted by trained moderators. In addition to this, another questionnaire was completed by telephone interview, in order to diagnose attitudes with regard to organic and conventional production, the values declared by winemakers and the reasons for decisions regarding specific production methods, consisting of 9 questions based on a 5-point Likert scale and 5 metric questions. The interviews were conducted during the course of one telephone conversation with the respondent. The selection of the research sample and sample subjects was purposeful. Those winemakers whose production is registered and whose product is officially on sale on the commercial market were selected for the sample (N = 123, based on: winogrodnicy.pl), everyone was contacted, but only 56 winemakers took part in the survey, including 7 organic and 3 in the conversion process. However, these 10 respondents account for nearly 90% of the population of certified or seeking certification winemakers.

4.2. Description of the Applied AHP Method

The comparative method was first used by the 13th-century philosopher Ramon Llull in the context of social choice theory and the theory of electoral systems and was based on simple binary comparisons (Colomer, 2013). The Pairwise Comparison (PC) method was improved upon by main scholars, including the 18th-century French mathematician and philosopher Nicolas de Condorcet, and other researchers in the modern era, such as L. Thurstone, Y. Takane, R.D. Luce, R.A. Bradley and M.E. Terry (Kułakowski et al., 2019).

Multi-criteria methods are the most well-known application of the PC method, and include the Analytic Hierarchical Process (AHP) and its extension, the Analytic Network Process (ANP). Both methods were developed in 1970s by the American mathematician Thomas L. Saaty to facilitate decision-making processes (Saaty, 2008).

The Analytic Hierarchical Process (AHP) is one of the most widely used methods in complex decision making. This method is one of "measurement through pairwise comparisons and relies on the judgments of experts to derive priority scales" (Russo & Camanho, 2015). The AHP method can be carried out in several phases. These include (Schmidt et al., 2015):

1. Creation of a hierarchical model – definition of: goals, criteria and alternatives.
2. Judgment of criteria – pairwise comparison.
3. Weighing of priorities.
4. Combination of the alternatives' priorities.
5. Analysis of inconsistency and sensitivity.

Step 1: Use of the AHP method allows for the creation of an appropriate structure of the decision-making process, the functioning of which is influenced by many independent factors. The analysis makes it possible to specify the main problem, as well as sub-problems situated at hierarchical levels. Each level is characterized by a group of criteria related to each specific sub-problem (Khashei-Siuki et al., 2020). In this way, a model is created, with the main goal at the top while alternative decisions are at the bottom of the hierarchy. The criteria are then located in the middle between the goal and the decision variants (alternatives) (Abastante et al., 2019).

Step 2: After preparation of the hierarchy tree, it is possible to move onto the next step related to the pairwise comparison of criteria. At this stage, criteria are compared in pairs on a one-to-one basis. Experts taking part in the study make a comparative judgment of each pair of criteria taking the specific goal into account (Baffoe, 2019). In order to be able to complete this step, it is necessary to employ the numeric scale known as the Saaty scale (Table 2). It is used to determine which criterion of the pair is dominant with reference to the goal of the comparison (Saaty, 2008).

Table 3.
Structure of AHP responses

Importance	Equal importance	Moderate importance	Strong importance	Very strong importance	Extreme importance
Value	1	3	5	7	9

Step 3: With the help of the subjective judgment, the decision maker makes a choice between the individual criteria, and also specifies what relations there are between them. If the relations between the judgments are reversible, they become the inverse of integer functions. In this way, it is possible to create the matrix $A = [a_{ij}]$ (dimensions: $n \times n$) (Saaty, 2002):

$$A = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ \frac{1}{a_{12}} & 1 & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \dots & 1 \end{bmatrix} \quad (1)$$

Matrix A contains values showing the degree to which decision makers prefer x_i to x_j when viewed from the perspective of the higher-ranking goal. For each of the matrices, a vector of preferences should be indicated – the last of these is referred to as the weight vector. This is what decides the importance and influence of the criteria. The higher it is, the more important it is, and influence increases. It can be expressed as follows (Wojnarowska et al., 2021):

$$w = [w_1, w_2, \dots, w_n]^T \quad (2)$$

Step 4: The step allows for all the judgments of decision makers to be aggregated to obtain an overall priority. This can be done by: the Aggregation of Individual Judgments (AIJ) for sets of pairwise comparisons, the Aggregation of Individual Priorities (AIP) and the aggregation of priorities of units at each node of the hierarchy (Forman, Peniwati, 1998). When a group of decision makers forms a homogenous structure and expresses a willingness to function collectively as a single entity, AIJ is used. Each of them compares the criteria on their own, and, by taking the geometric mean, it is possible to obtain a group judgment. However, if the decision makers do not feel like acting as a single whole and compare the criteria individually using their own personal value systems, a consensus may be reached using AIP (Ossadnik et al., 2016).

Step 5: The results obtained from the comparison matrix refer to the relative importance of each criterion. They give a weight to each of the individual criteria ($w_1, w_2 \dots w_n$), which has to be checked for consistency (Bojórquez-Tapia et al., 2001). The consistency index of the individual values assigned by the decision makers depends on the deviation between λ_{max} , and n . The closer the deviation is to zero, the higher the consistency between decision makers is. This may be shown as follows (Fiore et al., 2020):

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (3)$$

Perfect consistency of the square matrix can be achieved when the highest eigenvalue of the matrix (λ_{max}) is equal to the number of compared criteria (n). The following equation shows this property (Saaty, Vargas, 1985):

$$\lambda_{max} = n \text{ for each: } a_{ij} = \frac{w_i}{w_j} \quad (4)$$

On the basis of the above dependencies, it is possible to calculate the consistency ratio in the last step. It is the quotient of the Consistency Index (CI) and the Random Consistency Index (RI), which is dependent on the size of the comparison matrix (Wang et al., 2020):

$$CR = \frac{CI}{RI} \quad (5)$$

The matrix may be considered to be consistent if the value of the Consistency Ratio is less than or equal to 0.1 (Park et al., 2020).

4.3. Analysis of Results Using the AHP Method

For the analysis of empirical data, the Pairwise Comparison (PC) method was used to assess the preferences (importance) of items or criteria in a relational database and single out the most effective solution. The hierarchical model was prepared by breaking down the decision-making problem and presenting it as a hierarchical sequence. Next, all the possible pairs were analyzed according to a special, bipolar scale of comparison, and the results were then put into the matrix and weight ratios, as known as priorities, were specified. The program Super Decision was used

to make the relevant calculations. For each matrix, the Consistency Ratio (CR) was also calculated to show if the respondents were consistent in their judgments. The Consistency Ratio (CR) was estimated for each expert (reported for each matrix). The creator of the method, Saaty, set the acceptable value of CR at 0.10 (10%), which means that a matrix with a $CR > 0.10$ should be considered to be inconsistent and discarded or repeated (Saaty, 2008). However, in practice, this requirement is difficult to meet, and the threshold value for matrix acceptance proposed by Saaty provoked such controversy that many scientists considered it too restrictive. In this article, a limit of $CR \leq 0.20$ has been adopted.

This model was developed to assess the choice of method of wine production. The structure of the model is divided up in the conventional way, taking into account the stated main goal, the main criteria, the sub-criteria and possible solutions. The main criteria were taken to be areas of sustainable development, i.e. economic, environmental and social criteria. To provide more accurate data on the factors taken into consideration in the decision-making process regarding the choice of wine production method, based on a review of the literature, sub-criteria representing appropriate factors for each main criterion were also taken into account. In the case of economic criteria, costs of production, subsidy system, market development, farming efficiency, profits on sales, labor intensity and competition were taken into account. Sub-criteria taken into account in the social area included a sensory judgment of the wine by the winemaker, the risk of lack of product acceptance, institutional controls, sensory judgment according to the consumer and judgments of responsibility of production. For the environmental criterion, sub-criteria such as the following were singled out: environmental safety of farming method, expression of terroir, attacks of parasites, quality of raw material (grapes), frequency of spraying and frequency of agronomic treatments. The alternatives adopted were determined on the basis of the possible wine production methods, i.e.: organic or conventional farming and winemaking.

Table 3 shows the calculated values of local priorities for the main judged criteria, broken down into conventional and organic winemakers. The aggregated average values for both surveyed groups is also presented. The analysis conducted shows there to be divergences in the levels of the criteria taken into account among groups of conventional and organic winemakers. Among conventional winemakers, the key criterion taken into account in the process of choice of production method is the economic criterion with a local priority value of 0.5047 while among organic winemakers that criterion was judged to be of the lowest importance i.e. 0.0574. A similar divergence can be seen in the judgment of the organic criterion, which was considered to be of key importance by organic winemakers with a local priority value of 0.6673 while, among the group of conventional winemakers, the local priority value was 0.2788. No such fundamental differences were shown only for the social criterion.

Table 4.*Local priority values for main criteria*

CRITERION	Local priorities (aggregated)	Local priorities (conventional)	Local priorities (organic)
1 economic	0.3929	0.5047	0.0574
2 social	0.2312	0.2165	0.2753
3 environmental	0.3759	0.2788	0.6673

Table 4 shows the values of local and global priorities for the judged sub-criteria, broken down into conventional and organic winemakers, as well as average values for those groups. The economic sub-criterion judged by conventional winemakers to be most important, i.e. with the highest local priority value (0.2105) was profits on sales, which, based on the judgments of organic winemakers, was in second place after market development. Both among organic and conventional winemakers the lowest level of local priority for the analyzed criterion was assigned to the factor of competition.

In the case of the second criterion, i.e. the social criterion, responsible production was considered to be of key importance, receiving the highest local priority values both among conventional and organic winemakers, of 0.3490 and 0.4484 respectively.

In the group of environmental sub-criteria, both the groups of conventional and organic winemakers considered the factors of environmental safety of farming method and quality of raw material (grapes) to be of most importance.

Table 5.*Local and global priority values for judged sub-criteria*

CRITERION	Local priorities (aggregated)	Global priorities (aggregated)	Local priorities (conventional)	Global priorities (conventional)	Local priorities (organic)	Global priorities (organic)
1.1 costs of production	0.1596	0.0627	0.1536	0.0775	0.1791	0.0103
1.2 subsidy system	0.0643	0.0253	0.0645	0.0325	0.0637	0.0037
1.3 market development	0.1962	0.0771	0.1631	0.0823	0.3037	0.0174
1.4 farming efficiency	0.1622	0.0637	0.177	0.0893	0.1142	0.0066
1.5 profits on sales	0.2039	0.0801	0.2105	0.1063	0.1825	0.0105
1.6 labor intensity	0.1596	0.0627	0.1787	0.0902	0.0974	0.0056
1.7 competition	0.0541	0.0213	0.0525	0.0265	0.0594	0.0034
2.1 sensory properties of wine according to the winemaker	0.1471	0.0340	0.1290	0.0279	0.1907	0.0525
2.2 risk of lack of product acceptance	0.1447	0.0335	0.1684	0.0365	0.0879	0.0242
2.3 institutional controls related to organic production	0.1217	0.0281	0.1558	0.0337	0.0400	0.0110

Cont. table 5

2.4 sensory properties of wine according to the consumer	0.2083	0.0481	0.1979	0.0429	0.2330	0.0641
2.5 responsible production	0.3782	0.0874	0.3490	0.0756	0.4484	0.1234
3.1 environmental safety of farming method	0.2680	0.1007	0.2790	0.0778	0.2076	0.1385
3.2 expression of terroir	0.1291	0.0485	0.1255	0.0350	0.1491	0.0995
3.3 risk of pest attacks	0.1048	0.0394	0.1099	0.0307	0.0763	0.0509
3.4 quality of raw material (grapes)	0.2366	0.0890	0.2297	0.0640	0.2748	0.1834
3.5 frequency of spraying	0.1562	0.0587	0.1565	0.0436	0.1542	0.1029
3.6 frequency of agronomic treatments	0.1053	0.0396	0.0993	0.0277	0.1380	0.0921

Table 6 presents the percentage values for sub-criteria according to their importance for the achievement of the selected main goal.

Table 6.

Sub-criteria according to their importance for achievement of goal

Sub-criteria according to their importance for achievement of goal	Conventional	Organic
1.1 costs of production	7.8%	1.0%
1.2 subsidy system	3.3%	0.4%
1.3 market development	8.2%	1.7%
1.4 farming efficiency	8.9%	0.7%
1.5 profits on sales	10.6%	1.0%
1.6 labor intensity	9.0%	0.6%
1.7 competition	2.7%	0.3%
2.1 sensory properties of wine according to the winemaker	2.8%	5.2%
2.2 risk of lack of product acceptance	3.6%	2.4%
2.3 institutional controls related to organic production	3.4%	1.1%
2.4 sensory properties of wine according to the consumer	4.3%	6.4%
2.5 responsible production	7.6%	12.3%
3.1 environmental safety of farming method	7.8%	13.9%
3.2 expression of terroir	3.5%	10.0%
3.3 risk of pest attacks	3.1%	5.1%
3.4 quality of raw material (grapes)	6.4%	18.3%
3.5 frequency of spraying	4.4%	10.3%
3.6 frequency of agronomic treatments	2.8%	9.2%

An analysis of values shows there to be large divergences in the judgment of sub-criteria between conventional and organic winemakers. It is worth noting that, in the case of conventional winemakers, profits on sales (10.6%) are the most important, while, for organic winemakers, it is quality of raw material (18.3%).

4.4. Analysis of the Results of the Behavioral Survey

The purpose of the behavioral survey conducted to complement the AHP method was to precisely indicate differences in preferences, values and perception of conventional and organic farming and production. The survey questions concerned an assessment of the organic certification system, factors influencing the decision regarding method of production and an assessment of the organic method.

In analyzing the survey questionnaire based on the Likert scale², a comparison of the arithmetic means of the responses of organic winemakers, those in conversion, those declaring organic production and conventional winemakers, was used. The responses of winemakers, who claim to apply organic farming principles and have organic production, but who are not certified and do not plan to seek certification, were discarded. A graphic representation of the responses concerning the perception of organic certification is shown in Figure 5.

The statistical significance of mean differences was verified on basis of the following formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 s_1^2) + (n_2 s_2^2)}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad (6)$$

where the critical area is found in Student's t-test tables for n_1+n_2-2 degrees of freedom of Student's t-test distribution.

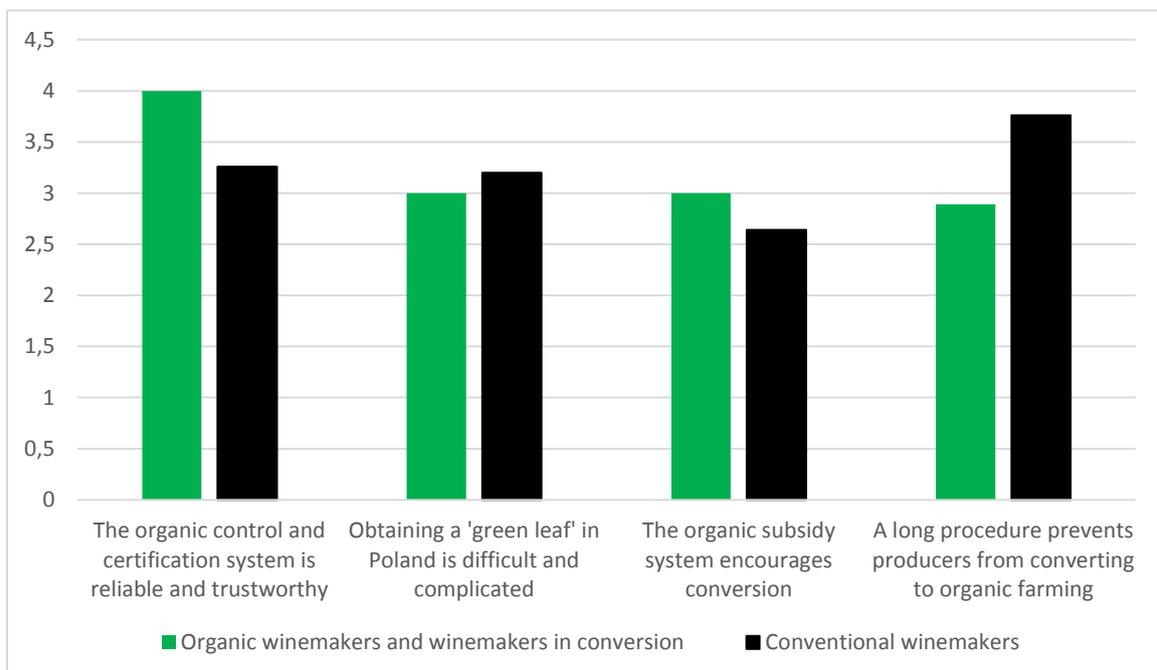


Figure 5. Assessment of conventional and organic winemakers regarding the economic and institutional context of organic certification

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

The differences in mean responses between groups are not large, though all of them are statistically significant. Organic winemakers and those in conversion on average display a higher level of trust in certifying institutions. They consider the procedure of obtaining a certificate to be difficult and complicated to a lesser degree than conventional winemakers. The time needed for conversion is more rarely considered to pose a problem than in the case of conventional producers in the process of deciding on the method of production. At the same time, organic producers and those in conversion are more positive in their assessment of the subsidy system.

As far as the relations of winemakers with their environment and social factors are concerned, a comparative set of results is presented in Figure 6.

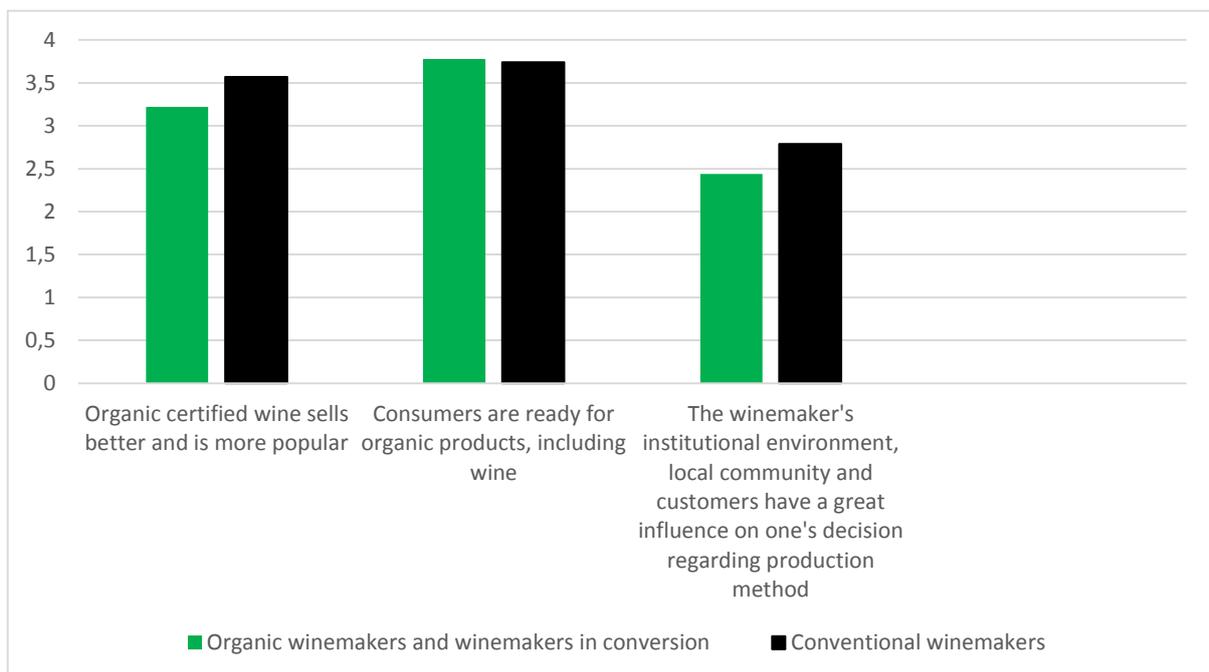


Figure 6. Assessment of conventional and organic winemakers regarding the social environment

As far as the assessment of social factors and social influences are concerned, the differences between the mean responses are not statistically significant. This means that both groups are equally convinced as to the readiness of consumers to accept organic products. Winemakers are however rather skeptical in their approach when it comes to the influence of the social environment on their production decisions.

The largest differences in the perception of organic winemaking are on environmental issues – the impact of that method on the natural environment and the possibility of organic farming in the context of environmental conditions. These differences are shown in Figure 7.

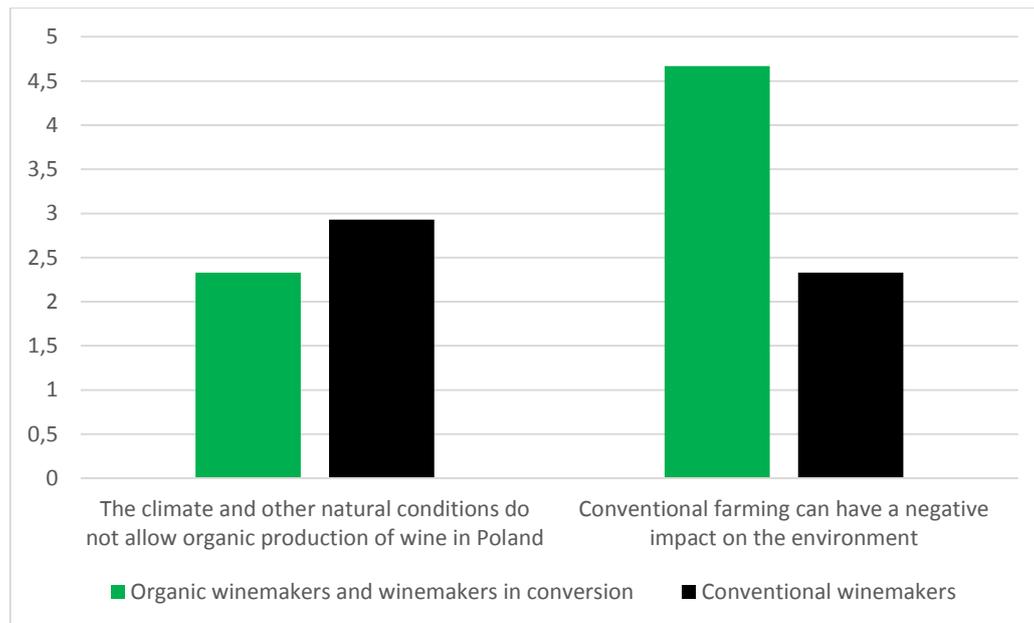


Figure 7. Perception of environmental issues in the view of organic and conventional winemakers

The largest differences in mean responses are to be seen with reference to the perception of the effect that conventional agriculture and processing can have on the environment. Organic winemakers and those in conversion clearly see the potential for conventional methods having a negative impact on the environment. Conventional winemakers disagree with this point of view, instead tending to believe to a greater extent that the climate and natural conditions are not conducive to organic production in Poland. It should however be emphasized that, on average, they do not believe such production to be impossible.

5. Discussion

The aims of the studies was to:

- Construct a decision-making model to understand making a choice process between conventional or organic production.
- Indicate the factors conditioning the decision-making process of pioneers in Polish winemaking regarding production method.
- Indicate the barriers and motivators to the implementation of principles of organic production, in the context of values and beliefs based on the example of Polish winemakers.

Referring to the first aim of the studies conducted was to recreate a decision-making model characteristic for organic and conventional producers, to understand an optimum method of production of wine, taking into account economic, social and environmental criteria, pointing out any significant difference between the groups of producers analyzed, that is between

conventional and organic winemakers. Studies conducted to date of the criteria of choice between an organic or conventional method of production focus on two areas – looking for statistical relationships between specific population and/or institutional variables and examination of the values underpinning farmers' decisions. Among the population characteristics related to the functioning of the organic system, age was one of the factors analyzed amongst other things. However, there are no clear conclusions drawn one way or the other here. In Norway and the Czech Republic, young farmers were found to be more willing to engage in organic production, while older farmers above all expected a stable, predictable income (Anderson et al., 2005; Koesling et al., 2008; Pechrová, 2014). In turn, in surveys of farmers from South Korea, age proved to be an insignificant factor (Lee et al., 2016), while in Nepal, the older the farmer, the greater the chance for organic production was shown to be, as older farmers are subject to less pressure to be productive (Singh et al., 2015). A study in the subject of a choice of an organic or conventional method of production by winemakers also did not reveal demographic criteria such as age, gender, roles or experience to be important in making this decision (Cobelli, Chiarini, Giaretta, 2021). Another of the variables frequently analyzed was the level of education. Here, the conclusions were rather similar – a higher level of education was related to a greater tendency to choose organic farming (Lee et al., 2016; Singh et al., 2015). In studies conducted among Czech and German farmers, as in the case of Chinese and organic Austrian farmers, the decision to convert to organic farming was often down to financial considerations related to subsidies (Bichler et al., 2005; Darnhofer et al., 2005; Home et al., 2019; Pechrová, 2014; Wang et al., 2018). An element frequently shown to play a role is the impact of the external social environment, from which organic farmers receive support, whether from the group, an important entity or even appropriately constructed direct sales networks (Anderson et al., 2005; Wang et al., 2018). As far as the values declared by organic and conventional farmers are concerned, studies from New Zealand based on the decision-tree method showed that organic farmers made the conversion based on a life philosophy, a fear of chemically treated food and a concern for health. For a significant group, financial incentives were also a motivating factor (Fairweather, 1999). The aforementioned studies conducted among farmers in Norway also showed there to be differences in the values presented by both groups. Organic farmers indicated 'sustainable and environmentally friendly farming' to be the number one priority of their work, followed by production of high-quality food, and then, only in third place, stability of income, which was the value which was judged to be the most important by conventional farmers, (Koesling et al., 2008) something which was confirmed by the results obtained from the research conducted for the purpose of this article. Surveys of Swiss farmers have shown that the choice of production method is, in their opinion, dependent on the belief that technical and social problems have been solved. Producers often feel social pressure to be productive, and organic production is, in their view, not oriented toward productivity. The authors note a dichotomy between 'us' and 'them', which is not conducive to conversion (Home et al., 2019). Surveys of farmers in Austria have shown that,

despite noticeable correlations between population characteristics, it is the values held by farmers that play the key role. The authors identified 5 types of attitude: 1) committed conventional, 2) pragmatic conventional, 3) environmental conscious, but not organic, 4) pragmatic organic 5) committed organic, which differ in terms of their approach to economic and environmental values (Darnhofer et al., 2005).

Research on winemakers and the motives and barriers in making decisions about organic production indicate a significant advantage of non-economic motives in the behavior of organic winemakers. Among the issues affecting the decision to produce organic, it was indicated: performance and effort expectancy, social influences, self-efficiency and specific attitude towards wine production (Cobelli et al., 2021). the key role of non-economic factors is indicated by Dominici, Boncinelli, Marone (2019). In this study, a key role in the decision about organic production is played by passion, the desire for independence, and life close to nature. Conversely, decisions regarding conventional production are dictated by pecuniary motivations and profit maximalism. These results are confirmed in our research. A detailed study of the motivators and barriers to implementing organic production in selected regions of Germany reveals the positive impact of, among others, environmental awareness (preserving the ecosystem, healthy soil), ideological attitude, and social capital. As for the identified barriers, the authors point to concerns about low yield, ideological prejudices, skepticism, fear of financial risk, bureaucracy and more work (Siepmann, Nicholas, 2018).

In this context, the present survey showed that, the organic winemakers consider environmental issues to be the values of the most importance with a priority value of 0.6911 for organic farming and 0.3089 for conventional farming. In turn, conventional farmers confirmed that they assign greater value to conventional production with a priority value for that production method of 0.5700 compared to only 0.4300 for organic production. None of the groups surveyed considered the social factor and the impact of the surrounding community to be significant (Table 6). The results obtained confirm that conscious choices are made with regard to the farming method used for the production of wine in the groups analyzed.

Table 7.

Local priority values for analyzed alternatives

CRITERION	Local priorities (aggregated)	Local priorities (conventional)	Local priorities (organic)
ORGANIC FARMING	0.4981	0.4300	0.6911
CONVENTIONAL FARMING	0.5019	0.5700	0.3089

The results obtained also indicate there to be significant differences resulting from the judgment of sub-criteria according to their importance for achievement of their goal between conventional and organic winemakers, especially when it comes to economic and environmental criteria (Fig. 8). For organic winemakers, it is above all quality of raw material and the environmental safety of farming method which count, and not the cost of production or

farming efficiency. These producers assign a lower value to the subsidy system, which may indicate that the choice of that method of production is made based on an individual value system, and not due to economic considerations. The analyzed criteria were judged differently by conventional winemakers, for whom profits on sales and the related farming efficiency are of most importance. This confirms it to be a commonly-held belief that, from an economic point of view, the yield of organic farming is lower.

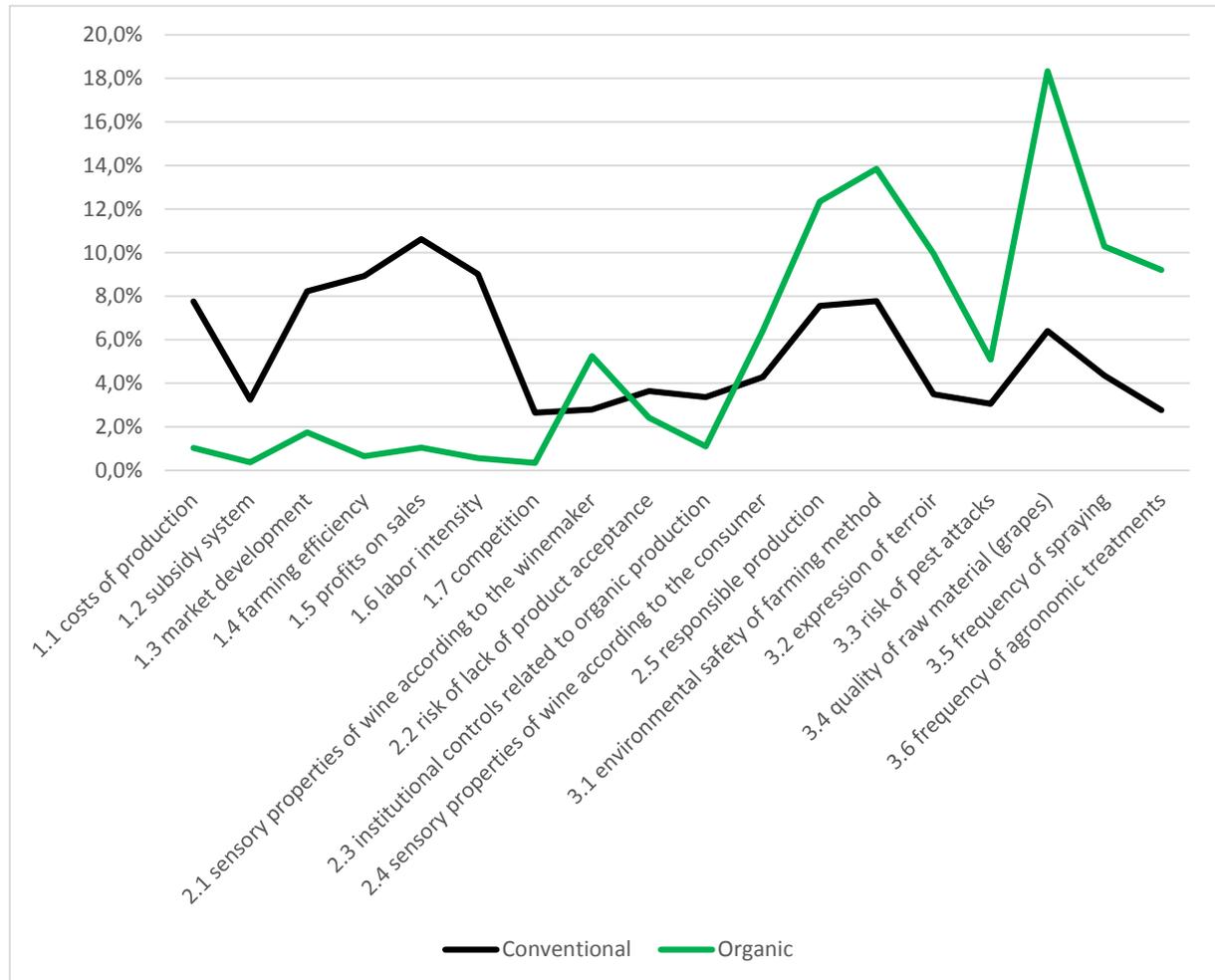


Figure 8. Sub-criteria according to their importance for achievement of goal

Surveys conducted using the AHP method diverge from the results obtained from the behavioral survey, which also showed differences in the perception of organic and conventional production. It revealed there to be statistically significant differences of opinion with reference to the effect of environmental issues and institutional and economic factors. No statistically significant differences were found with reference to the social area. Organic producers on average show a slightly higher level of trust in certification, and see it as having slightly more benefits, and they perceive the process of obtaining certification itself as being less difficult (Fig. 9).

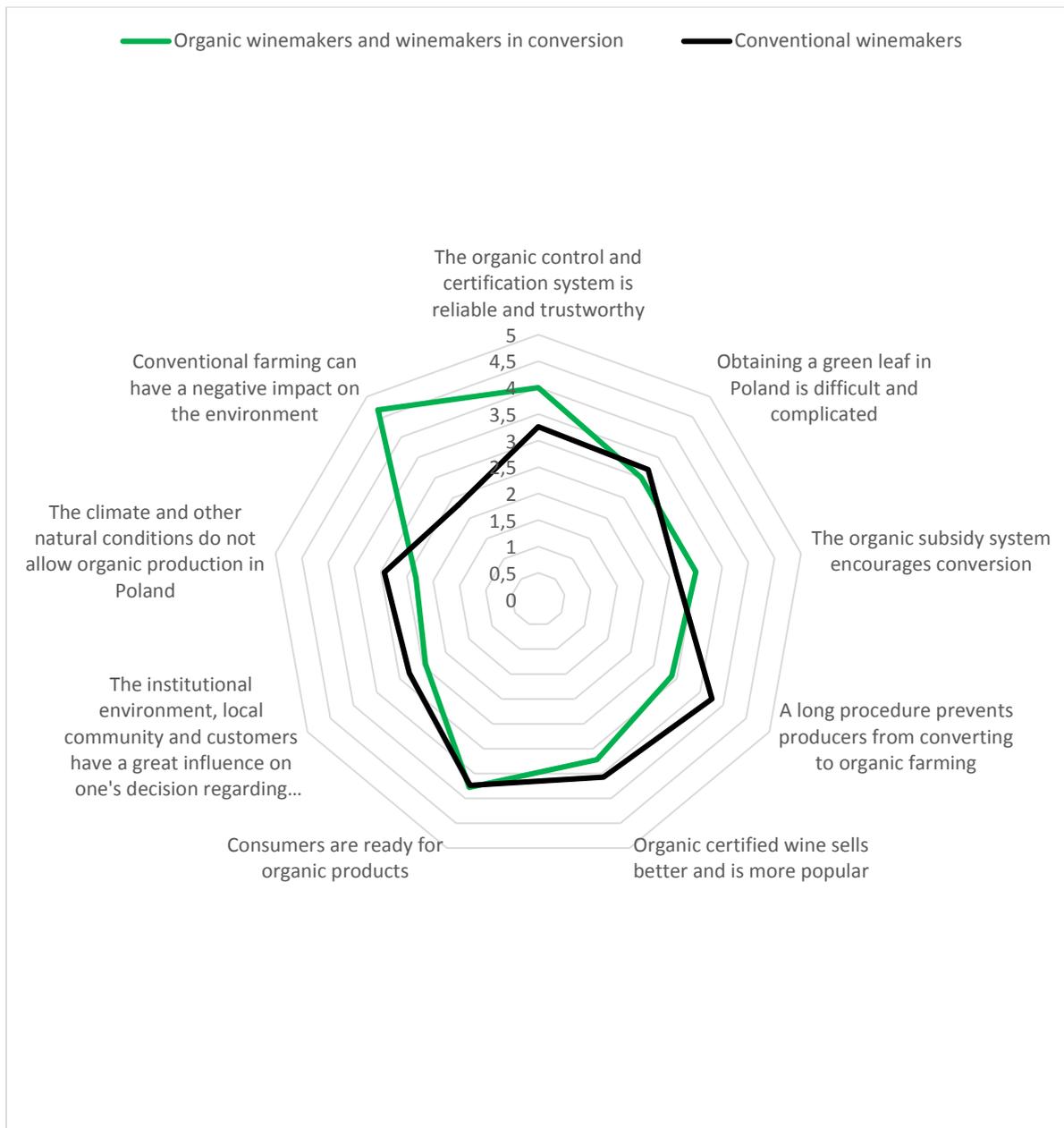


Figure 9. Values among conventional winemakers and organic winemakers and those in conversion

Conclusions

In the context of the formulated research issues:

- Why is organic wine production not very popular, despite growing popularity of organic wine?
- On what values is the winemakers decision-making process based?
- What are barriers and motivators of conversion into organic wine production?
- What actions can be taken to support the conversion towards organic production?

the following conclusions can be made:

The choice of method of production (organic or conventional) depends on the hierarchy of values declared by the winemaker, and the key values taken into account by conventional winemakers are values from the economic area in contrast to organic winemakers, for whom it is values of an environmental nature which are key. Only the social area was a common point of importance to both conventional and organic winemakers. It can therefore be concluded that the low interest in organic production proves the priorities of winemakers, who identify more strongly with pecuniary values.

The course of the decision-making process proves that conventional winemakers more often prioritize economic issues, and organic ones - environmental ones. This is confirmed by a behavioral survey, in which conventional winemakers reveal skepticism towards the method and organic certification.

In the context of the studies conducted, it is also possible to diagnose some barriers to conversion to organic farming. It seems that the main barrier is a lack of environmental sensitivity and awareness, as well as an insufficient level of knowledge and information concerning the benefits of organic farming, above all those of an economic nature. Attention is also drawn to concerns related to the institutional dimension of conversion to organic production. Wine producers are a clearly polarized group and it is possible to conclude that the area which divides them is above all their attitude to the natural environment. In the surveyed group, organic farming still seems to be understood more as a kind of personal mission, or even extravagance, rather than an efficient and profitable alternative method of production.

Attention should however be drawn to certain limitations in the studies conducted. They result from the relatively small population of organic farmers, despite the fact that 90% of winemakers identified in an entire population as organic or in conversion took part in the surveys. In the future, it is planned to conduct surveys on a wider sample, carrying out comparative studies between countries.

The conducted studies may prove to be useful material in making a choice of wine production method not only for producers entering the market, but also for winemakers who are planning a change in production method, but above all, serve as a basis do for the formulation of policy-making recommendations, especially in agricultural and environmental policy. There is also a visible need for education about the possible environmental effects of conventional farming in a monoculture. Support is also needed in improving farmers' knowledge in the area of organic farming – regarding not only procedures and requirements, but also its economic benefits. Identifying organic production with ideology, lack of financial efficiency and greater risk is a dangerous barrier to sustainable development. The research indicates the needs of: changing the attitude of agricultural advisory institutions and administration bodies responsible for agriculture strategies and disseminating knowledge about organic production and its advantages.

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NEW PRODUCT CONCEPT DEVELOPMENT AS AN EFFECT OF REVITALIZING THE OLD MARKET IN BYDGOSZCZ

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Purpose: Revitalization constitutes an indispensable part of urban development. The use of this concept is thus crucial in the development and communication of new regional products. The elements of territorial marketing enable development of a new product structure – a place. The main article objective entails an attempt to define territorial marketing in the context of revitalization, i.e., as a concept of new product – place – development. Additional objectives are to indicate the impact of revitalization on the change in the surroundings of the Old Market in Bydgoszcz and to link the revitalization processes with the marketing communication of tourist activity.

Design/methodology/approach: The article analyses the latest scientific literature on revitalization and territorial marketing. A case study analysis was additionally carried out. Case study conducted in this article was related to the Old Market in Bydgoszcz. Market plate revitalization was analysed at first. Subsequently the authors of the article made an analysis of the Old Market's adjacent streets as well as its key objects.

Findings: Owing to the revitalization of the Old Market Square in Bydgoszcz, a new local product has been developed – a place of modified features and functions. The use of territorial marketing tools has helped to attract tourists and residents. The revitalization showed that the Bydgoszcz's Old Town is an attractive place for business, bringing restaurants and entertainment venues to the area.

Practical implications: Revitalization and its areas had a positive impact on the development of facilities located in the vicinity of the Old Market in Bydgoszcz. An important element is the skilful management of this place and its financing for further development.

Social implications: The key element in the revitalization of the Old Market in Bydgoszcz is the implementation of economic, cultural and social aspects. The implementation of these aspects has a positive impact on local residents and local entrepreneurs.

Originality/value: The results of the analysis conducted enrich the literature on revitalization and territorial marketing. Moreover, they serve as a recommendation for further quantitative research in this field.

Keywords: revitalization, place marketing, Bydgoszcz.

Category of the paper: Literature review.

1. Introduction

The process of revitalization has been normalized in the Polish law by the Act of 9 October 2015 (Journal of Laws 2015, item 1777). The revitalization process itself has become part of the changes in contemporary degraded cities. It very often leads to the creation of new or renovated tourist spaces. City authorities increasingly often decide to undertake actions aimed at promoting the tourist areas. The search for effective ways to reach the potential customers necessitates development of new, original products, which can be based, *inter alia*, on the concept of revitalization.

Each place on the tourist map of Bydgoszcz can perform many different functions for the residents and visitors. Using appropriate marketing products, it is thus worthwhile to distinguish these functions and arouse interest among the potential customers. By distinguishing a specific site, a tourist product – place – can be created. This product constitutes a specific combination of the goods and services offered in a given area.

Infrastructure improvements enable tourist services to be offered, which can include accommodation, catering or recreation. The aim of this article is therefore to determine the impact of revitalization on the change in the surroundings of the Old Market Square in Bydgoszcz. An additional objective is to link the revitalization processes with place marketing and indicate the elements that can be used for tourist promotion of the Old Market Square in Bydgoszcz. The analysis is based on a review of the literature on marketing and revitalization as well as on the results of urban space observation.

2. Territorial marketing as an element of territorial unit management strategy

Territorial marketing, which in the literature on the subject is often referred to as ‘place marketing’, has been one of the fastest growing areas of marketing in recent years. Precise definition of the notion of place marketing can pose problems, however. Because it is a soft concept, it has not been defined by law. Nevertheless, it can be inscribed into the issue of territorial unit management, as one of the strategy elements. Place marketing is a constantly developing concept and can take different territorial forms, which makes indication of a homogeneous definition a difficult task. Attempts to define the concept in question can, nevertheless, be found in the national and world literature (Deluga, 2012; Widomski, 2019).

Place marketing is defined as the entirety of the activity undertaken by local, regional and national entities which aim to create exchange and impact processes, by recognizing and satisfying the needs and desires of the local community (Szromnik, 2016).

Polish literature on the subject often refers to the term 'place marketing' as a market concept of territorial unit management. Both anticipation of changes as well as skillful use of the resources at hand constitute quite an important element (Lewicki, 2017).

Other authors believe that place marketing can be identified with city marketing, as an element in a system of goods exchange, and meeting the changing resident needs, within a city and its immediate surroundings (Chotkowski, Deluga, 2008).

I.P. Rumpel and T. Siwek, in turn, define place marketing as institutional strengthening of the information flow between the resident and tourist demand and the supply, which is represented by the city authorities (Rumpel, Siwek, 2008).

It is worth noting that all these definitions of place marketing have one common element, i.e., the emphasis on meeting the resident needs first, and those of the tourists and investors, to whom the offer is addressed, at a later stage.

Place marketing is also defined as the marketing activities implemented as part of particular place management. It should therefore serve as one of the primary factors in the strategic planning of a given place's policies, including economic development policy. Through strategic planning of a place, unique selling propositions can be created. This concept allows only those places that can shape the attractiveness of a given area to be exposed in the marketing activities adopted (Knapik, 2009; Metaxas, 2009).

It should be noted that place marketing is carried out by multiple entities. These entities can comprise, inter alia, local government units, including local authorities and administration employees. One of the important marketing implementation elements is the local society and organizations. The activities undertaken as part of place marketing are intended to serve the economic, urban, tourist, social and cultural development of both the city and the entire region (Kalinowska-Żeleźnik, Sidorkiewicz, 2015; Gabryšová, Ciechomski, 2021).

Territorial marketing today is becoming one of the key elements in the development of contemporary local space. It constitutes one of the most recognized, at the same time the most effective, tourist product communication tools. Place marketing is therefore used by local authorities to promote a given area not only among the tourists, but among the residents as well. The marketing tools used by local authorities are designed to support socio-economic activation, the effects of which are felt by the residents and tourists (Marak, 2004; Dziechciarz, 2021; Andruszkiewicz, Schulz, Skorupa, 2021).

Place marketing is primarily used to create a positive image of a given city. From the residents' perspective, the main task of place marketing is to attract potential investors, so that new jobs can be created, which in turn results in an overall increase in the resident satisfaction and encourages others to move to that particular place. By properly targeting the place marketing tool, city authorities can attract a specific group of people, including, inter alia: students, various types of skilled professionals (Zdon-Korzeniowska, 2011; Kęprowska, 2021).

As mentioned earlier, place marketing refers to the positive creation of a given space's image. Owing to intensive and consistent outward promotion, it is possible to attract potential tourists. As such, one important aspect entails each territorial unit's formation of a useful set of marketing tools (also known as the marketing-mix). Both European as well as world literature, propose many marketing-mix sets for territorial units. One of the most widely used forms of marketing is the '4P' model, according to which, the behavior of potential customers can be influenced through: product, price, place and promotion (Zdon-Korzeniowska, 2011).

3. Revitalization as a process of developing a new product – a place

Attempts to define the term 'revitalization' emerged as early as in the first half of the 19th century, in the United States. The term itself can be used in many disciplines, e.g., architecture, urban planning, economics or management (Dziechciarz, 2021).

Currently, many scholarly studies exist, which have attempted to bring the essence of revitalization closer to understanding. In Poland, the overarching document dealing with revitalization is the Act on Revitalization, adopted on the 9th of October 2015 (Journal of Laws 2015, item 1777). According to the provisions of the Act, revitalization "is a process of leading out of a state of degraded area crisis, carried out in a comprehensive manner, through integrated actions undertaken for the benefit of the local community, space, and economy, which are territorially focused and carried out by revitalization stakeholders on the basis of a communal revitalization program" [translated from the original wording in Polish] (Journal of Laws 2015 item 1777, 2015).

The Act of 9 October 2015 on revitalization contains provisions concerning, inter alia, the principles and procedures for preparation, conduct and evaluation of revitalization. One important element related to the revitalization process is public participation (Journal of Laws 2015 item 1777, 2015).

Social participation is the citizens' participation in the decision making significantly related to the functioning of their communities. In Poland, social participation is used quite rarely, and if it is used at all, it mainly concerns the elements of spatial management, i.e., architecture, urban planning, spatial planning, nature conservation, preservation of monuments (Pawłowska, 2012; Leśniewska-Napierała, 2019; Koliński, Nowak, 2021).

According to the Revitalization Act, social participation primarily includes the preparation, conduct and evaluation of revitalization, in a way that ensures active participation of the stakeholders, i.e., the local community. Active stakeholder participation can occur through, inter alia, participation in public consultations (Dz.U. 2015 item 1777, 2015; Pawłowska, Staniewska, Konopacki, 2012).

In the opinion of many authors, revitalization in Poland is lagging behind other Western European countries. This mainly concerns cities. This phenomenon enables the city managers initiating revitalization to benefit from foreign experience (Masierek, 2020; Lorens, Martyniuk-Pęczek, 2010). The idea of revitalization is to preserve the cultural heritage, i.e., the architectural values of a city, which are characteristic for the city, the region, the country (Lechman, 2007).

One of the primary tasks of revitalization is to change the urban aesthetics while maintaining spatial order. Additionally, revitalization investments enable socio-economic revitalization and restoration of the lost value of neglected properties. These goals are the ones most commonly set by local revitalization programs (Dziworska and Górczyńska, 2018).

Many authors of scientific publications believe that revitalization is a process of planning the activities initiated by local entities based on a comprehensive diagnosis and assessment of the local entities' development and the state of the resources possessed. This process is meant to lead to local community development and improvement of a given city's functioning in the regional, national or global environment (Farelnik, 2015; Masierek, 2020; Kopeć, 2010; Przywojska, 2017; Dziworska, Górczyńska, 2018).

Revitalization can therefore be viewed as one of the elements territorial of marketing – as a promotional tool. Promotional tools can include, inter alia, various types of mass events, organized in the Old Market Square in Bydgoszcz in order to affect the external and internal environment. In the case of the Old Market Square in Bydgoszcz, the internal environment primarily includes the city residents, the local mass media, the various opinion leaders and local entrepreneurs, whereas the external environment can primarily include the tourists, the potential investors, and the local authorities. The main task of the Old Market Square in Bydgoszcz revitalization primarily entails consolidation of the positive relationships existing between the immediate environment and the residents/tourists. The link between revitalization and territorial marketing enables the region to be distinguished from others (Dziechciarz, 2021).

4. Financial aspects of revitalization

European funds have played an important role in the revitalization process financing in recent years. In the years 2007-2013, revitalization was most commonly identified with various types of renovation, adaptation and modernization. Despite the change in the perception of revitalization processes in the European Union, the EU funds were spent based on a narrow understanding of revitalization (Ślebocka, Tylman, 2016).

According to the report "Study on the management system and the implementation of revitalization processes in Poland"¹, prepared by the Institute of Urban and Regional

¹ For linguistic purposes, the title has been translated from the original in Polish "Badanie systemu zarządzania i wdrażania procesów rewitalizacji w Polsce".

Development and ECORYS Sp. z o.o. for the Ministry of Development Funds and Regional Policy, the sources of revitalization financing were diverse and heterogeneous. The combination of available financing sources therefore constitutes an important element. As per the report, the types of revitalization financing differed, depending on the type of the program implemented. In the Municipal Revitalization Program (MRP), the funding from the European Union was planned at a lower level than in other revitalization and local revitalization programs (RP/LRP) (Jadach-Sepiolo, 2020).

The Municipal Revitalization Program is a revitalization program prepared and adopted on the basis of Article 14 of the Act on Revitalization. The Revitalization Program (RP/LRP) is a multi-year revitalization program adopted pursuant to Article 18 item 2 point 6 of the Act on Municipal Local-Government, prepared based on the revitalization guidelines contained in the Operational Program 2014-2020 (Journal of Laws 2015, item 1777, 2015).

According to the report, the share of municipal funds in the Municipal Revitalization Program financing was 53%. In other revitalization programs, EU funding prevailed, accounting for 51%. As per the report, 59% of urban municipalities benefited from municipal budget financing, 14% of urban-rural municipalities benefited from private sources of financing, and 49% of rural municipalities benefited from the EU budget financing. Detailed data is shown in Figure 1.

Figure 2 shows the share of RP/LRP revitalization funding sources. The biggest share of financing was the municipal budget. The share of EU budget financing increased by 8%, compared to share of financing in MRP.

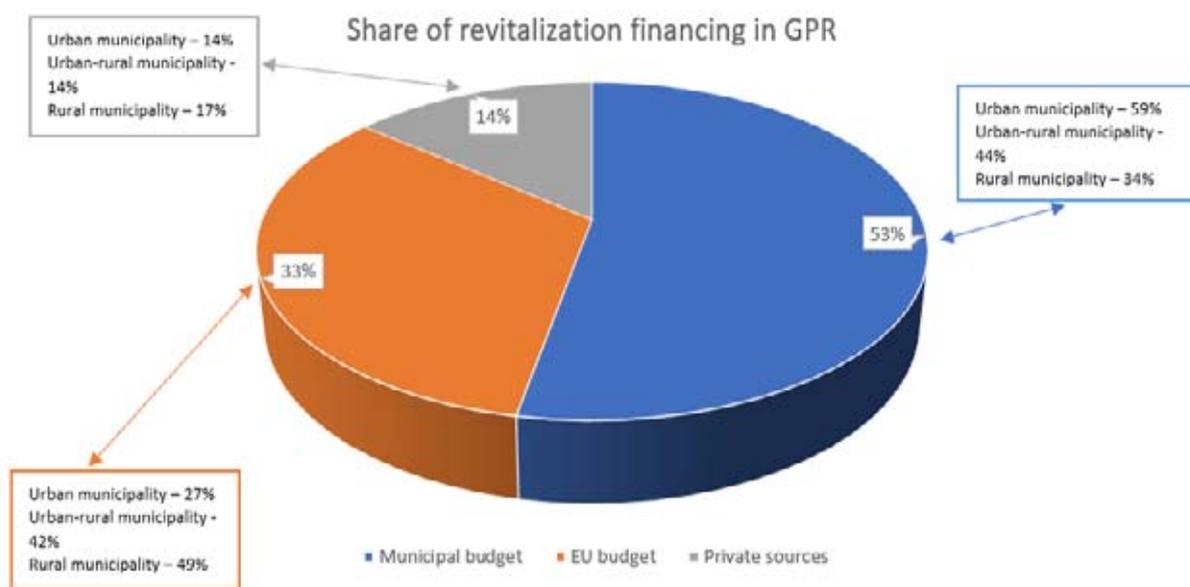


Figure 1. Share of financing sources in MRP revitalization. Own elaboration based on the "Badanie systemu zarządzania i wdrażania procesów rewitalizacji w Polsce [Study on the management system and the implementation of revitalization processes in Poland]" report, A. Jadach-Sepiolo, Institute of Urban and Regional Development, ECORYS Sp. z o.o., 2020, accessed: 22.11.2021.

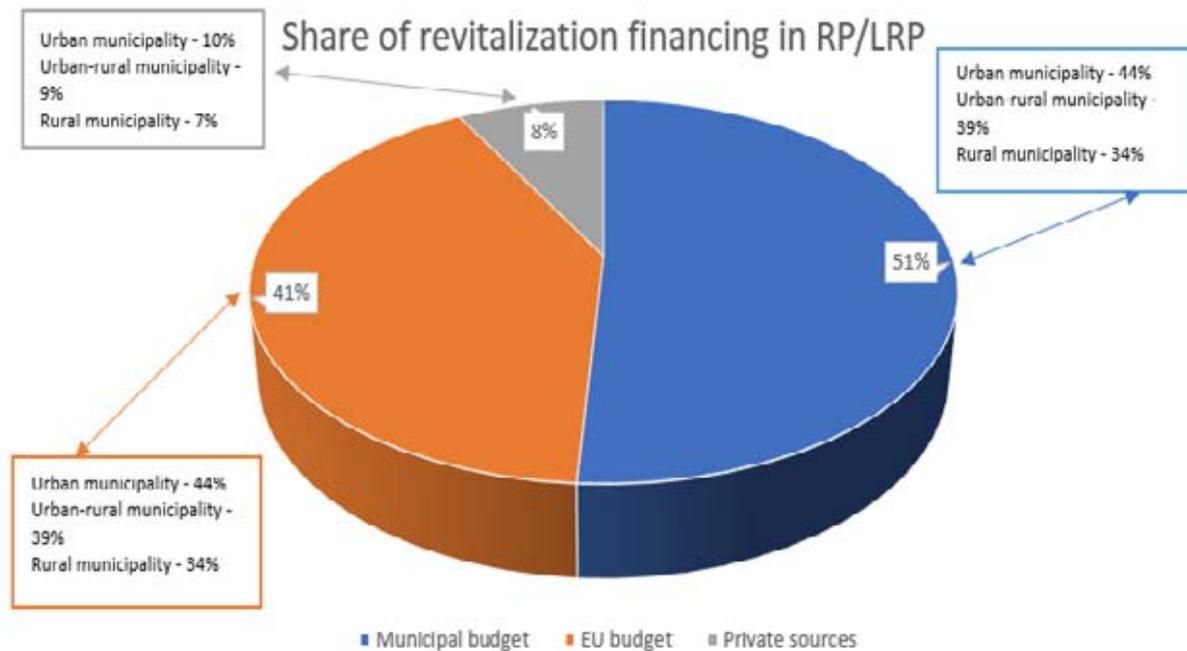


Figure 2. Share of financing sources in RP/LRP revitalization. Own elaboration based on the "Badanie systemu zarządzania i wdrażania procesów rewitalizacji w Polsce [Study on the management system and the implementation of revitalization processes in Poland]" report, A. Jadach-Sepiolo, Institute for Urban and Regional Development, ECORYS Sp. z o.o., 2020, accessed: 22.11.2021.

Private resources include, inter alia: loans and bank guarantees, leasing or private sector investments, as well as activities undertaken under public-private partnerships. Public funds include all kinds of financial instruments that are created by the local government. Public funds additionally include those funds which can be influenced by local governments, such as: rents, municipal bonds, loans, credits or funds of non-returnable character, i.e., taxes and betterment levies. The European Union resources allocated for revitalization include resources from the structural and investment funds: European Regional Development Fund, European Social Fund and Cohesion Fund (Gralak, 2010).

Revitalization of the Old Market Square in Bydgoszcz took place as part of the Old Market Square Socioeconomic Revitalization project, which was a continuation of the project included in the LPR Revitalization of the Old Market Square with its adjacent streets and the Mostowa Street with the Sulimy-Kamińskiego Bridge communication path. The projects were financed via various sources, including the EU funds (European Social Fund and European Regional Development Fund), the City of Bydgoszcz budget, and private funds (Resolution No. IV/12/18 of the Bydgoszcz City Council, 2018).

5. The concept of Old Market Square revitalization

Most of the buildings in Bydgoszcz date back to the 19th and 20th centuries, yet, the city has retained the plan of an old-town complex - a chessboard of streets separates a grid of plots. Owing to this clear spatial layout within the limits of the former medieval wall of Bydgoszcz, the Old Market Square has been listed in the register of historical monuments. It was placed under conservation protection as early as in 1984. In 1992, however, the Bydgoszcz City Council adopted a resolution recognizing the need to protect the cultural landscape of the city within the boundaries of 1939, with particular emphasis on the Old Market Square. It was therefore considered appropriate to implement a project of revitalizing the Old Market Square and the adjacent streets, since already in 2010, these areas were characterized by high degradation (the last renovation of the Old Market Square was carried out in the 1970s due to the removal of the railroad tracks running through the market area). The revitalization planned was to improve the spatial order and the aesthetics of the place. Other objectives were as follows (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010):

- reversing the negative image of the degraded areas and activity zones,
- strengthening the local residents' identity,
- stimulation of local community activity,
- counteracting the phenomena of exclusion and social pathology,
- increased interest in the city center as a place to live and conduct business,
- increasing the city's touristic attractiveness,
- restoration of touristic values.

Revitalization of the Old Market Square consisted in the development of public space on the market plate and the adjacent streets. They are located inside the central area of the Old Market Square, constituting, together with its plate and the foreground in front of the City Hall building, the Bydgoszcz's public city square area, including the following streets: Farna, Niedźwiedzia, Jana Kazimierza, Batorego, Kręta, Mostowa, Magdzińskiego (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010; Bydgoszcz under construction, 2018).

The Old Market Square revitalization was planned already in 2010, i.e., on the 26th of May 2010 to be exact., the Bydgoszcz City Council enacted Resolution No. LXVI/1018/10 amending the Resolution on Local Revitalization Program for the City of Bydgoszcz for 2007-2015. The project was named: "Revitalization of the Old Market together with the adjacent streets and Mostowa Street together with the Sulimy-Kamińskiego Bridge traffic route"². The first stage of implementation involved preparation of proper project documentation, including the cost estimate of the undertaking. A project feasibility study and transport concept analyses, including traffic measurements, were carried out as well. The construction works were

² For linguistic purposes, the title has been translated from the original in Polish "Rewitalizacja Starego Rynku wraz z przyległymi ulicami oraz ul. Mostowej wraz z ciągiem komunikacyjnym mostu Sulimy-Kamińskiego".

commenced in the second stage of the Old Market Square revitalization, including the road works, sewage works, street lighting and electrical works. It turned out necessary to develop proper traffic organization and road surface drainage within the construction work areas. The third and final stage involved promotion of the project (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010).

Figure 1 shows several-days-long Old Market Square revitalization works in progress. The work on the plate of the market square started on 25.06.2018. First, the works were targeted at removing the old pavement with numerous holes as well as at moving the Monument of Struggle and Martyrdom of the Bydgoszcz Land, visible in its original location in the photograph below (figure 1) (Bydgoszcz w Budowie, 2019).



Figure 1. Revitalization works on the Old Market Square in Bydgoszcz. Source: Bydgoszcz w Budowie [Bydgoszcz under construction – Old Market Square] website, Beginning of revitalization, 22.10.2021.

First, the contractor carried out work in the central part of the market square plate, so as to move closer to the buildings only after the summer season, in order to respect the restaurants' use of the outdoor dining areas. In addition the Old Market Square cleaning up and the surface leveling and replacing, a decision was made to permanently remove car traffic from the area (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010).

Such a decision resulted from the numerous reports submitted by the residents, for whom the vehicles caused a nuisance in the Old Town of Bydgoszcz landscape. Fixed hours were established for possible deliveries to the entrepreneurs running their businesses in the Old Market Square. For this purpose, but also for law enforcement and rescue services, a roadway was designated, accented with paving brick. It is a material adapted to carry heavy loads and, more importantly, to depict the historic character of the place. It was necessary to preserve the linear paving within the Old Town was necessary, due to the conservation guidelines and the master plan for the area. It was also planned to increase the amount of greenery, to mark the location of the former town hall, and place a fountain in the area of the non-existing western frontage of the market square, which had been demolished in 1939 by the

Germans occupying the town at the time. A Jesuit church as well as the Monument of Struggle and Martyrdom, which was moved, had once been located there. The fountain, however, turned out an impossible project, due to the lack of consent on the part of the monument conservator, as it could possibly damage the foundations of the frontage. Ideas also emerged to create underground routes among the ruins or to expose them under a glass structure. The foundations of the old buildings are too shallow to make these proposals feasible, however. The 18th meridian running through the square was additionally exposed using lighting. A clock showing the local time, 12 minutes different from the official time, was also planned. On the southern frontage of the square, at the entrance to the library, there is a fountain of children playing with a goose. The fountain, as well as the monument mentioned, received illumination (Official Service of Bydgoszcz, 2019).

The table below (Table 1) shows the changes implemented during the Old Market Square revitalization.

Table 1.

Comparison of the Old Market Square before and after revitalization

Prior to revitalization	Post-revitalization
Row paving, numerous holes, unevenness, steps, curbs	Replacement of the surface, large granite slabs, a separate lane of the road made of linear cube (conservation guidelines), no steps, no curbs, but a large gutter around the slab
Lighting lamp in the middle of the square	The lamp was removed; apart from that, the lighting system was thoroughly replaced, streetlamps were placed on the periphery, Kupffender's fountain (children playing with the goose) and the monument received illumination
-	A line showing the 18th meridian, illuminated by a LED light source, made of brass elements
-	The Monument of Struggle and Martyrdom of Bydgoszcz Land was moved a few meters, receiving a new plinth and illumination
Car traffic in the Old Market Square area	Entry to the Old Town area is allowed only to law enforcement and rescue services, and to suppliers of goods in specific hours (between 1:00 a.m. and 8:00 a.m.)
-	The outline of the former town hall has appeared, delineated by darker panels
-	Nozzles releasing water mist were installed on the west frontage (because of the shallow foundations, the monument conservator did not allow a fountain)
Varying patio table umbrellas at nearby restaurants	Unification of the patio table umbrella color and shape; the premises differ in fencing and chairs; a ban on beach sand in the outdoor dining areas

Source: own elaboration based on the article "Stary Rynek. Koniec remontu [Old market Square. End of renovation]" published at: www.bydgoszczwbudowie.pl, 22.10.2021.

Figure 2 shows the final effect of the revitalization works carried out on the Old Market Square in Bydgoszcz. The total cost of the project amounted to 14.3 million PLN. The Old Market Square revitalization project was co-financed by the European Regional Development Fund under the Regional Operational Program of the Kujawsko-Pomorskie Voivodeship for 2014-2020 (Official website of the city of Bydgoszcz, 2019).



Figure 2. View of the Old Market Square after revitalization. Source: www.bydgoszczwbudowie.pl, 21.10.2021.

During the grand opening of the revitalized Old Market Square, which took place on the 28-29 June 2019, concerts, cabaret and music performances, competitions and attractions for children were organized, which marked the beginning of the stage of the last revitalization work planned, i.e., promotion of the site (Official Site of Bydgoszcz, 2019).

The area revitalized amounted to 0.75 ha. Owing to the revitalization, the Old Market Square has gained uniformity and coherence, incorporating reference to the history of the place and its geographical location. As such, the cultural and identity value of the city has unquestionably increased (Official site of Bydgoszcz, 2019).

6. Changes in the Old Market Square surroundings

The Old Market Square is an old marketplace, a space in the city where people gathered to trade, buy and sell. Such places were the centers of public life, around which infrastructure was developed, and cities were formed. Markets used to bustle with noise, variety, and chaos. They transformed with time, depending on the development of trade, the socio-economic changes, and the historical events. After the political transformation which took place at the end of the 20th century, the importance of markets began to decrease dramatically, due to the development of other built-up commercial structures, and further on, the emergence of shopping malls which are very common today. They have taken over the role of markets and became the 'heart' of the city. They provide a more secure and comfortable space for customers and are therefore more willingly chosen by them. As a result of such progressive development, the former market squares changed their function and mainly became a representative place of the city. The trade from the former 'marketplace' has also been moved to the premises around the old market square and thus they have great influence on the competitiveness of this place. For this reason, other authors also decided to analyze the Old Market Square surroundings (Pasiut, 2012; Kuc-Słuszniak, 2008).

Work on the revitalization of the streets adjacent to the market began in 2014 and was divided into four stages. Adequate stormwater drainage and surface drainage were constructed. In addition, new street lighting was installed, and the necessary electrical work was done. New teletechnical channels and water mains were laid. Taking advantage of the situation, meaning the fact that the streets were dug up, the network managers reconstructed their installations, e.g., the heat pipeline along the Mostowa Street and the Ku Młyny Street was renovated. In the very end of the revitalization, work was carried out on laying the roadway with inline stone paving and granite sidewalks with stone curbs. With the exception of the Trybunalska Street, the remaining streets under renovation were given the status of pedestrian streets. The revitalized streets are marked (orange arrows) on the plan of the Old Town surroundings shown in Figure 3. In addition to the streets, the following bridges were renovated: Sulimy-Kumińskiego, Ku Młynom, Tamka (Zarząd Dróg Miejskich i Komunikacji Publicznej in Bydgoszcz Municipal Roads and Public Transport Authority in Bydgoszcz, 2014).

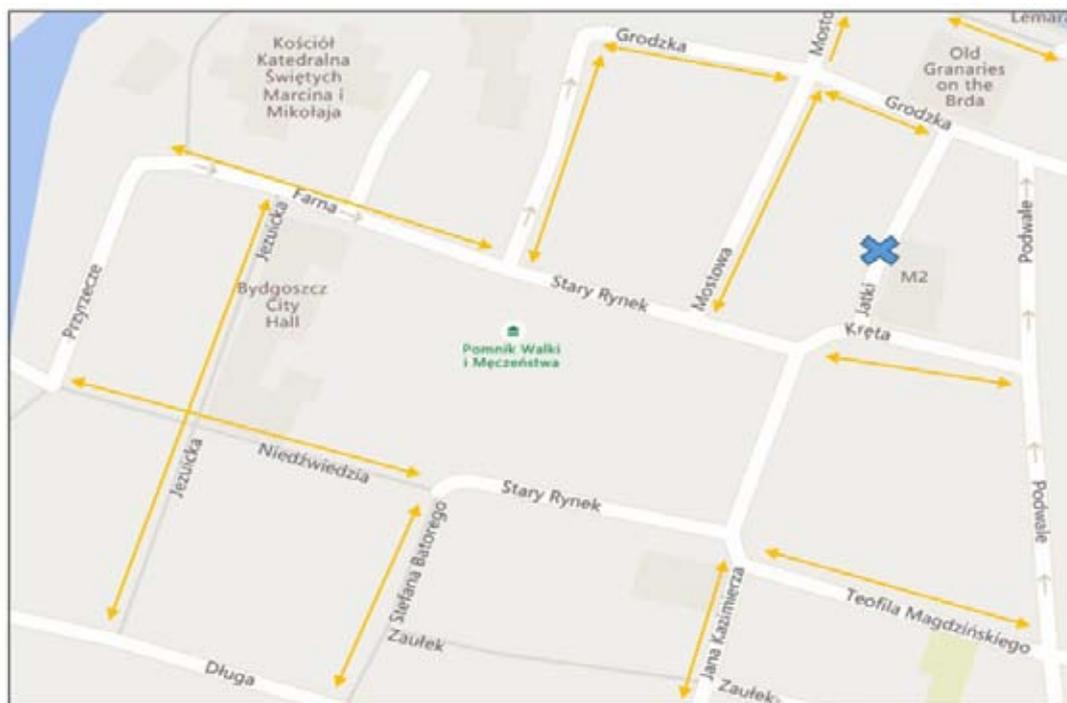


Figure 3. Plan of the Old Market Square and its surroundings with revitalized streets designation. Source: own elaboration using Microsoft Bing, 22.10.2021.

The aforementioned resolution of the Bydgoszcz City Council of 26 May 2010, (Resolution no. LXVI/1018/10) included, inter alia, a decision to implement a project of the Jatki Street redevelopment, which began with the demolition of the KASKADA restaurant. The location of this area is indicated in Figure 3 with a blue 'x' mark. The project was named: "Demolition of the KASKADA restaurant under the project of cleaning up the center of the city of Bydgoszcz in order to proceed with the restoration of the historic downtown buildings"³. In the context of

³ For linguistic purposes, the title has been translated from the original in Polish "Rozbiórka restauracji „KASKADA” w ramach projektu porządkowania centrum miasta Bydgoszczy w celu przystąpienia do odtworzenia historycznej zabudowy śródmiejskiej”.

the Old Market Square revitalization, it was a very important undertaking. The object mentioned had been closed, and being located in an area adjacent to the Old Market Square, it disfigured the downtown landscape (figure 4). The catering complex had been operating since 1969 and occupied 7019 m³ (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010).



Figure 4. The KASKADA restaurant adjacent to the Old Market Square. Source: <https://en.m.wikipedia.org/>, 23.10.2021.

The demolition and deconstruction of the building in question took place between 2010 and 2011. The project placed special emphasis on "the possible mechanical hazards as well as the spread of dust and the possible hazardous substances within the area of the work conducted, in order to comply with all the environmental criteria" [translated from the original in Polish] (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010).

In place of the demolished restaurant, one applicant (Cukiernia Sowa Sp. j.) reconstructed the historic buildings of the Mostowa Street and the Jatki Street. This improved the perception of the city center in the spatial, social, and economic spheres. New jobs were created involving new social and economic functions, one of the aims of which was to increase the tourist attractiveness of the city of Bydgoszcz. The demolished restaurant was replaced by a hotel, a parking lot, and commercial premises. The entire building has been architecturally integrated into its surroundings and today it harmoniously matches the history of the place. This resulted in an object that has economically revitalized the location and restored its former functions. The managing entity was Cukiernia Sowa Sp. j. The total cost of the project amounted to 246 672.82 PLN, the majority of which was covered by the beneficiary (Cukiernia Sowa Sp. j.) from its own resources – PLN 171 677.32, while the remaining amount, i.e., PLN 74 995.50 was obtained from the Regional Operational Program of Kujawsko-Pomorskie Voivodship – European Regional Development Fund, as part of the "Degraded city districts revitalization" program. Figure 5 shows the location of the investment discussed. The yellow arrow indicates the location of the demolished KASKADA restaurant. The view from the other end of the revitalized Old Market Square illustrates the coherence, elegance, and modernity of the buildings erected in the place of the former restaurant. Figure 6 presents the reconstructed Jatki

Street. Currently, it is one of the most atmospheric streets in Bydgoszcz, full of exquisite restaurants (Resolution No. LXVI/1018/10 of the Bydgoszcz City Council, 2010).



Figure 5. View of the Old Market Square with the location of new buildings erected in place of the demolished KASKADA restaurant. Source: own elaboration using the graphics from www.bydgoszcz.pl, 23.10.2021.



Figure 6. Reconstructed Jatki Street in Bydgoszcz. Source: www.my-tuitam.pl, 24.10.2021.

The Old Market Square revitalization carried out in 2019 resulted in an immediate harmonization of the market square plate, streets and buildings. Owing to the consistency, the old-town style and the high aesthetics and usability of the buildings, the Old Market Square in Bydgoszcz has gained a new look, becoming a great place for recreation for both the residents and the increasingly numerous tourists.

Surrounding the Old Market are many restaurants, cafes, pastry shops, a bakery, but also pubs and music clubs. In addition, there are grocery stores and branch stores, as well as a bank head office. All the premises harmoniously fit into the historic location of the Old Town. Owing to that, the ‘showpiece of the city’, i.e., the Old Market Square, vibrates with life and is filled with bustle, laughter and joy of the visitors. From year to year, an increase in the number of tourists is recorded in Bydgoszcz. The only exception was the year 2020, when due to the pandemic caused by the SARS-CoV-2 virus, the government imposed restrictions on, inter alia,

hotels and catering facility functionality, as well as limited the rules for gathering. Figure 7 shows estimated numbers of Bydgoszcz tourists and one-day visitors for the years 2013-2020.

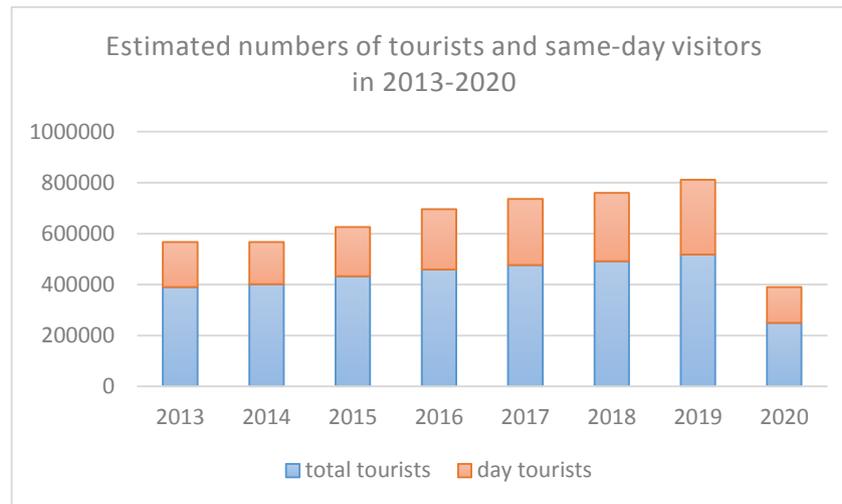


Figure 7. Estimated number of tourists in Bydgoszcz between 2013 and 2020. Source: own elaboration based on data from the Central Statistical Office, 24.10.2021.

7. Conclusion

For the purpose of this article, the literature on revitalization and place marketing was reviewed. An attempt was made to find a common element in the definitions of the essence of revitalization and place marketing. The rough definitions of revitalization show that this process is to first of all serve the local communities. It should also be noted that the process is meant to influence the preservation of the cultural heritage of a city or region. Owing to the combination of the revitalization process with the components of place marketing, it is possible to indicate the elements to be used by the Bydgoszcz authorities when promoting the Old Market Square. Such an element is, *inter alia*, a product – a place.

One of the key elements that should be emphasized when promoting the Bydgoszcz Old Market Square is the cultural heritage preservation during the revitalization processes. The revitalization processes implemented, although numerous and varied, were designed to improve the technical condition and raise the aesthetic value of not only the Old Market Square, but also the historic buildings located in the immediate vicinity. The mixing of history, industry and environmental protection provided an opportunity to combine public and private facilities. Owing to this combination, a business partnership has been created between the objects of the Bydgoszcz Old Market Square and the numerous infrastructure objects around the Old Market Square in Bydgoszcz. Such partnership has resulted, *inter alia*, in improved functioning of the local community and the local economy, but primarily, in the promotion of the Bydgoszcz Old Market Square. One positive premise for such partnership is the possibility of creating

competitive advantage for the tourist region and development of the enterprises cooperating within such a network.

One of the best ways to create and implement a new product – a place – is revitalization. This process allowed new areas of tourist activity in the Old Market Square in Bydgoszcz to be identified, which, owing to the use of marketing tools, can bring economic, social or business benefits to the local community, but also to the tourists visiting the place.

The revitalization of the Old Market Square in Bydgoszcz and the development of urban infrastructure and various tourist facilities and services enabled many initiatives to be undertaken, so as to attract potential tourists. These initiatives include various cyclical events, such as: the Christmas Market in the winter, percussion art exhibitions - DRUMS FUSION, or Music in the City Center in the summer. Organization of such events contributes to the increased recognition of the Old Market Square in Bydgoszcz.

The revitalization also resulted in increased tourist traffic within the Old Market Square and the renovated streets adjacent to it. The revitalized Old Town turned out to be a very appealing place for business, attracting numerous catering and entertainment establishments. As the offer of the service establishments located at and near the Old Market Square increased, so did the inflow of tourists to the area.

The Old Market Square revitalization was carried out in accordance with the ideas of place marketing. Numerous social consultations, organized at various stages of the project, allowed the needs of the city residents to be met more precisely. The transformation of the Old Town, from a degraded area that did not fulfill its social and tourist functions, was undoubtedly a breakthrough moment for the city of Bydgoszcz. The success of place marketing is very complex, dependent on many factors, entities, and is additionally measured by the level of various social groups' satisfaction. Nonetheless, the development of the Old Town as a meeting place with many great venues, charming streets, and attractive architecture, in just a few years, should be considered a success, built on planning, hearing the community, respecting the cultural and historical values, and taking the voice of the entrepreneurs conducting business in the Old Market Square into account.

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IMPROVING BUSINESS MAINTENANCE PROCESSES USING LEAN MANUFACTURING TOOLS – CASE STUDY

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Objective: The aim of this article is to analyze and evaluate the introduction of selected Lean Manufacturing tools into the management of a given enterprise, the task of which is to increase the efficiency of the machine park and improve the quality of finished products. The introduced changes are also expected to increase the detectability of waste, avoid unnecessary stopping of machines and unplanned stoppages.

Design/methodology/approach: As part of the research, the internal materials of the surveyed company were analyzed and free interviews with employees and specialists of the plant were conducted. An efficiency analysis of the production process was carried out.

Findings: In order for the improvement of technical progress to function well, the requirement of an appropriate technical condition and the course of technical progress. The entire process flow of the product should be analyzed.

Research limitations/implications: Subjectivity of the analysis thanks to the use of a qualitative approach in research. Future research may be related to creating a mentoring program in the area of interest.

Practical implications: The results of the study can be used as input data for the design of training programs in the study area.

Social implications: The concept of lean manufacturing is a tool for constant changes that can be observed both in the modern economy and in society. They require dynamic flexibility from entrepreneurs and looking for solutions that can optimize production processes. The concept includes a slogan such as corporate social responsibility, which grew out of sustainable development. It is prioritized by managers of various companies. Therefore, this work deals with the subject of Lean Management as an instrument of responsible business.

Originality/value: This article is addressed mainly to companies that want to implement and improve Lean Manufacturing tools. It shows how companies can improve selected areas of production.

Keywords: logistics, machine park, lean manufacturing, continuous improvement.

1. Introduction

The development differentiation of Polish voivodships can be seen on many levels, including economic, infrastructural, economic, social or human capital, this in turn is reflected in the level of their competitiveness and innovation. The national strategy of regional development indicates that the aim of the state's regional policy should be to increase the competitiveness of regions (especially in the international arena) with simultaneous activities aimed at equalizing development opportunities, and thus aid for less developing regions (Krajowa Strategia Rozwoju Regionalnego 2010-2020). Building, and thus maintaining a competitive and innovative voivodeship is a complex and long-term process.

In the era of strong competition on the market of production and service enterprises, constant improvements of production processes aimed at increasing efficiency and obtaining better economic results is an important element of both their development and the entire region. Enterprises that want to remain competitive must constantly increase their production potential by looking for ways to improve production.

Companies are forced to look for available opportunities to increase the efficiency of the entire enterprise, and in particular taking into account the production processes, so that their efficiency is as high as possible. Each change should be monitored, which allows for a constant search for improvements that increase efficiency and the elimination of waste areas and cost reductions (Anh Nguyen Xuan, 2016).

The Lean concept, used to improve efficiency and effectiveness, provides tools in this respect, i.e. Total Productivity Maintenance (TPM). The pillar of TPM is the belief that it is possible to optimize production processes in a non-investment manner, and the period of operation of machines and devices can be adequately extended by introducing selected solutions in the functioning of maintenance services and the approach to maintenance activities among operators. Therefore, it is not necessary to invest in newer and newer technologies, the payback period of which is sometimes longer than the operational usefulness of the device (Kruczek et al., 2009).

This article aims to analyze and evaluate the use of selected Lean Manufacturing tools in a selected enterprise, which are to enable, above all, an increase in the efficiency of the tested production plant.

2. Lean Manufacturing

The need for improvement has been known in organizations for a long time. Now it has become a requirement and is gaining more and more importance. Internal improvement characterizes enterprises that want to be flexible, quickly adapt to turbulent surroundings and, above all, effective. In production management, there is also a process approach to the organization of production, because in this way it is easier to observe when and how the added value for the customer is created in the manufactured products. All activities improving the process and its better layout allow for more satisfactory economic effects (increase in efficiency, cost reduction, improvement of quality issues), but most of all, the level of customer satisfaction increases (Bhamu, Sangwan, 2014). Improving production is a complex process that can be continuous and slow, as improvement actions can be adapted to the process in small steps. On the other hand, improvement can be implemented on the basis of innovations that, of a radical nature, can lead to breakthroughs in production (Trenkner, 2016).

The positive effects of production improvement can also be seen in the reduction of many disruptions during the implementation of processes. These can appear anywhere, because apart from the main production, disturbances are also found in supporting and controlling processes. Each of these types of processes can be affected by two types of disturbance (Wiśniewski, 2010):

- special – more unfavorable from the quality perspective, as they can significantly affect the properties of a given process and the product itself. They can appear suddenly, but they can also be intensifying and systematic disturbances. If they can be quickly identified with the source, it is relatively easy to remove them completely (example: machine failure, operator error);
- random – usually occurring in large numbers, with a lower degree of interference in the process, although it may lead to its variability. It is necessary to identify them as well as the cause, source of origin, in order to prevent the reduction of their impact, because in theory they are already inscribed in the nature of the process, and their complete elimination is practically impossible (example: a design defect of the material).

By introducing specific improvements and changing the organization of the process, the enterprise is therefore able to limit the impact or fully eliminate many disruptive factors, and also quickly correct the functioning of the process. Thanks to this, financial losses that could possibly be generated can be prevented.

One of the most effective, popular around the world and gaining more and more popularity concept of improving production enterprises is the Lean concept, and in relation to manufacturing processes – Lean Manufacturing (Thurston, Ulmer, 2016).

Lean Manufacturing is a view that has its origin in the Toyota Production System, which dates back to the 1970s and 1980s (Çiarnienė, Vienažindienė, 2012). The leading goal in it is to eliminate waste, which is nothing other than losses for the company (Yamada, 1972). Eliminating losses is considered to be the most effective way to increase the profitability of the enterprise. It is important here to know what exactly is a loss and at what point it is created. In this way, there is a great chance to combat the so-called bottlenecks in the production process throttling and inhibiting the possibility of greater efficiency (Bicheno, 2008). At this point, it is worth presenting the types of waste, taking into account the 3 factors (man, machine, material) that are defined by the Lean Manufacturing concept (Czerska, 2014):

- excessive traffic,
- waiting,
- overproduction,
- overprocessing,
- defects and errors,
- warehousing,
- excessive transportation.

The main value of Lean Manufacturing is the orientation on the constant pursuit focused on the growth of the defined added value for the customer, which is an indication of the direction in which the improvements should go, while the consumed resources and times of product production cycles will be reduced by eliminating the above-mentioned waste ("doing more with less") (Thurston, Ulmer, 2016).

The leading method of Lean Manufacturing is KAIZEN, the idea of which is to constantly improve and improve systems, involving all employees, regardless of their function in the company. In the use of work and workshop, it has the task of leading the progress and technological progress (Gabryelewicz et al., 2015).

One of the core Lean Manufacturing tools is 5S, which has methods to increase workplace safety and increase productivity. The interpretation of the TPM functions is due to 5 that they meet the legalization and legalization of the impacts on productivity and merfet and technology technology, so as not to reap the benefits. It also teaches the discipline necessary to exercise workers as workers (Imai, 2006).

3. Company analysis and research results

The research covered company X, which specializes in the production of plastic cards. It is a company that offers various cards that can be used as discount, gift, loyalty or ID cards. They are largely used in the commercial industry. The company provides products and services to many countries around the world. It is the industry leader in the voivodeship. The company

also offers cards with a paper base, which are an environmentally friendly solution. The following plastics are used for production: PVC, PS (Polystyrene) and PET-G.

The technological process of cards begins with the preparation and delivery to the printer by graphic designers of graphic files that are needed to start a given order. At each station, the necessary materials needed for production should be prepared. For printing the cards, offset printing, digital printing or screen printing are used. The color palette is used for reproduction CMYK (a set of four basic colors: cyan, magenta, yellow and black). Screen printing is used as an auxiliary technique, most often it is used to apply a base, signature panels or UV varnish. The next stage is folding the sheets. The sheets are merged using dedicated machines. It is done by machine picking the materials in the correct order – foil, card back, card face and foil. The prepared sheets are ready for the next stage – lamination.

The main goal of the study is to analyze and assess how the selected Lean Manufacturing tools will improve the manufacturing process. First of all, it enables an increase in the efficiency of the tested production plant.

The introduction of appropriate Lean Manufacturing tools allows us to achieve satisfactory efficiency and quality of manufactured products. The main pillar is implementing the philosophy of continuous self-improvement in employees.

The work includes an analysis of theoretical issues, own observations and an analysis of internal materials of the examined enterprise, as well as free interviews with employees and specialists of the enterprise.

Two research sources were used for the analysis. The first of these are primary sources that result from the analysis of performance data. They also include: a description of the technological process and the introduced Lean Manufacturing tools (derived from own observations) as well as data obtained through free interviews with employees of the company.

The second is secondary sources. They are based on materials provided by the company, including: performance reports, training materials on the implemented 5S tool as well as requirements and standards for the production of cards.

In this article, the company that has implemented 5S management has been observed. Work is still underway to maintain order and discipline at the workplace. The main assumption of introducing the 5S method was to create a work environment that improves quality, reduces waste and increases efficiency. It greatly influences employees by increasing responsibility for tools, activities and processes related to their workplace. 5S is conducive to continuous improvement, both of employees and processes, which affects efficiency.

The person introducing 5S is designed to train employees, show in a simple way that maintaining cleanliness and order and equipping your workstation with the tools necessary for work significantly contributes to increasing the efficiency and comfort of work. The person designated to introduce 5S is obliged to provide and show the employee examples of practical solutions.

The inspected plant gradually introduced changes. Initially, he designated the areas in which the 5S method would be implemented one after another. The main selection criterion was in which part of the enterprise it is most needed to carry out a cleanup action.

In the case of this company, it was a production hall. The first steps that were introduced were to organize the production, to designate places marked with different colors. This was to make employees aware of where to put good products, where bad, with quality defects, and where products that are ready for the next stages of production. In this case, color markings were used. There are designated areas for finished products marked with green tape, for bad ones – red. On the other hand, when it comes to completing one stage of production, the end operator puts a piece of paper with the machine written on the pallet, which is the next in the queue of order execution. There are also designated places for pallets next to each machine, so that everyone knows how to put a pallet and that there is no situation where they will interfere with the work of the operator of a given machine. When it comes to forklifts, there are also designated places to shorten the time of searching for them all over the hall by an employee. They are set up so that each operator has easy access to them.

In addition, each workstation has been tidied up and equipped with the tools necessary to perform work on a given machine. There were also special places for each operator to put them back so as to avoid situations where his substitute, when starting work, did not have an adequately equipped station with the necessary tools.

Information on problems is collected on an ongoing basis from the entire production department. The 5S leader works on delivering solutions and engages employees in process improvement. This is to streamline and optimize production and the employees involved are rewarded for submitting ideas.

For the company, personnel training is a priority. The premise of the plant is the conviction that only well-trained personnel are able to work efficiently and perform the necessary maintenance. In order to verify the correctness of the implemented solutions in the enterprise, an internal 5S audit is carried out once a month. It consists in assessing the strengths of the company that work properly and which can be improved. Supervision has a motivating effect on employees because the committed team is rewarded.

Examples of the productivity of: production machines, machines from the personalization department and employee productivity are discussed below.

Company X has specific capacities for each machine. Starting with the production machines (see table 1).

Table 1.*Efficiency of sample bodies*

Process/machine name	Description	Efficiency per hour
Komo	Obverse print	70000
Komo	Reverse print	70000
Svecia	Varnish printing	15000
Svecia	Panel printing, color	13000
Kolator	Merge sheets	15000
Laminator	Sheet lamination	11000
Punch A	Cutting a card with a key	7000
Punch B	Cutting out	11000
AVI	Automatic control	7000
KURZ-2000	Overlaying a hologram	1900
MM-7000	Applying a magnetic strip	2900
Packing	Packing	18000

Source: own study based on data from the examined enterprise.

As shown in Table 1, each machine in production has a specific capacity per hour. For each shift, managers prepare a schedule for employees with a specified machine and describe in detail how much time the operator can spend on the device and calculate what standard should be performed adequately to the rest of the working time.

Machine operators have been trained for 5S in order to best adapt their work stations. Every tool has its place. The next step in the training of machine setters is to provide knowledge on how to maximize the available time of the machine for production. The maintenance department and the production department, with appropriate cooperation, allow to improve the efficiency of even the most worn-out machine park and reduce the risk of such threats as breakdowns or unplanned stops.

Another department of the surveyed company analyzed was personalization, which is also equipped with a machine park. There are much fewer machines in this section than in production, but the number of functions in which we can personalize the card is very extensive. As a result, the functionality of these machines is very high.

The personalization department is managed in a similar way to the production department. The employees were also trained in the 5S method and the workplace at the machines is adequately equipped with the necessary tools. The higher aspect in the personalization department at the beginning of the training of machine operators was the transfer of knowledge on the elimination of minor failures and the observation of parts that wear out on the machine. Thanks to this, the operator can transfer the required parts to the maintenance worker in advance, so that he can place the order and schedule the replacement in the near future.

Table 2.
Weekly breakdown by shift

Changes	DEPARTMENT	Working time [h]	Instrument time [h]	Objective [pcs]	Execution [pcs]	Efficiency [%]	Productivity [%]
	Change I	BODIES	3 089,5	461,6	24 070020	21 432 860	78,23%
PERSONALIZATION		8 031,5	175,5	11 349465	9 306 415	66,93%	55,20%
Change II	BODIES	2 713,5	428,7	21 292770	17 985 263	72,11%	46,49%
	PERSONALIZATION	5 534,5	94,0	7 779575	5 899 818	64,12%	59,89%

Source: own study based on data from the examined enterprise.

Table 2 describes the time of work and the goal to be performed and what has been done, thanks to which it is possible to calculate losses or profits. From the table above, it can be concluded that the higher efficiencies on the bodies are estimated to be around 80%, while the larger losses and lower personalization efficiencies on a weekly basis are only around 50%. It follows that the introduction of selected Lean Manufacturing tools was more successful in the production department. When it comes to the personalization department, by talking to the operators and employees of the department, come to the source of the problem together. Using the Kaizen method, the idea of which is to constantly improve and streamline processes, involving all employees, regardless of their position in the company.

The implemented selected Lean Manufacturing methods contributed to the achievement of efficiency at the level of 80% up (Table 3). This allows you to estimate what number of finished products the operator is able to produce during one shift. It is a great help for department managers in defining the time necessary to perform a given order and estimating when the order will be ready so that the logistics department can order transport. Before the implementation of the changes, there were crises due to which the delivery had to be postponed at the last minute, which was associated with costs.

Table 3.
Weekly employee performance breakdown

	Working time [h]	Instrument time [h]	Objective [pcs]	Execution [pcs]	Efficiency [%]	Productivity [%]
Worker 1	99,0	0,0	207 500	179 155	81,08%	81,08%
Worker 2	460,0	4,0	5 946 585	5 729 877	93,61%	47,43%
Worker 3	288,0	89,0	2 590 580	3 129 800	105,52%	38,89%
Worker 4	465,0	21,0	4 275 500	3 935 986	86,44%	82,54%
Worker 5	248,0	13,3	1 027 875	978 116	82,16%	77,77%
Worker 6	401,0	55,4	3 497 375	3 429 725	82,59%	42,93%
Worker 7	361,0	36,5	2 146 000	2 222 995	86,37%	77,64%
Worker 8	347,0	33,0	1 836 000	1 958 613	80,36%	72,72%
Worker 9	390,5	111,1	4 002 700	4 134 400	102,78%	40,50%
Worker 10	48,0	0,0	504 000	488 940	89,45%	89,45%

Source: own study based on data from the examined enterprise.

An improvement that influenced the quality of manufactured products and minimized the waste of material was the organization of workstations and equipping them with the necessary tools. The reduction of errors during the production process resulted in the production of smaller additives. From the 8% allowance for a given job, it was reduced to 3%, which contributed to a reduction in production costs.

An internal suggestion program called. By filling in the sheet available in boxes located in each of the production areas of the plant, employees can submit their ideas to improve the production organization system to make it more efficient, or with improved ergonomic conditions in the work area. For the implemented suggestions, a reward system has been established, consisting in the fact that once a month an elected committee meets, which rewards the ideas collected from the month and selects 3 of them that gave the greatest effect in terms of efficiency or ergonomics. And the solutions that will be used are rewarded in the form of a director's bonus added to the basic salary. This gives you even more motivation to share each idea and come up with newer and newer improvements.

Recommendations for further improvement are the introduction of a preventive maintenance procedure, which involves the operators taking care and monitoring of the condition of the machines. The goal is to introduce a routine where employees are required to record each fault, taking into account what exactly failed and what was the repair time. Such information is useful for planning the order and allows you to accurately estimate the time of execution of a given order. In addition, these measures should affect the efficiency and stabilize the quality of production.

In order to increase the efficiency of the personalization department, it will be helpful to analyze the process of repeated orders and create a diagram, thanks to which operators will be able to tune machines faster and more efficiently. The purpose of the solution will be to create a pattern for regularly repeated orders, thanks to which the machine setup time will be minimized. The idea of improvement is to increase the efficiency in a given department, and shortening the machine changeover time makes it possible.

4. Summary

The aim of this article was to analyze and evaluate the introduction of selected Lean Manufacturing tools into the management of a given enterprise, the task of which is to increase the efficiency of the machine park and improve the quality of finished products. The discussed changes increased the detectability of waste, avoided unnecessary stopping of machines and unplanned stoppages. Reducing the number of device failures increases their availability, and thus the efficiency of production departments.

The analysis of the data collected above allows to determine the effectiveness of the implementation of the principles and tools of the Lean Manufacturing concept in the surveyed company. This allows you to see results in terms of increasing efficiency and striving for further improvement.

In order for the improvement of processes to be effective and function well, it requires appropriate recognition of the situation of the examined company and the course of the production process. The entire course of the product process should be analyzed, taking into account each stand separately. This will allow you to capture waste and react quickly to eliminate it. Thanks to the analysis of the process, it is possible to spot the most troublesome stages of production and with the involvement of each employee, both managers and machine operators, it is possible to find a solution to the problem easily and quickly by introducing appropriate improvements.

Research conducted at the Poznań University of Technology shows that the 5S and Kaizen methods are the most common solutions implemented in enterprises among Lean tools. This is due to the flexibility of their application. Referring to these studies, it has been shown how beneficial the implementation of the above-mentioned tools is. The Kaizen philosophy enables or even encourages the involvement of all employees, which makes it easier in the enterprise to implement a culture of continuous improvement at all levels in contact with the production area. The advantage of 5S are the proven effects achieved with minimal investment, which is also part of the concept of reduced production.

The improvement of production processes is continuous and requires constant improvement. The direction of improvement should result from such conditions as optimization changes and customer and market requirements, or improvements, exclusions for improving the course of the process. By presenting such an attitude and carrying out production, you can count on success and safe work in the industry sector. In the era of additions, additions, and errors that are completed and necessary.

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ECONOMIC CONDITIONS OF LEGAL REGULATIONS DURING THE COVID-19 PANDEMIC

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Purpose: The purpose is to present the importance of law for the proper functioning of the state economy within an international organization during the Covid-19 pandemic.

Design/methodology/approach: analysis of the legal regulations, comparative studies.

Findings: Distinguishing the positive and negative aspects of the law's impact during the pandemic crisis.

Originality/value: Linking the legal and economic dimensions at the two levels of the state and the European Union (EU) integration grouping. Analysis of selected regulations of economic life from the perspective of law and economics.

Keywords: European Union, legal regulations, the Covid-19 pandemic.

Category of the paper: Conceptual paper.

1. Introduction

The World Health Organization (WHO) has declared a coronavirus outbreak on January 30, 2020. The public finances of many countries have been challenged to increase public spending. The European Union faced a serious economic threat after the 2007-2008 crisis and the progressing slowbalization. The response of states and the EU became a proliferation of ad hoc regulations (covid law) and strategic documents, which became a determinant of the fight against the virus treated as a cyclical irregular phenomenon in order to create a resilient economy at two levels within the nation state and the EU (strong interdependence between levels). The Law & Economics stream has shown that important connections between these areas have been evident for centuries, as evidenced in modern times by, for example, the development of constitutional economics. Hence, the Public Choice area explores the importance of government regulation of business, which boils down to: price setting, subsidies, taxes, etc. Regulations, according to the statement of K. Jajuga, are the linking element between

these two areas (Jajuga, 2015, p. 37). In terms of their economic evaluation they are divided into: positive theories of regulation – welfare economics, negative concepts – Chicago School (Stigler, Peltzman, Becker) (Göran, Hägg, 1997, pp. 338-351), the Virginia school (rent-seeking theory) and mixed (Stiglitz, 2020) – both excessive overregulation of the economy and excessive deregulation have negative consequences (Bochenek, 2016, p. 219).

The article defines covid laws more broadly as all legal norms at various levels (state, international groupings) that directly or indirectly affect economic reality. The link between them is public character and scope of impact. The epicenter of consideration was health (as a public welfare) and human life, the legal protection of which determined economic life. By early November 2020, more than 50 million people worldwide have been infected with coronavirus. More than 12 million, which is 25% of them, are living in Europe (C10, 2020). The epidemic crisis itself was characterized by:

- black swan model structure, it was evolving and disruptive, increased uncertainty among producers, service providers, and consumers,
- simultaneous demand shocks (shortage of protective and specialized medical equipment for hospitals) and supply shocks (oil problem, physical closure of companies) and reduction of investment plans under the influence of uncertainty or due to liquidity constraints of companies (C4, 2020, C11, 2020),
- symmetrical impact on European countries and asymmetrical in terms of entities, as the sectors most affected were those requiring face-to-face interactions, such as cultural and creative industries and aviation industry (due to decreased mobility), while the least affected were pharmaceuticals and digital industries – the acceleration of digital transformation, and asymmetrical impact in terms of geography – the crisis was felt most in the epicenters of globalization, e.g., multi-million agglomerations,
- in terms of consumption, its decrease was observed in relation to luxury products and an increase in the importance of basic commodities (Kudelko, Wałachowski, Żmija, 2020, p. 41; European Parliament, 2021a; Matera, Skodlarski, 2020, pp. 363-369).

The economic and social situation has increased the demand for public aid and public service delivery. In this extraordinary situation, economic life was significantly affected by legislation:

- a) aimed at saving human lives – restriction of movement (only the movement of goods), closing borders, strict restrictions on conducting business in selected areas – lockdown.
- b) support (aid) for entrepreneurs and individual sectors of the economy, two-dimensional:
 - obtaining benefits, e.g., benefit for idle time for entrepreneurs and contractors (EU and national level):
 - reducing obligations to the state, e.g. fiscal revenues to the state budget (national level). All the measures implemented in group b) were primarily aimed at protecting the economy and saving jobs. Historical experience with epidemics shows that all kinds of quarantines and epidemic restrictions have always

resulted in economic losses, e.g. to maritime trade (Scott, Duncan, 2020, Bartosiewicz, 2020, p. 16), which nowadays in connection with job losses leads to protests in many European capitals. Legal regulations also play an important role in the EU cohesion policy, as evidenced by discussions around financial support for member state economies linked to compliance with the rule of law standards. The purpose is to present the importance of law for the proper functioning of the state economy within an international organization during the Covid-19 pandemic. In the article EU perspectives were adopted, without discussing the actions of individual countries.

2. Polish response in the field of legal regulations to the Covid-19 pandemic

In the first phase of the Covid-19 pandemic, the dominance of actions taken by the states themselves was apparent. First of all, borders were closed, national budgets were modified, and public spending, including for health care, was increased. This was a particular problem for countries that had not previously invested in this sector. Some have even pointed to a period of fascination with the nation-state from the mercantilist era or the return of Keynesian concepts (demand stimulation). The global financial crisis of 2008-2009 also started a discussion on the effects of the dominance of the neoliberal doctrine in economics, which has brought increased income inequality, neglect of climate change (Europa 2050, 2020). The pandemic has become a difficult drift between liberty and the common good (a problem for economists). In connection with the fact that at the beginning of the pandemic there was a problem with access to personal protective equipment, medical supplies (e.g. Italy), in subsequent stages it concerned access to tests, vaccines (Hungary approved the vaccine Sputnik), countries became model homo oeconomicus maximizing supply of necessary resources to their countries, this time intentionally (unlike in the vision of A. Smith). The scale of individual public aid from member states was significant (at first it was ad hoc activity, later accepted by the EU). Some legal solutions did not work out, a classic example being the issue of border regions in Poland.

In Poland, the fight against the Covid-19 pandemic began in March 2020. Important for the functioning of any economy is its specific economic system, which in the Polish Constitution is called a social market economy (Art. 20, 22 of the Constitution of Poland of 1997), juxtaposing economic freedom with its statutory restrictions. The pandemic, on the other hand, dramatically increased the number of restrictions affecting the economy. There was no crisis management in the first stage. In Poland, no crisis team had been appointed by the end of June. All decisions were made by the Minister of Health, who declared an epidemiological threat emergency from March 14, 2020 (Rozporządzenie Ministra Zdrowia z dnia 13 marca 2020 r..., 2020; Golinowska, 2020, p. 13) due to Sars-Cov2 virus infection, and then on March 20

an epidemic crisis was declared (Rozporządzenie Ministra Zdrowia z dnia 20 marca 2020 r..., 2020). In response to the health and economic situation, the special purpose act (Ustawa z 2.03.2020 r..., 2020) was created, the alternative of which was the introduction of a state of emergency (the problem of compensation from the State Treasury). Since March 31, 2020, a number of regulations of the Council of Ministers (repeatedly adjusted to the current situation) on the establishment of certain restrictions, orders and prohibitions in connection with the occurrence of the epidemic crisis have been introduced (Rozporządzenie Rady Ministrów z dnia 31 marca 2020 r..., 2020). After 3 waves of the pandemic some regularities are clearly visible: waves: increase in incidence (lockdown), decrease in incidence – easing restrictions (return to economic activity in particularly vulnerable sectors). However, it is apparent that each successive wave is gentler on the economy than the previous one. This is influenced by greater research coverage (testing, vaccination). For example, the wave of infections in the fall of 2020 and the accompanying tightening of restrictions led to a decline in production at the end of the year, although to a lesser extent than in the first half of 2020 (OECD, 2021).

In Poland, the main response to the economic problems resulting from Covid-19 was a set of laws known as the anti-crisis shield, supplemented by implementing regulations. The shield has evolved from level 1.0. through 2.0, 3.0, 4.0 to 5.0 (industry shield) (covering the period from April 1 to October 2020). It is based on 5 pillars: employee safety (e.g. wage subsidies, assistance for self-employed employees), financing of enterprises (program of the new chance policy for SMEs, health protection (digitization of health protection), strengthening of the financial sector (regulatory package of the Financial Supervision Authority and the Ministry of Finance), Public Investment Program (modernization of schools) (Kudelko, Wałachowski, Żmija, 2020, p. 96). It comes down to:

- Job protection and employee security (this is still an important issue as in Q2 2021 almost 1/4 of the unemployed, i.e. in the group of 466,000 unemployed previously working, 110,000 (23.6%) of them indicated that the termination of their most recent job was a direct result of the COVID-19 pandemic; however, in the previous quarter it was 27.3%) (GUS, 2021c).
- Financing entrepreneurs (corporate financial results in 2021 were higher than in the critical year 2020, Total revenue was 19.7% higher than a year earlier, and tax deductible revenue increased by 16.2%) (GUS, 2021d).
- Health care. In 2018 Poland spent only €830 per capita on health care (PIE, 2021). In 2019, 4.3% of GDP was spent on health care in Poland (public funds). The mean for the group of countries analyzed is 6.53% and the median is 6.42%. Poland had 3rd lower score in this group. In 2019, public spending on health care in Poland, in relation to GDP, was lower than in all neighboring OECD countries (Skóbel, Kocemba, Rutka, 2021, p. 2).

Moreover, it concerned strengthening the financial system and public investment (a tribute to Keynes). The estimated value of the Anti-Crisis Shield support, including the financial one, is PLN 312 billion (Serwis Rzeczypospolitej). In shield 1.0 the management of the budget of the state as well as local governments was made more flexible, especially fiscal rules of local governments, the Liquidity Guarantee Fund (Fundusz Gwarancji Płynności) in Bank Gospodarstwa Krajowego was created, a whole range of tax and system solutions, e.g. e-receipt were created, special regulations between employees and employers (one-month idle work benefits; their scope was extended in the shield 2.0) were created, working time was made more flexible. In shield 2.0 the selected changes include: exemption from social security contributions, expansion of the circle of micro-entrepreneurs in terms of support from the Industrial Development Agency (in Polish: Agencja Rozwoju Przemysłu), expansion of changes in the issue of public procurement, support for non-governmental organizations. Shield 3.0 expanded exemptions from social security contributions, included decapitalization of the Industrial Development Agency (development institution) with cash up to PLN 900 million, support for bus transportation. In shield 4.0 particular focus was on the support for local government budgets. Shield 5.0 was already industry-specific, concerning the tourism, stage and exhibition industry (e.g. additional benefit for idle time). It is worth noting that the flexibility of the provisions is apparent, as the term concerning the so-called negative economic consequences was not defined and was left to the individual assessment of entrepreneurs, which increases the number of applicants (Bartosiewicz, 2020, p. 42; Kudelko et al., 2020, pp. 77-98, Ustawa..., druk sejmowy nr 330; Ustawa z dnia 16 kwietnia 2020 r..., 2020, Ustawa z 14 maja 2020 r..., 2020, Ustawa z dnia 19 czerwca 2020 r..., 2020). The laws in force in Poland often contained certain gaps, repetitions and were sometimes unclear to market operators, which seems to be the result of ad hoc actions. Controversy arose over Regulations of the Council of Ministers as sources of law in the context of sanctions. The shield was supported by, among other things, changes regarding development institutions (Ustawa z dnia 31 marca 2020 r..., 2020): In Poland, aid could also be granted to an entrepreneur in a difficult economic situation in order to enable him/her to carry out business activities for a period necessary to develop a restructuring plan or a liquidation plan for the company. As a result, the number of companies that declared bankruptcy in the second quarter of 2021 amounted to 84, and was 46.5% lower than in the same period of 2020. A decrease in the number of entities that declared bankruptcy was reported in manufacturing (17 vs. 40), trade services; repair of motor vehicle (20 vs. 41), services (12 vs. 25), construction (16 vs. 19), and transportation (6 vs. 13). An increase in the number of enterprises that declared bankruptcy was recorded for accommodation and catering (6 vs. 5) as well as information and communication (4 vs. 3) (GUS, 2021 b; Ustawa z dnia 16 lipca 2020 r..., Dz.U. 2020, poz. 1298). Therefore, activities in this sector should be continued.

The Polish Air Navigation Services Agency, in a report on changes in air traffic in Polish airspace in 2020 compared to 2019, showed declines that appeared especially during the first lockdown in April (-87 percent), May (-85 percent) and June (-83 percent). For the entire year

2020, the number of total aircraft operations decreased by 58.7 percent to 376,900 operations (Polish Air Navigation Services Agency, 2020). The largest drops were recorded in Warsaw. Significant changes concerned also tourism in its broadest sense. The tourism sector is particularly important in the EU for countries such as Croatia, Cyprus, Greece and Portugal (European Commission, 2020c). In 2019, the contribution of the travel and tourism sector to Polish GDP in 2019 was 1, 9% (Obłąkowska, 2021, pp. 195, 204). Supply in Poland was high, while potential demand was radically decreasing, limited by state regulations (Matera, Skodlarski, 2020, p. 363). A number of measures have been taken to mitigate the effects of the lockdown. As part of Poland's fiscal policy, tour operators were reimbursed for their contributions to the Touristic Guarantee Fund for packages canceled due to the epidemics (UNWTO, 2020). Accommodation services and tour guide services were also supported. Under the monetary policy, the Polish Financial Supervision Authority (in Polish: Komisja Nadzoru Finansowego) undertook activities related to reserves and reclassification of loans to existing SMEs to allow for offsetting credit losses over the longer term. Some flexibility was provided in how banks met capital and liquidity requirements. Poland has focused on developing domestic tourism through free vouchers for families with children (Ustawa z dnia 15 lipca 2020 r..., 2020; Carmona, 2020). As a result, there is an increase in interest in facilities in Poland during the months of easing restrictions. In April 2021, 379.8 thousand tourists used tourist accommodation facilities, 4 times more than in the previous year (GUS, 2021).

Overall, after Poland's GDP fell by 2.7% in 2020, OECD in May 2021 projected it to grow by 4.7% in 2022, the EC in turn by 5.2%. The forecast is therefore relatively optimistic. The dilemmas facing Poland are the effects of the projected 4th wave of the epidemic, along with growing social discontent, which is important if only for the concept of the political business cycle, and the remaining challenges posed by the EU – problem of the coal sector in Poland and the costs of transitioning to a green economy. Economic policy continues to pursue fiscal support and accommodative monetary policy.

3. Regulations of the European Union as an international organization in relation to the Covid-19 pandemic

The region can be analyzed on several levels. Etymologically, *regionalis* means concerning an area. It can be understood in the administrative-legal sense as part of the state (Horodecki, 2010, p. 38). In line with the principles of international economic relations the region will be identified much more broadly as a continent or a part of it in the form of an international organization – geographical region of the world (Olesiuk, Vaschenko, 2013, p. 68). In this case, it deals with the issue of functioning of the European economy, and in particular of the countries forming an integration grouping called the EU. Of key importance to this dimension is regional

integration, which creates blocs of economically cooperating countries that are part of the global economy. In this dimension, geographical area is important (Olesiuk, Vaschenko, 2013, p. 68). The EU was founded for economic reasons, is currently at the furthest stage of integration in the world (Economic and Monetary Union), has a common axiological system, is a manifestation of regionalization and globalization (Horodecki, 2010, pp. 41-42). It should be remembered that in the structure of the EU, the member states play a decisive role, but there are also differently defined regions which are beneficiaries of public funds coming from the EU (NUTS) and the public administration of the nation states. They are vertically and horizontally related to the levels analyzed (cohesion policy). The European regional system is a mixture of different institutional, cultural, social and economic factors. The relationship between member states has changed with successive EU treaties (primary legislation). Within the EU, legally binding instruments include regulations, directives and decisions, while non-legally binding instruments include, for example, opinions. Due to the actions taken by EU bodies on an ad hoc basis, the article takes into account the normative acts, which, like recommendations and opinions, are not binding for their addressees, e.g. communications (Biernat, 2021, p. 31, Art. 288 TFEU; Barcz, Wyrózumska, Górka, 2020, pp. 273-274). The economic position was determined by the EMU and the legal position by the Treaty of Lisbon (2009) creating a uniform and coherent international organization with significant autonomy of its own legal order (the role of the organization's norms in relation to the national legal order). The state within the EU has meta competencies (competencies of competence) and is in a special process of interdependence with the EU. It needs to improve its economic efficiency (double speed integration process). The more efficient the state, the greater its ability to influence the decision-making process of the EU. It is worth pointing out the competences of the EU in relation to the member states in the discussed issues: exclusive (competition rules), shared (economic and social cohesion, public health) and supporting activities (tourism) (Barcz, Górka, Wyrózumska, 2020, pp. 44-48, 115; Olesiuk, Vaschenko, 2013, p. 92).

The pandemic forced a quick response of the EU e.g. in relation to the 2007-2008 crisis. In January 2020, the EU focused on the concept of better lawmaking (C2, 2020). On March 13, 2020 the EC set out the *European coordinated response to counter the economic impact of the Coronavirus*, with particular attention paid to the need to protect aviation and supply chains (especially in relation to China, as the EU is also an actor in the global market). Special attention was given to EIB resources (C1, 2020). The first phase used those measures that did not require approval of the EC. The specificity of regulations concerning the state aid in the EU not interfering with the rules of free competition required notification to the EC. This concerned Article 107 of the TFEU with criteria such as exceptionality, causality, proportionality. European authorities dealing with competition have been regularly finding monopolistic practices e.g. google (favoring services in Internet search engine, abuse of dominant position in mobile telephony market (Stiglitz, 2020, p. 81). The European Commission has expressed its readiness to adopt an appropriate legal framework for declaring aid to remedy a serious

disturbance in the economy compatible with the internal market (Kopeć, 2021; Kudelska, 2020). The list of member states that have received EC approval for state aid in the period 2020-2021 is presented by A. Bartoszewicz (Bartosiewicz, 2021, pp. 151-157; European Commission, 2021). Therefore, the EU had to make the provisions more flexible to accommodate extraordinary expenses. Particular attention should be paid to state aid measures adopted pursuant to Article 107 sec. 2 let. b and sec. 3 let. b of the TFEU in respect of Poland. The EC concluded that the coronavirus epidemic qualifies as an exceptional occurrence because it is unpredictable in nature with a significant economic impact. Therefore, exceptional interventions by member states to compensate for the damage associated with the epidemic are justified. The EC approved, in accordance with EU state aid rules, a Polish program to partially compensate large companies for damages suffered due to the pandemic outbreak, which was part of a broader Polish support scheme, the so-called Financial Shield for Large Enterprises (European Commission, 2021b; 2020b). In turn, in May 2020, the EC approved a Polish program of aid to SMEs worth about €1.6 billion. In September 2020, the EC approved an aid program in the amount of €32 million to compensate airports for the damage caused by the pandemic outbreak. On March 15, 2020, Poland banned all international and domestic air passenger services at Polish airports (European Commission, 2020).

In order to counteract the effects of the pandemic crisis, the EU introduced, in addition to Article 107 of the TFEU – Temporary Framework for State aid measures (5 times modified on April 3, 2020, May 8, 2020, June 29, 2020, February 1, 2021). This concept is meant to mean multiple aid from the states in the form of direct subsidies, repayable advances or tax benefits, in the form of loan guarantees, subsidized interest rate of loans, etc. The most important changes include the shift from approving aid schemes to taking individual aid into account, the increase in aid thresholds and the increase in the duration of the framework until the end of 2021. In the period from March to December 2020, the EC issued 399 decisions on aid concerning programs as well as individual ones (24 decisions concerning Polish aid measures) in this regard (Kopeć, p. 4, C3). The concern with state aid is that easy access to finance leads to the creation of low-productivity companies (zombie companies). The popularization of zombie companies increases barriers to entry the market and makes access to finance more difficult for healthy companies (Europe 2050, 2020, p. 36).

The situation of European companies determines to a large extent the European labor market. Young people and women were the most disadvantaged during the pandemic. The unemployment rate rose sharply in 2020 in both the EU 27 and the Eurozone, reaching 7.8% and 8.7% respectively in the period from July to September 2020 (European Parliament, 2021a). In the EU-27, 1.1 million young people aged 15-24 and another 1.02 million aged 25-29 lost their jobs between the fourth quarter of 2019 and the first quarter of 2021. Youth employment for the age group 15-24 fell from 33.4 % to 31.2 % (-2.2 pp.). The fourth quarter of 2020 confirmed the increase recorded in the previous quarter, albeit at a more moderate pace. Hence, young people are still far from their level of employment before the onset of the crisis (figure below) (European Parliament, 2021b, pp. 14-15).

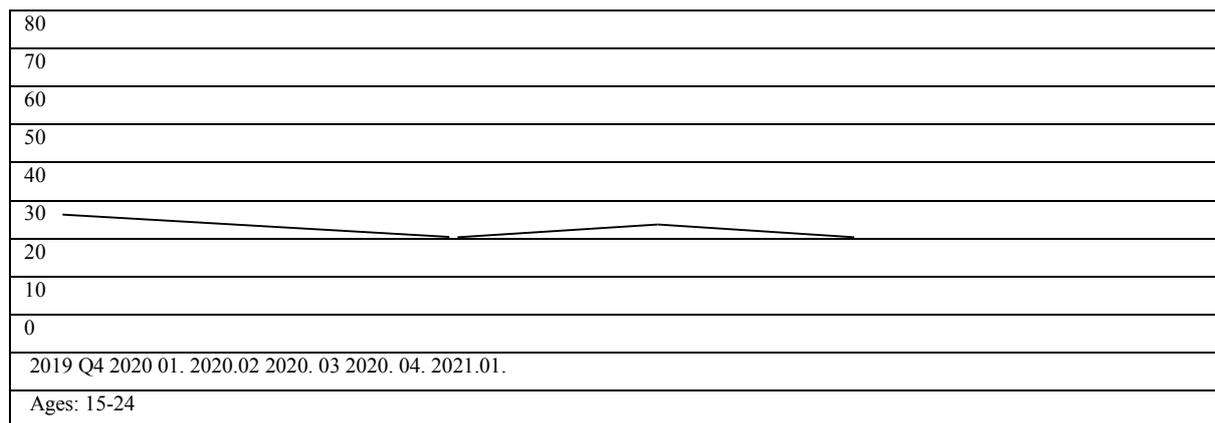


Figure 1. Youth employment rates (European Union). Source: European Parliament, 2021b, p. 14.

In contrast to economic recessions in 2008, the governmental measures to halt the pandemic have had the most indirect impact on the economic sectors in which women tend to be overrepresented – i.e., gastronomy, hospitality, retail, care, domestic work (European Parliament, 2021c). Between March 2020 and February 2021, the number of unemployed in the EU rose by around 2.4 million, of whom more than 1.3 million were women. Female unemployment increased by 20.4 percent, against 16.3 per cent for men (Social Europe Publishing, 2021, p. 1).

The EU has therefore launched the Support to mitigate Unemployment Risks in an Emergency (SURE) instrument, which complements national measures taken by member states to combat unemployment and protect jobs. Financial assistance takes the form of a loan from the EU to a member state. The maximum amount of financial assistance shall not exceed €100,000,000,000 for all member states (RC1, 2020). By the end of 2020, member states had requested assistance in the form of a loan of over €90 billion and received it (C9). The EU has authorized more than €2 trillion for support of business. The EU tools are used to assist in joint actions of states (offensive side) and to respond to actions of third countries (defensive side) (Ananicz et al., 2021, p. 31). Due to the fact that the EU implements a common transport policy and this is a sensitive sector during the pandemic, a regulation has been introduced giving options to reduce, waive or defer minimum access package and reservation fees for this type of service (Rozporządzenie Rady Ministrów z dnia 31 marca 2020 r..., 2020). The EU will support member states without forgetting its long-term goals of the European Green Deal and the Digital Agenda (2050). The EU has explicitly defined resilience as the ability to cope with economic, social and environmental shocks or persistent structural change in a fair, sustainable and socially inclusive manner (RC2, 2020). Despite the appearances, the pandemic in some ways favors environmental solutions. In the automotive industry, for example, despite the decline in demand for new vehicles, the impact of the pandemic on demand for electric vehicles appears to be much less severe (European Parliament 2021a). In relation to EU external interests, the *Team Europe* principle is adopted (EIB and EBRD funds) (C5, 2020).

The EU launched a proposal of the European Recovery Plan using a common pool of financial resources to be financed by borrowing from financial markets, known as NGEU Eurobonds with a total value of €750 billion (Riccardo et al., 2021, p. 230; Bańkowski et al., 2021, p. 5, C11, 2020). The Next Generation European Union (NGEU) fund issued its first bonds in June, raising €20 billion (World economic outlook update, 2021). Grant funds are to be repaid from new own sources e.g. digital tax or contributions from member states, deferred until 2058, while those from loans will be covered by borrowing countries. By issuing bonds, the EU becomes a basis for macroeconomic stabilization in the region and a player in financial markets (Ananicz, 2021, p. 25). In some industries, dynamic acceleration can be seen (digital industry). It is worth mentioning that in 2020 nearly 60% of the population had access to the Internet, 4.6 billion people were its users (Matera, Skodlarski, 2020, p. 389). Today, added to this are e-services, e-purchasing, e-education, e-administration, e-learning, and the transition of entrepreneurs to the online sector.

In summary, the EU response to the pandemic crisis included:

- Recovery Plan for Europe (€750 billion – Next Generation EU, €1074 billion EU budget),
- Budgetary flexibility,
- Coronavirus Response Investment Initiative (EU Cohesion Policy),
- State aid and financial rules,
- Additional safety nets (SURE 100 billion for employees, European Investment Bank (EIB) – 200 billion for companies, ESM 240 billion for citizens (European Commission, 2020d).

The EU also pointed to the importance of research on Covid-19 to accelerate the fight against the disease and stimulate the development of the medicinal products sector on the one hand and to lead to economic recovery on the other (C7, 2020). High hopes for the economies of European countries have come from accelerated vaccination and increased number of tests performed. The concerns facing the EU are related to new variants of the virus and the 4th wave of the pandemic. However, the EU focuses on maintaining the uniform market while increasing restrictions, but not as radically as at the start of the pandemic (C8, 2021).

Conclusions

The Law & Economics stream indicates that the market is extremely sensitive to legal regulations (positive and negative impacts). The market in democratic countries is free but regulated at the same time. It is impossible to go through all the sources of law and leading EU communications in this article. However, the selected examples show that it is the legal regulations that have significantly influenced the demand and supply in both the domestic and

European markets, in order to protect the most important value – human life. However, the market is a phenomenon not an entity. From the market perspective, restrictions have a pejorative dimension. Because coercion is a national case, the strongest effect of law is at the state level (fear of sanctions). However, as the scattered initiatives of member states distorted the functioning of the internal market in the first phase of the pandemic, significant public aid was supported by the EU. This would not happen without legal instruments.

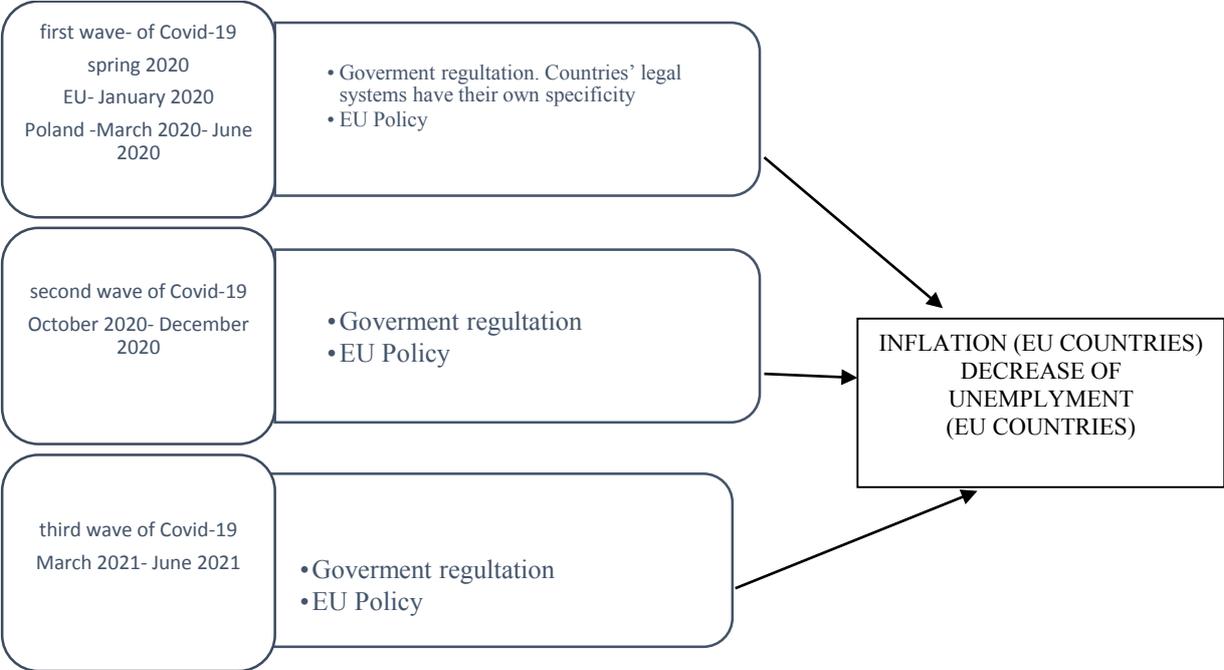


Figure 3. 3 waves of Covid-19 pandemic. Sources: PIE, 2020.

Assuming the stages of pandemic development, it is clear that the initial period is dominated by the negative impact of the necessary legal regulations on the economy of the so-called regulations restricting business activity. Although the pandemic is not over yet, with each wave of the pandemic we can see an increasing number of positive regulations (aid) and the first socio-economic effects of their implementation. In crisis situations, interventionism intensifies, as shown by the history of economic crises e.g. New Deal of F.D. Roosevelt. This involves modifying public spending, refocusing economic policy goals, and building long-term strategies. Far-reaching activity of a state raises concerns among economists. However, the causes of the modern crisis are not economic but natural. It seems that the activities indicated above are justified, because there can no longer be an economy of uncertainty, it must be replaced by an economy of resilience, for the EU is a global actor. The system of interdependence between the EU and member states remains strong. Integration of countries within this grouping will not stop but will change, i.e. slow down in some areas and accelerate in others, such as in the digital sphere. It seems that in the future the changes may affect the primary law of the EU.

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FACTORS' EXPLORATION OF THE INNOVATIVE DELIVERY FORMATS' DEVELOPMENT IN E-GROCERY

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Purpose: The main purpose of this research is to investigate acceptability of different delivery methods in e-grocery and to show the direction of e-grocery development desired by consumers.

Design/methodology/approach: For the purposes of the article, qualitative research (FGI) was carried out, the research sample consisted of 36 participants differing in terms of age and purchasing routines. The research was conducted on Polish citizens, and due to the prevailing pandemic, the interviews were conducted online. In addition, the authors analyzed the literature on the subject, which helped to distinguish and describe the methods of delivery.

Findings: The conducted qualitative research proves that the most friendly and known form of delivery is door-to-door delivery. High hopes are placed in the development of stationary parcel machines (with different cooling zones) for perishable products. Drones have been recognized as a solution for the future that is currently not adapted to the needs of the present and is not covered by legal standards. Similar concerns were highlighted in the case of an unmanned mobile refrigerator. Receiving online purchases in a stationary store is a kind of a compromise between online shopping with delivery and traditional grocery shopping carried out entirely in the store. Moreover, older groups of interviewees emphasized the issue of online shopping safety during the Covid-19 pandemic. The youngest group of interviewees emphasized ecological factors such as reducing the carbon footprint as an important issue of e-grocery purchases, and perceived the use of too large packaging (too much plastic) as a minus.

Originality/value: The expectations of the demand side as to the method of delivering e-grocery purchases were examined. The advantages and disadvantages of individual solutions for the delivery of perishable products purchased online were indicated, according to the assessment of representatives of different age groups with different purchasing routines (division into stationary and non-stationary shoppers).

Keywords: e-grocery, delivery methods, pandemic Covid-19.

Paper type: Research paper.

1. Introduction

The coronavirus pandemic has a crucial influence on every human being in many areas of life such as education, professional work, and health as well as food consumption and dietary habits of people. The United Nations' Food and Agriculture Organisation (FAO) has discussed various effects of global consumption during the Covid-19 pandemic, including limited access to the food markets. In many countries, restaurants and eating places are closed. Moreover, there are restrictions to grocery shopping like the limited number of people in buildings or even the entire closure of particular types of shops (Eftimov et al., 2020).

In the face of the threat and growing uncertainty, population was accumulating stocks and buying products with a long shelf life which resulted in an increase in the sales volume. The change of the existing traditional model of trade into e-commerce was stimulated by intense development of modern technologies and the general access to the Internet (Gemius, 2020). This article focuses on the development of the e-grocery market. Special attention was paid to modern methods of delivering non-durable products. The aim of the paper is to explore factors of the innovative delivery formats' development in the e-grocery. For this purpose, qualitative research was carried out on a sample of 36 people diversified in terms of age and the way of shopping for food.

2. Theoretical background

There is no doubt that the current pandemic negatively affected many traditional enterprises (Wang et al., 2020; Oktavia et al., 2021). The new situation has created an opportunity for the development of e-commerce enterprises (Surjandy et al., 2021). The e-grocery business model has become widespread especially during the pandemic (Kim, 2020). Fear of being around potential infected people in generally accessible places contributed to a change in the purchasing behavior for many consumers (Guberina, Wang, 2021). The feeling of insecurity caused by the current pandemic leads to many ill-considered behaviors (such as buying in panic) and duplicate patterns found in other countries, which is very simple in the era of social media. ABC News indicated that anxiety about the virus spreads fast in age of social media and resulting in anxiety among people (Ahmad, Murad, 2020). As a result, consumers try to maintain control over the changing environment (Kozłowska, Abramowska et al., 2020). Very few empirical studies were carried out to investigate the consumer online shopping behavior of grocery products. In a theory explaining online food shopping behaviors, five important characteristics are (Alaimo et al., 2020):

1. influence of relatives or friends on shopping choices, also known as social norms,
2. degree of difficulty in reference to information acquisition and use of technology to complete transactions,
3. compatibility of online grocery shopping with personal values and lifestyle,
4. advantages perceived by consumers in offers presented by online shops in comparison to traditional purchase channels and
5. perceived risks connected to the online purchasing process like problems with payment or quality.

The changes in retail purchasing behavior during the Covid-19 pandemic were visible (Table 1.). In the context of growing consumer concerns about loss of health during COVID-19 pandemic many grocery stores have chosen to launch home in-house deliveries or mobile applications (for example via the Glovo mobile app). More and more Poles use online shopping and use various payment and delivery methods (Grygierek, 2020, p. 13), including the largest Polish networks as Biedronka, Lidl, or Żabka. It is worth mentioning that previously selected grocery chains offered such a service before the pandemic, but its real boom occurred during the time of lock-down. Consumers who were concerned about issues including health are more likely to spend more money on home deliveries (Unnikrishnan, Figliozzi, 2020). Consumers worried about the prices of products in stationery stores are less likely to use house deliveries.

Table 1.

The retail trend in Poland and COVID-19

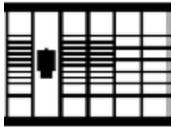
Turnover (constant prices)		March 2020 as % of March 2019	April 2020 as % of April 2019	May 2020 as % of May 2019	June 2020 as % of June 2019	July 2020 as % of July 2019
Retail sale of food, beverages and tobacco	Poland	102%	89%	93%	93%	97%
	Central and Eastern Europe GDP weighted average	106%	94%	97%	97%	99%
Retail sale in non-specialised stores with a prevalence of food, beverages or tobacco	Poland	102%	90%	93%	93%	98%
	Central and Eastern Europe GDP weighted average	106%	94%	97%	96%	99%
Retail sale in specialized stores with a prevalence of food, beverages or tobacco	Poland	100%	89%	90%	94%	95%
	Central and Eastern Europe GDP weighted average	99%	86%	92%	97%	97%

Source: own elaboration based on European Institute of Innovation (2020).

By conducting a focus group interview, the authors would like to determine the range of changes that have occurred in the purchasing behavior of fast-moving consumer goods (FMCG), including the preferences for food (e-grocery) delivery formats.

In the article, e-grocery is defined as on-line grocery being an intensely competitive, low margin and high volume industry that has evolved rapidly from a simple form of local operation to an industry that is dominated by global companies making the best of advanced technologies and complex operations that are often offered to the retailers as "standard application models by external consultants and advisers" (De Kervenoael et al., 2006). Several forms of deliveries could be defined for e-grocery such as door-to-door delivery, click and collect – lockers, Click and collect – Pick Up from the store or some future formats as drone delivery or Impersonal mobile locker (table 2.)

Table 2.
E-grocery delivery type description

Delivery type		Description
	Door to door delivery	We include door to door shopping to the attended home e-grocery delivery. This is food delivery restricting travel to the store. Online purchases are delivered to the consumer's door via courier.
	Click and collect – Lockers	E-grocery delivery to a dedicated and properly adapted locker installed at the customer's yard. The order is processed without the presence of the consumer. The collection of the order is possible thanks to the generated access code.
	Click and collect – Pick Up from the store	The click-and-collect option allows for ordering online and picking the order from the store or a locker placed next to the store.
	Drone delivery	The customers are able to order goods as food through their phone and have them drone delivered at their house.
	Impersonal mobile locker	An unmanned vehicle with cabinets properly prepared for transporting food. Delivers the e-grocery order to the previously designated pickup location.

Source: own elaboration based on Miliotti et al., (2020).

Before Covid-19 pandemic, the most preferred delivery format in e-grocery was door-to-door delivery. However, pandemic changed preferences (Milioti et al., 2020), and new formats of food delivery have begun to gain popularity. Main purpose of the study presented in the paper is to determine the factors influencing this change.

3. Research method

In the outlined situation of the SARS-CoV-2 pandemic, the main research aim has been posed. We want to discover why in the pandemic people changed their purchasing behavior or why they did not. Focus groups interviews (FGIs) were chosen as a method of collecting data for this purpose, because it enables to discover the way how and why customers think and decide (Olejnik, Reshetkova, 2021). Basic research questions were asked about the new purchasing e-grocery model in the Polish market. Moreover, respondents were asked about using e-grocery pick-up points (lockers) as an alternative to stationary but also door-to-door shopping models. It was assumed, that age demographic variable and attitude towards buying food (traditional and on-line) as behavioural variable are important control variables in the research. Followed by Thiruvenkadam and Panchanatham (2016) demographic factors such as gender, age, education, family type and income have a crucial influence on the behaviour of grocery shoppers. The distinction between online and traditional shoppers was based on a need to differentiate research criteria.

FGIs were carried out in 3 different age groups with people who use the e-grocery model and in other 3 different age groups with people who are not familiar with this shopping model and stay in traditional shopping models. In that case, two different scenarios had to be created. In order to properly define the sample, it was necessary to use a survey (in this case it was an online questionnaire) – *the full recruitment questionnaire is attached*, to help select participants before the actual test (focus group). The authors of the recruitment questionnaire envisage 3 following paths:

1. catching people responsible for grocery shopping in their household and using only stationary stores during a pandemic,
2. catching people responsible for grocery shopping in their household and using online and brick-and-mortar shopping, or only online, during a pandemic and
3. eliminating people who are not responsible for providing their family with groceries.

It is worth emphasizing that the research was successfully approved by the Research Ethics Committee (no. 31a/2021) of the Poznań University of Economics. Main research assumes a deliberate selection of respondents based on a pre-survey online questionnaire (table 3.).

Table 3.

The FGIs samples for food buyers in Poland (November 2021)

Age of participants	E-grocery buyers	Traditional model buyers
18 - 29 years	3 women + 3 men	3 women + 3 men
30 - 49 years	3 women + 3 men	3 women + 3 men
50+ years	3 women + 3 men	3 women + 3 men

Source: own elaboration.

The whole sample consisted of 36 people. The division into age groups is based on deduction (Table 3). The first group are representatives of the generation of young people, who are most often still learning (students or interns) and do not have a large financial base. These are people who have always used modern technology and feel connected with the Internet space. The next age group is the people who have a larger budget. People who already know their life path and are developing professionally. This group works with modern technology on a daily basis and appreciates its added value and usefulness. The last group consists of people over 40 years of age. The oldest representatives had to get used to technological novelties, depending on their attitude, they willingly use new solutions or do not want to give up their old good habits. Representatives of this group are already settled and often take into account the needs of their families in their purchasing decisions. The study was planned based on the literature of the subject (Kaczmarek et al., 2013) and similar already completed and described FGI's. (Van Droogenbroeck, Van Hove, 2019; Kawa et al., 2019). In order to keep the interview participants interested, various methods were used, including projection methods such as juxtapositions of pictures and graphics. The questions were structured in such a way as to obtain answers to the issues raised, but also, when required, to stimulate the imagination of the participants.

4. Results

During FGIs every group was asked to define advantages and disadvantages for every of five define food delivery formats: door-to-door delivery, click and collect – lockers, click and collect – pick up from the store or some future formats as drone delivery or impersonal mobile locker (tables 4-6).

Table 4.
Advantages and disadvantages for door-to-door delivery in Polish food buyers opinion (November 2021)

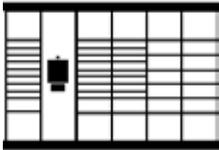
		
	+	-
Stationary group (18-29)	"food delivered home on any day" "bringing heavy grocery shopping straight home" "great convenience"	"sometimes a very long waiting time for delivery (e.g. 2 weeks)" "the courier can come just when I am not at home"

Cont. table 4.

E-grocery group (18-29)	"possibility to choose the delivery date" "comes and pick, simplicity and comfort" "shopping at the door" "ease and speed of receipt,, "you don't have to carry heavy things"	"destruction of roads and surfaces, ecological problem" "delivery costs" "human failure as a driver" "specific pickup time" "no option to choose without nets: ecology"
Stationary group (30-49)	"food delivery to the door" "heavier shopping does not have to be lifted" "they bring us home without leaving"	"hard to set the time, you have to adjust to the courier" "non-compliance of the delivery with the order" "lack of physical movement, laziness"
E-grocery group (30-49)	"visible expiry dates of the products, I know what I am ordering,, "convenient and easy to order at any time,, "the best form of delivery for people who do not have time for stationary shopping"	"frozen fruit and vegetables" "only for big cities, small range" "we must be home" "intervals of several hours, it would be better to have a more precise delivery date, e.g. 1-1.5 hours"
Stationary group (50+)	"possibility to come to a given address" "no need to lift shopping"	"have to be at home to wait for a delivery" "doubt about payment on delivery: can I pay while picking up my shopping?"
E-grocery group (50+)	"no need to carry heavy shopping from the shop" "some products are not available in the shop, possibility to order other types of products"	"the fear of having to be at home at that time"

Source: own elaboration based on FGI.

Table 5.*Advantages and disadvantages for click and collect – lockers in Polish food buyers opinion (November 2021)*

		
	+	-
Stationary group (18-29)	"possibility to buy food from different temperatures,, "possibility of the contactless collection,, "any pick-up time, whenever it fits within 24h" "a good solution for products that are hard to get in your neighborhood"	"what if there is a power failure?" "What about goods and money if I don't have time to pick up the goods?" "What if you buy more items that need to be stored at different temperatures?" "it is not known what happened with the products before they were put into the parcel locker,, "if damage occurs, who is blamed?" "doubt how to file a complaint, if something will be broken"
E-grocery group (18-29)	„lockers located in the near area - a reason to go for a walk" "pick up no matter when picking up, easy and flexible" "no need to contact with other people"	"Power outages can waste goods,, "occupying urban space" "the need for personal collection" "What if we don't pick up the food?" "expiry date, products with the longest date are not always delivered" "fruit and vegetables may be stale"

Cont. table 5.

Stationary group (30-49)	„you can pick up your groceries anytime”	"no control" "interruption of the cooling sequence" "there aren't too many points like this" "can food products be kept fresh?" "There are no refrigerators in small towns" "It is faster to buy stationary instead of going to the refrigerator if it is further away than the store" "doubt in what conditions my package is waiting for collection"
E-grocery group (30-49)	"limited contact" "shopping intimacy" "convenient selection date"	"limited number of places" "overflow" "you have to go further, it may not be close to home"
Stationary group (50+)	“possibility to pick up when individual wants”	“fear of power cut off” “doubt about sterilization and decontamination of the lockers”
E-grocery group (50+)	“security – closed boxes, strangers do not have access to products (e.g. in a stationary shop they take out frozen food)“ “convenience of pick-up time”	“unreliability of machine” “technical problems with pick up”

Source: own elaboration based on FGI.

Table 6.

Advantages and disadvantages for drone delivery, click and collect – pick up from the store and impersonal mobile locker in Polish food buyers opinion (November 2021)

						
	+	-	+	-	+	-
Stationary group (18-29)	"order for any hour and ad hoc for now" "no interaction with other people"	"the danger that someone may illegally take over the drone or the drone will make a mistake" „low lifting capacity" „problem with temperature maintenance"	"future, good ecological solution" „no interaction with supplier"	"pick-up time cannot be determined" "few refrigerators – high cost"	"good alternative between traditional shopping and online, "the possibility of exchanging bad products"	"need to leave home" "transport groceries"

Cont. table 6.

E-grocery group (18-29)	"delivery to the indicated address" "good for homes outside the city"	"technology could be unreliable: failures, poor targeting" "low lifting capacity" "violation of the airspace" "legal regulations"	"a solution to the future, it reduces the carbon footprint"	"you still have to bring your purchases upstairs"	"You can drive up yourself on the way home and pick up without queues"	"need to leave home"
Stationary group (30-49)	"24 / h purchase available" "avoiding traffic jams"	"where will it land?" "low capacity" "there must be a short distance to the store" "not very practical form of delivery to apartment blocks"	"stability" "shopping privacy"	"you have to be in a specific place at a given time to pick up"	"convenient, I can pick up my groceries on my way home"	"I don't know if I will be able to replace the wrong product, you have to trust a stranger"
E-grocery group (30-49)	"good for hard-to-reach areas"	"the weather is an obstacle" "out of town" "Aviation permits and regulations - legal problems" "they make noise" "bad for city estates" "low load capacity"	"good solution for big cities"	"must meet the relevant regulations" "all other vehicles would have to be autonomous"	"during a pandemic, a very good form of shopping, I do not wait for delivery and avoid queues"	"you still have to go to the store"
Stationary group (50+)	"opportunity to purchase hard to find products" "fast delivery" "delivery directly to home"	"problem in particular seasons, how about strain or now?"	"a great solution in places where there are no shops, such as small villages"	"everyone must gather the same time, problem with coordination"	"I can't wait in lines"	"need to pick it up, maybe it's better to do shopping this time"
E-grocery group (50+)	"time-saving"	"interference, e.g. noise" "very limited privacy" "drones over the heads of pedestrians" "low payload capacity"		"it's solution for the future"	"good hybrid model between stationary and online shopping"	"delivery inconvenience, I have to pick up my shopping"

Source: own elaboration based on FGI.

All meetings took place successfully without technical problems. The length of the meetings was 60-80 minutes depending on the group. The tables below show the results for each group divided into participants who do online shopping and people who purchase food products the traditional way.

4.1. General conclusion based on group traditional buyers 18-29 years old

A general conclusion drawn from the interviews conducted with the youngest group of people who do stationery shopping is that they cannot fully trust modern solutions. They are concerned about the unreliability of the technology as for example of drones which could be overtaken by hackers or have a wrongly programmed route. The most significant inhibitor is the fear of spoilage of products sent to fridges or their questionable freshness in any form of delivery. Respondents particularly value the possibility to choose products themselves, comparing expiry dates or choosing fruit and vegetables. Some of the participants are not keen on online shopping because they fear higher prices of food products. They are aware of the rapid development of modern forms of shopping, however, of the dense network of stationery shops, they remain with the traditional form of shopping. They treat shopping as a form of leaving home, a chance to talk and learn about new products. The pandemic has not significantly changed their shopping routines, most of them pay more attention to longer expiry dates, but do not want to give up the privilege of buying fresh bread or fruit and vegetables. The youngest group speculates that in the distant future, the need to go to the shop will be greatly reduced, interview participants pointed to solutions such as food teleportation, robots designed to purchase products and delivery, self-refilling fridges, or 3D printing of food in a printer.

4.2. General conclusion based on group e-grocery buyers 18-29 years old

When it comes to a group of people doing e-grocery in age 18-29, they are familiar with modern technology, willing to use the benefits of shopping online shopping. They see many more advantages of such shopping. The interviewees claim that it saves time and they emphasize that it is the best solution in terms of economics due to many reasons. Firstly, saving money because it does not yield to merchandising, lures in the form of impulse products, and encourages to plan shopping to buy only the products are needed. Secondly, there is full access to market information so individuals can choose the best offer. An important aspect related to the pandemic is reducing the need to leave home due to safety aspects but also convenience. The surveyed group is willing to use new delivery solutions. Most often they decide to use door-to-door delivery. They are aware of consumers and perceive some risks associated with new forms of delivery, especially the problem of wasting food due to technological defects – fridges, legal loopholes, low lifting capacity, and wrong delivery address in the case of drones. The other cons are the possibility of receiving a stale product or waiting for the courier, however, despite these possible complications, they opt for modern

forms of delivery, the value of such an opportunity. They are promoters of online shopping. Most of them are open to trying out fridge vending machines as well as other forms of technology. Participants asked about alternatives to the presented delivery types indicated online shopping with the possibility of picking up the complete order in the shop without waiting in line and walking around a shop with the basket. They think that it is a good intermediate between traditional shopping and remote shopping. As a disadvantage, they perceive the way to the store, which simply means the necessity to leave the house and to bring the shopping up to the upper floors by themselves. The interviewees attach great importance to ecology and caring for the environment. They saw the need of the carbon footprint reduction as well as minimization of the plastic packaging use. According to the respondents, the future belongs to technology and its development in the case of drones, mobile fridges, and even the creation of a new profession of "shopper". Also, in respondents' opinion in the future will be universal access to food 3D printers, teleport shopping as well as the creation of a suburban food transport network that delivers shopping directly to the indicated address.

4.3. General conclusion based on group traditional buyers 30-49 years old

Those taking part in the research pointed out that at the beginning of the pandemic they were less likely to shop for groceries because of the queues and chose instead to stock up for the whole family. For stationary shoppers, this saves time as it is easier for them to decide what and how much to buy. In addition, they can pay attention to choosing products with longer shelf life. Another benefit is the availability of products and not having to wait for delivery. Being in a shop, it is easier to be aware of one's needs and to see the products carefully. An important aspect highlighted by several participants is the possibility to go out for mental health and stress relief, especially appreciated when working remotely. According to those taking part in the survey, stationary shopping is particularly done by older people, people who want to meet in person, people who have difficulty with technology, heavy drinkers, and those who are in control of their shopping. When considering modern delivery methods in the future, people specifically mentioned the ability to pick up a pre-prepared parcel in-store, food printing, pipelines over the city, and a divided fridge lift system. Participants stated that food will be able to be printed, people will consume products in very small sizes, a virtual shop will be available for food and pick up and will materialize the product when the image or box diet is lifted.

4.4. General conclusion based on group e-grocery buyers 30-49 years old

Among online shoppers, in age 30-49 the structure of shopping changed during the pandemic. Their attention was paid to not wasting food and starting to make food at home. There were queues in shops, which further strengthened the desire to use online delivery. The emerging problems were the lack of free delivery times, for example, one participant was waiting 3-4 weeks for delivery, and for another in the area of living there was not food possible

to be delivered. In the case of in-store shopping, people pointed out the importance of shopping strategically according to a more precise list in order to limit exposure to the virus. The main benefits of online shopping identified by the supporters of online shopping were: ease of choice, no queues, time to refuel, no impulsivity, intimacy in shopping, saving time and fuel, and the possibility of repeating a fixed list (you don't have to choose from scratch, but the online shop remembers your previous choices and preferences). Taking the idea of modern delivery methods into the future: fridges built into blocks of flats already by developers for every flat. Another idea is a cooperation between Allegro/InPost/Amazon with developers and posts boxes with fridge option, assigned to each flat. The innovative idea was an intelligent control: when you see that you are running out of flour, it appears, a smart fridge that orders itself. Other ideas were discussed to pick-up of ordered groceries in a nearby shop, and also to the door but with an external delivery company, for example delivery by uber or taxi.

4.5. General conclusion based on group traditional buyers 50+ years old

Stationary buyers over the age of 50 pointed out that due to the pandemic they started to buy healthier products and do it less frequently which resulted from queues. In addition, they choose to visit shops during the day when there are fewer people because of shorter waiting times and safety. Participants also drew attention to the essence of the habit of systematically doing their shopping in a fixed favorite place and the related major inconvenience of stationary shopping, the rearrangement of products in many categories. According to the research for participants, it is definitely easier to go to a shop than to start a computer and shop online. It was the main conclusion that traditional shopping simply is easier and saves time. Their aversion to technology, makes them decide to buy food products by delivery. The ability to pay on delivery would be a key issue for them. Additionally, they appreciated the solution of a mobile shop that could reach a place where there are no shops at all. In the contrast to participants in the other groups, they indicated that local shops with a shopper could return in 30 years, concerning a question about future grocery solutions. The detachment from technology and the emphasis on the aspect of the relationship with another person were different from the views presented in other groups associated with far-reaching technological solutions. In addition, it was recognized that in the future we would be taking tablets to protect our energy needs. Another idea concerned intelligent fridges.

4.6. General conclusion based on group e-grocery buyers 50+ years old

Most of the participants among 50+ buyers initially do shopping traditionally and switched to online shopping due to the pandemic situation. This was determined for a number of reasons, including reluctance to go out due to the epidemic threat, daunting queues in stationery shops but also an expansion of the offer in online shops. Individuals indicated that they had previously felt aversion to online solutions, but the epidemic situation made them try. Additionally, it was pointed out that the world is constantly changing and technology is present as evidenced by the

removal of cash registers in shops and the replacement with self-service checkouts. An additional advantage of online shopping is undoubtedly the convenience, time-saving, no need to carry heavy things, quick and easy access, the possibility to compare offers between shops and extend the range of products. In online shops it is possible to get to know and buy new brands, due to the growing competition there is a widening of the offer and following social trends related to ecology and bio eco. A preparation service and the possibility to pick up the goods on their own. Also, the introduction of robots that will deliver food to people's homes was identified as a desirable solution for the future. In the future, in 20-30 years' time, participants expect personalized drones, as well as shops, to accurately recognize our habits and self-order products according to our needs.

5. Limitations and future research

The qualitative research brought several main conclusions. All surveyed groups showed the greatest interest in the door-to-door delivery. As an alternative to traditional shopping, they see picking up online purchases in-store. For most respondents, parcel lockers are the future of e-grocery delivery. The other two formats (drones and unmanned mobile coolers), according to the respondents, are not adapted to the current road conditions and do not meet the necessary legislative conditions. The most interesting conclusion from the research was the orientation of the youngest group of respondents to environmental issues. Participants from both groups (18-29) often drew attention to the issue of a large amount of plastic, excessive large packaging, or increasing the carbon footprint by each trip to the store. People preferring in-store buying emphasized the fear of the quality of the products, what is more, they perceived shopping in the store as a form of physical activity and as a way of satisfying social needs (contact with other people). The average age group (30-49) is the group that most frequently uses e-grocery and various forms of delivery. People who have not previously shopped online for groceries were interested in new forms of delivery and did not rule out a change in the form of purchase. The oldest surveyed group (50+) emphasized the convenience of home delivery, higher variety of products and the ease of comparing the offer, and in times of a pandemic, they appreciate safety. People who are in favor of stationary shopping emphasized the fear of receiving low quality products. They treat going to a store as an opportunity to learn about market novelties and as an opportunity to save money. They consider e-grocery shopping to be expensive and they want to do their own shopping in stationery stores at all costs.

Main purpose of the paper was to explore factors of the innovative delivery formats' development in the e-grocery. As mentioned in research section, age and attitude towards new technologies is important in choosing innovative format in e-grocery. Moreover, according to the conducted research, safety (perceived risk), opportunity of meeting other people (social

influence), threat of buying low-quality food (performance expectancy and service quality) could play a significant role in choosing new formats while buying food. These variables are considered as crucial in UTAUT 2 model (van Droogenbroeck, van Hove, 2021).

Taking into account the results from the qualitative research, quantitative research with a focus on delivery formats is strongly recommended for the future. Due to the limited number of people surveyed, the authors plan to continue their ongoing research related to e-grocery changes during the pandemic in quantitative terms. This will make it possible to analyze a global view of particularly interesting topics concerning the choice of delivery formats on a representative sample of participants. The issue of acceptance of new technologies by the user, in particular, the use of mobile devices for shopping purposes is illustrated by the UTAUT 2 model. The authors intend to use this model to check what factors determine the willingness to make e-grocery purchases. The dynamically growing value of the worldwide mobile shopping market as well as the increase in the number of scientific articles and commercial reports on this area show the growing popularity of online shopping, also in the food sector.

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THE DYNAMICS OF NEW DELIVERY FORMS DEVELOPMENT OF GROCERY PRODUCTS IN POLAND – FRISCO CASE STUDY

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Purpose: The coronavirus pandemic has a crucial influence on every human being in many areas of life, like education, professional work and state of health. Also, it impacts food consumption and dietary behavior of people. The purpose of the paper is to diagnose the dynamics of new e-grocery delivery formats development caused by Covid-19 in Poland.

Design/methodology/approach: This study follows a mixed method approach, which is based on qualitative interviews, secondary statistics and case study of Frisco – the most successful Polish enterprise on e-grocery sector. Multi-level perspective was used to give a context for changes observed on Polish e-grocery market.

Findings: The pandemic influenced the dynamics of the development of the e-grocery market in Poland, which follows the way how American e-grocery market performs. The landscape before Covid-19 pandemic was dominated by big players like *Amazon* and *Walmart* on the USA market, however big players like *Piotr I Paweł* and *Tesco* disappeared from the e-grocery market in Poland. During pandemic, in both countries a rapid growth of local suppliers was observed. In the USA, big players have been consolidating, however in Poland a previous small enterprise, Frisco, when became a market leader, was bought by big retail player – *Eurocash*. Frisco implements door-to-door deliveries format. However, some new delivery formats, like food parcel lockers, are implemented by big companies like *InPost* on Polish e-grocery market.

Research limitations/implications: Due to the difficulties related to recruiting 8 American e-grocery consumers to the focus group, the authors decided to use smaller (4 people each) mini-groups. The method is adequate to map the general landscape. However, a quantitative study is needed to deepen the information on factors of new delivery formats' development. This article analyzes companies that provide only general information published in public reports.

Practical implications: The paper helps to understand the changes on Polish market in multi-level perspective. The time of the pandemic opened a window of opportunity for new delivery formats, such as food parcel lockers. The implementation of new delivery solutions was possible by observing more developed markets such as American or German one. The development of modern technologies and the general access of potential customers to the Internet also enabled the change of the existing model of traditional trade to e-grocery.

Social implications: Many customers have discovered new shopping opportunities which has led to a permanent change in purchasing behavior. In this article, the authors compare the change in landscape of Polish and American e-grocery market during Covid-19 pandemic.

Originality/value: The paper helps to understand the dynamics of new e-grocery delivery formats development caused by Covid-19 in Poland with multilevel perspective. Moreover, the change in e-grocery market landscape was described. It is needed to deepen the research by new format factors analysis and further observations, what will be the future of these new formats.

Keywords: e-grocery, food delivery, covid-19, multi-level perspective, food parcel lockers.

Category of the paper: In this article, the authors, using qualitative research (mini groups), are looking for answers to the question of how the pandemic changed the landscape of e-grocery, with particular emphasis on new delivery formats' development.

Introduction

There have been significant changes in retail over the past few decades. Both the development of information and communication technologies, sector specialization IT, as well as the growing requirements and the variety of customer needs have led to the emergency of innovative solutions in the field of retail and the creation of new distribution channel, such as electronic commerce (Sławińska, 2016, pp. 33-36). The influence of new communication technologies on retail was being observed around first decade of twenty first century (Powell, 2000; Smáros, Holmström, 2000). A characteristic feature of traditional trade is direct customer contact with the seller and a product. Despite numerous advantages, traditional retail has also many disadvantages. Electronic commerce (e-commerce) is treated as an alternative form of sale, departs from standard solutions in favor of virtualization and automation of the sales process and eliminates the limitations of stationary trade (see Schramm-Klein, Wagner, 2014). E-commerce makes it possible to carry out the transactions directly from the place of residence around the clock. It is desirable especially for people with disabilities and people living in rural areas, who have a limited possibility to purchase in a traditional form (Qiao, Qi, 2018). This landscape was rapidly changed by Covid-19 pandemic. Changing landscapes, according to modified multi-level perspective (Dannenberg et al., 2020), could change the regime of the market and open the niches for innovations.

The purpose of the paper is to diagnose the dynamics of new e-grocery delivery formats development caused by Covid-19 in Poland. Multi-level perspective was used to show the context of possible changes on the Polish e-grocery market. The method of case study was chosen to diagnose the dynamics of the fastest growing Polish e-grocery enterprises. Moreover, Authors decided to compare the most successful enterprises in the USA and Poland.

Multi-level Perspective

The Multi level perspective (Geels, 2002; 2011) offers a framework to understand the different dynamics of innovations. The model provides an analytical framework to explain under what circumstances and with what effects an innovation can move from a niche to a growth phase. The MLP explains how innovations disseminate by focusing both on technology and socio-economic contexts. It draws on the concept of technological regimes established by Nelson and Winter (1977), who contributed to a comprehensive perspective on complex regimes (Genus, Coles, 2008). Successful distribution of an innovation is not explained by the technology itself but by its application, exploitation, supporting policies, availability of capital, and so on. Hence, it requires a comprehensive perspective in the context of transition studies (Geels, 2002), particularly those that focus on the interrelation of economic crisis and innovation diffusion (Archibugi, 2017). Geels (2002, 2011) and Dannenberg, P., Fuchs, M., Riedler, T. and Wiedemann, C. (2020). distinguish this into socio-technical landscapes, socio-technical regimes and niches (see Figure 1).

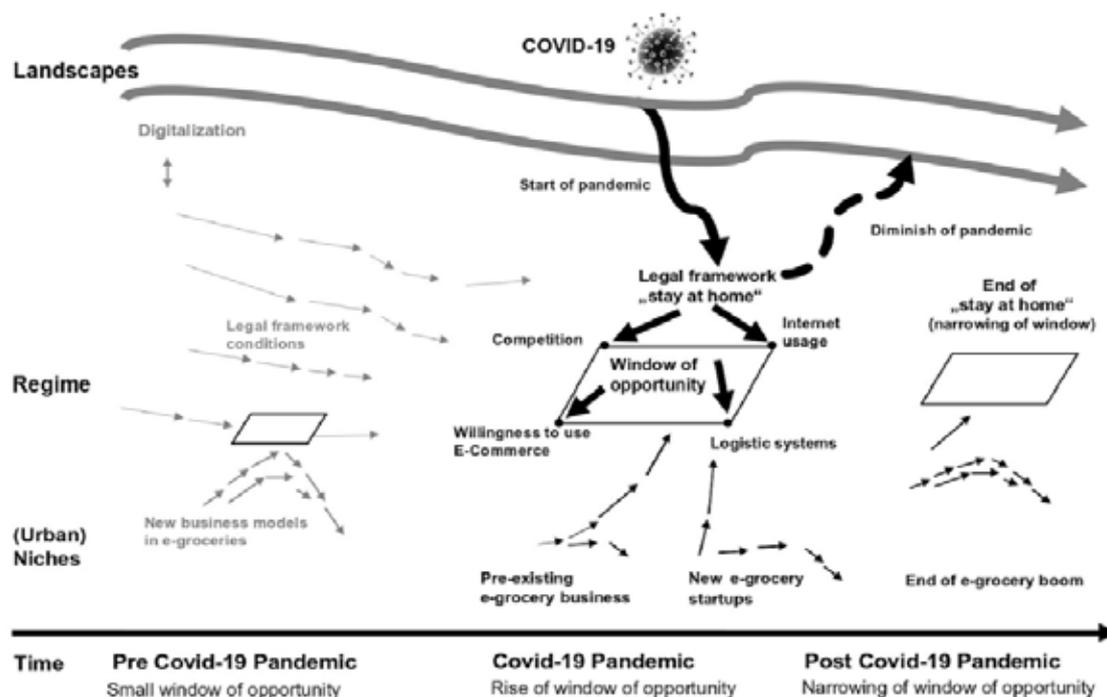


Figure 1. Potential rise and decline of a window of opportunity through COVID-19-related 'stay at home' measures. Source: Dannenberg, P., Fuchs, M., Riedler, T. and Wiedemann, C. (2020). Digital Transition by COVID-19 Pandemic? *The German Food Online Retail*. *Tijdschrift Voor Economische en Sociale Geografie* 111 (3):543–60.

Socio-technical landscapes are predominant framework conditions that can only marginally be influenced by individual actors. Landscapes include basic social issues (e.g. the values of a society), political settings (e.g. constitution) as well as economic conditions (e.g. oligopolies) or ecological conditions (e.g. climate). Such a landscape is usually relatively rigid but can change in the long term ('longue durée', e.g. due to demographic change; Geels, 2011).

Landscape can also change through economic and political crisis (Dederichs, Dannenberg, 2017).

Socio-technical regimes are embedded in the landscape. Regimes are characterised by established practices. A stable regime configuration offers actors a safe and stable framework for their activities. In contrast to the comparatively rigid structure of the landscapes, regimes can change significantly faster, for example through learning processes. Regime components are particular technologies, actual markets and policies. Moreover, they include, for example, infrastructure, technological knowledge, and company networks (Zademach, Schulz, 2016). There is a special focus on the driving role of customers (or users).

Technological niches are protected areas (e.g. from competition). They are fields of experimenting and trying out, such as R&D laboratories, subsidised demonstration projects, or settings in which users have special demands and are willing to support innovations (Geels, 2011). Lee and Malerba (2017) distinguish three types of windows of opportunity: (i) windows that are opened by new basic technologies like within digitalisation; (ii) windows based on a new type of demand or a major shake-up of existing demand, and (iii) institutional windows induced by public intervention. Digitalisation during ‘stay at home’ could be such field of special demands and policy intervention. The innovation of food online trade has already emerged in a niche and could now significantly affect the middle – and mediating – level of the sociotechnical regime and possibly the landscape. This happens when a window of opportunity opens (Geels, 2002; 2011).

Spread of COVID-19 was a shock at landscape level and ‘stay at home’ policy changed the socio-technical regime. COVID-19 can be seen as an exogenous global landscape development (see Geels, 2011), which led to the ‘stay at home’ measures at the political sub-regime (see Dannenberg et al., 2020). The Authors described the dynamics of German e-grocery market, which had many similarities to the Polish one.

Food retail entered a special situation in many countries. In general, while retail stores that did not provide essential goods or services had to close, and politicians responded to this with economic support measures, the food trade as a ‘systemically important service’ remained open to ensure supply for the population (ZPP, 2021). Nevertheless, food retail faced severe restrictions. There were strict hygiene measures (disinfection, compulsory use of shopping trolleys, limitations on the number of customers, and rules to keep distance from food counters and cashiers). Other food providers, like restaurants and canteens were required to close entirely. In total ‘stay at home’ led to an increased demand in food trade retail, and – partly due to stocking up and panic buying – even bottlenecks in terms of the supermarkets’ ability to supply products (BEVH, 2020). Products that were considered to have a shelf life aspect were purchased more frequently, sometimes with growth rates of over 400 per cent compared to the same period last year (Nielsen, 2020).

This situation implicated the expansion of the niche for online grocery retail. The ‘stay at home’ policy helped online grocery retail to develop a new configuration that breaks through by taking advantage of a windows of opportunity and in this way adjusts the socio-technical regime (Geels, 2011). Subsequently, special attention is given to the extent to which the changes in online food retailing are now experiencing a ‘thicker and more transformative’ (Murphy et al., 2014, p. 264) dynamic, through which the previous food retail regime is changing in its nature and with its actor constellations.

The ‘stay at home’ measures and the general reduction of activities (especially in terms of gastronomy) have expanded a protected area for online food retailing. This is characterised by less competition from other industries and a continued high demand for food. This enabled the online grocery retail in Germany to conquer larger markets and growth rates of ca. 150 per cent in March 2020 (Nielsen, 2020). Online purchases were replacing offline retail purchases.

At the same time, this situation came as a surprise to food retail, and online retailers’ capacity quickly reached capacity limits. Ultimately, 22 per cent of potential new customers could not place an order because the desired products or delivery dates were not available (Nielsen, 2020). A main reason for using food online retail during the crisis was the fear of infection. Twenty per cent of customers indicated that this was an important motive for buying groceries online. For new customers, however, the most frequently mentioned motive (31% of those surveyed) was panic buying (fear of contagion and the aim to buy ahead). In contrast, this was a minor motive for existing customers (9% of those surveyed). This difference suggests that some customers mostly register with the online services for the purpose of buying stocks and above-average quantities when they place their first order (Halm 2020). The study indicates that new e-grocery customers due to COVID-19 crisis were driven by the temporary motives limited to the crisis. The window of opportunity was opened by Covid-19, but some of the niche changes could be more permanent than the others.

Landscape change during Covid-19 on a global scale

The influence of new communication technologies on retail was being observed around first decade of twenty first century (Powell, 2000; Småros, Holmström, 2000) and the landscape had not been changed much till the middle 2010’s. A comparison of countries in the 2014-2015 top ten list of offline–online global grocery markets shows that performance in the offline market, contrary to expectations, is not necessarily matched by performance in the online market. As shown in Figure 2., besides China and the United States, countries like India, Russia and Brazil in the top five global grocery markets in 2015, did not even appear in the top ten online list (Institute of Grocery Distribution, 2015).

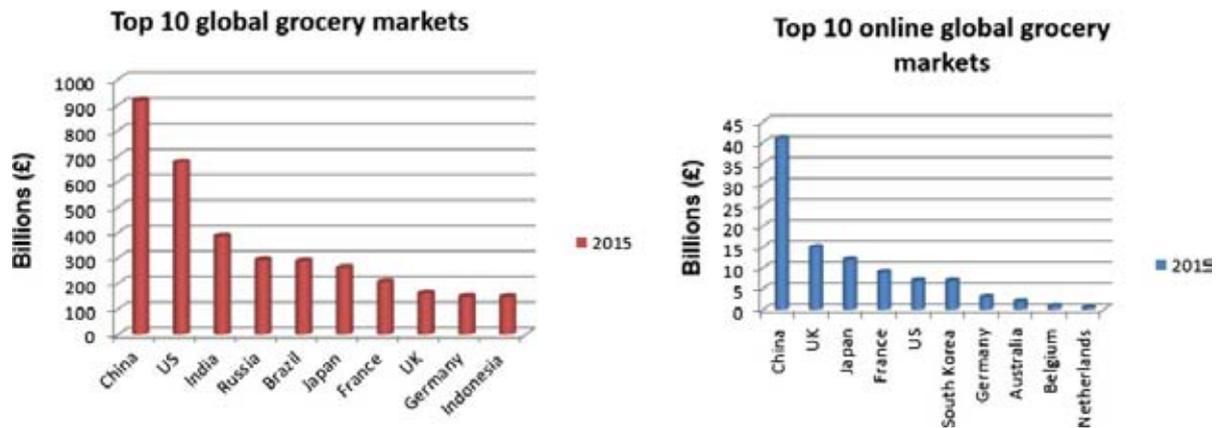


Figure 2. Top ten global grocery markets (offline and online). Data source: Institute of Grocery Distribution (Institute of Grocery Distribution, 2015).

As shown in Figure 3, in 2015, out of the top ten offline global grocery retailers, only 30% (*Walmart stores*, *Tesco plc.* and *Costco*) appear as part of the top ten online global grocery retailers. While *Walmart stores* led the offline global grocery ranking, it appears only second in the online list, where Amazon leads. This disharmony between countries as well as organizations relating to performance in the offline and online global grocery spaces, signals the existence of uniqueness, possible complexities and challenges in the online grocery business.

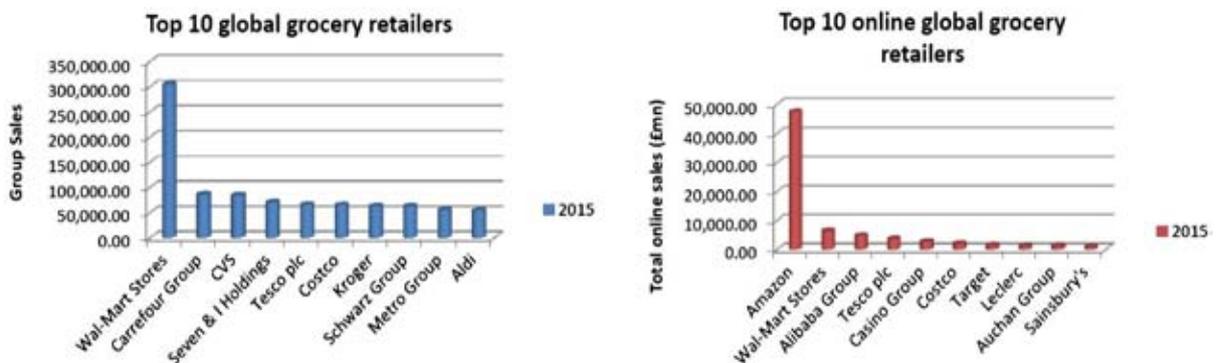


Figure 3. Top 10 offline and online global grocery retailers. Data source: Institute of Grocery Distribution (2015).

The landscape on e-grocery market that appeared in this period (figure 2 and 3) lasted until the pandemic. The e-grocery market model (landscape) formed in the United States is the model that the Polish market is currently pursuing. Before pandemic, there were a few big players that have become entrenched in the purchasing awareness of consumers. In the United States, the pandemic could have influenced a larger volume of e-grocery purchases, but it did not mean that it was necessary to create a new business solution from scratch.

The Covid-19 pandemic has stimulated particularly rapid development of the e-grocery industry. Grocery shopping delivery is an increasingly available option. Suppliers are developing a distribution network not limited to the city, more and more often it is possible to order groceries for suburban areas.

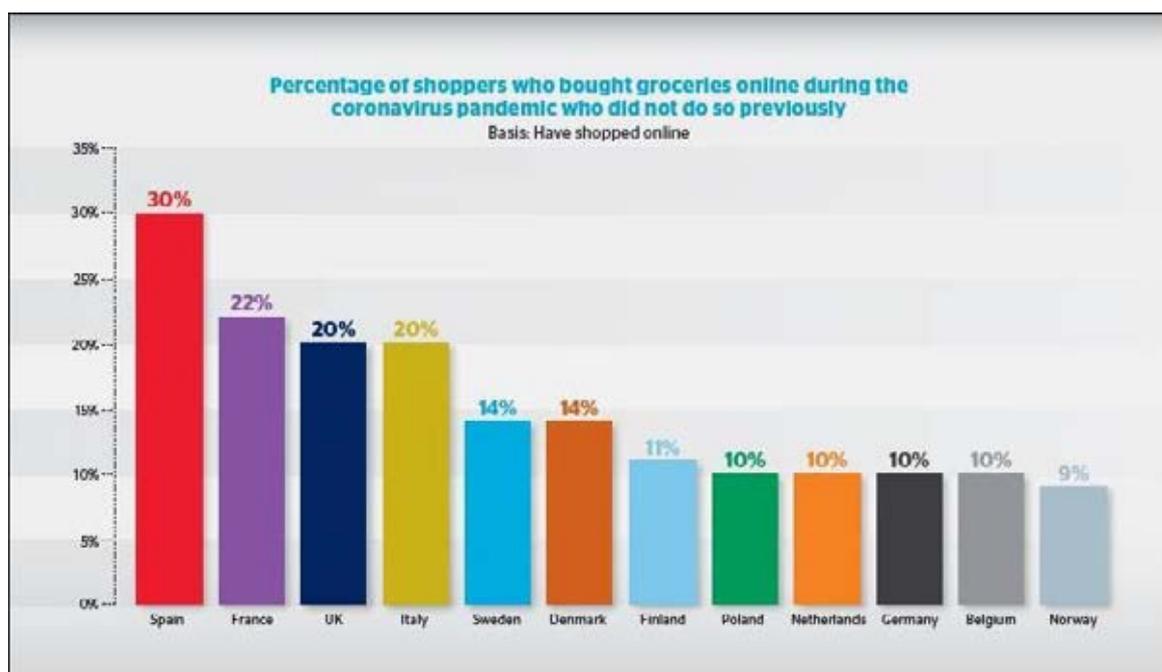


Figure 4. The e-grocery industry in Europe during Covid-19. Source: DirectLink, <https://www.directlink.com/coronavirus-pandemic-drives-online-grocery-shopping/>.

According to Direct Link rapport (2020), online shopping in some product categories (clothes or electronics) has always been very popular, groceries and pharmacy goods from 2020 are two notable newcomers. Food, in particular, has very high sales figures in certain countries. The online grocery shopping trend does not only apply to the Polish market (Figure 4). The data from 2020 show the highest increases in Spain (30%), France (22%), and the United Kingdom (20%). In Poland, an increase of 10% was recorded. Important information is a fact that the data concern consumers who have not used e-grocery so far. Perhaps users who are forced to buy FMCG products online, fearing infection, will continue shopping for e-grocery also after the pandemic, which may change the landscape of e-grocery market for years.

Covid-19 pandemic has changed the landscape and enabled to develop new formats in e-grocery (new regime). The world economy contracted by 4.3% in 2020, while for many countries of the world the fall was the worst since the Second World War. The pandemic has hit developed countries the most, as many European countries and some US states have taken strict quarantine measures (Food Retail and Consumer..., 2021).

The biggest e-grocery players in the USA during Covid-19 pandemic

To find out what purchasing behavior is dominant in the United States, qualitative research was organized with US residents. The research method was to interview in mini-groups. Due to IMAS international association (2021), a mini-group is a special form of focus research.

In this article, the authors, are looking for answers to the question of how the demand side uses e-grocery in the context of not only purchases but, above all, delivery methods. Due to the smaller size of the groups, the authors conducted the study in two mini-groups. The interviews were conducted via "Skype" with residents of the United States. To standardize the time of the meeting, the authors decided to select participants from among the inhabitants of the city of New York and nearby towns and villages. The division of groups is shown in table 1. It is assumed that in the mini-group the conversation takes place in a group of 2-4 respondents and a moderator. Our mini group consisted of 8 people (four women and four men). Four of the respondents live in a large city and the other four live outside large urban agglomerations. The research was done via skype. The interview was conducted in English and lasted 70 minutes. Our interlocutors answered questions about the e-grocery market and modern forms of delivery.

Table 1.

Mini groups study participants

		Male	Female
Group 1	City	2	2
Group 2	Downtown	2	2

Source: own study.

When we asked about the possibility of online delivery of groceries, the respondents answered differently. The respondents living in the city most often talked about door-to-door delivery. However, due to the greater concentration of small shops, the interviewees admitted that they often buy some products at nearby shops. People living further from the city declare different ways of shopping. In the area where they live, there are just a few options for e-food delivery. They can do online ordering from the major food store chains like *ShopRite* or *Stop'n'Shop*. These suppliers also deliver the orders. *Costco* also makes it very convenient to order food. What is more, they declare local purchases, carried out in local entrepreneurs. They order from a produce supplier who reinvented his business during the pandemic. Originally, the company delivered products to restaurants. Unfortunately, those restaurants were shut down during Covid-19. So, to keep the company viable, the enterprise offered its services to the local households. *Instantcart* is the company that often is the ordering/delivery system used by these companies, especially *Costco*. All of the above do door-to-door service.

Another question was related to the most popular delivery methods. *Amazon* does grocery via *Whole Foods*, which is not available in some areas. Some people use the regular ordering system if they need a more exotic ingredient like specialty baking chocolate or some spices and other rare products. The participants of the study pointed out *Walmart* parcel lockers for grocery shopping as one of the most popular methods of collecting purchases. However, the most popular, according to respondents, is door-to-door delivery, offered by many companies, including giants such as *Amazon* or *Walmart*. These big retail chains have separate websites

dedicated to e-grocery orders. During the interview, one of the participants mentioned an innovative form of delivery of groceries used by *Amazon*. The company itself called its delivery as “*Prime Air*” future delivery system. This company designed air delivery to safely get packages to customers in 30 minutes or less using autonomous aerial vehicles (drones). *Amazon* has few options of e-grocery delivery on its website, the company gives the customer the choice of door-to-door delivery or personal pickup in a store or parcel locker.

During the study, participants mentioned barriers to purchasing resulting from the place of residence. Despite the large selection of grocery suppliers, you can still find so-called food deserts in the USA. According to a 2009 U.S. Department of Agriculture report, about 2.3 million people in the USA live more than a mile away from a supermarket and don't have reliable vehicle access (National Public Radio, 2019).

Speaking of food deserts deliveries, the respondents mentioned several home delivery companies, but not in full scope. This kind of delivery services were offered through companies such as *Instacart*, *Peapod*, and *ShopRite*. The results in rural areas was not nearly as promising. National Public Radio (2019) states that the 59 rural census tracts analyzed, zero qualified for full grocery delivery. Thirty percent of them were partially deliverable to, and 69.5% of the tracts were not deliverable to at all.

It can be concluded that the United States is one of the world leaders in the e-grocery market. The observation is based on the direction of development of the e-grocery market and the already available solutions for the delivery of grocery purchases in USA (Mkansi et al., 2018). The landscape of e-grocery in the USA was based on two big players like *Amazon* and *Walmart* functioning nationwide before Covid-19. They used pandemic as the window of opportunity to consolidate and developed new delivery formats in e-grocery, such as food parcel lockers (*Walmart*) or aerial vehicles – drones (*Amazon*). However, this window of opportunity was used by some local suppliers to expand door-to-door delivery formats. American path dependency in e-grocery would be a good pattern for Polish market (see Fai, 2003; Bergek, Onufrey, 2014).

Changing the landscape of e-grocery business in Poland during pandemic

Many ideas come from the United States. Before Covid-19 pandemic, the landscape was similar in Poland as it used to be in the USA. In Poland, e-grocery sector was dominated by couple of big players, especially by Tesco (the whole Poland) and Piotr I Paweł (Western Poland). However, after the disappearance of Tesco from the market (the process started in 2018 and finally all 301 point of sales were sold in March 2021; Tomaszkiwicz, 2021), except Warsaw metropolitan area, no company could meet the e-grocery needs declared by consumers. Due to the pandemic, the e-grocery business model had to become popular in other Polish cities. An example of such an intense expansion is the case of Frisco, which, being the leader of the

Warsaw e-grocery market, decided to extend its activities into Poznań and Wrocław. Showing the market leader path may define the way how market will react and how followers will change the market landscape.

The pandemic negatively affected many traditional enterprises but also created an opportunity for the development of e-commerce enterprises. The e-grocery business model became widespread, especially during the pandemic. Fear of being around in generally accessible places and gathering many potential infected contributed to a change in the purchasing behavior of many consumers. An example of an e-commerce store with a food assortment is the Frisco company, operating on the Warsaw market. Frisco.pl is one of the online supermarkets operating on the Polish market, which is a convenient alternative to grocery shopping in hypermarkets. Orders are carried out throughout Poland, however, Frisco services, due to the specificity of the market, are the most popular on the Warsaw metropolitan area. The assortment of the online store is not limited to groceries and household chemicals. In the offer of the e-commerce concept, you can find a wide selection of specialists, local, BIO, and fresh products (Eurocash group, 2020). The order can be placed via the website or via the mobile application. The picking of orders is largely done by machine, and the high standard of services is ensured by appropriately adapted vehicles equipped with a refrigerator. Free delivery is carried out for orders in Warsaw worth at least PLN 250. A modern business model respects the time of potential customers, which is why Frisco offers deliveries in hourly intervals specified by the buyer, 7 days a week. E-commerce business, like traditional companies, is not indifferent to loyalty programs. In the case of Frisco, the customer who purchases for the sixth time receives permanent access to the Frisco Friends program, which offers privileges in delivery, more attractive prices, and gifts (Frisco, 2020).

Table 2.

The COVID-19 influence on Frisco performance (Orders and Average basket in PLN)

	I	II	III	IV			
	Before (January- February)	The first COVID wave (March- May)	Summer (June- September)	The second COVID wave (October)	* Before/ 1st wave	# Before/ 2nd wave	Overall (Jan-Oct 2020)
Daily orders	1 650	1 750	1 980	2 102	6%	6, %	27%
Average net basket	260	386	296	331	48%	12%	27%

Source: own elaboration based on Grupa Eurocash, "Nr 1 na warszawskim rynku-raport, s. 4".

The company's success was determined by some numerical changes in individual categories (Table 2). For the financial statements for shareholders, Eurocash, which has had a majority stake in Frisco since 2020, has prepared a report that takes into account pandemic and non-pandemic periods with different amounts and types of trade restrictions. The results are divided into 4-time orientations, taking into account the restriction-free periods January-February and June-September, as well as the first and second waves of cases and the increasing number of

restrictions in March-May and October. The months of January-February were considered by the authors of the report as the period before the pandemic, and thus they became a reference point for comparisons of the following months.

When analyzing the data (table 2), significant changes in volume can be noticed in the first wave of the pandemic. What's more in table 2, the average shopping basket is also rising (+48%), and the number of daily orders (+6). In the compared periods, only the share of loyal customers decreases, which may be due to the acquisition of an above-average number of new users. The results from the summer period provide the following conclusions: the number of regular customers and the number of daily orders have increased, the daily value of the basket and the share of selected shopping categories have decreased. These data prove that the group of regular customers is growing. This is largely related to satisfaction with the quality of the services provided. Perhaps the use of the e-grocery business model will become permanent in consumer habits, also after the end of the pandemic (Frisco, 2020).

The pandemic had an impact on the popularization of the e-grocery format, therefore in the case of Frisco, decisions were made to extend the range of services. The cities that have had a full scope of delivery since mid-2021 are Wrocław and Poznań. The summary of the financial results for the first half of the year showed a sales increase of PLN 33.9 million year to year basis. This result includes sales data from Warsaw (PLN 126.7 million), Wrocław (PLN 10.5 million) and Poznań (PLN 0.37 million).

The pandemic had forced entrepreneurs to create new solutions for the supply of grocery products. E-grocery shopping has become more popular and FMCG sellers saw an opportunity to reach new recipients by developing innovative forms of delivering grocery shopping. Door-to-door delivery has not been the only alternative to stationary purchases for some time. The new solution developed by Inpost is pick-up lockers with three thermal zones, enabling the storage of food products awaiting collection by the customer. This solution is being implemented in three Polish cities: Warsaw, Cracow, and Wroclaw (table 3).

Table 3.

Click and collect lockers in Poland by InPost

Click and collect lockers			
Warsaw	32	7	39
Cracow	16	6	22
Wroclaw	3	2	5
Together	66		

Source: <https://inpost.pl/lodowkomaty>.

Pick-up points are adapted to the storage of various types of food products. In total, 66 refrigerator machines were built in Poland, of which the most active (32) are located in Warsaw. The second-largest number of e-grocery pick-up points is located in Cracow (16), only three refrigerators are in operation in Wroclaw. InPost announces the expansion of its operations to new locations.

Conclusion

The agri-food sector has experienced huge change over the past few decades which, along with the increase in globalization, led to the diversification of sales markets and had a positive impact on Poland's participation in the international arena. According to multi-level perspective, the COVID-19 pandemic triggered new challenges that have changed the existing landscape in e-grocery market. Lockdown, limited trade, further restrictions, and also a change in consumer behavior have become the stimuli that motivated the improvements into the existing regime solutions. The 2020 pandemic turned out to be a great obstacle for many companies, but there were companies that, despite restrictions, dynamically developed their activities. The food sector continues to play an important role despite the pandemic in the Polish economy. Although the epidemic was supposed to inhibit the development of many sectors, this is where the reverse trend was observed. In the face of the threat and growing uncertainty, the population stocked up and bought long-term products' expiry date, which contributed to an increase in the sales volume. The development of modern technologies and general access to the Internet of potential customers also allowed for a change in the existing model of traditional trade on e-commerce.

The pandemic influenced the dynamics of the development of the e-grocery market in Poland, which follows the way how American e-grocery market performs. The landscape before Covid-19 pandemic was dominated by big players like *Amazon* and *Walmart* on the USA market, however big players like *Tesco* and *Piotr I Paweł* disappeared from the e-grocery market in Poland. During pandemic, in both countries a rapid growth of local suppliers was observed. In the USA, big players have been consolidating, however in Poland a previous small enterprise, *Frisco*, when became a market leader, was bought by big retail player – *Eurocash*.

Frisco implements door-to-door deliveries format. However, some new delivery formats, like food parcel lockers, are implemented by big companies like *InPost* on Polish e-grocery market. The Polish suppliers try to implement some new delivery formats of grocery purchases, as it is observed in the USA. The most popular delivery solutions, such as door-to-door or special parcel lockers, existing before Covid-19 pandemic, became more and more popular. The change of shopping habits was caused by a pandemic and probably for a large part of them, even after the cancelling of economic restrictions, a significant percentage of new habits will be observed in the future. The case of *Frisco* gives an opportunity to express that the change of e-grocery market in Poland could be permanent, especially for click and collect lockers format. The authors decided to use smaller (4 people each) mini-groups, due to the difficulties related to recruiting 8 American e-grocery consumers to the focus group, which is the limitation of the study. The method is adequate to map the general landscape. However, a quantitative study is needed to deepen the information on factors of new delivery formats' development and to foresee will the new formats be permanent or are they just a quick short-lasting reaction on current market needs.

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DIFFERENTIATION OF THE REGIONAL DEVELOPMENT IN THE CZECH REPUBLIC, SLOVAKIA AND POLAND

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Purpose: The purpose of the article is to present the variation in the level of the development of 95 subregions of the NUTS-3 level in Poland, the Czech Republic and Slovakia. The level of the development shall be established in a multi-criterion manner, separating three factors of the regional development: the society, the natural environment as well as the economy.

Design/methodology/approach: The article presents the level of the regional development of the NUTS-3 regions based on 31 indicators based on public statistical data of the Eurostat database. The level of the development has been presented based on the synthetic gauge exhibiting the taxonomic distance of each region from the established pattern of development. The research procedure was composed of four stages and comprised: a selection of variables, a reduction of multi-attribute space, specifying the level of the regional development of the researched units as well as a classification of regions against the scale of the level of the regional development based on the ranking created according to a decreasing value of the synthetic gauge.

Findings: As a result of the research procedure conducted, spatial differentiation of 95 subregions of the NUTS-3 level in Poland, the Czech Republic and Slovakia with respect to the level of the regional development as well as three components constituting the factors of the said growth is presented. The highest value of the synthetic gauge has been registered in regions comprising the capitals of the respective countries. Moreover, large developmental discrepancies within the respective countries have been identified.

Originality/value: The results obtained as a result of having conducted the research may constitute a source of inspiration for the EU institutions within the scope of specifying the richest and the poorest EU regions with the purpose of an efficient management of the cohesion policy in the subsequent programming periods.

Keywords: regional development, distance from the role model, Hellwig's reduction method, NUTS-3 units.

Category of the paper: Research paper.

1. Introduction

Specifying the level of the regional development as well as its changes is an incredibly important research problem both in the economic theory and in the economic practice. For example, the allocation of the EU funds to specific subregions, as well as the intensity of state aid for communities depends on the level of the development (Albulescu, Goyeau, 2014; Nistor, Glodeanu, 2014; Azis, 2020; Matsuura, 2015). Researching the significance of the process of the regional development, its core, its causes and consequences is the subject of a lot of scientific reports (Jašková, Havierníková, 2020; Dreyer et al., 2006; Mukhametzhan et al., 2020; Shikverdiev et al., 2019; Orlova et al., 2018; Vučković et al., 2018). A characteristic feature of the regional development is its spatial differentiation. The growing discrepancies in regional development in turn constitute one of the main problems of the contemporary economy, and the fundamental goal of the European cohesion policy is convergence, i.e. activities directed towards decreasing the differences in the level of the development of the EU regions (Beugelsdijk et al., 2018; Charron et al., 2014; Martin, Sunley, 1998).

In the study, the level of the regional development based on 31 indicators categorized within the three subcomponents (factors) of the development has been presented: the society, the natural environment and the economy. The basis applied to calculate the indicators was statistical data from the Eurostat database, enriched by the data from Statistical Offices of Poland, Slovakia and the Czech Republic. The main assumption of the article is to present the variation of the level of the regional development of the Czech Republic, Slovakia and Poland within the arrangement of specific subregions, i.e. the third level of classifying territorial units for statistical purposes applied by Eurostat (the so-called NUTS-3). The level of the regional development shall be presented based on a synthetic gauge representing a taxonomic distance of a given subregion from the established pattern of development.

In the article, a hypothesis is verified according to which the regional development of the subregions in Poland, the Czech Republic and Slovakia is highly varied, and its highest level is registered in the subregions located around the capitals of the countries researched as well as the biggest provincial cities: Warsaw, Prague, Bratislava, Wrocław, Cracow or Poznań, and the lowest – in the subregions located the farthest from the large cities indicated constituting the centres of growth. The research encompasses all NUTS-3 subregions in Poland, the Czech Republic and Slovakia – 95 units in total.

2. Stages of the research procedure

In order to research the level of the regional development of the NUTS-3 level subregions in Poland, the Czech Republic and Slovakia, a synthetic gauge of the distance from the recommended pattern has been used. The research procedure has been conducted parallelly – in the static dimension (based on the values of the indicators in 2019) as well as in the dynamic dimension (based on the change of the value of the indicators in the years of 2010-2019). The research procedure was composed of four respective stages:

1. the selection of variables – the creation of a matrix of geographical information,
2. the reduction of the multifeature space,
3. indicating the level of the regional development of the units subject to research,
4. the classification of the subregions against the scale of the regional development.

Table 1.

Indicators taken into account in the analysis specifying the subcomponents of regional development

The subcomponent of development	Indicators
The society (11 variables)	the natural growth per 1,000 inhabitants; the migration balance per 1,000 inhabitants; the feminization coefficient in total; the share of people at the production age in the total number of people; the share of people at the post-production age in the total number of people; the share of people at the pre-production age in the total number of people; the number of people at the post-production age per 100 people at the pre-production age; the number of people at the non-production age per 100 people at the production age; the total birthrate; the median age of the population; the average age of women at birth
The natural environment (10 variables)	the share of farms below 5 hectares in the total number of farms; the share of farmland as well as natural green areas in the total area; the share of farmers-farm owners under the age of 35 in the total number of farm owners; road transport of goods measured in tonnes per 1,000 inhabitants; registering misdemeanour and a crime concerning the natural environment per 1000 inhabitants; the use of the electrical energy for heating the living quarters (as the EU average), the use of electrical energy for freezing the living quarters (as the EU average), the quantity of accommodation per 1,000 inhabitants; the municipal waste per 1 inhabitant; disposed of municipal waste per 1 inhabitant
The economy (10 variables)	the creation of enterprise coefficient; the share of microenterprises in the total number of economic entities; the share of the employed in farming in the total number of the employed; the share of the employed in the financial sector in the total number of the employed; the share of the employed in the sector of information and communication in the total number of the employed; the share of the employed in the sector of professional services in the total number of the employed; the number of trademarks per 1 mln inhabitants; the share of the employed in services in the total number of the employed; the number of consumables per 1 mln inhabitants; GDP per 1 inhabitant (as the EU average)

Source: authors' own elaboration.

At the first stage of the research procedure conducted, a matrix of geographical information was built based on 31 indicators (table 1), which specified the level of the development of the NUTS-3 units in 2019 as well as the changes thereof in the years between 2010-2019 in relation to three subcomponents of growth: the society, the natural environment and the economy. Subsequently, Pearson's linear correlation coefficients were calculated between all the researched departure indicators separately for 2019, as well as separately for its change in the years of 2010-2019. It is extremely important, however, for the indicators selected for a synthetic gauge of distance from the recommended pattern to be loosely correlated between each other. As a result, the information capacity of those indicators differs.

The matrices of Pearson's correlation coefficients were the basis of conducting a reduction of the departure variables by using Z. Hellwig's reduction method – i.e. to separate the diagnostic features, i.e. those indicators which shall be taken into account in further research procedure (Balcerzak, 2016). Z. Hellwig's reduction method uses for calculation the correlation coefficients between the variables. In Z. Hellwig's reduction method, the diagnostic feature is the indicator whose sum total of the absolute correlation coefficients with other features is the highest. Next those variables are eliminated for which the value of the correlation coefficient with the diagnostic feature is higher than the critical value specified based on the hereinbelow mentioned pattern (Nowak, 2018):

$$r^* = \sqrt{\frac{(t^*)^2}{n-2+(t^*)^2}} \quad (1)$$

where:

r^* – critical value of Pearson's linear correlation coefficient,

t^* – the t-Student statistics value (at the significance level $p = 0.05$),

n – the number of departure indicators (variables).

As a result of the method applied, those variables are eliminated which are significantly statistically correlated with the diagnostic feature (called satellite features). At every next step, there is a reduction of the correlation matrix by the central feature and the satellite features. Z. Hellwig's method is repeated, obtaining new reduced correlation matrices, up to the point of exhausting a collection of features or the separation of isolated features (Hauke, Kossowski, 2011). The procedure of the reduction of variables has been eightfold: separately for the level of the regional development in total as well as separately for the level of the development for each subcomponent both in the static dimension (for the data for 2019), as well as the dynamic one (for the data for 2010-2019).

At the next step of the research procedure, a pattern and an anti-pattern of the level of the regional development have been devised. A pattern has been defined as the maximum standardized values of the respective diagnostic features, and the anti-pattern – their minimum values (Spychała, 2020). At the next stage, the taxonomic value of each researched subregion of the NUTS-3 level from the pattern of development was devised based on the hereinbelow mentioned pattern (Reiff et al., 2016):

$$d_{i0} = \sqrt{\sum_{j=1}^m (z_{ij} - z_{0j})^2} \quad (2)$$

where:

d_{i0} – the taxonomic distance of the i subregion from the assumed pattern of development,

z_{ij} – the standardised value of the j indicator (feature) for the i subregion,

z_{0j} – the standardised value of the j indicator (feature) for the pattern of development.

At the last stage of the research procedure, a synthetic gauge for each NUTS-3 subregion was devised, being an indicator of the level of development in a particular subregion. The value of the synthetic gauge was calculated for the general level of the regional level of development as well as separately for each of the three subcomponents of the development. The synthetic gauge was calculated based on the following pattern:

$$v_i = 1 - \frac{d_{i0}}{d_0} \quad (3)$$

where:

v_i – a synthetic gauge of the level of development of the i subregion,

d_{i0} – the taxonomic distance of the i subregion from the assumed pattern of development,

d_0 – the taxonomic distance of the pattern from the antipattern of development.

A synthetic gauge of the level of the development assumes values from 0 to 1, with a proviso that the higher the value, the higher the level of the development of a particular phenomenon. Based on the calculated synthetic gauges, a ranking of 95 subregions of the NUTS-3 level in Poland, the Czech Republic and Slovakia was established, and its subcomponents were subsequently subdivided into five groups: at a very high (20% of the subregions at the highest value of the synthetic gauge – the 1. group – places 1-19 in the ranking), high (the following 20% of the subregions – the 2. group – places 20-38 in the ranking), average (subregions located on positions 39-57, taking account of their decreasing placement based on a given synthetic gauge – the 3. group), low (subregions on positions 58-76 – the 4. group) and very low (20% of the subregions at the lowest value of the synthetic gauge – the 5. group – positions 77-95) level of development. Taking account of the research conducted in the dynamic dimension, subregions for which the indicator took the highest values (20% of the researched units), were classified into the group comprising units of a very high variability of the intensity of the phenomenon, and the units for which the indicator assumed the lowest values (20% of the researched subregions), classified into the group exhibiting the relatively low variability of the level of development of a particular phenomenon.

Table 2.

Extreme values of the synthetic gauge within the respective subcomponents of the regional development in 2019

The highest values of the synthetic gauge (2019)			The lowest values of the synthetic gauge (2019)		
Item	The NUTS-3 subregion	Value	Item	The NUTS-3 subregion	Value
The society					
1	Poznanski (PL)	0.652	95	Miasto Łódź (PL)	0.148
2	Gdanski (PL)	0.646	94	Sosnowiecki (PL)	0.254
3	Kosický kraj (SK)	0.611	93	Walbrzyski (PL)	0.270
4	Presovský kraj (SK)	0.604	92	Královéhradecký kraj (CZ)	0.273
5	Warszawski wschodni (PL)	0.596	91	Sandomiersko-jedrzejowski (PL)	0.295
The natural environment					
1	Koszalinski (PL)	0.566	95	Miasto Wrocław (PL)	0.270
2	Liberecký kraj (CZ)	0.533	94	Bratislavský kraj (SK)	0.284
3	Slupski (PL)	0.522	93	Gliwicki (PL)	0.298
4	Jihočeský kraj (CZ)	0.490	92	Katowicki (PL)	0.300
5	Gdanski (PL)	0.478	91	Miasto Warszawa (PL)	0.301
The economy					
1	Miasto Warszawa (PL)	0.856	95	Sandomiersko-jedrzejowski (PL)	0.094
2	Miasto Kraków (PL)	0.610	94	Pulawski (PL)	0.127
3	Miasto Wrocław (PL)	0.594	93	Lomzynski (PL)	0.127
4	Miasto Poznań (PL)	0.590	92	Chelmsko-zamojski (PL)	0.135
5	Hlavní mesto Praha (CZ)	0.573	91	Bialski (PL)	0.143
The level of the regional development in general					
1	Miasto Kraków (PL)	0.471	95	Sandomiersko-jedrzejowski (PL)	0.245
2	Miasto Warszawa (PL)	0.456	94	Sosnowiecki (PL)	0.272
3	Bratislavský kraj (SK)	0.450	93	Chelmsko-zamojski (PL)	0.273
4	Poznanski (PL)	0.439	92	Lomzynski (PL)	0.277
5	Warszawski zachodni (PL)	0.438	91	Pulawski (PL)	0.285
6	Gdanski (PL)	0.437	90	Miasto Łódź (PL)	0.287
7	Kosický kraj (SK)	0.423	89	Walbrzyski (PL)	0.290
8	Hlavní mesto Praha (CZ)	0.422	88	Kielecki (PL)	0.290
9	Slupski (PL)	0.414	87	Kraj Vysocina (CZ)	0.292
10	Miasto Poznań (PL)	0.409	86	Czestochowski (PL)	0.294

Source: authors' own elaboration.

Table 3.

The highest and the lowest values of the synthetic gauge within the respective subcomponents of the regional development in the years of 2010-2019

The highest values of the synthetic gauge (the period of 2010-2019)			The lowest values of the synthetic gauge (the period of 2010-2019)		
Item	The NUTS-3 subregion	Value	Item	The NUTS-3 subregion	Value
The society					
1	Miasto Warszawa (PL)	0.571	95	Szczecinecko-pyrzycki (PL)	0.226
2	Warszawski wschodni (PL)	0.542	94	Legnicko-Glogowski (PL)	0.243
3	Miasto Kraków (PL)	0.540	93	Jeleniogórski (PL)	0.261
4	Warszawski zachodni (PL)	0.530	92	Wloclawski (PL)	0.261
5	Bialostocki (PL)	0.526	91	Koszalinski (PL)	0.279
The natural environment					
1	Bytomski (PL)	0.672	95	Nowosadecki (PL)	0.346
2	Miasto Warszawa (PL)	0.666	94	Slupski (PL)	0.383
3	Trojmiejski (PL)	0.638	93	Leszczynski (PL)	0.416
4	Katowicki (PL)	0.631	92	Jeleniogórski (PL)	0.430
5	Gliwicki (PL)	0.627	91	Nowotarski (PL)	0.464
The economy					
1	Miasto Warszawa (PL)	0.552	95	Gorzowski (PL)	0.274
2	Trojmiejski (PL)	0.537	94	Koszalinski (PL)	0.279
3	Miasto Kraków (PL)	0.490	93	Ústecký kraj (CZ)	0.286
4	Jihomoravský kraj (CZ)	0.489	92	Walbrzyski (PL)	0.289
5	Plocki (PL)	0.488	91	Legnicko-Glogowski (PL)	0.293
The level of the regional development in general					
1	Miasto Warszawa (PL)	0.590	95	Jeleniogórski (PL)	0.329
2	Trojmiejski (PL)	0.550	94	Legnicko-Glogowski (PL)	0.329
3	Warszawski zachodni (PL)	0.534	93	Koszalinski (PL)	0.340
4	Bialostocki (PL)	0.513	92	Szczecinecko-pyrzycki (PL)	0.347
5	Miasto Kraków (PL)	0.497	91	Slupski (PL)	0.354
6	Warszawski wschodni (PL)	0.493	90	Walbrzyski (PL)	0.359
7	Rzeszowski (PL)	0.492	89	Gorzowski (PL)	0.367
8	Jihomoravský kraj (CZ)	0.483	88	Szczecinski (PL)	0.368
9	Lódzki (PL)	0.483	87	Karlovarský kraj (CZ)	0.374
10	Miasto Łódz (PL)	0.482	86	Nowosadecki (PL)	0.376

Source: authors' own elaboration.

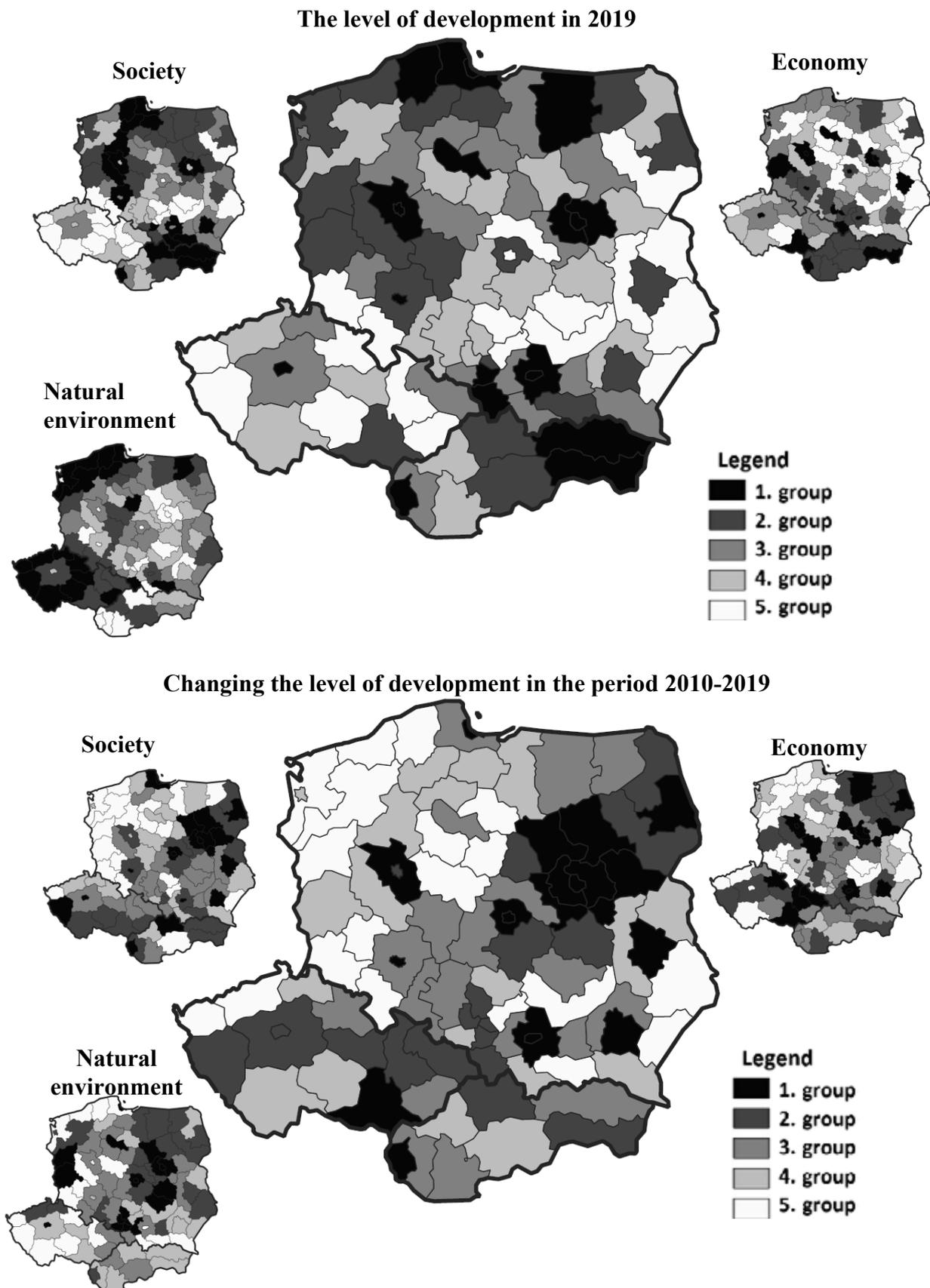


Figure 1. The differentiation of the regional level of the subregions in Poland, the Czech Republic and Slovakia. Source: authors' own elaboration.

In figure 1 as well as in table 2 and 3, the results of the research conducted have been presented. Table 2 presents the NUTS-3 units exhibiting the highest and the lowest values of the synthetic gauge within the respective subcomponents of the regional development calculated separately for 2019. In tab. 3, the NUTS-3 subregions of the extreme values of the synthetic gauge were compiled calculated for the changes in the years of 2010-2019. Figure 1 contains choropleth maps representing the spatial variation of the regional level of the NUTS-3 subregions in Poland, the Czech Republic and Slovakia in 2019 as well as the changes in the development in the years 2010-2019.

3. Conclusions based on the research conducted concerning the respective subcomponents of development

As a result of the research procedure conducted, spatial differentiation of 95 NUTS-3 level subregions in Poland, the Czech Republic and Slovakia was presented with respect to the level of the regional development as well as three subcomponents being factors of that growth (figure 1). In the researched group of units, the value of the synthetic gauge representing the level of the regional development in 2019 ranged from 0.24 to 0.47 (table 2). The value of the gauge representing the change in the level of the regional development of the subregions in the years of 2010-2019 ranged from 0.33 to 0.59 (tab. 3). A similar differentiation was observed in the case of the society (0.15-0.65 for 2019 as well as 0.23-0.57 for the change in the years of 2010-2019), the natural environment (0.27-0.57 as well as 0.35-0.67 respectively) as well as the economy (0.09-0.86 respectively as well as 0.27-0.55). One should thus note that the biggest differentiation of the subregions was registered in terms of the economy, and the biggest similarity of the researched units was observed in the case of the natural environment.

Taking account of the level of the development of the „society” subcomponent, the highest value of the synthetic gauge in 2019 was registered in the poznański, gdański and kosický kraj subregions, and the lowest in Łódź and the subregions: sosnowiecki and wałbrzyski. The high position of the districts indicated was decided on by: a high migration balance, the beneficial age structure of the population as well as a high indicator of fertility. A low position of the respective units was decided on by: a very high share of people at the post-production age in the total number of people as well as the negative birthrate. Taking account of the analysis conducted in the dynamic dimension, the biggest change in the level of the development of the „society” subcomponent in the years of 2010-2019 was observed in Warsaw, Kraków and the Eastern warszawski subregion, and the lowest – in the following units: the szczecinecko-pyrzycki, legnicko-głogowski and jeleniogórski subregions. The weaker position of the NUTS-3 units indicated in the research on the change in the level of the development of the society was decided on by: the decrease in the birthrate indicator as well as an increase in the

indicator of the demographic burden. A high position of the respective subregions in the ranking was decided on by: a very high increase in the migration balance, an increase in the share of the people at the production age in the total number of people, as well as a relatively high decrease of the average age of women at the moment of giving birth.

Based on the state of the natural environment, the highest value of the synthetic gauge in 2019 was registered in the following subregions: koszaliński, liberecky kraj as well as in the ślupski subregion, and the lowest – in Wrocław, bratislavsky kraj as well as in the gliwicki subregion. The high position of the NUTS-3 units in the research was impacted mainly by: the lowest use of electrical energy for the purpose of cooling the living quarters as well as the number of accommodation units per 1,000 inhabitants. The low position in the ranking of the subregions mentioned hereinabove was decided on by: the problematic road transport of goods measured in tonnes per 1,000 inhabitants as well as a significant amount of municipal waste per 1 inhabitant. Taking account of the analysis conducted in the dynamic dimension, the biggest improvement of the state of the natural environment in the years of 2010-2019 was observed in the bytomski subregion, Warsaw and the trójmiejski subregion, and the lowest – in the following subregions: nowosądecki, ślupski and leszczyński. The lower position of the units in the research was decided on by: the increase in demand for cooling the living quarters per capita as well as an increase in the quantity of municipal waste per 1 inhabitant. A high position in the ranking of the respective units was decided on by: a relatively high share of natural green areas in the area in total as well as the highest in the period researched increase in the percentage of waste disposed of.

Taking account of the level of the development of the economy, the highest value of the synthetic gauge in 2019 was registered in Warsaw, Cracow and Wrocław (in those cities the most microenterprises per 1,000 inhabitants were registered, as well as the biggest share of the employed in the finance sector in the total number of the employed was observed), and the lowest – in the subregions: sandomiersko-jędrzejowski, puławski and łomżyński (of the lowest number of microenterprises per 1,000 inhabitants as well as the lowest coefficient of the creation of enterprises). From another standpoint, taking account of the analysis conducted in the dynamic dimension, the biggest progress in the level of the development of the „economy” subcomponent in the years of 2010-2019 was observed in Warsaw, Cracow and Trójmiasto, and the lowest – in the following subregions: gorzowski, koszaliński and ustecky kraj. The NUTS-3 units position in the research conducted in the dynamic dimension was influenced mainly by: the percentage of the employed in the financial sector, the share of the employed in the sector of professional services as well as GDP per capita (in all three indicators, the highest growth was registered in Warsaw), as well as the number of trademarks per 1 mln inhabitants (the highest growth in Cracow) as well as the changes in the structure of the size of the enterprises.

4. Summary – the general level of the regional development of the NUTS-3 subregions in Poland, the Czech Republic and Slovakia

Summarizing the results of the research conducted concerning the level of the regional development of 95 NUTS-3 subregions in Poland, the Czech Republic and Slovakia, one may indicate the following conclusions. The level of the general development of the subregions in 2019 was specified based on 31 indicators separated within three subcomponents of the development: the society, the natural environment as well as the economy. The highest value of the synthetic gauge was registered in big cities being supraregional centres of growth: Cracow, Warsaw and Bratislava as well as the subregions forming agglomerations – the poznański, the Western-Warsaw and gdański subregions. The hypothesis stated at the beginning of the article has been positively verified. Moreover, among 3 national capitals (Warsaw, Prague and Bratislava) as well as 5 remaining subregions being single cities (Cracow, Wrocław, Poznań, Szczecin and Łódź), 6 units have been qualified into the group of units at a very high level of the regional development. However, Szczecin and Łódź have not been classified in the group of the best developed subregions: Szczecin was found in the middle of the compilation (51. position), and Łódź has been classified on the 90th position in the ranking of the best developed NUTS-3 units in Poland, the Czech Republic and Slovakia (the 5th position from the bottom). Taking account of the analysis conducted in the dynamic dimension, the biggest change in the level of the regional development in the years of 2010-2019 was observed in Warsaw, Trójmiasto (comprising Gdańsk, Gdynia and Sopot), Cracow and the Western warszawski as well as białostocki subregion. Łódź, Bratysława and Wrocław (the 9th, 12th and 17th position respectively) were also high in the ranking. Prague was on the 30th position and Poznań – on the 34th position among the 95 subregions at the biggest change in the level of the regional development in the years of 2010-2019, and Szczecin – as far as on the 62nd position. It is well worth noting that the subregions at a very high level of the regional development are usually those units in which the biggest change in the development was registered in the years of 2010-2019 (and the reverse). Apart from the big cities indicated, the group also includes the subregions surrounding the provincial capitals such as those including: the gdański, poznański, wrocławski, warszawski wschodni, warszawski zachodni, krakowski, rzeszowski or bydgosko-toruński provinces. On the other hand, the subregions at the weakest level of the regional development include the NUTS-3 units located at the periphery as well as far from the strongest regions, e.g. the sandomiersko-jędrzejowski, sosnowiecki, chełmsko-zamojski, jeleniogórski or koszaliński regions. One may thus conclude that – on one hand – the current level of the development of the respective subregions in Poland, the Czech Republic and Slovakia is to a large extent shaped by the activities taken in the last decade, i.e. in the period of complete participation in the policy of cohesion of the European Union, and on the other hand – bigger and bigger disproportions are observed at the level of NUTS-3

units, as to the largest extent, the level of the regional development has increased in the economically strongest subregions (in Warsaw as well as in the capitals of the provinces being at the same time supraregional centres), and to the least extent – in the relatively weakest developed subregions (e.g. in those ones that are located at the northern, north-eastern and south-western border of Poland as well as the south-western border of the Czech Republic). Large developmental disproportions may also be observed at the NUTS-2 level units. Within the area of almost each of them, the subregions both at a very high level of the regional development, as well as units classified as the 20% of the least developed NUTS-3 units in the countries researched, are located. The abovementioned considerations, the research conducted as well as the results obtained may thus constitute an inspiration to go into more in-depth analyses in that direction.

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POZNAŃ PRIMARY HOUSING MARKET: CHANGES AND SUSTAINABLE DEVELOPMENT

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Introduction/background: Pursuing sustainable urban and community development should be a key objective for local governments. The needs of the current generation should be accommodated in a way that respects the environment and accounts for the needs of the generations yet to come. It also calls for the need to plan for and maintain a sustainable market for residential properties – a specific real estate market segment that is characterised by its localness and uniqueness and which serves to accommodate the needs of households, both the fundamental ones (those relating to physiology, safety and belonging) and those at a higher level (such as recognition and self-fulfilment).

Aim of the paper: This study is meant as a contribution to further research and its purpose is to present certain developments in the local primary housing market over 2016-2020 and identify potential problems that could have an adverse impact on a sustainable development of both the city concerned and its population.

Materials and methods: Our discussion here is based on real estate market data, including those found in publications from Statistics Poland (GUS) and the National Bank of Poland (NBP), and on research conducted by the Poznań University of Economics and Business, Department of Investment and Real Estate.

Results and conclusions: Our research shows that the local primary market for residential real estate in Poznań is on a dynamic growth path, driving up supply, demand and, consequently, prices. While this is welcome news for many market stakeholders, it also gives rise to legitimate concern about the proper and sustainable development of local communities going forward.

Keywords: sustainable development, local housing market, housing supply and prices.

1. Introduction – How the market for residential properties operates: the specifics

Fairly commonly, the residential property market is seen as a discrete segment of the market for real estate. It is understood as an area in which sellers and buyers interact with each other by exchanging rights to (residential) property for other assets (most often, money), or as a certain totality of conditions allowing for a transfer of title to residential properties with specific rights and obligations for transaction parties (Kucharska-Stasiak, 1999, p. 11; Kucharska-Stasiak, 2005, p. 7). Or, following M. Bryx (2006, pp. 18, 87-91), it may be defined as a system – comprised of a number of subsystems (of property trading, investment, financing or management) – involving numerous actors interlinked through various relationships and manifesting their different expectations and preferences (Gawron, 2016, pp. 31-32). We could also look at it through the lens of classical economic definitions according to which a residential market is an area where housing demand and supply meet, shaping housing prices and facilitating housing transactions in the process (Łaszek, 2006, p. 7; Nykiel, 2008, p. 15; 2011, p. 56).

It is not a multitude of definitions, however, that make the residential segment what it is within the larger real estate market, but a number of other notable characteristics. First, what makes it unique is what that market offers to interested parties – housing. The importance of housing in socio-economic life (both individual and collective) has been emphasised in numerous studies (Bryx, 2001, p. 13; Dziworska, Trojanowski, 2007, p. 146; Andrzejewski, 1979, p. 14; Gawron, 1992, p. 84; Kaltenberg-Kwiatkowska, 1982, pp. 7-8; Trzeciak, 1976, p. 394). Most importantly, it is an essential good for every household to function the way it should; as such, it is essential for a country's economic development.

Second, this is not a homogenous market segment. Rather, it features a number of overlapping partial markets, each differing from another in terms of location, type of housing, form of lease, age, quality or financing (Gurran et al., 2015, p. 8). Based on the criteria presented by H. Gawron (2016, pp. 32-33) and E. Kucharska-Stasiak (2016, pp. 59-61), one could distinguish the markets for single-family housing and multi-apartment buildings (what is offered); the markets for sale or long- or short-term lease of housing (ownership); the markets for popular or apartment dwellings (quality); the primary market (where housing is bought straight from property developers) and the secondary market, often referred to as second-hand or used housing market (housing origin). Naturally, a lot more segments could be distinguished.

Third, this is an imperfect market. In terms of organisation, it could be compared to oligopoly. Its actors have a rather limited access to market information, have to cope with significant (relatively large) financial burdens, and often make irrational decisions (not just buyers or tenants, but also sellers and landlords).

Fourth, it is a local market. A typical residential housing market is limited to its locality. Every town or city is different in terms of their history, spatial configuration and built developments, demographics and economic situation, or housing buyers' habits and preferences. Additionally, that local dimension derives from what forms an essential feature of each real property – housing (as a good) cannot be moved in space. According to S. Belniak (2001, p. 42), this means that supply is “localised”, while demand may be a bit more mobile, originating from both local and non-local areas. All of this means that any inter-market studies and comparisons are difficult, as any phenomena that are present within one market do not have to have the same impacts on the other. On top of that, it would be wrong to copy, or transfer, trends or phenomena present within one local market to another. One example would be the development of the market for apartment buildings in Warsaw that did not occur in Poznań (Strączkowski, 2021, p. 38).

Fifth, this is a market with a relatively low transaction volume compared to other markets. Also, supply here is created over a relatively long time, with new housing stock requiring quite some time to be completed (1.5 to 2 years, on estimates). In that time, the investor faces a number of risks, including a change in the market situation, variable demand or price fluctuations, in addition to running project costs (Gurran et al., 2015, p. 9). Importantly, striking and maintaining a market equilibrium is very difficult – rising prices on housing markets can drive up demand, leading in consequence to higher supply, but that does not necessarily have to bring the price to its equilibrium point.

Sixth, due to its nature, the housing market is considered to be very difficult to balance; in other words, it is characterised by long-term disequilibrium, stemming from the nature of demand and supply. While demand rises over a long time, at a pace that depends on population numbers or income figures, it is subject to short-term fluctuations. Its level may depend on property prices or interest rates for loans. Supply, on the other hand, is completely fixed over a short time, given a long project development timeframe, estimated at 1.5 to 2 years (Belniak, 2001, p. 43; Kucharska-Stasiak, 2006, pp. 65-66). Furthermore, the residential property market does not have to develop evenly at all. Some of its segments may be on a volume growth path, while others may combine both quantitative and qualitative changes (Foryś, 2011, p. 47). Also, local markets feature observable demand-supply mismatches, as reflected in the differences between housing that is offered for sale and one that buyers would prefer to buy, or between the sellers' and buyers' price expectations (Bartkowiak, Strączkowski, 2019, pp. 20-21).

Seventh, the housing has great importance for sustainable urban development. M. Bryx (2021, pp. 83-84) writes that housing construction consumes what is one of the most important non-renewable resources – land. That consumption goes beyond the development (construction) process alone and is also involved in subsequent property use. Hence the discussions and demands concerning proper spatial planning in cities and towns, energy efficiency standards for buildings, wider housing environment (going beyond a dwelling alone

to include any amenities that add to the quality of life), or housing affordability for people that is a condition not just for a proper development of the housing market but also of society more generally – one that is capable of engagement in diverse efforts, both in their own interest and that of the general public (country). All of these considerations mean that the housing market is subject to state interventionism, as reflected in legal frameworks regulating housing trade or management or the programmes created to meet the housing needs of a population. Also, the housing market needs specialists for its operation. Those with a professional involvement (whether close or more remote) in the housing market may, to a certain extent, shape the developments on it. Accordingly, in interpreting the notion of sustainable urban development, we should take into account the issues affecting the development of local housing markets and their individual elements – housing supply and prices and housing demand.

2. The local housing market in Poznań: the supply side

The local housing market in Poznań is considered to be one of the largest such markets in Poland. As reported by Statistics Poland (GUS) and the National Bank of Poland (NBP), the city's housing stock is estimated at more than 270,000 dwellings, which makes this market quite saturated at 511 dwelling units per 1,000 residents. At the same time, the market sees quite a lot property development activity and property developers – in the last five years (2016-2020), their number rose from 77 to 100. It is not a coincidence that property developers are now regarded to be a key player in the supply of new housing stock. Between 2016 and 2020, property developers accounted for more than 80% (sometimes even 90%) new dwelling completions – Table 1 (the remaining completions came from the local government and individuals).

Table 1.

Dwelling completions by property developers, Poznań housing market, 2016-2020

No.	Description	unit	year				
			2016	2017	2018	2019	2020
1.	Number of dwelling completions by property developers	psc	2 453	3 685	3 545	4 182	4 476
2.	Dwelling units from property developers as a share of total dwelling completions	%	84	91	88	83	91
3.	Average area of a completed dwelling unit from a property developer	sqm	52,8	53,3	55,1	54,3	54,8
4.	Number of dwellings offered (end of Q4 data for each year)	psc	4 462	3 632	5 367	6 021	5 219

Source: Own compilation based on data from Statistics Poland (GUS) and the National Bank of Poland (NBP).

This rising activity among property developers is reflected in the figures for dwelling completions. While there was close to 2,500 dwelling completions initially in the reported period, their number at the end of it, in 2020, shot up to nearly 4,500. This means, on average, new housing stock rose by 456 units from year to year. The data are for actual completions – the stock that was actually constructed and formally reported as completed. We should not forget, however, that a large part of housing offered by property developers is sold while still under construction, before its completion. This is why very often the number of dwellings offered for sale (in quantitative terms) is much larger than that of completed dwellings. This is quite important because, in any discussion of new housing supply, these two parameters should be kept separate.

Regarding housing supply, one should also mention the size, or area, of dwellings, whether completed or sold. As for new dwellings, their average area has remained relatively unchanged, ranging between 53 and 55 square metres (sqm). These trends are borne out by the data on the housing on offer:

- The largest percentage here is for dwellings of 40-60 sqm in size (in 2016-2020, 51% on average), albeit their share in the last two years declined, giving way to slightly larger units (60-80 sqm).
- At 25% of the housing offer, the units of 60-80 sqm in size have the second largest share.
- At 7%, the relatively largest units, of more than 80 sqm, have the smallest share (NBP).

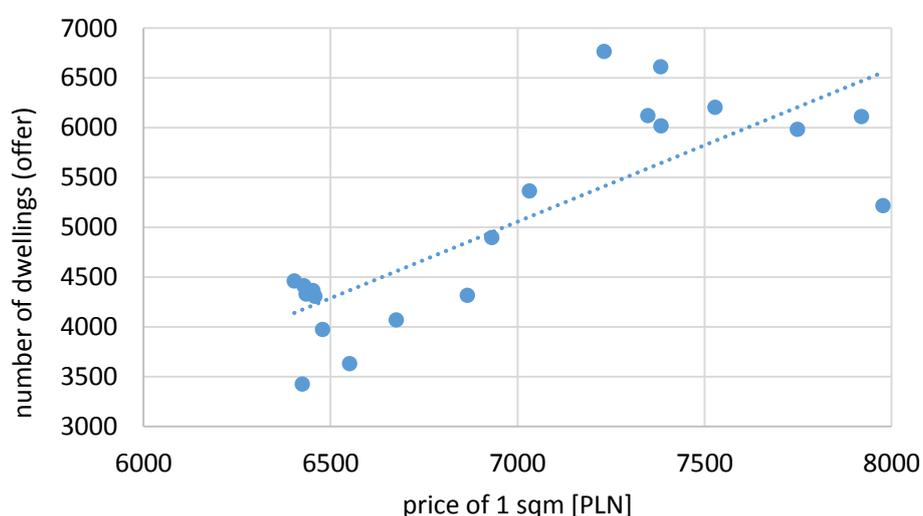


Figure 1. Number of dwellings on offer and their price per sqm, Poznań primary housing market, 2016-2020 (quarterly data). Source: Own compilation based on data from the National Bank of Poland (NBP).

Comparing the supply and asking prices (and specifically, the average per sqm prices), we can see that the higher the price, the more units there are on offer. This is not a surprise, really, seeing as the rising housing prices encourage property developers to intensify their activity, leading to a large number of development projects.

3. The local housing market in Poznań: the prices

Similar to supply, housing prices have been on an upward trajectory in the last few years. This trend is true of both asking and transaction prices (Table 2). Most often, this is explained by a large interest in residential housing or reported demand from buyers. That said, and importantly, the rising prices are the result of rising construction costs. This is reported in the press (Zielińska, 2021; Muratorplus.pl, 2021; Kaźmierczak, 2021) and in publications from the National Bank of Poland (Łaszek et al., p. 20) or Statistics Poland which, when identifying the five largest barriers to construction activity, including general economic uncertainty or high fiscal burdens, also refers to:

- employment costs and shortages of qualified workforce, and
- costs of materials (Błażej, 2020, p. 15).

Table 2.

Housing prices and costs (PLN), Poznań housing market, 2016-2020

No.	Description	year				
		2016	2017	2018	2019	2020
1.	Average asking price per one sqm of dwelling area, primary market*	6 403	6 551	7 033	7 394	7 980
2.	Average transaction price per one sqm of dwelling area, primary market*	6 304	6 382	7 017	7 396	7 633
3.	Difference between asking and transaction prices	99	169	16	-2	347
4.	Average expenditure by property developer per 1 sqm of new residential buildings**	4 000	4 145	4 139	4 597	5 012

Note:

* Figures for Q4 in each year.

** No data for Poznań were available, so the figure shown is one for Poland. Given how development projects are implemented (utilising general contractors operating nation-wide), the figure can be considered reliable.

Source: own compilation based on data from Statistics Poland (GUS) and the National Bank of Poland (NBP).

Based on Statistics Poland's published benchmark for average construction expenditure per 1 sqm of new residential buildings, we can see that the cost is now up by 25%, or one percentage point more than the average asking price per sqm, and by 4 percentage points more than the average transaction price per one square metre of dwelling area (Table 2).

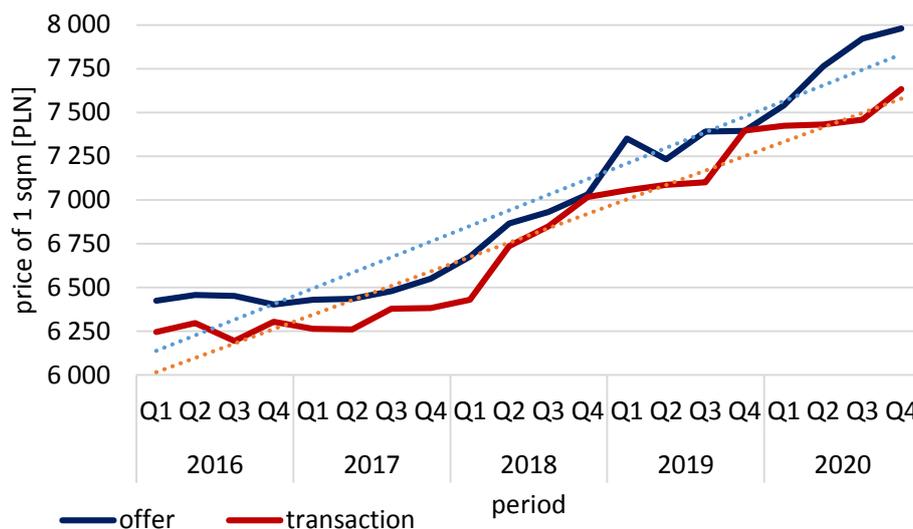


Figure 2. Changes in asking and transaction prices for one sqm of dwelling area, Poznań primary housing market, 2016-2020 (quarterly data), Source: Own compilation based on data from the National Bank of Poland (NBP).

Looking at quarterly rises in average prices per sqm of dwelling area over 2016-2020 (Fig. 2), we can see that:

- the asking price went up by 24% from PLN 6,400 to PLN 8,000, meaning that it rose on average by PLN 89 from quarter to quarter;
- the transaction price went up by 22% from PLN 6,200 to PLN 7,600, working out to an average increase by PLN 82 (from quarter to quarter).

Note that in rises asking prices were minimally higher and the difference between them and transaction prices, while subject to certain fluctuations, is nevertheless increasing.

4. The local housing market in Poznań: the demand side

Similar to supply and prices, the housing demand over 2016-2020 has been on an upward trend. While recently lower than the year before, the average transaction volume grew by 245 units a year. The Poznań housing market is unique in that most transactions there are on the primary market; importantly, too, the significance of that segment is steadily increasing (Table 3).

Table 3.
Poznań primary housing market indices, 2016-2020

No.	Description	unit	year				
			2016	2017	2018	2019	2020
1.	Number of dwellings bought	pcs.	3 885	4 805	4 465	5 414	4 807
2.	Percentage of dwellings bought on the primary market	%	55	62	62	68	70
3.	Average gross salary	PLN	4 771	5 062	5 406	5 743	5 998
4.	Housing affordability on the primary market*	points	3,82	3,65	3,76	3,73	3,68

* This index is shown for a 50 sqm dwelling as a typical unit in development projects and for a two-person household's average annual net income (actual income received). This is the so-called P/I ratio which factors in housing prices and household's annual income. The score of up to 3 points reflects housing affordability for households; the score of 3.1-4.0 reflects moderate unaffordability; the score of 4.1-5.0 reflects unaffordability; and the score of more than 5 points means high unaffordability (more on the ratio in: Mazurczak, Strączkowski, 2014, p. 107).

Source: own compilation based on data from Statistics Poland (GUS) and the National Bank of Poland (NBP).

Interestingly, the rising housing prices notwithstanding, the housing affordability index has been improving, even if minimally. While at 3.82 initially in the reported period, 2020 saw it drop to 3.68 in 2020. It should be recalled, however, that the index is estimated for a 50 sqm dwelling and the average pay in the enterprise sector (which grew faster than prices). As such, the ratio should be treated with some caution, especially as its level is interpreted as reflecting entrenched moderate unaffordability (in other words, housing is relatively expensive).

Another aspect that is worth looking into when discussing housing demand are the sizes of dwellings bought and their structure. As regards new dwellings, their average area has remained relatively unchanged, and was slightly upwards of 50 sqm. These trends are borne out by the data on housing sales, as follows:

- The largest percentage of dwellings bought is for units of 40-60 sqm in size (in 2016-2020, 52% on average), albeit their share in the last two years declined, giving way to slightly larger units (60-80 sqm).
- At 25% of the housing offer, the units of 60-80 sqm in size have the second largest share.
- At 5%, the relatively largest units, of more than 80sqm, have the smallest share (NBP).

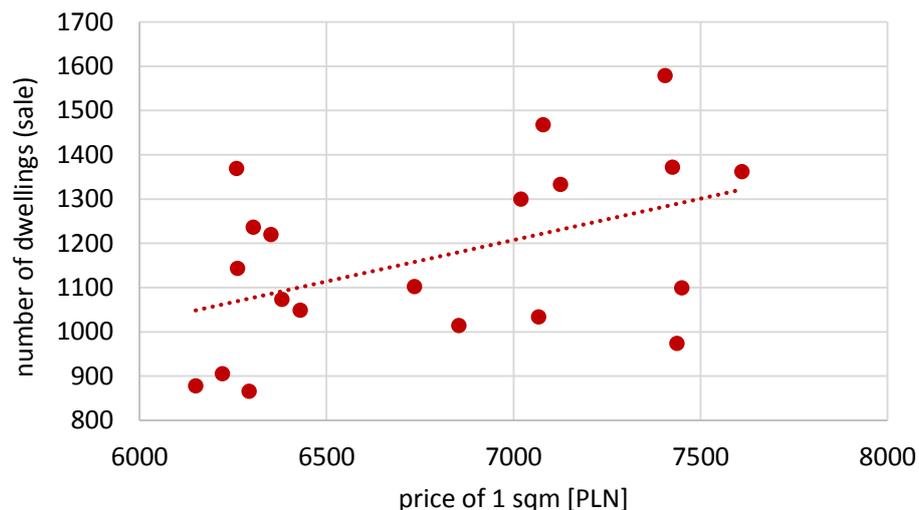


Figure 3. Number of dwellings sold and their price per sqm, Poznań primary housing market, 2016-2020 (quarterly data). Source: Own compilation based on data from the National Bank of Poland (NBP).

Comparing sales figures and transaction prices (and specifically, the average per sqm prices), we can see that the higher the price, the more units are bought. What we have here, then, is a situation where, encouraged by a strong interest from buyers, property developers can raise their housing prices, while the buyers, afraid of their further rises, factor in even higher price levels in their decision-making processes. The question that remains is about the factors that drive the demand for housing.

Those who take out home loans are encouraged by bank lending policy and low interest rates. Interestingly, the Financial Stability Department at the National Bank of Poland expects a further easing of lending policy criteria and a continued growth of what is already a strong demand in 2021 (Sytuacja..., 2021, p. 1). Inflation is certainly one of the factors driving up housing purchases: with low interest rates, some people venture onto the property market and grab the opportunity to earn money there, e.g. from leases. As such, the strong housing demand also results from investors' activity, as is reflected by NBP's surveys into the sources of funding for home purchases depending on reasons why people bought housing in 2020. It turns out that those who buy it as an investment (almost 30%) most often pay for it in cash (63% among those intend to resell at the right time and 50% want to lease their premises) (Łaszek et al., 2021, p. 38).

5. Changes on the housing market and sustainable development

These reported changes – in supply, prices and demand – are for the primary housing market in Poznań. On the supply side, what they show is that, on the one hand, the growing prices act as a strong driver for property development (to build new stock), and that, on the other hand,

the rising construction costs force the developers' hand to up their asking prices so that they can protect their planned margins. This ties in with the producer theory and its tenets. In turn, the strong demand on what is a specific and spatially limited local market is a price-generating factor. It is worth noting, though, that this situation might complicate the operation of the market going forward. Already discussions are underway about property developers' pricing and cost policies, while the buyers, afraid of potential price hikes, might be investing their funds in available properties either not quite well informed or even against their judgment. Also, the strong pressure to build new housing might strain some urban areas excessively, but also potentially compromising the general quality of life across the residential environment (premises, building, and surrounding area).

To sum up, the housing market, including how it develops, is of crucial importance. The situation on that market now (with the housing prices and demand both rising) might be welcome for many of the actors professionally involved in its workings, especially property developers (who can sell their output quite quickly) and banks (who can onboard and service new borrowers). It might worry the buyers, though, both due to rapidly rising prices and because of their limited ability to negotiate the terms of purchase with developers.

The situation on the ground should also give pause for consideration of how it might develop going forward, especially in the context of wider sustainable development. Assuming that one of its purposes is to build sustainable cities and communities, where the needs of the current generation are met in sustainably, with respect for the environment and accommodating the needs of future generations (Serwis Rzeczypospolitej Polskiej, 2021), there is no hiding that sustainability should be sought across all areas of urban activity, including on the housing market, and in particular with a view to creating the real opportunities for home ownership.

As things are, however, the rising prices on the Poznań housing market might present an ever greater barrier to home ownership, including by young people (those aged 35 or less), a cohort which studies show to represent the largest group of buyers (NAR, 2017; NAR, 2019; Strączkowski, 2021, p. 167). Not only that – young people find it difficult to rent a place, seeing as the rent payments alone, without operating charges, eat into nearly a third of what young couples earn. What we see, then, is a form of exclusion and a number of negative developments that affect housing, especially as (Rudzka, 2021; Bartkowiak, Strączkowski, 2021):

- 45.1% of young people aged 25-34 live with their parents (with the EU average at 28.6%);
- in 2018, the most frequent pay in Poland (the statistical mode) was PLN 1,765 net (GUS, 2020), while it is common knowledge that young people are paid less than more experienced persons in the job market;
- not having a place of one's own can effectively deter any plans to marry or have a child (Strączkowski, 2012, pp. 12-14);

- despite rising average wages, 80% childless married couples, 55% married couples with one child, 45% with two children and 35% with three children are considered creditworthy (Stan mieszkalnictwa w Polsce, 2020, pp. 9-10);
- more than half of young people (55%) do not believe they will be able to buy their own place.

This raises questions about the future and how to ensure proper (across-the-board) development pathways not just for the country's housing market and economy, but also – and perhaps most importantly – the future generations of Poles.

Questions abound, too, about the acceptable limits to housing prices and about how much demand can be stimulated locally. Also, more and more concerns are being voiced about the future housing rental market: other than during the COVID-19 pandemic when they went down, the last years have seen their rent rates steadily increasing. At the same time, the supply of rented accommodation is growing from year to year, giving rise to legitimate concerns about falling profitability for rentals. Certainly, these considerations provide an input for further research into the rules and principles for ensuring sustainable development of the housing market.

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FORMING OF POLISH REGIONS' VISUAL IDENTIFICATION SYSTEM. A QUALITATIVE RESEARCH APPROACH

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Purpose: This paper aims to verify and present the diverse opinions of respondents about the logo of Polish voivodeships, obtained in the process of qualitative research and to evaluate them critically.

Design/methodology/approach: Research using a qualitative approach. The authors used the technique of a standardized in-depth interview. As a tool, an answer sheet was used, which was completed by the respondents themselves. A deliberate sample selection was used based on the criterion of the occupational category.

Findings: This paper contains the developed conclusions based on the analysis of the respondents' opinions. Includes vital considerations on the appropriate design of visual signs to promote regions to audiences. The conclusion relate to the symbolism used in the logo, colors, and consistency between individual elements.

Research limitations/implications: The respondents were full-time, extramural, and postgraduate students. The issue raised in the paper requires empirical research and confirmation among the other groups.

Originality/value: The paper contains a collective analysis of opinions on all logos of Polish regions.

Keywords: place visual identity, regions' visual system, visual identification system.

Category of the paper: Research paper.

1. Introduction

Managing territorial units in Poland more often sees the need to conduct coordinated, planned, and consistently implemented activities to promote the region (Sekuła, 2015), which can be defined as a cultural or historical territory and is a consequence of an administrative division (Pietrzyk, 2000). Place marketing practices are applied in cities, regions, and countries

of all sizes (Alux et al., 2015), and even in cross-border areas such as the Oresund region, which includes Denmark and Sweden (Falkheimer, 2014). It can be noticed that while large territories manage their brand, pointing its attractiveness, in smaller areas, the importance of territorial marketing activities in the implementation of various development goals is also emphasized (Alux et al., 2015).

An adequately designed visual identification system helps to create and maintain a clear image of a place. This system is an essential part of the marketing communication enabling the region to present its identity and uniqueness (Łuczak, 2010). In communication activities, visual elements are ahead of verbal methods of informing about a brand or product (McQuarrie and Phillips, 2008). This is especially important in the local government sector due to the often limited budget allocated to promotion. An adequately presented logo is the function of a general transmitter of information about the identity of a given place (Riezebos, 2003). The appropriate logo of a territorial unit should allow the recipient to quickly identify, remember and, above all, influence his decisions related to the use of the place. The key to constructing a proper and effective system of visual identification is understanding the local values possessed by a given area, which at the same time determines the originality and uniqueness of ideas related to the graphic presentation compared to other units (Wahyurini, 2014).

In numerous studies related to territorial marketing, visual identification issue appears relatively rarely, especially about regions. They are much more diverse than cities, so it is more difficult for them to create a coherent set of symbols and distinguish marks with which it will be possible to show their individuality (Raszkowski, 2009). Apart from exceptions, there is also a lack of studies that would show the effects of activities in this area (see e.g. Daszkiewicz, Waniowski, 2011).

Assuming that the logo is the key visual distinguishing feature, this paper aims to verify and present the diverse opinions of respondents about the logo of Polish voivodeships, obtained in the process of qualitative research and to evaluate them critically.

2. Research assumptions

For many years, all Polish voivodeships have actively used logos in their promotional activities, allowing them to distinguish a place and emphasize its specificity (Zdon-Korzeniowska, 2012). Most of the systems identifying Polish voivodeships were designed primarily to target tourists. Planned and coordinated promotional campaigns accompanied the introduction of each voivodeship logo, but part of the logo was changed after a few years. Figure 1 shows a graphic presenting the current logo of 16 voivodeships.



Figure 1. Logos of Polish voivodeships in 2021. Source: own compilation based on <https://contentsolutions.pl/hejty-i-propsy-czyli-najbardziej-emocjonujace-projekty-logo-polskich-miast-i-wojewodztw/>.

The research used a qualitative approach, focusing on three primary areas: exploratory, diagnostic and image research (Dyjas-Pokorska, 2004). Due to the aim of the research, the authors of this paper focused on the image aspect and one of the four dimensions of the brand (Aaker, 1996), namely the brand as a symbol, trademark, logo. To gather opinions, the technique of standardized in-depth interview was used with the use of a tool in the form of an answer sheet completed by the respondents themselves. Respondents were presented with the logo of each of the 16 Polish voivodships in alphabetical order and asked to evaluate, present associations and individual opinions about each of them. A deliberate sample selection was used based on the criterion of the professional category. The respondents were full-time, extramural, and postgraduate students. A total of 320 answer sheets were collected, 100 of which were rejected after the initial review. The remaining 220 sheets were subject to the final analysis, based on which the conclusions were developed. All of the sheets selected for the study had a complete number of responses. The vast majority of respondents focused on classifying and evaluating each of the 16 logos in the following three dimensions: the accuracy of reflecting the specificity of the region and enabling unambiguous identification, arousing the recipient's desire to know or visit a given place, and a subjective attitude towards the aesthetics

of the logo. A smaller number of respondents referred to each component of the logo, expressing their opinions on, for example, the size, font style, signet size, or the colors and shades used. Based on the collected opinions and obtaining a general assessment of the respondents' attitudes, it was also possible to compare the perception of the logo with the original intentions of the authors of the projects.

3. Results

The logo of the **dolnośląskie** voivodeship consists of a logotype presenting the name and a signet representing three squares, which were initially intended to symbolize three areas of tourism characteristic of the region (the heritage and history of the voivodeship with numerous castles and palaces, forests, and mountains as well as spa tourism) (Dolnośląskie ma logo turystyczne, 2011). Designing a logo that would promote Dolny Śląsk region as a whole was a challenge because the research conducted earlier (Daszkiewicz, Waniowski, 2011) showed that a significant number of respondents (over $\frac{3}{4}$ of the total) associate the voivodeship mainly with its capital and facilities located in Wrocław.

People assessing the logo of the Voivodeship most often paid attention to its main element, which was a signet consisting of three icons. One of them shows the castle, which, in the respondents' opinion, was often associated with numerous buildings located in Dolny Śląsk. The symbol of the fountain was understood ambiguously, more often associated with the Wrocław Pergola and the fountain in the Market Square, and less often with what the creators intended, i.e., with spa springs. Some respondents did not have any associations with the signet referring to specific objects, apart from defining the symbols presented in them. Some of the respondents' positive opinions regarding the logo concerned that the icons in the signet may to some extent be associated with the resources of Dolny Śląsk. However, they are too universal to be unequivocally used to promote the specificity of this region. People positively evaluating the logo considered that it represents various tourist attractions that any visitor can encounter. The graphic design was assessed negatively by the majority of respondents as careless, unprofessional, unrepresentative, and even infantile.

The inspiration to create the logo of the **kujawsko-pomorskie** voivodeship was the regional costume and the kujawiak, one of the most famous Polish folk dances. According to the people responsible for the region's branding strategy, the dance rhythm expresses features that are a metaphor for the values presented by the region – “peace, impulse, power” (Założenia..., 2016). However, these associations were mentioned by few respondents. The vast majority did not express any unequivocal reflections on colors, which was why they assessed them negatively, as not referring to the specificity of the voivodeship. Tested persons pointed, for example, to space, spilled paints, a police siren, game pieces. The vast majority of opinions

assessed the colors used as incomprehensible, unnatural, chaotic, and, above all, too difficult to interpret. The combination of colors was found to be quite aggressive, in some opinions evoking concern. Only a few respondents suggested that perhaps the authors' intention was to present regional colors in the survey. Most expressed the opinion that the logo does not suggest what can be found in this region, it does not represent any keynote, and, above all, does not encourage visitors.

The logo of the **lubelskie** voivodeship consists of a signet showing the first letter of the name of the voivodeship and the slogan "Lubelskie – taste the life." The signet showing the red L letter dominating the logo was assessed by most respondents rather positively, as being eye-catching and memorable, but not flashy. The font used to present the name and slogan was judged to be well-chosen in terms of graphics, and the colors were aesthetic. The slogan, associated with the developed catering industry and local products, was also positively assessed. Most of the respondents decided that the logo encourages visitors, focuses on promoting regional specialties, seems friendly and positively influencing. However, there were too frequent and robust connections with the well-known brand of pasta, Lubella. The main objection concerned the lack of elements pointing directly to the region's specificity, which means that it cannot be identified with the voivodeship represented.

The authors' intention of the visual identification system of the **lubuskie** voivodeship was to give it the broadest possible character. The colors used reflect the natural values of the region. Also, they symbolized vitality and expansion (green), openness (blue), and cleanliness (white). The promotional slogan should evoke associations with the West, i.e., modernity, innovation, and dynamic development. This is how the respondents assessed the logo as modern and traditional at the same time. The shape of the signet was most often associated with a highway leading through the fields, which emphasizes its dynamic character. The colors of the signet, due to the natural shades, were strongly associated with nature, primarily with the sun, water, and green areas, which evoked positive feelings. A significant number of respondents decided that the colors used reflect the specificity and resources of the voivodeship and reflect its natural character. The slogan "Lubuskie is worthwhile" (*org. Lubuskie warte zachodu*) was received very positively, and the respondents pointed to its twofold message - as encouraging to visit and pointing to the geographical location of the region. The terms most often used to evaluate the logo were: pleasant, aesthetic, relevant, encouraging.

The logo of the **łódzkie** voivodeship was designed in the shape of a clothing label, symbolizing the region's textile traditions, and these were also the most frequent associations among the respondents. However, for most respondents, the signet ring was incomprehensible, and the colors used were assessed as gloomy and depressive. The respondents almost unequivocally stated that the logo does not fulfill its essential functions. It does not indicate the region and strongly does not encourage visitors. The logo was found to be bland, overwhelming, poor, graphically weak, and not memorable. Opinions also suggested that the logo perpetuates the stereotypes attributed to the Łódź region because it brings to mind associations related to

dirt, neglect, and poverty. Critical opinions also pointed to the very idea of the project as utterly inadequate for promoting the region among tourists or external investors.

The logo of the **małopolskie** voivodeship, selected in the competition, assumes evoking associations with essential advantages of the region in the recipients. The two main advantages are the beauty of nature and cultural heritage. The signet symbolizes the mountain ranges and the river. Also, it resembles the shape of the historic church towers and the royal crown.

A signet in shape similar to the letter M was most often associated with mountains, which, in respondents' opinion, directly referred to tourist attractions, the specificity, and the region's location. Many opinions referred to the colors described by the respondents as pleasant, modern, attractive, intriguing, and memorable. There were also voices of people for whom these colors were too flashy and too varied. However, the respondents most often associated the colors of the signet with the diversity and openness of the region. The logo was assessed positively by most of the respondents; the opinions about legibility, quick associations, aesthetics, and the relevance of the idea prevailed. The respondents characterized them as modern, simple, but specific, encouraging them to visit the voivodeship and enabling unambiguous identification with the region.

The logo of the **mazowieckie** voivodeship consists of a red signet representing the name of the voivodeship, the first letter M of which is modeled on the shape of a heart, and a slogan directly related to the symbol: "Heart of Poland." In the research, the first letter of the logotype, representing the name of the voivodeship, was unambiguously associated with the heart, which may evoke positive emotions and optimism. The shape and design of the heart were sometimes associated with Valentine's Day or the annual national charity campaign "WOŚP." Respondents pointed out that the logo was kept in vivid white and red colors and often pointed to national and patriotism associations. The slogan "heart of Poland" was also positively assessed. However, the logo was unambiguously associated with Warsaw and not the entire region. Thus it does not encourage people to get to know other places outside the capital. Due to its structure (name and promotional slogan), this logo in no way reflects the specificity of the entire mazowieckie voivodeship.

Consisting of a logotype and a signet, the logo of the **opolskie** voivodeship shows the Piast Tower in Opole and decorative ornaments referring to plant motifs and the slogan "Blooming Opolskie." People who recognized the shape of the Piast Tower expressed the opinion that placing the building, which is characteristic of the voivodeship's capital, is a good idea, as it is a representative symbol of the voivodeship, famous for its many castles and palaces. For the respondents who did not recognize this tower, the logo did not seem characteristic of this voivodeship. The slogan "Blooming Opolskie" was understood by the respondents variously and ambiguously. The respondents guessed that it could figuratively indicate the region's dynamic development, be synonymous with the term "sustainable development" or symbolize an area that cares about a clean environment and promotes ecology.

Podkarpackie voivodeship is most often associated with the Bieszczady Mountains. However, the people responsible for preparing the strategy for the visual identification system of this region also tried to use the aviation traditions that make it unique. The slogan “Podkarpackie – open space” is directly related to the strategy of building the image of the region, according to which Podkarpackie offers development opportunities and prospects for both investors and residents (Zdon-Korzeniowska, 2012).

In the vast majority of respondents' opinions, the signet was associated with mountainous areas, which was assessed as accurately reflecting the character of this region. Some respondents pointed to the arrow located in the graphic, most often interpreted as a symbol of the region's development. In the opinion of the respondents, the colors used were consistent, accurately selected, associated with nature, freedom, and cleanliness of the environment. Less numerous opinions criticizing the signet used in the logo referred to the lack of creativity and too far-reaching universality. The slogan “Open Space” was often associated with a phrase aimed more at investors than tourists or residents. As a whole, the respondents considered the logo to be aesthetic and modern, but not very attractive from the tourist point of view, which, despite reflecting the specificity of this region, does not encourage visitors and getting to know this part of the country better.

The logo of the **podlaskie** voivodeship is a bison-shaped signet, consisting of about 300 squares of different colors and the slogan “Podlaskie powered by nature.” The animal used in the logo symbolizes this land, and small, colorful squares reflect the diversity of the place in terms of heritage, history, landscapes, and customs.

All respondents showed interest in the silhouette of the bison, and the vast majority of them associated the animal as a symbol of the Białowieża Forest. The very use of the bison silhouette was assessed by the respondents positively and ingeniously as an ideal symbol allowing for simple and obvious identification of the logo with the voivodeship. Presenting the bison, consisting of small squares and the colors used, met with explicit criticism. According to the respondents, the idea of using pixels distracted from the main symbol, and their density was overwhelming and chaotic for the audience. The bright colors that filled the bison graphic in the signet were assessed as too flashy, abstract, tiring, and hindering the perception of this logo. The respondents assessed the slogan “powered by nature” positively about the specificity presented by the region. At the same time, many opinions pointed out that it was inconsistent with the signet. According to the respondents, the unnatural colors contrasted the slogan pointing to green and clean areas inhabited in large part by animals. Consequently, despite the elements reflecting the specificity of the voivodeship, the logo was assessed as illegible, irritating, flashy, dissuasive, and discouraging from visiting the region.

The logo of the **pomorskie** voivodeship consists of a logotype showing the name of the voivodeship and a signet in the form of an exclamation mark preceding it. In their opinions, the respondents often pointed to the exclamation mark in front of the inscription. They assessed this procedure as illogical or even incorrect for grammatical reasons. The signet did not evoke

any associations with the region among the respondents; there were opinions among some people that placing the exclamation mark emphasized the importance of this region for its inhabitants or the country. Among the respondents, associations related to the colors of the signet appeared rarely. Individual opinions indicated that the colors might evoke sunset or amber. The respondents also paid attention to the type and color of the font used in the logotype. The most common associations were sea waves due to the flowing shape and dark blue colors and handwriting, which in turn was reminiscent of holiday postcards. The overall logo was assessed negatively by the respondents. The allegations concerned mainly with the lack of creativity and the failure to use elements or symbols associated with the voivodeship. According to the surveyed people, the logo does not encourage visitors, does not promote the region, and makes it challenging to identify.

In the signet of the logo of the **śląskie** Voivodeship, there are four characters stylized with the letter "S" in various colors and the slogan "Śląskie. Positive energy". The colors symbolize different types of tourism. Yellow means religious tourism, green – active, blue – cultural, and black – industrial. The logo promotes, above all, the tourist potential of the region, which is commonly associated mainly with mines, steel mills, and factories.

Despite using the logo of the Śląskie Voivodeship in four colors in the signet, the respondents paid particular attention to the black color associated with coal and numerous mines occurring in this voivodeship. A few opinions mentioned associations with the other three colors considered standard and universal, usually associated with nature, sun, and water. Some respondents pointed to the form of lines placed in the signet in the shape of a wave or the letter "S," which was associated with the first letter of the name of the voivodeship. In several opinions, the waves were associated with negative associations, e.g., with smog. Among the respondents, several times, there was an opinion regarding the slogan "Positive energy" that it is ambiguous due to the heavy environmental pollution associated with the mining industry. In most opinions, the logo, thanks to the black color, reflected its identity and industrial character. The recipients admitted that it allows for easy identification with the region. A significant part of the respondents appreciated the logo's simplicity, pointing to its legibility and ease of remembering. However, there were also negative opinions that the logo does not indicate what tourists can expect when visiting the region.

There is controversy around the logo of the **świętokrzyskie** Voivodeship related to the symbolism used in it. The signet ring shows a witch flying on a broomstick, which refers to local legends telling about witches' rallies on Łysa Góra. This is also how the respondents interpreted it. People who were aware of the famous legend regarding the Witches' Sabbath on Łysa Góra, associated this symbol directly with the region and assessed it as a good and inventive distinguishing feature; strongly pointing to the Świętokrzyskie Mountains. For the rest of the respondents, the symbolism of the signet was incomprehensible, and the image of a witch on a broomstick, in some opinions, was negatively associated with the villain, which caused concern. Few people also noticed that the shape of the graphics took the

form of the first letter of the name of this region. Some of the respondents also referred to the inscription showing the name of the voivodeship; in their opinion, the archaic shape of the letters is consistent with the signet referring to old legends. In most opinions, the logo was assessed as funny, mysterious, standing out from the rest, ambiguous, prompting a more profound interpretation and willingness to understand the message, and containing hidden symbols. Opposing opinions were expressed mainly by respondents for whom the symbol of the witch was incomprehensible, which, in their opinion, did not reflect the character of the voivodeship.

The logo of the **warmińsko-mazurskie** voivodeship consists of a logotype presenting the name of the place and a signet whose shape shows a sailboat in blue, green, and yellow. The colors reflect the resources characteristic of the region - the richness of nature, especially lakes and forests.

The analysis of respondents' responses assessing the logo of this voivodeship contained the most significant number of convergent opinions and associations. The respondents pointed to the image of a sailboat, which brought to mind vacation and carefree time. The graphics were found to be simple, legible, relevant, and eye-catching. According to the respondents, the colors used in the signet were vivid and associated with the sun and water. The few negative opinions referred mainly to the font style used to present the name of the voivodeship, which, according to the respondents, lacked delicacy and lightness and therefore did not fit the signet. Among the respondents, opinions were often expressed that the logo, through associations, strongly encourages quick visits to the region, rest, fun, and recreation and allows for precise identification with the voivodeship.

The logo of the **wielkopolskie** voivodeship is a signet made of four letters in yellow, blue, red, and green, forming the abbreviation of the name (Wlkp) and the slogan "great history, great adventure." Respondents assessing this logo pointed to the signet ring showing the abbreviation of its name. However, the idea was assessed as not very creative, not depicting the place and its specificity, and suggesting only the name. The form of the signet was associated with spilled paint, blots, children's drawings. Opinions regarding the colors used in the signet were divided. Some respondents criticized the colors used, claiming that the colors do not harmonize with each other, are chaotic, random, and do not characterize the region. The rest assessed them as modern, often associated with urbanity, active life, and youth. Opinions about the slogan in the logo appeared less frequently; among the people who assessed them, it was considered lofty, which can be addressed to people of different ages and having different expectations. The respondents pointed to a dissonance between, in their opinion, an infantile signet ring and a profound slogan that encouraged visitors to visit. In general, negative opinions prevailed due to the lack of specific associations and reflections related to its reception.

The **zachodnio-pomorskie** voivodeship logo reflects the region's strategy, in which particular emphasis has been placed on goals related to increasing investment attractiveness and promoting a modern economy. It shows a graphic of the symbol "OK," the purpose of which is

to evoke positive associations related to the region's development. Some of the respondents interpreted it in this way. However, most respondents did not present their associations or try to see their sense, claiming that its concept was incomprehensible. Some people referred to the technological context by comparing the logo to, for example, companies supplying the Internet, dealing with electronics, or introducing innovations. There were associations with the Windows and Microsoft logos. Attention was even paid to the way the signet was made, comparing the squares placed in it with post-in sticky notes or computer screens. The combination of colors used in the signet was usually assessed as pleasing to the eye, vivid, but universal and standard, not approximating the region's shape, landscape, or specificity. As a whole, the logo consisting of a logotype showing the name of the voivodeship and a signet ring was assessed as too technical, inadequate to the region's specificity, with an idea difficult to understand.

4. Conclusions

Creating a positive visual identification system of the voivodeship is more complicated than the corresponding action related to the city. It is more challenging to find distinguishing features characteristic of the entire region. In many cases, the respondents drew attention to it, emphasizing that the logo is illegible, incomprehensible, or based on a symbol characteristic for the voivodeship's capital rather than for the entire region (e.g., opolskie voivodeship) or a particular part of it (świętokrzyskie voivodeship). The most positive opinions related to the logo, which contained characteristic distinguishing marks facilitating quick identification with the entire region (mainly lubuskie and warmińsko-mazurskie). Therefore, one should strive to construct such a logo that in its message will cover the entire voivodeship, not only its capital.

Since it is impossible to find one distinguishing feature, graphic elements based on its name and not on characteristic objects dominate in numerous identification systems of Polish voivodeships. Among them, the logo of the mazowieckie voivodeship evoked the warmest associations. At the same time, the respondents had a much worse opinion about the logo of the pomorskie voivodeship. There was also an exclamation mark in the latter case, which the respondents found abstract, incomprehensible, and therefore quite extreme associations. This also applied to the zachodnio-pomorskie voivodeship with a stylized symbol OK, which for most of them turned out to be incomprehensible and inadequate to the character of the voivodeship. Focusing on the motives related to the region, but poorly associated, also does not give good results because only a few respondents associated the colors of the kujawiak as a distinguishing feature of the kujawsko-pomorskie voivodeship, emphasizing the lack of any relationship between the logo and this region.

The respondents quite often assessed the colors used in the construction of the logo. They emphasized that the right choice of colors can strengthen positive associations and evoke additional ones. Some recipients wanted to understand them and give them a specific meaning, positive (especially Mazowsze) or negative (kujawsko-pomorskie and łódzkie). The respondents generally rated too aggressive combinations of too many colors (Podlasie and Wielkopolska) as chaotic, accidental, or overwhelming.

Each element of the logo should be consistent and not raise contradictions in the mind of the recipient. Simplicity and unambiguity prevent the respondents from looking for hidden meanings. In this context, the logo of the łódzkie voivodship draws attention to the tradition related to the textile industry, which, according to the respondents, only strengthens negative stereotypes related to this region.

Some distinguishing features were also assessed as not very original, poorly showing the specificity of a given region (dolnośląskie, pomorskie). It was also pointed out, especially concerning the wielkopolskie voivodeship, to the illogical relationship between an infantile signet ring and a good slogan. Both of these elements must work together because only together do they form a coherent whole.

Some of the respondents' answers also showed that there is not always a complete correlation between the intentions of the creators of the visual identification system and the way of receiving the message, which may be different from the assumptions. In such cases, after more detailed research, a modification of the logo should be considered, which has been done by several Polish voivodeships in recent years, namely podlaskie, małopolskie or kujawsko-pomorskie.

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FINANCIAL AND ECONOMIC ANALYSIS OF INFRASTRUCTURE TRANSPORT PROJECTS WITH THE PARTICIPATION OF EU FUNDS

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Purpose/reason for writing the paper: Carrying out a cost-benefit analysis of large infrastructure projects in the area of transport causes considerable difficulties and problems in identifying the positive and negative factors of project implementation, and their translation into cash flows generated by the project. The aim of the paper is to present problem solving in the course of financial analysis and economic analysis of an infrastructure transport project.

Methodology/approach to problem solving/scope of the study:

The scope of the study and the approach to the problem include:

- presentation of the role of cost-benefit analysis in the process of assessing the competitiveness of infrastructure transport projects in terms of making decisions about their co-financing from community funds;
- characteristics of general assumptions of financial analysis and economic analysis of projects in the transport sector;
- discussion of the methodologies of quantification and monetization of socio-economic factors and factors influencing the external environment in the process of assessing the economic effects of a transport project on the regional and national scale;
- indication of the latest sources of methodological support for the preparation of cost-benefit analysis (CBA) of the project;
- embedding the issues of financial and economic analysis in the context of the requirements for beneficiaries' application for grants from the funds.

Arrangements: Different methodologies are used in transport projects to quantify and monetize the impact of individual factors on the external and socio-economic environment. The paper indicates the latest methodological studies, the scope of their application, examples of calculations and recommendations for beneficiaries on how to adjust the information they have to a specific project situation.

Practical implications: Adaptation of the Beneficiary to the applicable and recommendation source materials, knowledge of methodologies for conducting analyses increases the probability of reliable preparation of documentation and obtaining a positive decision regarding financial support for the planned investment project.

Social implications: Correct and consistent analysis of projects increases the effectiveness of obtaining their co-financing from EU funds. On the other hand, the implementation of modern infrastructure transport projects is a social good that increases the comfort of passengers, reduces the operating costs of carriers, reduces carbon dioxide emissions, noise and local environmental pollution, contributes to saving time and reducing road accidents.

Originality/value of the study (for whom?):

The paper is directed and will be useful for investors, as well as beneficiaries of community funds, in order to prepare project documentation for the implementation, execution and operation of infrastructure projects in the field of transport.

Keywords: efficiency of transport projects, cost-benefit analysis (CBA) of transport projects, economic analysis of transport projects, evaluation of the profitability of transport projects.

Paper category: general overview – review and analysis of concepts, techniques and phenomena.

1. Introduction: Financial analysis and economic analysis – two levels of analysis

Infrastructure transport projects are complex in terms of cost-benefit factors. At the same time, the vast majority of such a project has a *low financial efficiency*, and is even ineffective in terms of net cash flows, because it does not generate a financial surplus. However, the newly established transport infrastructure has social and economic benefits (as well as costs). Thus, the project should be assessed not only in terms of financial profitability for the Investor, as well as in terms of *costs and benefits for the region and the country* as a whole. Therefore, we have **two levels of cost-benefit analysis (CBA)** to assess the effectiveness of a large investment project in the field of transport (Kotowska-Jelonek, 2016, p. 465):

- *the first one* – from the point of view of the Investor of the project, i.e. for the assessment of the so-called financial efficiency; in this case the cost-benefit analysis is called **financial analysis** [The basic result of the financial analysis is the value marked FNPV (C)];
- *the second one* – in a broader sense, taking into account the costs and benefits generated by the project for various groups of the community (local, region, country) and from the point of view of the impact on the environment and the broadly understood environment, in order to assess the so-called economic efficiency; then the cost-benefit analysis is called **economic analysis** [The primary output of the economic analysis is the denominated value of ENPV].

In both cases, the range of costs and benefits included in the analysis is **different**. *In financial analysis*, these are simply capital expenditures, operating income and costs, and the residual value in income. *In the economic analysis*, these are the net socio-economic effects, i.e. the monetised balance of the benefits and costs of the project for society and the natural environment. The result of the FNPV financial analysis (C) should be supplemented with socio-economic effects in order to obtain the **overall economic effect of the ENPV project**. The sum of the adjusted cash flow of the financial analysis and the net socio-economic flow is the basis for the calculation of the economic performance indicators of the project,

including the base ENPV indicator. Depending on the value of FNPV (C) and ENPV, the decision-making process on granting co-financing for a project from community funds can be illustrated as shown in Fig. 1.

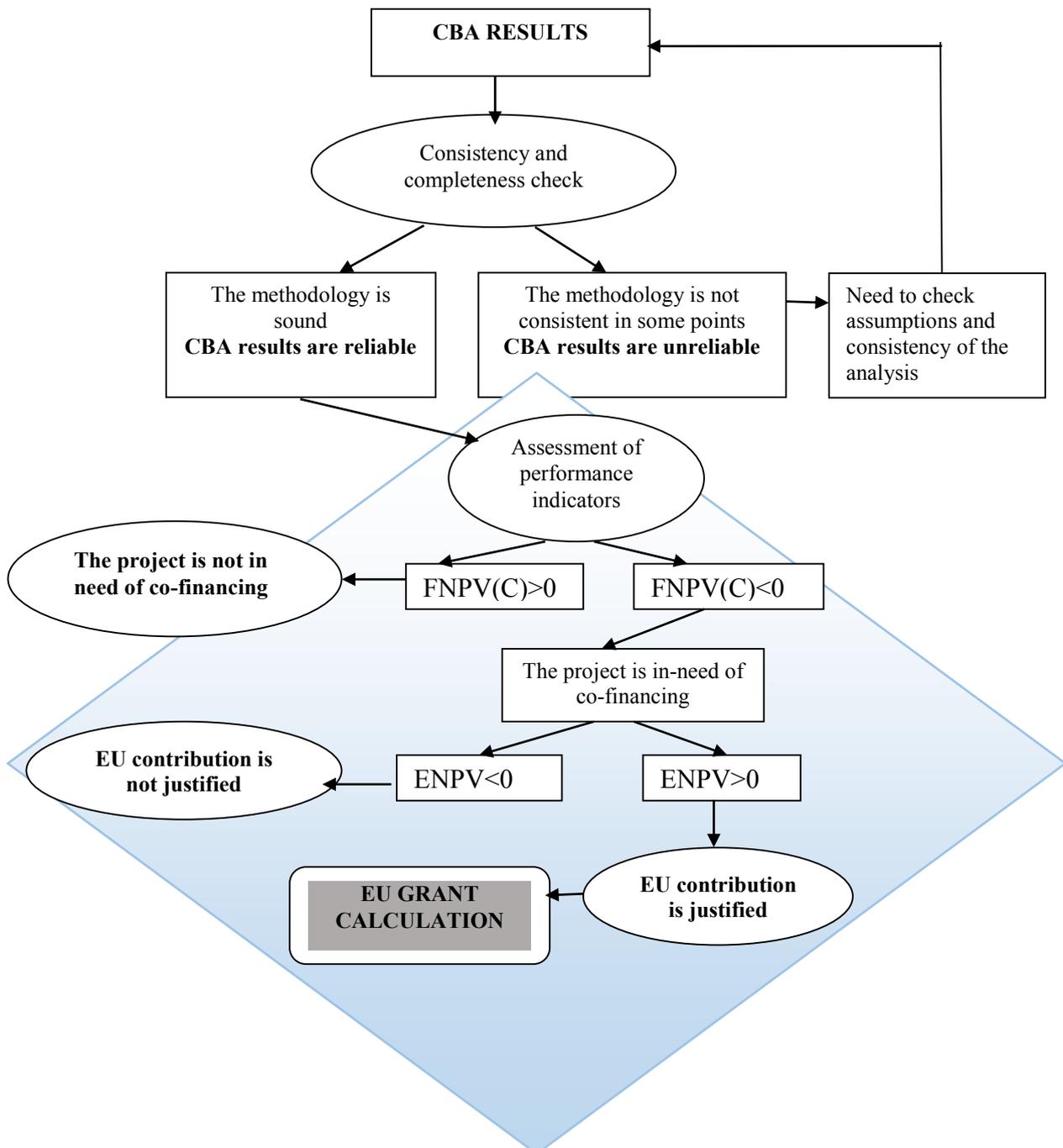


Figure 1. The role of cost-benefit analysis in the evaluation of major projects. Adaptation from: *Przewodnik po analizie kosztów i korzyści...*, 2015, KE, s.13; *Guide to Cost-Benefit Analysis...*, 2014, EC, p. 20.

If the result of the FNPV **financial analysis** > 0 , it means that the project is self-sufficient and financially viable and does not need external funding. However, if $FNPV < 0$, go to the next stage – determining the **economic viability on a national scale**. If the net result of the effects of the economic analysis $ENPV < 0$, it means that the project does not generate an adequate financial surplus for society, the costs exceed the benefits, and therefore such a project is unprofitable for the society, such a project should be rejected when deciding on financial support. As a rule, EU funding is granted to projects the profitability of which can be proven from the socio-economic point of view, i.e. their $ENPV > 0$. The next decision-making step is to calculate the so-called the *financial gap* of the project, i.e. estimating the value (scale) of co-financing, and determining the co-financing rate.

Ultimately, the quantified socio-economic benefits of an infrastructure investment together with net cash flows estimated on the basis of financial analysis constitute the basis for the calculation of economic efficiency indicators of the investment project (Wojewódzka-Król, Rolbiecki, 2018, p. 78); this is the basis for making a decision to co-finance the project according to the algorithm as shown in Fig. 1. **The aim of the paper is** to present problem solving in the course of financial analysis and economic analysis of an infrastructure transport project.

2. Financial analysis and methodological support

The aim of the financial analysis is to assess the **profitability of the investment from the investor's point of view**, to compare the investment outlays of the owner-manager of the transport infrastructure and revenues in the form of user fees for using the infrastructure. The **financial analysis** is carried out using the standard method of valuing benefits in the form of the sum of the net cash flows over the period of implementation and operation of the already completed project. The cash flow generated by the project takes into account the project expenditure with a minus sign and the project revenues discounted at the start of the project in the long term with a plus sign. This value is designated FNPV (C). The **net financial present value** of the investment is the sum resulting from the difference between the discounted value of the expected revenues and the discounted expected costs of the investment and the operating costs of the project:

$$FNPV(C) = \sum_{t=0}^n a_t S_t = \frac{S_0}{(1+i)^0} + \frac{S_1}{(1+i)^1} + \frac{S_2}{(1+i)^2} + \dots + \frac{S_n}{(1+i)^n},$$

where:

S_t is the balance of cash flows at time t ,

t is the discount factor selected for discounting at time t ,

i is the financial discount rate (Przewodnik, 2015, KE, p. 45).

The *discount rate* for transport projects implemented in Poland is recommended at the level of 4.5% (Wojewódzka-Król, Rolbiecki, 2018, p. 80). The parameter n is the number of years of the analysis period, in EU projects from 10 to 30 years. In the last year n , the *residual value* of the project is taken into account, reflecting the remaining potential of the fixed assets for which their useful lives have not yet fully expired. Recognition of the residual value in year n takes the form of estimated discounted net cash flows in the following years of the investment beyond the analysed period, or in the form of the market value of fixed assets as if they were to be sold at the end of the period under consideration.

In the case of financial analysis, a detailed presentation of the standard methodology for estimating and comparing costs and benefits in investment projects and calculating the financial profitability of the projects is presented in *Przewodnik po analizie kosztów i korzyści projektów inwestycyjnych. Narzędzie analizy ekonomicznej polityki spójności 2014-2020* (Guide to cost-benefit analysis of investment projects. Tool for economic analysis of the cohesion policy 2014-2020) in chapter 2.7, available in Polish (KE, 2015) and English (EC, 2014). The specificity of transport projects in terms of the costs of operating and maintaining infrastructure facilities, typical sources of income by transport type (fees, tickets, subscriptions, space rental, lease, etc.), as well as example case studies (road project, rail, urban transport) are presented in that *Guide...* in chapter 3.7. On the other hand, the preparation of documentation in part of the financial analysis for an infrastructure transport project, taking into account the application procedures for co-financing from EU funds, includes recommendations developed by the Centre for EU Transport Projects entitled *Analiza kosztów i korzyści projektów transportowych współfinansowanych ze środków Unii Europejskiej. Vademecum Beneficjenta (Cost-benefit analysis of transport projects co-financed by the European Union. Beneficiary Vademecum)* (CUPT, 2016) and *Guidelines* (MIR, 2015) concerning large income-generating projects, which present the methodology for determining the financing gap in a project eligible for external co-financing¹.

3. Economic analysis and methodological support

3.1. Economic analysis – the essence

The financial analysis is sufficient in the case of assessing the profitability of *commercial investments oriented at generating income*. On the other hand, the investment effectiveness calculation is particularly complex and difficult in the case of assessing the effectiveness of non-commercial investments in the field of transport infrastructure. With the traditional, i.e. financial approach to the evaluation of infrastructure projects, they could not be implemented because they would not be financially viable (Wojewódzka-Król, Rolbiecki, 2018, p. 74). Therefore, **economic analysis** should also be applied to such projects,

i.e. *socio-economic analysis*, because transport investments not only provide financial benefits for Investors, but in the first place are a source of economic and social benefits in the region and for the entire economy. In the social aspect, the implementation of a modern transport infrastructure project often results in positive effects, e.g. saving time for transport users, incurring lower operating costs for carriers, increasing revenues for infrastructure owners/managers from collecting fees for the use of infrastructure facilities and additional budget revenues due to taxes; benefits in the form of noise reduction, reduction of CO₂ emissions and other environmental pollutants, reduction of the number of road accidents, increased travel comfort and a sense of safety while travelling, etc.

Therefore, the economic calculation of the efficiency of infrastructure investments cannot rely solely on financial analysis. When assessing the effectiveness of this type of investment, it is also necessary to use a non-standard approach based on the use of **social calculus**, the purpose of which is to assess the contribution of an infrastructure project to the *general well-being of society*. In the economic analysis, unlike the financial analysis, external and environmental effects are taken into account. These effects are not subject to market transactions, therefore they are not valued by the market, which in practice means that the Beneficiary does not include them in the financial analysis (Wojewódzka-Król, Rolbiecki, 2018, p. 74).

3.2. Monetization of costs and benefits

In the entire process of financial as well as economic analysis, - one should:

- identify financial and socio-economic costs and benefits (broken down into groups of factors),
- quantify the costs and benefits in natural units (make a quantitative measurement in the project),
- carry out their valuation in monetary units (**monetize** them) in order to determine the overall *result of the economic analysis*, this process is shown in Fig. 2.

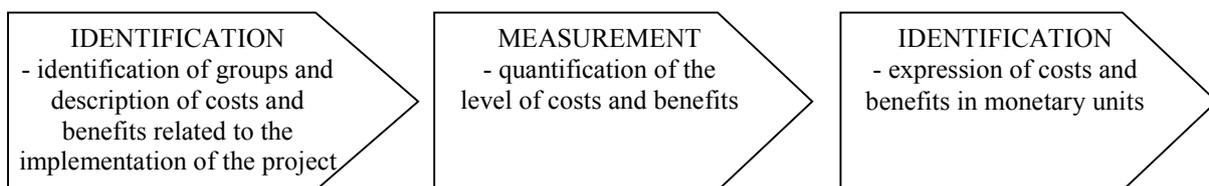


Figure 2. The process of identification, measurement and valuation of costs and benefits in assessing the effectiveness of the project. Adaptation from: (Rogowski, 2013, p. 110).

When carrying out a financial analysis according to standard classical methods, there are no difficulties in calculating the costs and benefits of the project in monetary units, there may only be problems related to the reliability of the forecasted incomeⁱⁱ. On the other hand, it is often difficult to calculate the value of *external effect*, although their identification may be easy. However, the effects of investments for society and the environment can be quantified

(expressed in quantifiable parameters) and monetized (converted into money) using the recommended methodologies.

The monetized socio-economic effects are added to a properly prepared cash flow statement from the financial analysis. It is then a quantitative cost-benefit analysis. The quantitative CBA methodology allows for the determination of the values of **economic efficiency** of investment indicators (ERR, ENPV and BCR) (Beneficiary Vademecum, CUPT, 2016, p. 9).

3.3. Differential method of cost-benefit analysis

The economic calculation of the implemented project is carried out using the differential method on the basis of an **incremental principle**. This means estimating the analysed cash flows in two variants: 1) with the variant "without a project", that is, "do nothing" – W0 and 2) with the variant "with the project" – W1. So it is a comparison of the current state and its duration in the future with the new state after the implementation of the investment, while the difference (W1-W0) will be the cash flow from the project. In the W0 variant and the "do nothing" scenario, the increased costs of operating the facilities in the future should be taken into account, with the current income parameters. Variant W0 can also be adopted according to the "minimum" solution as a counterfactual scenario. The counterfactual scenario assumes minimal replacement and adaptation investments in the current facilities, which will guarantee the maintenance of the infrastructure and its ability to provide services at the current level in terms of quality and volumes, as we cannot assume the discontinuation of services already provided at a level acceptable to users.

In order to identify and convert the socio-economic effects of the project into monetary units one should:

1. Develop **traffic patterns and transport chains** in a hypothetical situation if our project is not to be implemented (W0) and in a situation when it will be implemented (W1). We define the estimated mileage and time of such a travel. Then, we look for the differences between W1 and W0 in terms of externalities in *natural units* (Vademecum, CUPT, 2016, p. 67).
2. In order to facilitate the forecast of traffic volume, classical traffic modelling can be used. The traffic modelling software has a statistics module with the option to export the traffic statistics to a spreadsheet. Having statistical data for previous years, it is possible to generate forecast traffic parameters for projects W0 and W1 in all forecast time horizons. On this basis, we calculate the **differences in the W1 and W0 scenarios**, and we will obtain the *result-effect for the project* in **natural units**.
3. Then, this result is multiplied by the **unit cost of the appropriate natural unit** taken from the **tables** developed by the research teams, expressed in PLN.

3.4. The scope of costs and benefits in the economic analysis of a transport project and methodological support for their valuation

The basic catalogue of costs and benefits in economic analyses is generalized transport costs, including (Vademecum, CUPT, 2016, p. 73):

- operating costs of vehicles of other participants in the transport market than the beneficiary (the beneficiary's operating costs are subject to financial analysis and imported from it for economic analysis);
- time costs (wasted time, both in passenger and freight transport);
- accident costs;
- social costs of greenhouse gas (CO₂) emissions;
- social costs of non-greenhouse gas emissions (i.e. local effects of air pollution);
- social costs of noise emissions (in urban areas).

This catalogue should be treated as obligatory in the application procedures for funds from community funds.

As can be seen from Figure 2, first identify the costs/benefits of the catalogue in **quantification in natural units**, and then convert them into **monetary units**. Several calculation methodologies have already been developed in this regard. In the field of transport projects, it is best to use the methodologies developed at the Centre for EU Transport Projects (CUPT, [WWW.cupt.gov.pl](http://www.cupt.gov.pl)), and above all from two publications: *Analiza kosztów i korzyści projektów transportowych współfinansowanych ze środków Unii Europejskiej. Vademecum Beneficjenta* (Cost-benefit analysis of transport projects co-financed by the European Union. Beneficiary Vademecum) (CUPT, 2016), *Najlepsze praktyki w analizach kosztów i korzyści projektów transportowych współfinansowanych ze środków unijnych* (Best practices in cost-benefit analyses of EU co-financed transport projects) (CUPT, 2014). These studies were mainly based on *Przewodnik po analizie kosztów i korzyści projektów inwestycyjnych. Narzędzie analizy ekonomicznej polityki spójności 2014-2020* (Guide to cost-benefit analysis of investment projects. Tool for economic analysis of the cohesion policy 2014-202) (KE, 2015), and methodological manuals, the so-called Blue Books, prepared as part of the JASPERS initiative for road, air, rail and public transport infrastructure projects (NK, 2015).

It should be noted that in the subsequent financial perspectives of EU programs, newer editions of most publications are becoming available, containing improved methodologies of cost-benefit analysis, taking into account the experience acquired by research teams and beneficiaries. An extremely valuable element of the publication *Analiza kosztów i korzyści projektów transportowych współfinansowanych ze środków Unii Europejskiej. Vademecum Beneficjenta* (Cost-benefit analysis of transport projects co-financed by the European Union. Beneficiary Vademecum) (CUPT, 2016) are **unit cost tables** that facilitate the monetization of effects in economic analysis. Also for this purpose, the Blue Books (NK, 2015) containing unit cost forecasts until 2025, and for some indicators until 2050, are prepared.

3.5. Examples of the valuation of social and environmental costs and benefitsⁱⁱⁱ

We compare the **operating costs of vehicles** in road transport in different traffic conditions W0 and W1 and on the basis of the carriers' data on vehicle operating costs. The unit operating costs of vehicles PLN/vehicle-km were also estimated in the Blue Book (NK Infrastruktura drogowa, 2015, p. 119) depending on the terrain (flat, undulating) and travel speed.

In order to calculate the **savings of travellers' time**, e.g. thanks to the construction of a tram line, the statistics of transport performance in passenger hours (pash) should be generated from the traffic model. Comparing the data for W0 and W1 in each year (from the models in the forecast and interpolation horizons in the missing years), we will obtain a *differential result*, i.e. time savings of all passengers in a year, e.g. time savings = 1000 pash. Then we multiply this result by the *unit cost of time taken from the tables*, expressed in PLN/pash (1000 pash × 64.87 PLN/pash = 64 870 PLN) and we get the monetary value of the savings. This way, we will quantify the time savings. Time costs (time losses) in passenger transport are calculated on the basis of data on differential transport performance (pash), broken down into three travel motivations (business, home-work-home commuting and others), these costs are presented in Table 1. There are also studies available showing the estimated percentage of travel types in the total number. There are also other tables of time costs in freight transport in EUR/tonoh calculated in other Member States and methods of their conversion for the beneficiary country (Vademecum, CUPT, 2016).

Table 1.

Time costs according to the JASPERS Initiative (PLN / h, 2015 prices)

Travel motivation	Value of 1 passenger-hour
Business	64.87
Commuting	31.96
Others	26.82

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 96.

Savings for the environment due to the transfer of loads from road to rail, thanks to investment in intermodal transport, we need to know the transport work in tonne-kilometres (tkm) performed in W0 by road and in W1 by rail and in the feeder traffic – by roads. Then the transport work in W0 is multiplied by the unit environmental costs of transport of 1000 tkm by road, transport work in W1 for the feeder sections by the unit environmental costs of transport of 1000 tkm by road, and on the main route by rail by the unit environmental costs of transport of 1000 tkm by rail (Table 2). Actions will result in savings in external environmental costs between road-only and intermodal transport.

Table 2.*External costs of freight transport in Europe (EUR/1000 tkm)*

	Road transport		Railway transport	Inland navigation	Sea transport
	Delivery trucks	Freight trucks			
Accidents	56.2	10.2	0.2	0.0	0.0
Pollution of the lower layers of the atmosphere	17.9	6.7	1.1	5.4	2.3
Climate changes (low scenario)	7.6	1.7	0.2	0.6	0.3
Noise	6.3	1.8	1.0	0.0	0.0
Congestion (<i>delay costs</i>)	41.6	13.9	0.0	0.0	0.0

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 103.

The **costs of road accidents** and accidents at level crossings are calculated on the basis of the estimated probability of an accident. The methods of calculating the probability of a road accident occurrence are determined for the road transport performance expressed in units of kilometres, and for railway crossings – for the traffic product (Average daily traffic ADT × number of trains) at the railway crossing. The methodology for determining the probability of a road accident is described in the *Blue Book* (NK Infrastruktura drogowa (*Road infrastructure*), 2015). For railway crossings, Polskie Linie Kolejowe (PLK) has an internal *PLK safety methodology* (2012) and it is made available to beneficiaries preparing projects for PKP PLK. On the other hand, the monetization of accident costs in EU projects is made on the basis of data quoted in (NK Railroad Sektor, 2015) and in the *Beneficiary Vademecum* (Table 3). The accident cost forecast for the period until 2043 is presented in (NK Railroad sector, 2015, p. 121).

Table 3.*Accident costs according to (PLN/incident, 2015 prices)*

Cost	Unit value
Fatal victim	2 034 981
Victim badly injured	2 277 424
Victim slightly injured	31 303
Material losses	20 014

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 98.

The calculation of the **cost of climate change** in the form of carbon dioxide emissions is based on data from the rolling stock specification in terms of CO₂ emissions in tonnes and multiplied by the cost of climate change caused by 1 ton of CO₂ emissions (this cost is presented in Table 4).

Table 4.*Costs of climate change (EUR and PLN/tonne of CO₂ emissions, prices from 2015)*

Currency	Value 2015	Increase year by year
EUR	34.55	1.15
PLN.	144.59	4.82

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 100.

We calculate the costs of emissions of environmental pollutants in road transport in accordance with *NK Road Infrastructure 2015* and on the basis of technical specifications. After quantifying the emission, we monetize it according to the tables (Table 5).

Table 5.

Costs of pollutant emissions in land transport 2015 (PLN/tonne of emissions)

NOx	NMVOC	SO2	PM2.5	
			Urban area	Rural area
63,984.88	7,992.16	68,752.55	1,054,769.33	226,195.17

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 99.

The **evaluation of the improvement in passenger service quality at a railway station** is made by means of the *Passenger Willingness to Pay Analysis* (WTP) through questionnaire surveys in relation to the ticket price (Table 6).

Table 6.

Benefits of a comprehensive railway station modernization as a percentage of the average ticket price for journeys beginning or ending at that station

Type of railway junction	WTP (% of the average ticket price)
National change centre	10.21
Regional change centre	8.14
Medium-sized railway stations	13.86
Railway stops	14.69

Note. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 104.

The **impact of the project on noise**, e.g. when replacing the ground station with an underground station or when building a tram depot, is quantified on the basis of a noise and population density map. We calculate the number of people exposed to a given noise level and for whom the noise is nuisance. Then, we multiply the number of people determined in this way into the unit costs of noise per person. Noise unit cost tables are included in the *Blue Books* (2015) and in the *Beneficiary Vademecum* and shown in Table 7.

Table 7.

Noise costs depending on its level in Poland (PLN/person/year, prices from 2015)

dB	55–59	60–64	65–69	70–74	75–79
Polish	178	305	432	671	892

Note. dB – de cibel. Adaptation from: Beneficiary Vademecum, CUPT, 2016, p. 102.

In the case of most projects implemented on **railway infrastructure**, we deal with **mixed passenger and freight traffic**. For this type of projects, we use the methodologies of the *Blue Book Railway infrastructure* (NK, Railway sector, Railway infrastructure, 2015). The JASPERS initiative^{iv}, operating under the cooperation of the European Commission, the European Investment Bank and the European Bank for Reconstruction and Development, is in the process of preparing new detailed methodological recommendations for estimating the cost of time in rail freight transport.

4. Summary

In order to calculate the costs and benefits of an infrastructural transport undertaking and to monetize its quantified effects, one should use:

- external sources for macroeconomic forecasts, and
- unit cost tables.

First of all, these are the **Variants of the economic development of Poland** (Portal of European funds, Variants of economic development of Poland, 2020) published by Managing Authorities for beneficiaries of EU funds. These forecasts are updated at least once a year. Some forecasts, e.g. of demographic development, are prepared by the Central Statistical Office or other institutions. However, as regards the **unit costs** needed for economic analysis, it is necessary to: *first*, obtain the most recent data possible; *then* make appropriate adjustments in the direction of:

- conversion of foreign currencies into national currency (if unit cost tables are prepared in other countries and currencies),
- taking into account the purchasing power parity in the investor's country according to the formula:

for the target area = GDP per capita in PPS for the target area/GDP per capita in PPS for the exit area X value for the exit area^v,

- indexation by inflation to raise prices to the level of the year of the analysis,
- indexation with forecasts of economic development indicators.

The unit costs of individual factors for socio-economic analyses are periodically updated, and beneficiaries can expect that after the end of the current financial perspective 2014-2020 and the related settlement procedures in 2023, research teams will develop new updated tables of unit costs in transport. On the other hand, the methodology of quantification and monetization of economic effects in transport infrastructure projects is and will be supplemented and developed in order to present clearer algorithms for its application. The use of the latest sources and methodologies has a significant impact on the credibility of the results of economic analyses of capital-intensive infrastructure transport projects, and is the basis for the effectiveness of obtaining and co-financing projects from European funds in the next financial perspective 2021-2027.

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Notes

- ⁱ The calculation of the funding gap is presented in *Wytyczne (Guidelines)* (MIR, 2015) and in *Vademecum Beneficjenta (Beneficiary Vademecum)* (CUPT, p. 17-18).
- ⁱⁱ The methods of forecasting the demand for transport infrastructure services, and thus the revenues from it, are described in the *Beneficiary Vademecum* (CUPT, 2016, p. 35-48).
- ⁱⁱⁱ The examples are based on: (*Beneficiary Vademecum, 2016, CUPT*, p. 67-105) and (NK, *Blue Books*, 2015).
- ^{iv} JASPERS- Joint Assistance to Support Projects In European Regions. JASPERS initiative aims to assist within EU-funded major infrastructure projects of over € 50 million, such as roads, railways, water, waste, energy and urban transport projects. https://ec.europa.eu/regional_policy/archive/thefunds/instruments/jaspers_pl.cfm, 28.09.2021.
- ^v The GDP per capita index expressed in PPS (*Purchasing Power Standard*) shows the amount of GDP of a given country in relation to the EU average, the value of which was assumed to be 100. It is calculated taking into account differences in the price level between countries. (*Eurostat. Your key to European statistics*). <https://ec.europa.eu/eurostat/web/products-datasets/-/tec00114>), 26.09.2021.

SMART VILLAGE – USING NEW OPPORTUNITIES IN THE DEVELOPMENT OF RURAL AREAS

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Purpose: The main purpose of this paper is to identify new opportunities for the development of rural areas. A contribution to this should be the combination of modern tools and technologies that affect the improvement of the quality of life and the possibility of creating new jobs in rural areas.

Design/methodology/approach: The paper employs the desk research method in the form of an analysis. The analysis of the available literature on the subject on smart villages and the examples of smart villages described in the paper rendered it possible to establish the facts, verify the data and present the results.

Findings: The considerations presented in the article indicate that a key element in smart villages is smart human resources that respond to challenges and changes occurring in rural areas. In order to make a real change in a given area, collective action is required rather than individual, and, depending on incentives and local circumstances, these initiatives may prioritise economic, social or environmental issues – or a combination thereof.

Practical implications: A common space for development and shared commitment of the rural population enables building social ties as an integral functioning of Smart Villages.

Social implications: The needs of the rural community should always come first and the implemented solutions should be adjusted according to these needs, bearing in mind what resources that a given community has.

Originality/value: The article is an original approach to the search for intelligent solutions that are meant to improve the development of rural areas and make life easier for rural residents.

Keywords: rural areas, smart village, new opportunities, development, projects.

Category of the paper: research paper.

1. Introduction

Various disciplines deal with rural issues, including economics, sociology, agricultural sciences, geography, demography, ethnography and anthropology. Representatives of these sciences have developed dozens of definitions, each representing a village or rural area and the inhabitants of this area from a different perspective (Stanny, 2014). The main problem in studying the changes that occur in rural areas is the very definition of the term "rural area". It would seem that this term is broadly and well understood, but its correct definition poses much more difficulty. A village is a settlement unit where farmers live and work. They mainly deal with plant and animal production. A rural area is considered to be the area made up of individual villages, including their surroundings. The definition of rural areas should be treated flexibly as these areas are constantly changing. During the dynamic modernisation of the countryside, rural areas were characterised mainly as a place associated with agricultural production (Krakowiak-Bal et al., 2018).

One of the main features of rural areas is their heterogeneity, expressed in their multifunctionality and re-evaluation of rural regions towards new production and service opportunities. The method of distinguishing and classifying rural areas is changing (Gralak, Kacprzak, 2021). There are six types of delimitation approaches in the literature (Féret, 2020):

- an administrative approach, of legal and administrative nature,
- a demographic approach, based on the population criterion, i.e. population density,
- a location approach, based on spatial relations between urban and rural areas,
- an economic approach (structural and functional), based on such criteria as the share of agriculture in the GDP or cost of services,
- a landscape approach, based on land cover and climatic conditions,
- a combined approach that uses a combination of at least two different approaches.

For the needs of the Central Statistical Office (GUS), rural areas in Poland are distinguished on the basis of the territorial division of the country (the administrative approach) using TERYT identifiers. According to this classification, rural areas are those areas which remain outside the administrative borders of cities and include rural boroughs and rural areas of urban-rural boroughs (Borawska, 2017). Bański (2012) describes rural areas using seven features (Figure 1).

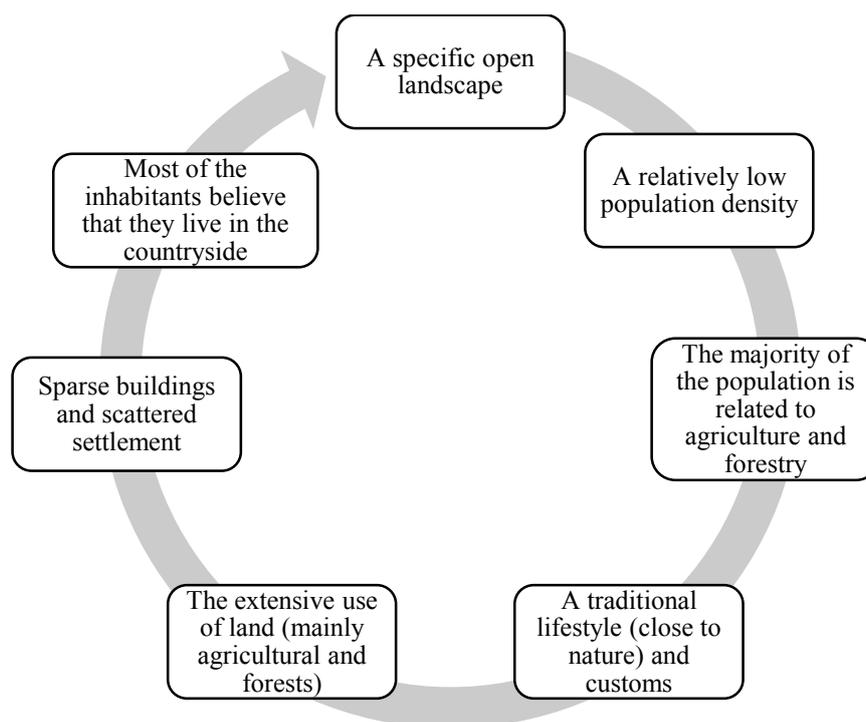


Figure 1. Features of rural areas. Adapted from: „Problematyka definicji i zasięgu przestrzennego obszarów wiejskich i stref podmiejskich” by J. Bański.

The implementation of the concept of multifunctionality consists in diversifying the socio-economic activity of villages in order to increase the sources of income from outside the farm, which include other sectors of the economy, e.g. the development of non-agricultural activities in rural areas (Roszkowska-Mądra, 2009). The multifunctional character of rural areas is the concept of shaping the rural development strategy, e.g. based on the non-agricultural economic activity of its inhabitants (Heller, 1998). The essence of multifunctional development is primarily local economic entrepreneurship, supported by various forms of capital inflow (Adamowicz, Zwolińska-Ligaj, 2009).

The paradigm of multifunctional rural development focuses mainly on achieving economic effects. The opposite is the revitalisation paradigm which includes social aspects into the deliberations on the development of rural areas. The countryside is primarily supposed to be the living space of its inhabitants (Wolski, Sykała, 2016).

Smart rural development allows local and regional aspects of rural development. The idea concerns the manner of operation under the conditions of change and the kind of response to challenges, not specific rural areas (Wolski, Wójcik, 2018). As Idziak (2019, p. 5) states, *what is happening in the Polish countryside depends on events, trends and decisions made in many places in the world*. The concept of smart villages is often the key to any attempts to solve the problem of depopulation and to stimulate services and development opportunities in rural areas. It is based on a functional, cross-sector approach and does not only affect the lives of rural residents, but also applies to people from outside the local community, including those involved in rural development, lawmakers, entrepreneurs, NGOs, etc. In smart villages, it is the people

who matter most. Rural residents matter when they take the initiative to find practical solutions, both in terms of some serious challenges that they have to face and, what is important, in terms of taking advantage of attractive opportunities that result in the transformation of rural areas (Kacprzak, 2019).

The definition of smart villages is concentrated around the features and approaches of rural communities (Wolski, Wójcik, 2019):

- skilful use of digital technologies, which bring us closer to the achievement of the assumed goals,
- consideration beyond the village boundaries. Although actions are taken at the local level, it is noted that the village is linked to larger urban centres and other villages,
- creation of innovative cooperation forms and communities of interests, thus bringing farmers, local governments, the private sector and society together,
- independent thinking is also important. Villages themselves assess their resources, select the most appropriate know-how and take the initiative to shape the reality that surrounds them.

The smart community is a key element in smart villages. It is thanks to appropriate human resources that it is possible to address the challenges and changes occurring in rural areas. The very areas of intelligent activities can be classified in three main areas of intelligent solutions (Kamiński and Leśniak, 2019):

1. Public services, i.e. e-health, e-care, remote education, transport (e.g. *telebuses* – public transport on demand), energy (e.g. RES), as well as security (e.g. CCTV surveillance).
2. Public management, i.e. e-government, waste management (e.g. container filling sensors), spatial planning (e.g. digitisation), as well as environmental monitoring (e.g. air quality sensors).
3. Entrepreneurship, i.e. precision farming, online trade (e.g. local products), rural tourism (based on intelligent solutions), and sharing (e.g. specialised equipment).

Current initiatives of smart villages focus on one or more of the wider aspects and conditions of rural development where collective action, rather than individual, is required to make a real change. Depending on local circumstances and motivation, these initiatives may prioritise economic, social or environmental issues – or a combination thereof. There is no need to do everything at the same time (ENRD, 2021).

The concept of smart villages appeared in the rural development policy of the European Union as an analogy to the concept of smart city, in view of the need to implement the stipulations of the Europe 2020 Strategy. And, although the Smart City idea is already being implemented in many Polish cities thanks to projects and programs related to the use of intelligent technological solutions, such as public Wi-Fi networks, intelligent traffic control or various sensors, meters and controllers, another important step is to create further development, also with active participation of residents, as in the case of Smart Villages – Smart Cities 3.0 (Kalinowski et al., 2021).

2. Material and methods

The aim of the article is to indicate new opportunities for the development of rural areas. The paper employs the desk research method in the form of an analysis. The analysis of the available literature on the subject on smart villages and the examples of smart villages described in the paper rendered it possible to establish the facts, verify the data and present the results.

3. A practical approach to the use of intelligent solutions

According to the EU Measure, smart villages are *rural areas and communities that make use of their existing strengths and assets as well as emerging new opportunities*, in which *traditional and new networks and services are improved through digital and telecommunications technology, innovation and a better use of knowledge* (ENRD, 2021, p. 3). There are currently noticeable trends among rural communities relating to the search for intelligent solutions to local problems. The importance of these activities concerns more and more than just digital technologies. Although digitisation and the growth of networking in rural areas are a key element of development, innovative solutions also include the social, economic and environmental scope (Godlewska, 2020) (Figure 2).

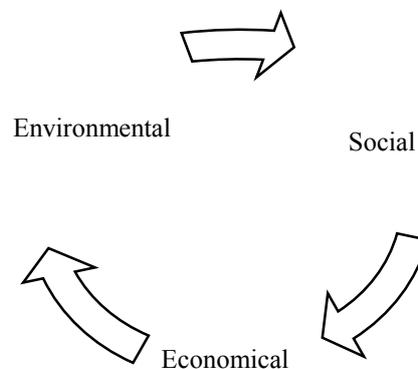


Figure 2. Additional range of innovative solutions. Adapted from: „Inteligentna wieś jako nowa koncepcja rozwoju obszarów wiejskich” by N. Godlewska.

When looking for smart solutions to enhance rural development, the link between smart village strategies at the local level and existing wider strategies should be considered. The broader strategies include e.g. digital strategies at the regional level or regional smart specialisation strategies. By combining these two strategies, rural communities have a better chance to implement and achieve their goals (ENRD, 2021). Smart solutions should be found everywhere. Sometimes a seemingly ordinary project can become innovative after implementing a few changes. The focus should not be placed on one of the possibilities, because

it alone does not create a good product, which could be called intelligent development. Therefore, actions should be combined to create something more unique, which will set an example of sensible management of space and resources. The source of inspiration for creating intelligent solutions are the resources provided by nature, e.g. for the production of own electricity. With agricultural production and the simultaneous use of modern technologies, a farm takes on a new dimension. It is thanks to the easiest obtainable resources and taking innovative actions that something extraordinary can be created, which makes us more self-sufficient (Godlewska, 2020).

An example of the use of intelligent solutions is the production and conservation of energy. There are many opportunities to be able to create something better than before, to rationally approach energy management and use it more efficiently. It might seem that the improvement of safety among the inhabitants of rural areas and care for the environment are not innovative solutions. Sometimes, however, little is enough. It would suffice to approach this area sensibly and introduce solutions that will make people's lives easier. This subject offers a number of possibilities for an intelligent approach. These include solutions that enable the implementation of modern methods of obtaining energy and its appropriate use (Figure 3).

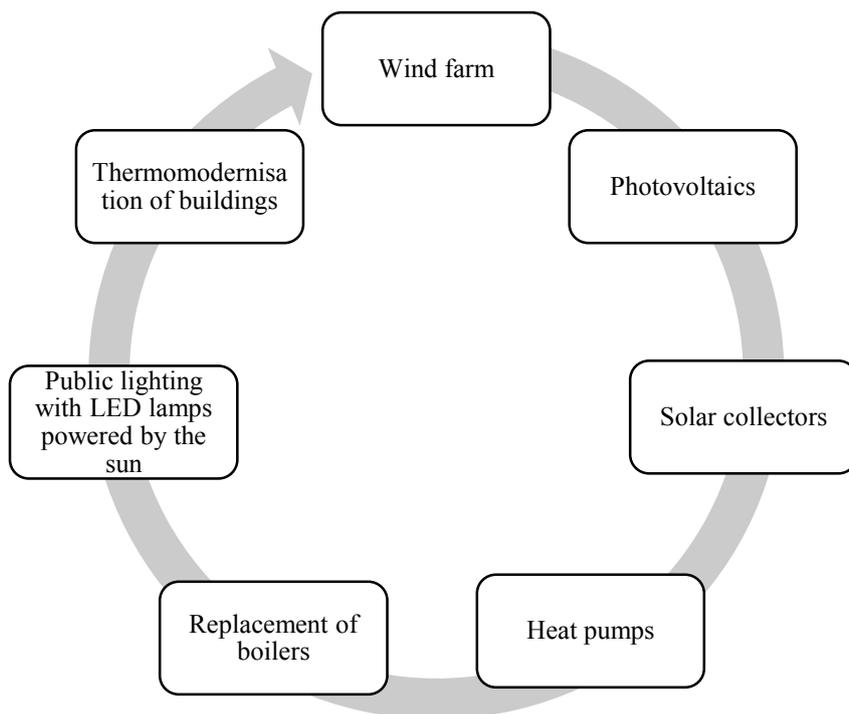


Figure 3. Additional energy use. Adapted from: Smart village – pomysł na „Inteligentną wieś” by K. Malecka.

Intelligent activities relate to various fields, including health and care. In this approach, particular attention should be paid to the selfless willingness to help the other person. Solutions should be found that would facilitate the continued peaceful life of the elderly and ailing part of the rural community. Special assistance should be provided to a larger number of patients who live alone and do not receive any support from the healthcare system. Most of these

residents are not even capable of attending a health center as the place is located a few kilometers from the person's residence.

Education is an extremely important element in the search for intelligent solutions. It is in this area where all the development success is placed. A series of measures should be implemented to facilitate the adaptation of children and young people to digital technologies, which increasingly concern everyone. The possibilities of searching for intelligent solutions should also include entrepreneurship, comprehensive rural development, communication between rural residents, common space and joint action, and sport (Malecka, 2021) (Figure 4).

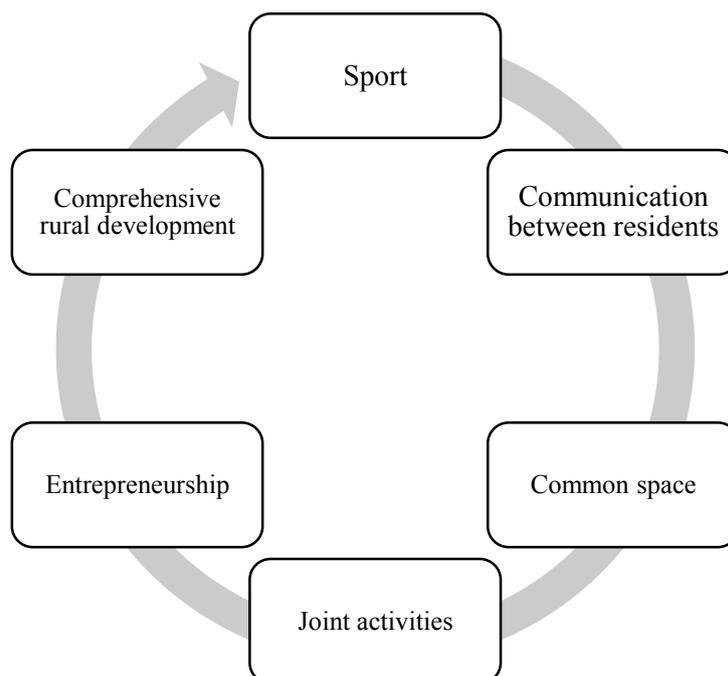


Figure 4. Search for intelligent solutions. Adapted from: Smart village – pomysł na „Inteligentną wieś” by K. Malecka.

There are a number of other opportunities offered by an intelligent approach to rural development. The needs of the rural community should always come first and the implemented solutions should be adjusted according to these needs, bearing in mind what resources that a given community has.

The common space for development enables building social bonds as an integral measure of smart villages. An example is an overgrown pond in the village of Spórok in the area of the city of Opole, which has been turned into a pleasant meeting and resting place by the collective efforts of the inhabitants. The works were performed as part of the Village Renewal. Another measure is the Astronomical, Cultural and Educational Centre in Niedźwiady, in the borough of Szubin. It was established on the initiative of astronomy enthusiasts gathered in the Pałucko-Pomorskie Astronomical and Ecological Association (Malecka, 2021).

4. Examples of the use of intelligent solutions in rural areas

The Smart Villages concept of rural development is an ideal example of positive changes that the countryside can undergo. It is possible to increase the efficiency of management and service provision and to improve the competitiveness of rural areas, while respecting the economic, social and environmental needs of current and future generations (Kamiński, Leśniak, 2019). Smart Villages is a community with an idea for its problems and its future; it is a village that uses the possibilities of modern technology, while caring for the planet Earth with which its fate is connected (Czy masz pomysł..., 2021).

A good initiative for intelligent rural development is the herbal manufactory "Lawendowe Pole" located in Nowe Kawkowo, in the countryside of Warmia. The owner left her job in Warsaw to move to the countryside. She is a very creative person. Pursuing her life passion, she runs Alchemical Lavender Workshops, offers agritourism services, has created the Living Lavender Museum and the Secret Garden of usable and forgotten herbal plants. In the living museum, a new workshop room was created, which is used for the needs of education and activation of the local society, as well as tourists visiting the Lavender Museum. In the workshop room, educational activities for children, adolescents and adults are conducted in the field of culture, art, ethnography, herbal medicine, ecology, sustainable agriculture and aromatherapy. The room was co-financed by the European Union funds under the Measure "Support for local development under the LEADER initiative" and under the Sub-measure 19.2: "Support for the implementation of operations under the community-led local development strategy" of the Rural Development Programme for 2014-2020. In addition, a herbal shop was established in the manufactory, where selected products made on the farm can be purchased (Kacprzak, 2019).

Another example is the Sudety Educational Farm. It is a modern, interactive education center where the fascinating past of the Earth is presented. It is located in the heart of the Land of Extinct Volcanoes which is in the region of the Kaczawskie Mountains. The farm was created by the Kaczawskie Association with the support of the European Union and the Provincial Fund for Environmental Protection and Water Management in Wrocław. Here, knowledge and skills are transferred in an interactive, dynamic way, based on models, digital visualisations and self-conducted experiments (Sudety Farm, 2021; Kamiński, Leśniak, 2019).

A modern, ecological sports and entertainment hall was built in the borough of Ryczowół. The hall is used by the children from schools and kindergartens, as well as members of sports clubs, youth, adults and seniors. The hall is equipped with CCTV monitoring, which makes it safe. There is modern sports equipment for handball, football and volleyball. The sports and entertainment hall was built with the support of the Provincial Fund for Environmental Protection (over PLN 1.8 million of preferential loan) and the Ministry of Sport and Tourism (PLN 3.5 million) (Gembiak-Binkiewicz, 2021).

The value of the hall is the possibility of activating a large group of residents, as well as integration. The hall has conference rooms where various social and official meetings are held (Kalinowski et al., 2021).

Examples of smart villages can be found not only in Poland. An example is the "Strategy for Internal Areas" in Italy. It was established to counteract depopulation of rural areas. In Finland, depopulation and digital transformation were also addressed through the "Smart Rural Project". In France, the "Mutual Agreements" were conducive to creating links between villages and cities and the benefits of the digital transformation were fostered by the "Digital Villages" initiative in Germany (Boba, 2019). There are also many other local projects. For example, the aim of the "Broadband Fibre" project in Östra Bräcke was to provide 150 km of the Internet cable for residents of the municipality of Östra Bräcke in Sweden, with all its benefits. 272 broadband Internet connections were created (Broadband Fibre..., 2021). The "Mallu Does The Rounds" project provided an easily accessible medical service to rural Finnish residents, using the Mallu bus. The measures concerned the conversion of a mobile caravan and equipping it with a mobile healthcare centre. Nurses provide a suite of medical services from a mobile unit, and an on-board computer and broadband connection link nurses to centralised patient information systems. The Mallu bus project helped to prevent disease and supported the independent lives of older villagers (Mallu Does..., 2021). Last but not least, the goal of the "Socially Responsible Wine Tourism" project was to promote sustainable and socially responsible wine tourism by contributing to the establishment of the thematic Wine Trails and increasing tourist visits to wine growing regions across Spain (Socially Responsible..., 2021).

Summary

The concept of smart villages is a relatively new concept that does not propose one universal solution – it is territorially sensitive, based on the needs and potential of a given territory with a development strategy and supported by new or existing strategies covering territorial areas (EU Action for..., 2021). Not only is technology important, but also business development, investments in infrastructure, human capital, production, good governance and citizen involvement matter. As technology is changing the world, it must be adapted and used in a smart way. The smart solution approach in rural areas primarily concerns people and their initiatives. Smart villages are smart communities with certain characteristics and attitudes that enable them to respond to the challenges arising from changes in rural areas. This requires rural communities to change the way they think about development and what they do to develop (Wolski, 2019).

Smart villages pay attention to e-literacy solutions, access to e-health and other essential services, innovative solutions for the environmental protection, promotion of technology-supported local products, etc. They include human settlements in rural areas and their surrounding landscapes. Smart village means looking for solutions to the improvement of the quality of life, underinvestment, aging society, depopulation, improvement the quality of services and security, respect for the local environment, insufficient job offers or the digital divide.

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ORGANIZATIONAL CULTURE OF A JUDICIAL UNIT

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Purpose: The cognitive purpose of this article is a presentation of results and organizational culture research significance for shaping of management actions in a selected judiciary unit. The research purpose was diagnosis of existing culture orientations among the judiciary administration workers in one of courts within the Silesian Voivodeship area.

Design/methodology/approach: The Cameron-Quinn research questionnaire was used for this research, carried out using a direct inquiry distribution among workers of the judiciary unit. Sample was selected purposely – the respondents were administrative workers of the selected judiciary unit.

Findings: Respondents did indicate dominating culture orientation in measures taken in the Cameron-Quinn classification, in both perceived and preferred formats. Workers did indicate that the worker managing style has a basis in hierarchic culture. Individual bases on job safety and working conditions constancy. Organization cohesion is ensured by formal principles and introduced rules. Besides, pressure on introduced rules constancy or least possible changes is exerted. Activity efficiency is reached by strict hierarchic dependences. Preferred rganizational culture should be a clan culture. Respondents did indicate that they would like the organization to be a place, resembling a big family. Personal engagement in an organization is the status in which they would most willingly create attachment to their job.

Research limitations/implications: Research was realized among workers of one judiciary unit. It had a piloting character. Therefore, the research conclusions cannot be transferred to workers of other units and their perception of organizational culture. Future research, performed in other units, may allow correction of managing elements and decision process configurations for better managing of public organizations.

Practical implications: Research results draw attention to important aspect of the existing culture orientation analysis – potential change in the area of managing the organization social potential towards better motivation systems, more efficient use of information in frames of feedback and, thanks to it, modification of operative decisions of different grade management and larger use of task teams for realization of randomly appearing projects (e.g. data processing or reorganization) in the different grade judiciary units.

Originality/value: The article is addressed to organizational culture researchers and public organization managers, especially in universal judiciary units. On a practice level the article value concentrates on a thought over organization activity cultural dimensions, which cause motivation attitude of workers, affect the intra-organization confidence level and this way it configures social capital factors – one of the immaterial organization asset structure elements.

Keywords: organization culture, judiciary unit, Cameron-Quinn questionnaire.

Category of the paper: research paper, literature review.

Introduction

Organizational culture is one of most important elements that build and support activities of contemporary organizations. The present reality forces many changes. Organizations, leaders and workers must define themselves in the upcoming globalization. In such a situation it's worth basing its actions on constant values and common identity, which shall allow organization cohesion. Enterprise future in present times depends on external and internal factors, the good of which should be cared using all the accessible tools, delivered by an organizational culture (Daszkiewicz, 2010).

Culture is the whole of human performances, products and achievements. This term is a wide research problem due to a permanent interest and progress in their definition. This notion characterizes with intricacy and variety, therefore research of this theme subjects to a special science branch, called "culture science". The other branches involved in the culture theme are, for example: culture sociology, culture anthropology or culture psychology (Edmondson, 1999).

In contemporary literature, culture has no identical definition. This term comes from a Latin word *cultus*, i.e. „carrying” or „cultivation” (Żuk, 2016). Originally this term related to a soil cultivation - *cultura agri*. It should be pointed out, that from ancient times the culture is defined as secondary meaning, metaphoric and defining lifestyle, education and upbringing. First it meant a nature cultivation, but later it was interpreted as cultivation of all the things that may be cultivated.

Irena Wojnar indicates that we „understand culture today not only as heritage, universals of creative human race deeds in the science or art branches but using this term we define a humanistic quality of people's actions and lifestyle” (Wojnar, 1996). The term “culture” includes such issues as human product – both by its brain or by a technical effort. The brain effort bases on a brain production and artistic sphere and also technical activity unites with structures, created by a human for adaptation, survival and cooperation within a natural environment.

Due to a quicker and quicker civilization progress, modernization of any life sphere and increasing tendency of changing internal and external processes, we should concentrate on an organizational culture problem. Nowadays it is often indicated that organizational culture should be a fundamental pillar of enterprise functioning. Lack of basic principles may lead to problems in functioning and push the organization in direction of fading the structures, which

are based on proper shaping of the organization character and internal climate (Rohlfer, Zhang, 2016).

Culture should describe and define a human being in any aspect of its life. Therefore, many interpretation ways exist, showing direction of research aimed for culture problems. Basic problems, by which the organization culture term is described, are mainly definitions, concepts, affecting the organization development and its character, changes occurring in a culture of given subject, concept review, influence of a leadership to organization culture or research methodology relating to the described term (Marcisz, 2017).

The article purpose is presentation of complex organizational culture research in a selected judicatory unit.

Organizational culture – significance for contemporary enterprises

First definition of an enterprise culture was presented by Jacques, who showed it as “customary and traditional way of thinking and acting, shared in smaller or bigger part by all the members and which must be learned and, at least partially, accepted by new members, so that they can be also accepted in a company” (Jacques, 1951).

Organizational culture may be defined as a culture, existing in given organization. According to Lidia Zbiegień-Maciąg, for its presence the culture-shaping factors are responsible, as follows: values, beliefs, standards, behavior patterns, symbols, invisible powers driving organization activity, unobservable but existing and acting, system of meanings, indications, directives mobilizing organization members, control mechanisms forbidding or allowing some behaviors (Zbiegień-Maciąg, 2005).

Taking into account complexity and variety of the indicated factors, we can see a picture of the expanded “culture” term. Organization which implements organizational culture into its system, must see a problem, which may occur in a moment of building, from very beginning, its own character, values or mechanisms, which affect company’s functioning. Many values, meanings or symbols are elaborated during enterprise activity only and it is impossible to indicate, from the very beginning, which direction the culture should develop. Elaboration of its own customs and behavior patterns may be a long-term process, which shall, in the future, define formalization directions.

Katarzyna Tobór-Osadnik indicates that „some researchers do not use the term of „organizational culture” or „organization culture”, but they define it as “company’s philosophy” or “organizational climate” (Tobór-Osadnik, 2016). Due to a larger civilizational progress, globalization or generalization of a life connected with work and career such term may be defined as „philosophy” or „climate” due to a generalization of this question. The shown words mirror the larger and larger popularization of the “culture” term.

The culture-science factors were gathered by Edgar Schein and presented as organizational culture levels (Siewierski, 1999):

- Artefacts – culture part best visible for an environment and organization;
- Standards and values – define behavior of organization members;
- Basic assumptions – define organization philosophy, organization life outlook, understanding of truth, human nature and activity and interpersonal relations.

Thanks to these levels we can indicate elementary parts creating the discussed problem. Many of these factors are apparent and measurable, but it is worth noticing that there are also less apparent elements such as social inter-actions, informal leaders or language used inside given organization.

Kim S. Cameron and Robert E. Quinn show that organizational culture definition was taken from two science branches, i.e. anthropology, based on a conviction that „organizations are cultures” and sociology, which says that „organizations have cultures” (Cameron, Quinn, 2003). Thanks to these two branches, professors noted that „two different approaches to a culture were developed: functional approach (culture emerges from common behaviors) or semiotic approach (culture seats in individual interpretations and recognition)”. These directions differ with its approaches to culture concept, because in the functional approach culture is a feature owned by organization, while in the semiotic approach it is an enterprise metaphor (Vasyakin, Ivlena, Pozharskaya, Shcherbakova, 2016).

Functional approach is comparable to hitherto presented definitions. It includes statement that possibility exists to define divergences between different organization cultures, managers or directors may change directions and cultures themselves and they can carry empiric research. It is said that in the first assumed theory the culture may foresee obtained results and efficiency of carried research. Whereas semiotic approach is based on a principle that nothing is functioning in the enterprise except a culture, and it can be seen on each stage in a situation when no organizational phenomenon exists. Followers of this direction show that a culture is a question, which should be examined independently from other, existing phenomena.

The “organizational culture” term was developed in XX century. „Organization Culture” is a term, which in a large scale entered to the Management Organization Theory within years 80 & 90 of XX century and was born in 1951 (...). Researchers emphasize that this question appeared in 1960-ties as a synonym of „climate”, and next in 1970-ties as „corporation culture” (Kopczewski, Pączek, Tobolski, 2012).

Grażyna Aniszewska refers to two main reasons, which led to enlarged interest in organizational culture in 1980-ties of XX century (Aniszewska, 2007):

1. Obtainment of a success, on American market, by Japanese companies, which earlier were seen as deliverers of low quality or even trashy products. This success led to increase of research in direction of culture conditions and mentality, which governs the Japan nation.

2. Continuous globalization progress creates more and more requirements due to quickly changing surroundings. One of important challenges for organizational culture became an Internet and lack of barriers for appearing in a market or access to information about products and they started to direct to internal enterprise factors, which was able to lead to efficient competition and later to obtainment of a market success.

Due to a speed in which today world develops, both society and enterprises have a task and necessarily must adjust to continuous changes. Thanks to organizational culture and its progress we can see that aspiration to be better and better isn't limited to people only. Organizations, thanks to organizational culture, may adapt to growing civilization requirements (Kohan, Safari, Teimouri, 2018).

K.S. Cameron & R.E. Quinn show the need to define both culture type and organization culture management ways „due to a growing need of joining and shaping cultures of different organization as effect of structural changes”. Authors, amongst factors of continuous development of this question, which is organizational culture, see mainly unarranged and unforeseeable changes in economic surroundings.

Other approach, on which post-modernists base, is opinion that organizational culture is „(...) consequence of objective perception of organization and surroundings by workers (...)”. Example of this definition indicates that not only one organizational culture is functioning inside an organization, and workers are essence of all the behaviors, which occur in the company (Cameron, Quinn, 2003). Worker is responsible for interpretations and giving a substance to all things and finally for creation of a culture in his brain. All the existing phenomena are caused by workers, who have the right to assess subjectively company's activity. However, they not always are able to decide rationally about organization functioning, using conflicts, i.e. their own assumptions, prejudices or principles. This approach shows organizational culture as disordered or unmeasurable one, however simultaneously it may be a trial of explanation of conflicts or resistance against changes. This direction puts, in first place, workers who, by means of implemented elementary principles and values, which within next step are interpreted by them and these features obtain substance and finally they may affect workers self-consciousness and their activities.

K.S. Cameron & R.E. Quinn simultaneously indicate that organizational culture is underestimated by workers. They present an estimation that workers don't know which organizational culture model exists in their own company. People, as long as they don't contact the new culture, or it's not precisely shown by employer, cannot define, which behavior, assumptions or identity feeling exists among the whole internal enterprise surroundings.

Agnieszka Szmurło emphasizes that „organizational culture is so important element that no enterprise can exist without it” (Szmurło, 2013). It should be indicated that researchers most frequently use assumptions that the culture is able to affect the whole organization functioning. Worker is a main element, which by its knowledge and experience can affect further functioning of his work and whole enterprise. A. Szmurło defines, „(...) enterprises of given branch, despite a fact that they produce the same goods or services, are near in the working organization aspect, but they differ with eg. approach to a customer, quality of produced goods, workers behavior, etc..”. All the mentioned differences are caused by presently existing cultures in organizations. Each culture leads finally to other characteristic features and activities (Tellis, Prabhu, Chandy, 2009).

Summarizing it may be said that organization affects a human being, and worker affects organization. This way a bond is created, called organizational culture.

Results of organizational culture research in a selected judiciary unit

Research was carried out in a selected judiciary unit in Upper Silesia. The inquiry questionnaire in this work consisted of three main modules. First module was short introduction including features of the researched. Next module was a part the task of which was examination of general status governing the judiciary unit. Last module was the part relating to the status preferred by administrative workers.

Modules, that had to show general status and preferred one, were based on a questionnaire proposed by Cameron & Quinn. These modules included six questions:

1. What is the general organization characteristics?
2. What is the organization leadership style?
3. What is the workers managing style?
4. What ensures the organization cohesion?
5. What is the highest pressure exerted onto?
6. What are the organization success criteria?

The research was conducted in order to obtain the answer how workers of the court percept an organizational culture in their working place. This research was done for the present and preferred status categories. The analysis was made for 106 performed inquiries.

In frames of the first question: „What are general organization characteristics?” hierarchic culture characterizes very strongly the existing status. It indicates little research subject ability to act in task groups or separated teams, performing additional, individual projects. Simultaneously it should be noted that functioning of such a group cooperation model, based on a task team arranging ability, and consequently also little other shaping of internal court’s administration structure is strongly percept as possible for implementation and justified in the

aspect of mutual relation shaping, including the one suitable for building a social capital (clan culture) activity format. It should be also taken into account, that the hierarchic culture must coexist with standards and attitudes developed within years and strongly rooted on a medium level of the Edgar Schein model, i.e. in standards and culture values, because it's required by both work specifics and internal organizational order, shaping habits, routines and mutual relation within task performance processes. The least chosen, both in existing and preferred statuses, was the admonition culture. The judiciary unit, in a natural way, isn't predestinated to concentrate on its own position in an environment, with a strategically created level of externalized flexibility. Preferring of a clan culture should ensure, in a simple understanding of workers, larger training activization and better quality of preparing to task performance, meaning improvement of communication systems, first of all, in a direct superior – subordinate relationship. Selection of a clan culture underlines also a worker loyalty towards organization and consequently necessity of estimation of this worker attitude norm in the worker evaluation systems. Clan culture simultaneously shows that workers don't think that tradition and cultivation of work relations based on a „positive orientation in management”, is only a distant horizon of identifiable future behaviors or only a symptom of intentional verbalism of a managing staff, declared for purposes of intra-organization PR. Admonition culture, with its directing to a dynamic risks taking and necessity of experiment testing of management novelties, is totally maladjusted to keep administration regime in settling cases in permanently overburden courts in Poland.

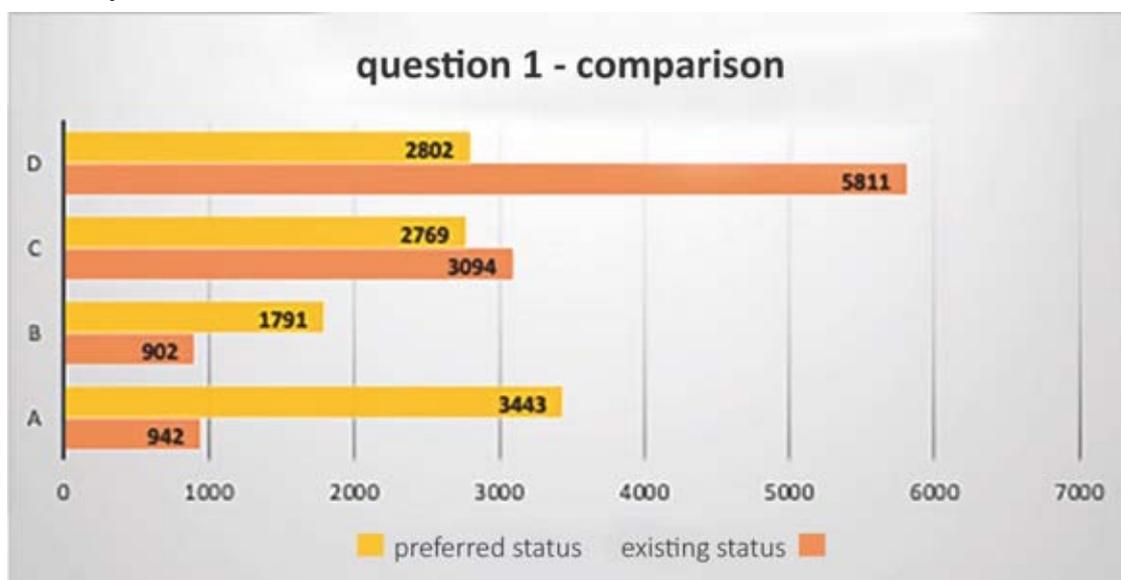


Figure 1. What is general organization character? – comparable analysis. Source: research based own elaboration.

In frames of second question, relating to a basic leadership style, at the percept status a market culture prevailed. This may mean that the management paradigm was focused on an over-standard organization aim realization imperative and total obedience during task performance, paying no attention to development need of a particular worker. This may result, partly from top, administrative pressure for increase of efficiency and proficiency in court

activities, and partly it may result from a redundant and uncritical attitude of different grade directors to the internal competition problem. It is also visible that the most preferred clan culture was most rarely perceived. Such a situation should incline management of the researched judicial unit to a deeper considering of the existing policy in the range of managing the organization social potential. Redundancy of a point dedicated tasks, with simultaneous order-distributive managing style and also many direct control elements, excluding postulates coming from workers in frames of existing feedbacks, in existing interpersonal communication processes, causes that the staff policy elements, aimed for worker personal development, are underestimated or ignored by managers on different grades, as possible for realization only in an undetermined future time.

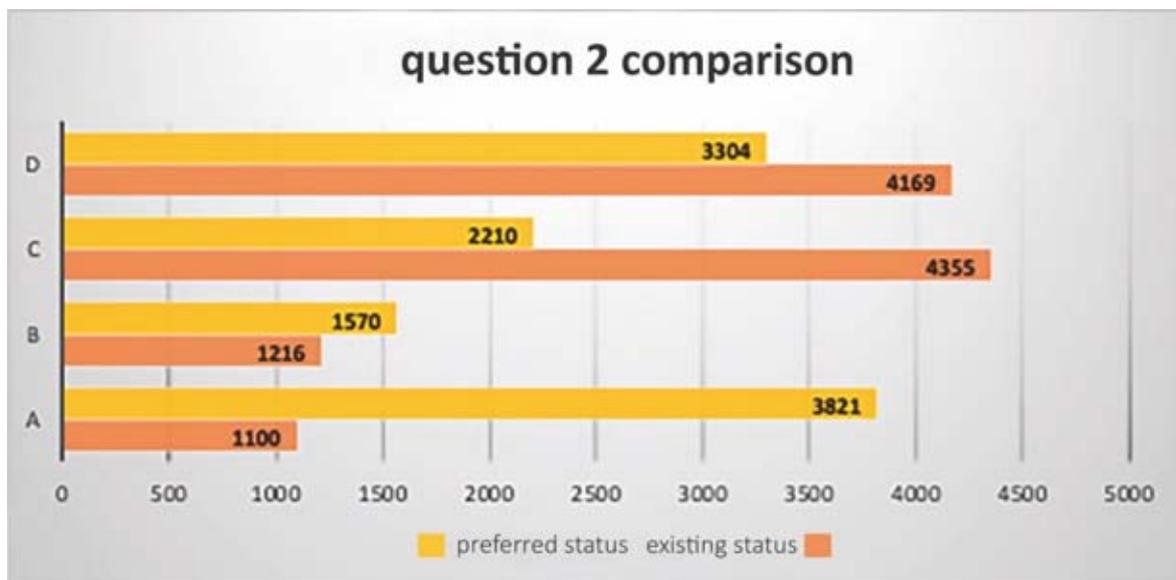


Figure 2. What is the organization leadership style? – comparative analysis. Source: research based own elaboration.

In the third question, relating to a worker management style the perceived status of organizational culture explicitly indicates a selection of hierarchic culture. This means that orientation to people, is accented on ordered performance of tasks, aimed for keeping personnel cohesion for performance of organization purposes by procedure and regulation formalism. Functional efficiency of the unit is evaluated higher than creation of individual professional career paths for a personnel and induction of attitudes for engaged personal development. Workers are inclined to take larger responsibility for performance of tasks and base their duty relations on an increased interpersonal trust potential. Workers of the judicial unit are perfectly aware that the value chain build in the researched organization do not predestine them to adjust themselves for a market uniqueness of performed services or to a visionary attitude to building of task teams and therefore the admonition culture was the less preferred choice in this question.

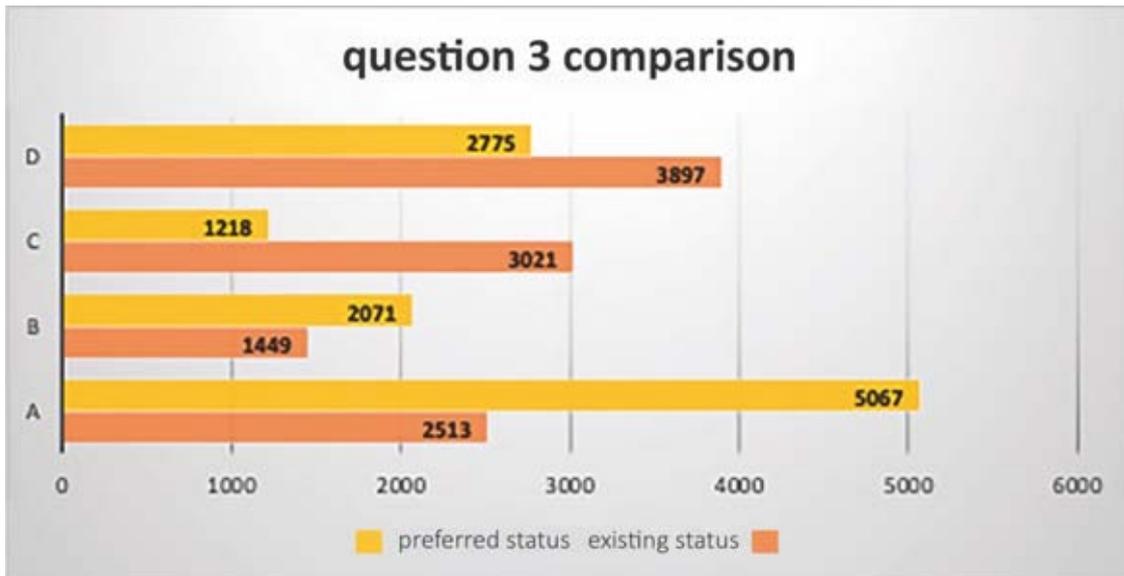


Figure 3. What is the worker management style? – comparative analysis. Source: research based own elaboration.

Answering the fourth question: „what ensures an organization cohesion” the inquired believe that the organization cohesion is guaranteed by a hierarchic attitude, procedures and keeping stable regulation codes. First of all, for operation activities, such a consensus is perceived by workers as a basic rule for keeping intra-organization cohesion. In the perceived status the inquired notice on management side no action leading to cooperation grade increase, and this way obtainment of coordination compactness based on a group solidarism, worker loyalty or social capital, axially fixed in and interpersonal confidence. In the preferred status the inquired saw practically no ability for keeping organization cohesion, with adjustment to a market culture.

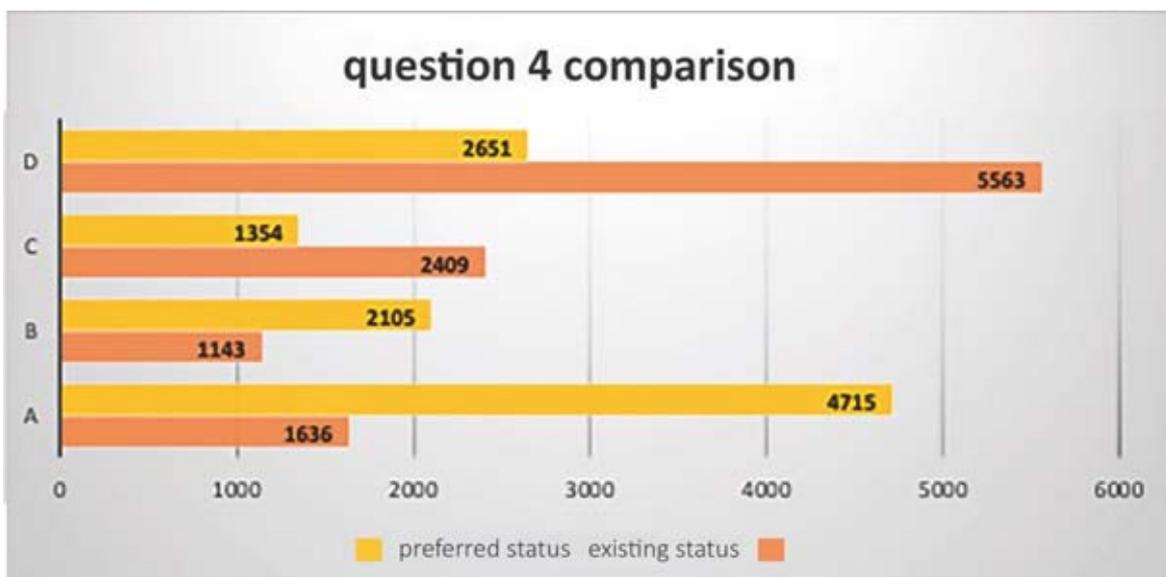


Figure 4. What is the largest pressure exerted on? – comparative analysis. Source: research based own elaboration.

Fifth issue focused on an answer to the question: what is the most pressure exerted on? The inquired indicated that at the present status the pressure is exerted on formalization of procedures, which means a hierarchic culture. At the preferred status they indicated that the pressure for building of durable organizational culture should be directed to a clannishness as orientation for consolidation of personnel resources and also and with possible shaping of professional careers and permanent ability to improve cooperation between different task teams, in frames of the existing hierarchic structure. Invariably the most rarely chosen preference was a market orientation, treated as completely unsuitable to the judiciary organization unit specifics.

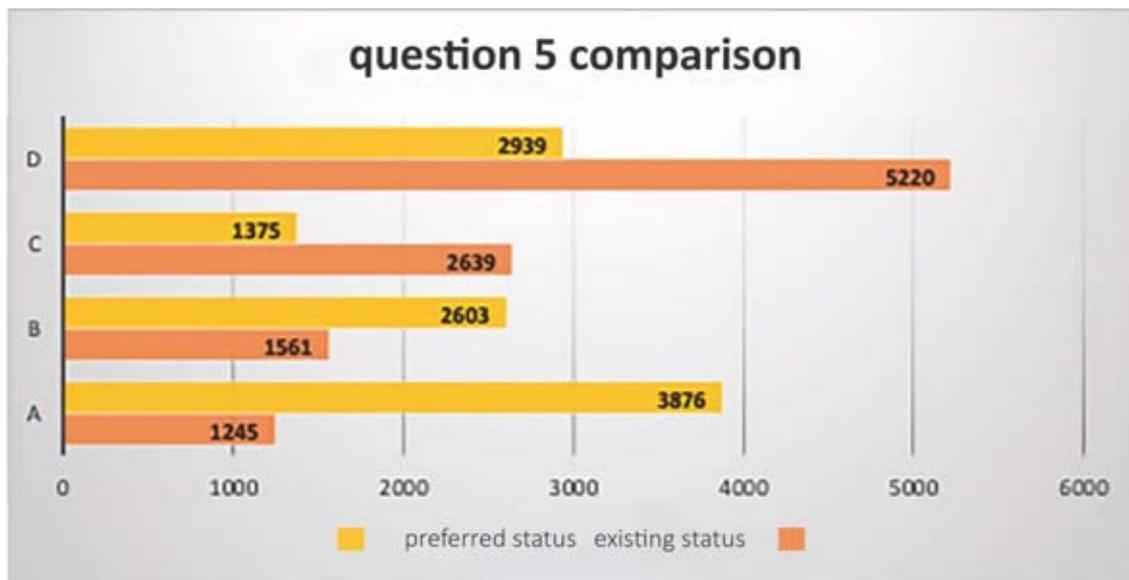


Figure 5. To which is the most pressure exerted? – comparative analysis. Source: research base own elaboration.

Answering the sixth question: „what are the organization success criteria”, the inquired interpreted the organization success source at the existing status, as univocal inscription into a hierarchy culture. Simultaneously the culture preferred success should have a clan culture character, which indicates to a fact that paradigm pole-reversal in thinking about relations and interpersonal bonds in a medium or top-grade management should occur. This may mean an integrated look to worker needs and keeping task realization regimes. The most important change area would be then a human resource management strategic system and stronger assistance of personal department in decision making processes from the medium or top-grade management level. Market culture isn't taken into account as a real attitude to solving the future researched judicial unit intra-organizational problems.

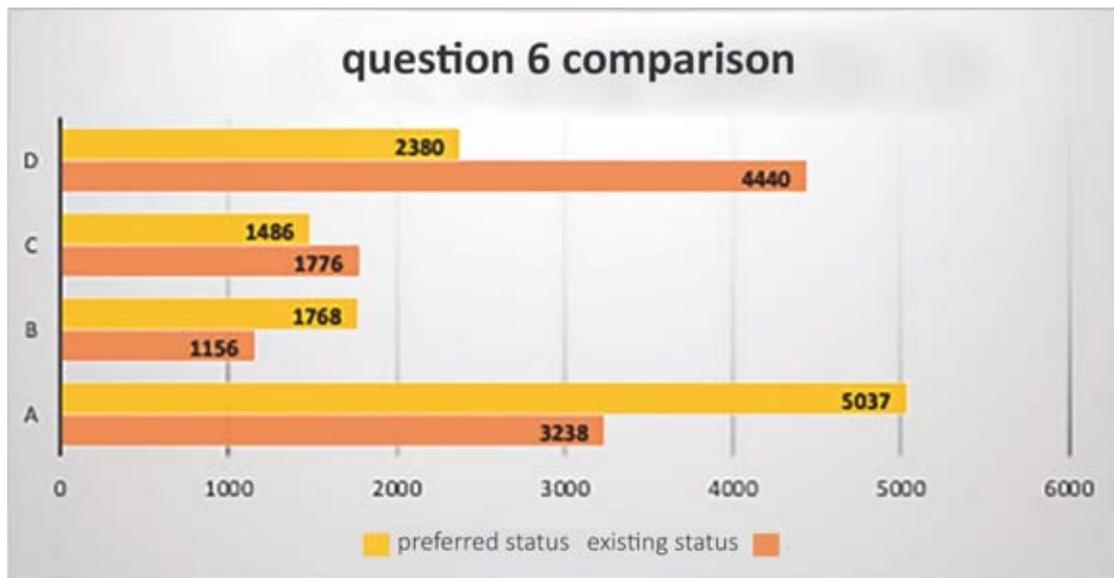


Figure 6. What are the organization success criteria? – comparable analysis. Source: research based own elaboration.

Conclusions

1. Organization culture is an important element in present times and progressive globalization. It allows to define some organization actions for attitude to a job, shaping effective management or mutual internal or external unit's relations.
2. To summarize the research, at the present status the court workers, in five from six questions, in a prevailing majority, indicated that the leading organization culture is the hierarchic one. This culture is based on a strong formalization of procedures, and workers indicated that such an organization characterizes with strict hierarchy and control of performed works. In the leadership style only, respondents indicated that this style bases on a market culture. Leadership was linked with resolution and pressure for obtainment of results, including keeping the best possible punctuality of performed individual duties. Workers indicated that the management style has its roots in a hierarchic culture. Individual bases on a job safety and work relations constancy. Organizational cohesion is ensured by formal principles and implemented rules. Pressure is also exerted on durability of the taken rules and least possible number of changes. Activity efficiency is obtained by strictly hierarchic dependences.
3. Preferred organizational culture would be the clan culture. Respondents indicated that they would like the organization to be a place that reminds a big family. Personal engagement into organization is a status in which they would willingly engage in their work. As for a leadership, respondents most frequently indicated a leadership type, which would directly devise or help. Most willingly they defined a leader that would

care about their workers. Leader, in its activities should introduce such a management style, which would characterize with accentuate team-work advantages and who would introduce a common agreement and cooperation of a whole society in frames of different internal systems helping self-organization. Court administration workers indicated that the organization cohesion is ensured by a loyalty and inter-personal confidence, which later may transfer into organizational confidence potential. Declared and realized in practice, engagement into organization issues is esteemed. As for organization success, respondents indicated most often that in the preferred status, they would like the human resource development to be meant as a success measure.

4. Workers would not like the organization to be managed by means of extended intra-worker rivalry. Formal requirement regime and obtainment of indicated purposes shouldn't be a paradigm in thinking about organizational culture. Moreover, respondents indicated that the organization cohesion in a least level should be ensured by means of intensive pressure to obtainment of results and aims. They wouldn't like the activity motives to be based on a verbalized, in any personal strategy, on a winning wish.
5. The carried research allows noticing of important shortages in shaping of intra-personal relations in the working place, which may result in conflicts between people in a future and consequently cause decreasing of task performance efficiency and petrification of a bureaucratic status quo oriented organizational climate.
6. In the preferred clan culture, introduction to a personnel management, creation of a series of additional trainings should be considered, e.g. in the range of team-work shaping, effective communication, time management or conflict solution methods.
7. It should be clearly indicated that it's necessary to create a better feed-back, better process shaping of information sending from performance grade to superiors and taking into account this information in a management staff decision-making process.

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DISTRIBUTED LEDGER TECHNOLOGY FOR SUPPLY CHAIN AND PUBLIC GOVERNANCE AS A RESPONSE FOR SUSTAINABILITY ISSUES

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Purpose: The purpose of this article is to systematize the problems faced by modern supply chains and problems observed in the field of public governance, as well as to indicate solutions to these problems based on the currently developing Distributed Ledger Technology.

Design/methodology/approach: The purpose of the article was achieved based on a thorough analysis of contemporary scientific articles and a number of industry reports, as well as websites of institutions involved in the development of DLT with particular emphasis on Blockchain technology. Moreover, two case studies on DLT implementation were presented.

Findings: A number of problems have been identified related to the sustainable development of supply chains and societies. They can be systematized by taking into account the concept of the triple bottom line. There are DLT solutions that emphasize sustainable development. Examples of such solutions are described in the article.

Research limitations/implications: (if applicable) If research is reported on in the paper, this section must be completed and should include suggestions for future research and any identified limitations in the research process.

Practical implications: The use of DLT-based systems in supply chain management and in public management solves specific problems. The article shows how the architecture of DLT systems contributes to the increase in the transparency of the supply chain or public service. Moreover, the article indicates that the implementation of blockchain solutions contributes to increasing the trust in the supply chain management and public governance.

Social implications: Described examples of DLT application show a number of benefits for society in terms of pro-ecological behavior, as well as in terms of security of data flowing through the public services system, which is often the subject of public concern.

Originality/value: The originality of the article is to emphasize the importance of DLT for shaping sustainable development and to present the described technology as a way to reduce the negative impact of problems identified in the area of both supply chain management and public governance.

Keywords: Distributed Ledger Technology, blockchain, sustainability, supply chain management, public governance.

Category of the paper: Research paper.

1. Introduction

The modern world increasingly recognizes the importance of information flows for the functioning of logistics systems. Therefore, it seems reasonable to look for the possibility of their optimization (Hacker, 2007). Both the area of supply chain management (SCM) and public governance are subject to the process of continuous strengthening of their effectiveness (Prayogo, 2018). For today's logistics, the efficiency of material flows is largely dependent on the quality of information flow (Rajaguru, Matanda, 2013) and inter-organizational information systems are a key solution for shaping relationships in supply chains (Pereira, 2009). The process of continuous development of information technology suggests a necessity for conduction of analyses concerning the possibility of implementing the newest technological solutions in the context of information flow management supporting material and financial flows. Undoubtedly, possibilities of streamlining these flows fit into the scope of logistic interest (Nowakowska-Grunt, Nowakowska, 2012). One of the technologies, that can be used in the SCM and public governance, is Distributed Ledger Technology (Queiroz, Fosso Wamba, 2019). As it is increasingly considered a next-generation information tool, it is argued that the use of Distributed Ledger Technologies (DLT) in SCM and public governance can affect the efficiency and growth of partnerships, thus affecting its performance (Kim, Shin, 2019).

In the area of SCM and public governance, DLT applications can contribute to the elimination or reduction of a number of problems and difficulties. This article aims to identify these problems based on the analysis of contemporary scientific sources and industry reports. The identified issues were presented in the form of three problem areas corresponding to the triple bottom line concept regarding the sustainable development of supply chains and public governance. Solutions using DLT are presented as a solution to the identified problems. The second part of the article describes the potential of DLT application in the area of pro-ecological activities, presents a selected solution aimed at improving the functioning of information flow in the food industry, and describes the possibilities of using DLT in the area of public governance, based on the example of Estonia – a country that is a pioneer in the use of Blockchain technology for public services. Therefore, the potential of using DLT was emphasized in the sustainability aspects.

2. Supply chain management and public governance problems in the context of sustainability

The issue of sustainable development firstly was noticed on the agenda of the World Commission for Environment and Development as early as 1987 (Imperatives, 1987).

At present, the literature presents many definitions of this term, which proves the considerable interest of researchers coming from various fields of science. From the point of view of economic sciences, sustainable development means, following Robert Solow – the 1987 Nobel laureate of the economy, the ability for future generations to live on a similar level to today's (Solow, 1991). In this context, one can recall the United Nations (UN) definition that defines sustainability through the prism of three main domains. Currently, ensuring the sustainable development of supply chains is considered in three basic dimensions: economic sustainability, social sustainability and environmental sustainability, which – for many years – have been referred to as the Triple Bottom Line (Elkington, 1998). Achieving sustainable development in all three dimensions requires collective commitment on the part of both public sector institutions and private business. The issue of aligning its operations with the UN's broad-based Sustainable Development Goals is beginning to be seen as a key one.

Among the main problems of modern supply chains regarding the aspect of economic sustainability, the following can be distinguished: insurance claim (Klibi, Martel, 2010), supply chain procurement contracts (Ghosh, Shah, 2015), high overseas financial transaction fees (Niepmann, Schmidt-Eisenlohr, 2017), loss due to discrepancy in information sharing among the supply chain stakeholders in real-time (Dubey, 2020) and cost of monitoring sustainability (Kshetri, 2018). Efforts in the field of environmental sustainability are therefore directed at limiting the negative impact on the environment, treated as a side effect of the conducted business activity. Organizations put their efforts in the context of energy efficiency, the amount of generated waste and the broadly understood emissions from economic activity (Saber et al., 2019; Sarkis, 2003). The main goal of environmental sustainability is to ensure intergenerational equality in the possibility of natural resources usage. In SCM, the main problems in this context appear in the nature-economy (transformation of natural resources into materials for production) and economy-nature (utilization of economy by-products) connection. In the first of these cases, every effort should be made to constantly reduce the use of natural resources, while in the second to limit the emission of substances harmful to the environment. To sum up problems of the last aspect of triple bottom line – environmental sustainability – they are related to such issues as: supply chain wastage, pollution issues, footprint, illegally traded animal parts or plants (Giannakis, Papadopoulos, 2016). In the area of social sustainability, the impact of business on the lives of employees, customers and local communities living near the organizations should be taken into account. This element of the triple bottom line conception is relatively rarely studied in management sciences (Venkatesh et al., 2020). However, the topic of socially responsible behavior when purchasing resources is sometimes raised. A clear example here is the supply chain of diamonds coming often from the war zone, which is sometimes referred to as “the blood diamond problem”. The emphasis is put on the ethical aspect of diamonds supply chain, which is frequently connected with forcing children to work (Epstein, Yuthas, 2011). Summing up this area, problems related to the aspect of social sustainability are: child labor, employee wages, sourcing from local communities and

public health, or food traceability. It is anticipated that the use of DLT may contribute to solving the above problems, thanks to the use of smart contracts, ensuring transparency of information flow, invariability of records in databases, easy access to data by stakeholders and broadly understood traceability (Chandan, Potdar, Rosano, 2019).

Contemporary SCM and public governance issues

A modern supply chains are characterized by a huge spectrum of information flowing through this system and a huge amount of documentation produced within it (EPRS, 2020). The majority of it is created and processed at individual stages of the flow within the supply chain – manually (Skiba, 2020). The use of DLT could significantly automate these processes, while also maintaining a high level of security for their implementation (Szewczyk, 2019). Storing data on transactions between the links of the supply chain in a dedicated, private blockchain would provide full transparency of activities performed within the supply chain for its participants. The actors in a given supply chain would, thus, gain access to transaction data and the stage of its execution in real time. The above-outlined issues in the SCM seem to suggest the statement that it is possible to use the DLT for SCM in order to reduce the impact of identified problems on supply chains.

Among the applications of DLT in SCM, some sources indicate: recording the flow of resources through individual links in the supply chain; tracking orders, receipts, invoices, payments and any other official documents; tracking digital assets (such as warranties, certificates, copyrights, licenses, serial numbers, barcodes) in a standardized way and in parallel with physical assets; sharing information on the production process, delivery, maintenance and consumption of products between suppliers and sellers, introducing new opportunities for cooperation on complex assembly lines with the use of IoT (Litke, 2019). In relation to other studies (Hackius, Petersen, 2017), 4 areas of DLT application in logistics can be identified: document processing/reduction of paperwork; identification of counterfeit products; facilitating traceability; Internet of Things support.

Documents summarizing the research conducted by the European Parliament Research Service (EPRS, 2020) indicate, in turn, four key areas of blockchain applications in relation to logistics: digitalization of resource exchange within the supply chain; cargo security in maritime transport; enforcement of trademarks and property rights; providing additional traceability and transparency in trade.

Other current problems, faced by modern supply chains, are indicated on the basis of (UNECE, 2019) in Table 1.

Table 1
Modern issues of SCM

Problem	Explanation
Proving the origin of goods	Many transactions are made on the basis that the delivered goods are of the declared quality or origin. Buyers do not have a cost-effective way to verify the authenticity of supplier's claims. This increases the dependence on contracts with established players and creates natural entry barriers for new and smaller suppliers.
Customs delays	Customs and excise officials at each border rely on the provided information while making decisions. The ability of unscrupulous actors to alter or fabricate information increases the risk and distrust of the process. This risk and distrust then become delays, costs and uncertainties for all actors in the supply chain, who do not know whether they are good or bad players.
Poor transparency in supply chains	Some of the biggest inefficiencies in many supply chains are the time and effort required to gather accurate information on the location, condition and estimated time of arrival of goods in the supply chain.
Supply chain resilience	When a supply chain breaks, it is often very difficult to recreate it in order to understand the root cause of problems. Being able to prevent and intelligently respond to these incidents has a huge impact on the costs and performance of enterprises, even outside the supply chain.
Errors in payments processing	Sometimes, an audit may not identify all potential discrepancies in the financial flows of the involved links in the supply chain.
Data-driven scams	Audits can overlook the signs of fraud hidden in thousands of data files. Blockchain technology already enables today's supply chain players to reduce and more easily identify fraud attempts.
Dispute resolution	As with the supply chain resilience discussed above, disputes that arise due to time, quantity or quality could be more easily resolved, if reliable data on these (for example time and date of delivery) were recorded on the blockchain. In theory, some disputes could also be avoided by using a set of smart contracts that self-execute based on terms pre-agreed by all parties, thus reducing administrative costs and legal bills.
Information flow that ends at the point of sale	Under current supply chain arrangements, with the limited exception of warranty items, the supply chain ends at the final consignee. Contact with the product is lost and important information about its use is not recorded.

Source: own elaboration based on: The United Nations Centre for Trade Facilitation and Electronic Business. (2019). *White Paper Blockchain in Trade Facilitation*.

3. DLT technology as a solution for sustainability threats

The issues described above correspond to the problem areas suggested in the section on the triple bottom line concept. In this part of the article, the author focuses on describing a few selected DLT-based solutions used in both the private and public sectors. Solutions that focus on all three components of the triple bottom line concept were chosen to emphasize the wide range of DLT applications in the context of sustainable development.

Selected DLT solutions for environmental issues

In the area related to the environmental aspect, a number of solutions supporting waste management can be identified. The speed of waste generation in modern cities undoubtedly results from the increased pace of progressive urbanization, economic development and

population growth in the world (Kouhizadeh, Sarkis, 2018). Solutions based on DLT can be used in the following problem areas (Ahmad et al., 2021a):

- tracing and tracking of waste of smart cities,
- reliable channelization of waste,
- protection of waste management documentation,
- efficient waste resources management,
- penalties for non-compliance,
- transparency in waste collection and trucks route optimization,
- robots-assisted and reliable waste segregation,
- accountability of waste management operations.

Modern cities generate huge amounts of various types of waste. Such waste then goes to various links in the waste management system (landfills, recycling plants, etc.). Traceability systems can therefore be useful in verifying the authenticity of data and ethical practices related to waste management (Mingaleva et al., 2020). It is based on precise tracking of the current location and condition of waste at every stage of its flow. The centralized solutions used today are susceptible to modifications and changes due to deliberate or accidental database corruption (Ahmad et al., 2021a). Therefore, DLT has the potential to replace the systems used so far in the area of waste management. Blockchain can control the condition and location of waste by creating digital asset tokens to track specific waste. Such tokens allow for a record of transaction history regarding property rights to waste, thus helping authorities to reduce waste management costs (Laurent et al., 2018). The immutability of DLT-based databases allows for ongoing verification of compliance with the actual waste management guidelines, as well as effective tracking of the waste life cycle (Gopalakrishnan et al., 2021). By assuming unchanging records in a distributed database, blockchain can verify the compliance of waste by, for example, comparing the weight of received and shipped waste without the possibility of falsifying such information. In this regard, solutions based on the Ethereum platform can be used. It is an open source platform that allows waste management entities to send and receive micropayments as rewards for participating in Ether cryptocurrency activities through smart contracts. The system built with the use of the Ethereum network enables full transparency of the waste flowing through the supply chain for all its participants, moreover, it enables the construction of a system that promotes ecologically responsible actions.

Waste sewerage, on the other hand, consists in detailed tracking of individual groups of waste characterized by a different degree of harmfulness to the environment and that can be recycled. DLT can ensure that the waste from the products sold is successively collected in the waste management system. Knowing unadulterated data on the sale and use of products, the flow of waste generated from them can be tracked. Producers are able to collect waste through a retail network or dedicated waste collection points. Centralized solutions require maintaining trust towards entities responsible for the system. Blockchain makes it possible to overcome this

need for trust by using smart contracts. Consistent and transparent DLT solutions also offer the creation of a system of incentives to participate in an effective waste disposal system. The system participant is motivated by micropayments for the correct direction of the waste flow. The speed of settlements and the high level of security of distributed registers determine the potential of DLT application. Smart contracts are able to provide access to data and the possibility to participate in the waste management system to authorized participants. In addition, they provide authorities with the ability to monitor waste activities and take regulatory action. An example of this solution is taking a deposit amount from a customer when purchasing a product. This amount is automatically reimbursed (thanks to the smart contract included with the purchase) upon return of the waste at the end of the product life cycle (Poongodi et al., 2020). The use of smart contracts in this way creates an incentive for product users to produce less waste. In addition to the function of encouraging responsible waste management, this solution virtually eliminates the possibility of fraud related to this waste. Due to the security of data of system participants, it seems that private blockchain platforms should be used. For example, the Hyperledger Fabric platform offers such solutions. It directs waste thanks to the separation of the manufacturer and seller modules. Transactions between them are verified and approved by validating nodes on the basis of a consensus mechanism. The Hyperledger Fabric code snippets allow you to register new system participants, buy and sell waste, pass it on, make returns, and update the amount of waste remaining in the system.

The implementation of waste management policy in cities requires the safe recording of documents related to invoices, proofs of purchase and various types of contracts. This results in an increased need to care for their safety and protection against manipulation. Decentralization of DLT solutions helps to validate documents coming from organizations involved in the system by comparing document signatures in the public and private key architecture. Blockchain is therefore able to minimize the amount of frauds related to the counterfeiting of documents regarding waste trade (ADDALIA, 2021). This is another use of smart contracts that are executed automatically and their effects are irreversible. Documents accompanying the waste turnover can be encrypted and stored, for example, in the InterPlanetary File System (IPFS). The content of such documents is available to authorized users via the blockchain platform. All changes in them are recorded on an ongoing basis, and system participants can quickly verify their authenticity. The consensus protocols used make falsification of the documentation theoretically impossible. Thanks to the DLT mechanisms, it is possible to verify on an ongoing basis which entity is responsible for the creation or modification of a given document. Due to the General Data Protection Regulation in force, it is suggested to use private blockchains in this case as well. Their use ensures that only entities authorized to do so have access to the data enabling the verification of compliance of documents.

The use of IoT devices allows remote monitoring of the flow of objects thanks to a network of sensors collecting huge amounts of data. The analysis of these data allows managing the waste management system more effectively, developing plans and striving to reduce the emission of negative substances to the environment (Esmailian et al., 2018). With the help of IoT devices, the use of key resources of the waste management system (waste transport trucks, garbage cans, employees, landfills, etc.) can be optimized. The lack of transparency in the functioning of these resources leads to the ineffective functioning of the entire system. Thanks to the use of DLT, it is possible to register entities responsible for the operation of devices and track their activities by recording them in an unchanging database. RFID sensors can, for example, be used to track the currently used capacity of garbage containers, informing the entities responsible for collecting waste and substituting a new container about its approaching exhaustion. The sensor networks are also DLT authenticated, ensuring that no one can send incorrect data to the blockchain. Thanks to the data collected in the blockchain system, it is possible to estimate the frequency of the need to transfer waste to the next link in the waste chain. Thanks to this, it is also possible to estimate the amount of waste flowing through the system and calculate the costs of its flows. It also creates a useful database for creating a network of entities responsible for waste treatment, taking into account the proximity of their location to the place where the waste is generated. Data from IoT sensors and recorded in distributed registers can also be used to optimize the allocation of waste storage devices, taking into account carefully researched needs in terms of the type and amount of collected waste.

Pursuant to the applicable documents, entities generating waste are obliged to segregate and store waste in appropriate containers and deliver it to the indicated places for further waste management. All types of waste, both municipal and industrial, must be stored in separate containers. Therefore, it is common to impose various types of penalties and fines for any non-compliance with the practices indicated in the legal acts. Decentralized blockchain architecture with the possibility of approving transactions with a precise indication of the time of their conclusion is a solution ensuring compliance of the activities of waste management authorities with applicable law. Moreover, it enables the automation of the process of imposing contractual penalties in the event of irregularities being detected (Ahmad et al., 2021b). The architecture of the smart contract used here should take into account the roles of its individual users. It is of particular importance to grant appropriate powers to the bodies responsible for imposing penalties, preventing them from being charged by unauthorized bodies. The penalty calculation functionality validates the data collected in a distributed database and imposes appropriate penalties on the authorities carrying out illegal activities.

Selected blockchain solutions for economic issues

In the area of SCM, there are many solutions based on DLT that are in the pilot phase or already operating solutions. Many of them are created thanks to the actions of the IT industry tycoons. The first solution described in this fragment of the article is a solution offered by IBM

to increase data transparency in the food supply chain. The increasing availability of food products for consumers nowadays leads to an increase in the complexity of supply chains. With this growth, there is a growing need to build trust among participants in this supply chain. The IBM Food Trust solution builds trust through the use of DLT, building transparency in the food supply chain. This solution provides authorized participants with access to data on the flow of food from the place of its production to the point of sale. Complete flow history with an indication of the time the food remained at specific locations, test data, storage temperature data or food accompanying certificates are available to users in seconds. The IBM Food Trust architecture enables a number of goals to be achieved in relation to the food supply chain (IBM, 2021):

- effectiveness of the supply chain – identification of ineffective processes, demand forecasting,
- brand building – increased transparency allows you to build the brand of food producers, wholesalers and retailers based on a transparent history of their activities on the market,
- ensuring the quality of the food offered – unprecedented insight into data on the food flow through individual links in the supply chain, including data from IoT sensors providing information about product parameters at individual stages of the flow,
- ensuring food safety – detection of deviations in food parameters in terms of its safety in real time, detection of cross-contamination and contact with substances hazardous to food, reduction of food-borne diseases (enabling the withdrawal of contaminated batches from the market),
- limitation of fraud – full transparency thanks to digitization of transaction records, storing them in a decentralized and unchanging manner, easy detection of attempts to modify food flow history records,
- waste reduction – optimization of the waste collection system, transparent data on waste turnover,
- ensuring the authenticity of origin – digitization of certificates and documents proving the origin and authenticity of food.

The solution described in this part of the article uses the previously mentioned Hyperledger Fabric open source architecture and integrates a number of solutions dedicated to the food industry. The simplified architecture of the IBM Food Trust is presented in Figure 1. The method of collecting and processing data in a distributed database is schematically illustrated in Figure 1.

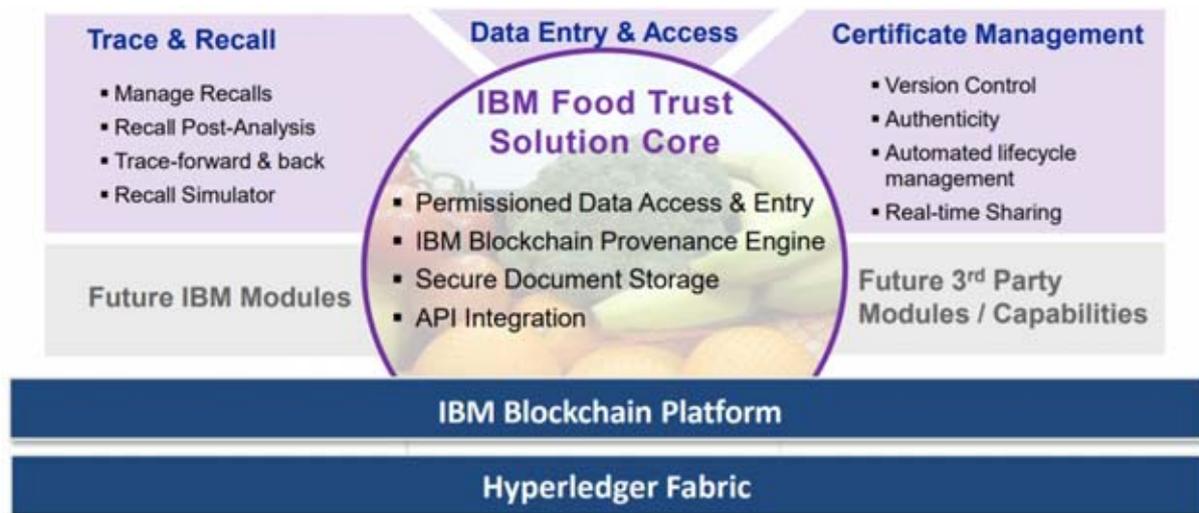


Figure 1. The simplified architecture of the IBM Food Trust. Adapted from: <https://www.ecireland.ie/uploadedfiles/leaders-congress/leaders-congress-2018/10.00-Michael-McMahon-IBM.pdf>, 30.12.2021.

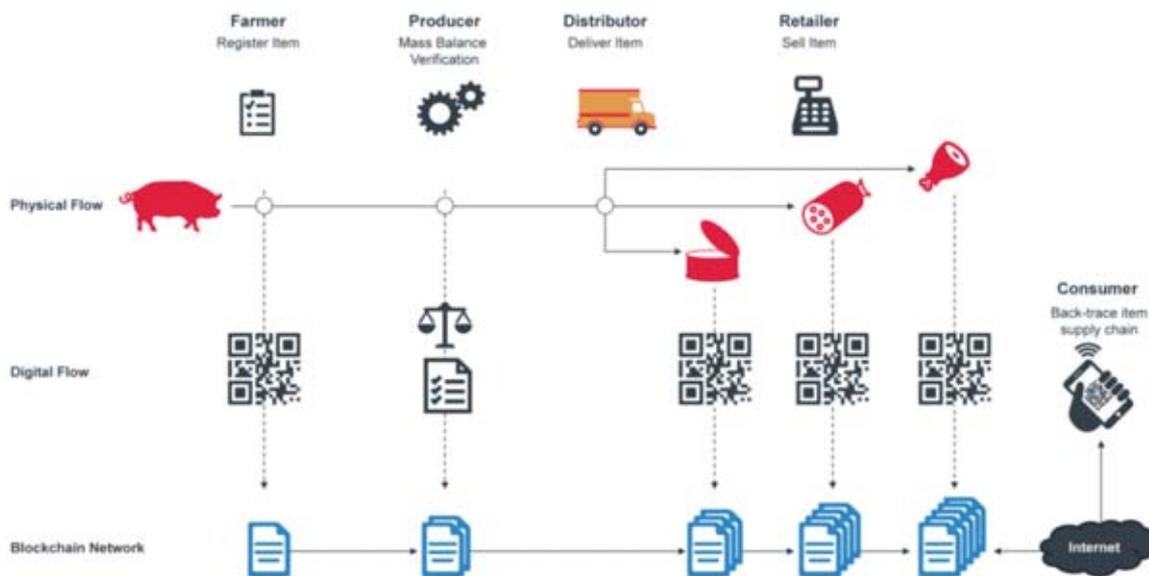


Figure 2. Physical and digital flow for IBM Food Trust blockchain network. Adapted from: <https://www.innovativeleaders.world/insights/item/32-nestle-bets-on-blockchain-for-food-traceability.html>, 30.12.2021.

Figure 1 suggests that the current architecture is open to the appearance of additional modules that can supplement the described solution with new functionalities. These solutions can be added both by IBM and by external organizations and validated in accordance with the consensus mechanisms resulting from the use of DLT. Figure 2 shows, however, that at each stage of the physical flow of goods through the food supply chain, there is a digitized flow of information that is stored in a distributed database in the form of non-modifiable records. The final recipient of food (consumer) has access to the history of data on the physical flow of the product, gaining full information transparency.

IBM Food Trust provide value for lot of food supply chain members. The value provided for particular food supply chain node is presented in Table 2.

Table 2

The value provided for food supply chain's nodes

Food supply chain node	Value added by IBM Food Trust
Growers	-Proving the farm is not a source of outbreak, -connectivity to the supply chain
Food manufacturers	-Instill trust between retails, suppliers and customers -Automated and reduced manual certificate management
Distributors	-Conduct targeted recalls -Enable internal data sharing
Logistic companies	-Enhanced ability to meet compliance standards -Manual processes reduction
Retailers	-Assure customers food supplied is safe -Conduct targeted recalls quickly
Consumers	-Learn about recalls and increased transparency -Reduce risk of being victimized by food fraud
Certification bodies	-Reduce fraudulent certificates -Increase renewal speed
Food services (HORECA)	-Assure customers food supplied is safe -Reduce wasted food
Regulators	-Identify contamination quickly -Reduce unnecessary testing

Selected blockchain solutions for public governance

The last group of DLT-based solutions that refer to the problems related to the tripple bottom line concept are those related to the social sphere. A case study that emphasizes the largest number of aspects is the example of Estonia as a country that has made a large adoption of blockchain-based solutions. Estonia is a country that started building digital solutions for society in the form of e-governance system in 1997. According to the PwC report, as of today, 99% of public services can be performed fully digitally (PwC, 2021). For example, it takes less than 5 minutes for an Estonian citizen to file a tax return, elections are online and all patients have electronic medical records. It is possible to set up a business completely online and tons of documents are signed electronically. Report shows that Estonia saves 2% of GDP annually thanks to the implementation of electronic solutions in the field of public services. The cornerstone of Estonia's digital society is X-Road. It is a technological and organizational environment that enables secure data exchange on the Internet between various IT systems. X-Road is therefore an interoperable ecosystem combining the functionalities of separate IT systems. This ecosystem is also currently implemented in Finland, Azerbaijan, Namibia and the Faroe Islands, and one of its functionalities is also the automatic connection of systems of individual countries. Such a connection is established between Estonia and Finland. The PwC report indicates that Estonian X-Road currently connects over 1,300 IT systems and offers over 2,700 services. X-Road's architecture is fully decentralized and multi-lateral, which allows any member of X-Road to access data related to other services provided through X-Road. The security of data flowing through the X-Road ecosystem is ensured by blockchain technology, and the logic of its operation is presented in Figure 3.

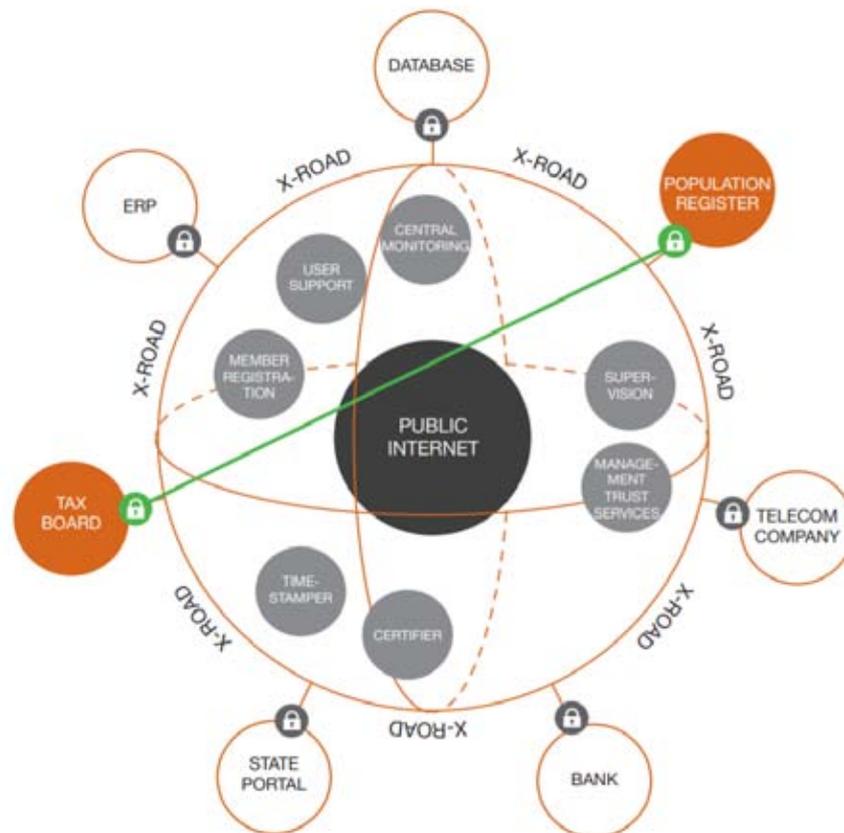


Figure 3. The X-Road ecosystem structure. Adapted from: <https://www.pwc.com/gx/en/services/legal/tech/assets/estonia-the-digital-republic-secured-by-blockchain.pdf>, 30.12.2021.

To ensure the security of such a wide-ranging decentralized ecosystem, Estonia was the first country in the world to start using blockchain solutions. In 2012, the first service embedded in DLT was the inheritance register kept by the Estonian Ministry of Justice. The technology used in this case is Keyless Signature Infrastructure (KSI). This solution is also used by NATO and the US Department of Defense and ensures that the data never leaves the KSI system, only the hash (a function that meets the encrypted demands needed to solve for a blockchain computation) is sent to the blockchain-based service. For this reason, the system is widely scalable and can ensure immutability of huge amounts of data. Among the national registers whose security is maintained by means of blockchain, the following can be indicated: Healthcare Registry, Property Registry, Business Registry, Succession Registry, Digital Court System, State Gazette. The logic of the blockchain-based solution is shown in Figure 4.

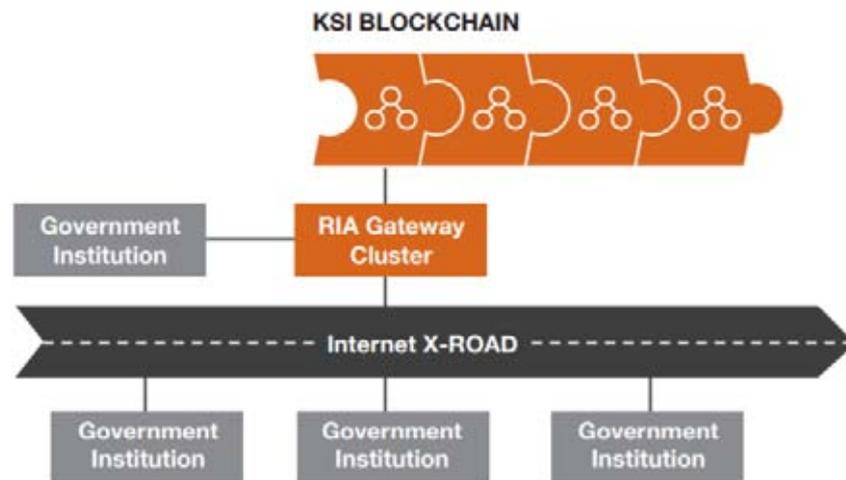


Figure 4. KSI Blockchain solution for Estonian X-Road ecosystem. Adapted from: <https://www.pwc.com/gx/en/services/legal/tech/assets/estonia-the-digital-republic-secured-by-blockchain.pdf>, 30.12.2021.

The data collected across the entire X-Road ecosystem by connecting a number of government institutions is processed using the RIA Gateway Cluster. Then the data from the databases is validated with a digital signature, and the encrypted information in the form of a hash is placed in the KSI Blockchain. Thanks to this, the confidentiality of the data is maintained (because full information never leaves the system in which it was created), and the blockchain stores information about the entity validating the correctness of the data and the time of its approval. Thanks to this, the information placed in the system integrated with the use of a blockchain cannot be modified retrospectively, while its confidentiality is maintained thanks to the use of hashing functions that are the foundation of DLT. The logic of the system can be explained in more detail by showing an example of the data flow coming from the system of an exemplary public governance area. The judiciary is such an example. Figure 5 shows how data is moved to the KSI Blockchain. Data on individual court cases is collected in an internal court system connected to the KSI Blockchain. Using the hash functions and electronic signature, only information about the document signatures of individual cases, the time of their closing and entities validating the transmission of data to the blockchain are sent to the blockchain. Detailed data on cases, legal acts remain stored in the internal system, while blockchain ensures their integrity and immutability.

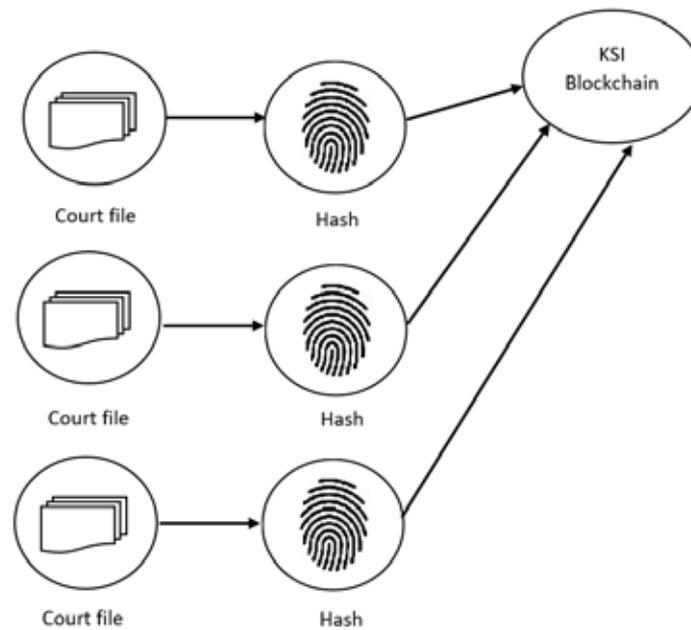


Figure 5. KSI Blockchain solution for Estonian X-Road ecosystem. Adapted from: https://riigipilveinfopaev18.publicon.ee/userfiles/RIA/kevad2018/riigipilv2018/7.2_Riigipilve_infop%C3%A4ev_GT.PDF, 30.12.2021.

4. Conclusion

Solutions based on DLT using Blockchain already streamline a number of processes in the SCM and public governance. However, they are at an early stage of development and show great potential for the future. This article has sorted out the problems of contemporary supply chains and public governance taking into account the aspects of sustainability. The author described the potential of DLT in solving these issues. The constantly appearing new DLT applications indicate the need to constantly analyze areas of their application. The future research work of the author of this article will focus on subsequent implementations of DLT solutions in the field of broadly understood logistics. The author is firmly convinced that Blockchain solutions have many challenges ahead of them, overcoming which they can be widely used. Considering the Estonian example described, there is a good chance that DLT will be used by mass users in other countries in the near future. Examples of pro-environmental applications are an interesting area of research for researchers in this field, and solutions improving the transparency of the flow of goods through the supply chain should contribute to increasing the awareness of its participants and reducing the possibility of data-based frauds.

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THE USE OF THE EUROPEAN UNION FUNDS FOR THE DEVELOPMENT OF AGRICULTURAL FARMS IN POMORSKIE PROVINCE OF POLAND

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Purpose: The aim of the article is to analyse data on the use of European Union funds for the development of agricultural farms in Pomorskie Province of Poland (*a.k.a. Pomerania*).

Design/methodology/approach: The paper uses a description and analysis of the available source data obtained from the Management Information System of the Agency for Restructuring and Modernisation of Agriculture (ARiMR), regarding the use of funds from the Rural Development Programme for the development of Pomeranian farms.

Findings: The research found that the European Union funds contribute to the development of farms in Pomorskie Province. Farmers gladly use the Rural Development Programme. Under Measure 4.1.1, over 66.0% of the submitted applications were accepted, which ranks Pomorskie Province first in relation to other provinces in the country. Under Measure 4.1.2, farmers from Pomorskie Province used nearly 60% of the available limit. Pomorskie is in the 4th place in this respect, with the result of 55.2%. Under Measure 4.1.3, Pomorskie Province was close to the national average with 42.2% of accepted applications. In terms of the number of beneficiaries to whom aid was paid out, Pomorskie Province ranks 12th among all provinces. Under Measure 6.1 in Pomorskie Province, 726 farmers were granted aid, and 64.1% of the submitted applications were approved. Under Measure 6.3 in Pomorskie Province, more than half of the submitted applications were approved and received funding in the amount of PLN 20,364,000.

Research limitations/implications: The main limitation in conducting research is the dearth of up-to-date data on EU funds for the development of farms in Pomorskie Province.

Practical implications: Further research will focus on obtaining information on funds that will not only arrive from the European Union, which are necessary to take influencing actions for the development of agricultural farms.

Social implications: The development of agricultural farms will contribute to the improvement of the environmental and living conditions of farmers and livestock.

Originality/value: The conducted analysis showed that there is a need to obtain information on funds for supporting the development of farms.

Keywords: agricultural farms, European Union Funds, Pomorskie Province, Pomerania.

Category of the paper: research paper.

1. Introduction

The Common Agricultural Policy is based on two pillars. The first one is made up of two elements: common organization of agricultural markets and a system of direct payments. The second pillar supports restructuring and investments in farms, and also promotes sustainable management methods, diversification and activation of rural areas (Żmija, 2016). Investments are a factor of development and structural changes in agriculture. Their goal is predominantly to increase the value of the farm, to improve the quality of production and the economic situation of farmers and their families, and, in the short term, to increase revenues (Lorencowicz, Cupiał, 2013). Direct payments are the basic instrument to support farmers (Krzyżanowski, 2015) and are designed to directly increase income. They are proportional to the size of farms, as this kind of connection affects the market to a lesser extent than the subsidies proportional to production capacity (Babuchowska, Marks-Bielska, 2011). In 2013 Poland saw a transfer of funds from the second pillar in favour of direct payments, whose budget after the transfer amounted to EUR 23.49 billion, which enabled the introduction of an additional payment for farms between 1 and 30 hectares in size. (Król, 2015) – the so-called *Additional (Redistributive) Payment*. An important issue of the Common Agricultural Policy after 2014 is also the issue of the environment. As a rule, as much as 30% of the funds received by a farmer depend on meeting the requirements for the diversification of crops and the maintenance of ecological focus areas, e.g. fallow land, catch crops, nitrogen-fixing crops, buffer zones or mid-field forest stands (Czyżewski, Stępień 2014).

The issues of using EU funds for the development of agricultural farms are also discussed by, inter alia, Grzelak and Kielbasa (2014) and Parzonko and Hornowski (2017) in their various works.

2. Methodology and organization of research

The aim of the article is to analyse the data on the use of the European Union funds for the development of farms in Pomorskie Province. The method of description and analysis was employed in this paper. The research material consisted of data obtained from the Central Statistical Office and the Management Information System of the Agency for Restructuring and Modernization of Agriculture on the use of funds from the Rural Development Programme (RDP) in the scope of measures carried out by the ARiMR as of December 31, 2020. Data was analysed on the number of submitted applications for granting aid, the requested amount of aid, the number of concluded aid contracts, the amounts stated in those contracts and the amounts of concluded payments, relating to the following measures:

- 4.1.1. Modernization of farms in the *Natura 2000* areas.
- 4.1.2. Investments aimed at protecting waters against pollution with nitrates from agricultural sources.
- 4.1.3 Modernization of farms – collectively for areas a, b, c, d, e.
- 6.1 Bonuses for young farmers.
- 6.3 Restructuring of small farms.

The obtained data are presented in tables. The collected material was analysed and described in detail.

3. Financing the development and investments in farms

Investments and the development of farms require significant financial outlays. Farms have the possibility to finance part of their investment costs with the help of European Union funds. Within the framework of the Rural Development Programme, which was approved by the European Commission on December 12, 2014, 14 groups of measures can be distinguished:

1. Knowledge transfer and information activity.
2. Advisory services, farm management and farm relief services.
3. Quality systems for agricultural products and foodstuffs.
4. Investments in fixed assets.
5. Restoring agricultural production potential damaged by natural disasters and catastrophes and introducing appropriate preventive actions.
6. Farm and business activity development.
7. Basic services and village renewal in rural areas.
8. Forestation and creation of forest land.
9. Creation of producer groups and organizations.
10. Agricultural-environmental and climate measures.
11. Organic farming.
12. Payments for areas with natural or other specific constraints (LFA).
13. Collaboration.
14. LEADER (MARD, 2015).

The main sub-measures which enable the financing of the development and investments in an individual farm are sub-measures under Measures 4 and 6:

1. Measure 4 – Investments In Fixed Assets:
 - Sub-measure 4.1.1 – Investments in farms located in *Natura 2000* areas,
 - Sub-measure 4.1.2 – Investments in farms located in particularly vulnerable areas,
 - Sub-measure 4.1.3 – Modernization of agricultural farms.

2. Measure 6 – Farm and business activity development:

- Sub-measure 6.1 - Business start-up aid for young farmers,
- Sub-measure 6.3 - Business start-up aid for the development of small farms.

Investments in farms located in *Natura 2000* areas is an activity that supports investments in grassland cultivation and livestock production on farms that operate in accordance with environmental protection requirements in *Natura 2000* areas. The basic requirement to gain access to the programme is a farm of at least 1 hectare of grassland located in *Natura 2000* areas. In addition, the investment must contribute to the maintenance and use of permanent grassland, will not adversely affect the protection objectives of the area, is not inconsistent with the obligatory protective measures that have been specified for the area where the farm is located and must meet the requirements of other legal provisions (e.g. Construction Law, etc.) (Rozporządzenie Ministra Rolnictwa, 2017). The aid that can be obtained is PLN 200,000 in the case of non-construction investments and PLN 500,000 if the investment is directly related to the construction, reconstruction or renovation of livestock buildings and other buildings used for agricultural production (Linkiewicz et al., 2014).

The use of support as part of investments in farms located in areas particularly vulnerable to nitrate pollution from agricultural sources enables financing the construction of manure plates, slurry tanks and the purchase of septic tanks. The programme is aimed at farmers who own livestock and allows them to adapt their farms to the requirements, which were set out in the action programme aimed at reducing water nitrate pollution from agricultural sources and preventing further pollution. As the programme became effective throughout the country on 5th June 2018, all livestock breeding businesses must adapt the surface of the plates and the capacity of the natural fertilizer tanks (Nabór wniosków..., 2021). A deadline has also been set for the adaptation for farms that do not have adequate infrastructure. In the case of larger farms – above 210 large units of conversion (LU), this deadline is December 31st, 2021. Smaller farms, however, have their deadline on December 31st, 2024 (Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi, 2020). Therefore, support under this sub-measure may be granted for the construction, reconstruction and renovation of manure plates, slurry and liquid manure tanks as well as in the event that a farmer applies, who meets the requirements of the "Young Farmer" programme for the construction, reconstruction and renovation of slabs for storing silage. The maximum grant rate is 50% of the eligible costs or 60% for young farmers. The amount that can be received is PLN 100,000 (Olender, 2020). After the investment is completed, the beneficiary should have a place for storing solid natural fertilizers for a period of at least 5 months and tanks that will enable storing liquid manure or slurry for a period of at least 6 months (Warunki przechowywania..., 2020).

Modernisation of agricultural farms is a sub-measure for which the largest funds have been allocated under the Rural Development Programme (MRiRW, 2015). It was initially divided into 4 areas: area "a" related to the development of piglet production, area "b" related to the production of cow's milk, area "c" related to the production of beef cattle, area "d" related to the rationalisation of production technology, increasing the production capacity, improving production quality, introducing innovation, changing the production profile or increasing the added value of a product (Linkiewicz et al., 2014). In November 2018, however, the RDP Monitoring Committee adopted changes to the Rural Development Programme, which made it possible to introduce a new area (Pokora-Kalinowska, 2019). On August 22nd, 2019, the ordinance of the Minister of Agriculture and Rural Development was published, which introduced area "e" – on irrigation of farms. The amount of support depends on the area in which the application was submitted. The highest limit was set for investments related to the development of piglet production and amounts to PLN 900,000 per farm. On the other hand, in the "b" – "d" areas, the limit is PLN 200 thousand or PLN 500 thousand, if the investment is directly related to the construction or reconstruction of livestock buildings. The limits of the above areas cannot be combined (Pokora-Kalinowska, 2020). A separate limit is in force in the area of farm irrigation and amounts to PLN 100,000 (Poddziałanie 4.1.3. Modernizacja..., 2020). The co-financing is available to farmers who run a farm with an area of at least 1 hectare and an economic size of at least EUR 13,000 or, if beneficiaries apply for aid under the joint use of machines within area "d", the sum of the economic sizes of the applying farms is EUR 15,000. However, the beneficiaries undertake to obtain the economic size at the level of EUR 13,000 for each of the beneficiaries, in the year in which they submit the final payment application (Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi, 2015). Aid under "a" – "d" areas may be allocated to the construction, conversion and renovation of buildings used for agricultural production and preparation for sale of agricultural products, purchase of machinery, establishment of orchards, creation of pastures and animal enclosures, purchase and installation of renewable energy sources equipment, and purchase of computers and farm management software. The costs of preparing documentation such as: cost estimates, reports, projects may also be financed, but they cannot constitute more than 10% of all eligible costs (ARiMR, 2020).

Individuals who start running a farm can take advantage of the Young Farmers Bonus, under which they can receive PLN 150,000 (prior to 2019 it was PLN 100,000). The main requirement is the time that has elapsed since the commencement of agricultural activity, which cannot be longer than 24 months. An important criterion is agricultural education, as each programme beneficiary, who does not have such education, undertakes to complete it within three years of receiving an approval. The aid is disbursed in two instalments, the first of which amounts to PLN 120,000 and is paid upon the applicant's request, which must be submitted no later than 9 months from the date of granting the aid. The second instalment of PLN 30,000 is also paid upon the farmer's request. The application for the second instalment of the bonus is to be submitted upon the completion of the objectives contained in the business

plan which was attached to the aid application. Under this programme, both the purchase of machinery and equipment, renovation and construction of buildings as well as the purchase of land can be financed (ARiMR, 2021). The area of the established farm must be at least equal to the average farm area in the country, and if the average is lower in the province where the applicant will be running their business, the average for that province is binding. Moreover, at least 70% of this area must be own land or land leased from the Property Resources of the State Treasury or Local Government Units. This area also includes land used on the basis of perpetual usufruct (Świerk, 2015).

Small farms can count on support from the Rural Development Programme through the Sub-measure Restructuring of Small Farms. As part of this measure, it is possible to obtain PLN 60,000 of a non-returnable bonus for the restructuring of a farm whose economic size does not exceed EUR 13,000. According to the adopted rules, the farm must be run for profit, which means that the income or revenue from agricultural sources must constitute at least 25% of all income/revenues. The rules for paying out the aid are similar to those for the Young Farmer Bonus. The application for the payment of the first installment should be submitted no later than 6 months from the approval. In the first tranche, 80% of the total amount of aid, i.e. PLN 48,000 is paid. The second installment in the amount of PLN 12 thousand (20% of the total amount) is paid upon request after the upon the completion of the objectives contained in the business plan. The aid can be used both for the purchase of fixed and current assets, but the cost of purchasing current assets may not exceed 20% of the bonus received.

4. Financing the development of agricultural farms in Pomorskie Province compared to other regions of the country in the light of ARiMR data

As part of the Sub-measure 4.1.1. Support for investments in agricultural farms located in *Natura 2000* areas, the Agency for Restructuring and Modernization of Agriculture (ARiMR) conducted 3 calls for applications. In total, 305 applications for aid were submitted in Pomorskie Province. This constitutes 7.6 percent of the total number of applications submitted under this sub-measure throughout Poland. Beneficiaries who submitted applications in Pomorskie Province applied for PLN 165,668.3 on average for investment co-financing (Table 1). Considering the limits that apply to this measure – PLN 200,000 of aid in the case of investments not directly related to livestock buildings and PLN 500,000 when the investment includes renovation, reconstruction or construction of livestock buildings, most farmers did not apply for the full amount of aid.

Table 1.

Number of applications and the requested amount of aid under sub-measure 4.1.1. Investments in farms located in Natura 2000 areas

Province	Number of applications	Requested amount of aid [PLN]	Average requested amount per 1 beneficiary [PLN]
Podlaskie	970	171,379,836.0	176,680.2
Mazowieckie	481	78,440,703.4	163,078.4
Wielkopolskie	458	76,421,574.3	166,859.3
Warmińsko-mazurskie	357	65,085,351.7	182,311.9
Pomorskie	305	50,534,919.3	165,688.3
Lubuskie	255	47,396,724.7	185,869.5
Zachodniopomorskie	243	44,760,828.5	184,200.9
Łódzkie	182	28,414,243.4	156,122.2
Kujawsko-pomorskie	181	25,758,849.7	142,314.1
Lubelskie	168	32,915,908.5	195,928.0
Dolnośląskie	136	23,431,272.5	172,288.8
Podkarpackie	117	15,836,695.8	135,356.4
Świętokrzyskie	70	11,914,450.8	170,206.4
Małopolskie	56	6,376,336.8	113,863.2
Śląskie	30	6,795,319.0	226,510.6
Opolskie	10	1,635,949.0	163,594.9
Poland	4,019	687,098,963.4	170,962.7

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

Table 2.

Number of concluded aid contracts and the percentage of applications approved under sub-measure 4.1.1.

Province	Number of concluded contracts which grant aid	Percentage of applications resulting in contract conclusion [%]	Amount of concluded contracts which grant aid [PLN]	Average aid granted under contract per 1 beneficiary [PLN]
Podlaskie	631	65.0	103,092,228.4	163,379.1
Mazowieckie	258	53.6	39,066,910.0	151,422.1
Wielkopolskie	230	50.2	31,789,725.2	138,216.2
Warmińsko-mazurskie	209	58.5	31,478,978.3	150,617.1
Pomorskie	204	66.8	30,337,087.5	148,711.2
Lubuskie	156	61.1	25,186,024.9	161,448.9
Kujawsko-pomorskie	122	56.3	16,052,821.9	131,580.5
Zachodniopomorskie	112	50.2	16,395,424.2	146,387.7
Łódzkie	102	61.5	12,851,227.0	125,992.4
Dolnośląskie	63	43.3	9,660,091.0	153,334.8
Lubelskie	59	37.5	9,069,810.0	153,725.6
Podkarpackie	59	50.4	6,344,449.0	107,533.0
Małopolskie	40	55.3	3,717,780.5	92,944.5
Świętokrzyskie	31	57.1	4,807,290.5	155,073.9
Śląskie	7	23.3	1,639,742.5	234,248.9
Opolskie	2	20.0	219,550.0	109,775.0
Polska	2,285	56.8	341,709,140.9	149,544.5

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

As a result of the verification of applications for aid, 204 contracts for granting aid were concluded for the total amount of PLN 30,337,087.5, which constitutes 8.9% of the total amount for which contracts were concluded throughout Poland. The average aid granted under the contract for one beneficiary in Pomorskie Province amounted to PLN 148,711.2, and over 66.0% of the submitted applications were approved, which puts Pomorskie Province in the first place compared to other provinces in the country (Table 2).

By the end of 2020, 134 beneficiaries received aid in the amount of PLN 18,328,078.70 in the province in question. The average amount of aid paid out was close to the average amount paid per 1 beneficiary in Poland as a whole (Table 3).

Table 3.

Number of beneficiaries and amount of payments made under sub-measure 4.1.1. Investments in farms located in Natura 2000 areas

Province	Number of beneficiaries	Amount of payments effected [PLN]	Average per 1 beneficiary [PLN]
Podlaskie	472	73,563,730.3	155,855.4
Mazowieckie	169	22,138,384.8	130,996.4
Wielkopolskie	152	19,454,354.8	127,989.2
Warmińsko-mazurskie	137	16,922,296.8	123,520.4
Pomorskie	134	18,328,078.7	136,776.7
Lubuskie	101	13,537,641.3	134,036.1
Kujawsko-pomorskie	83	9,711,616.9	117,007.4
Łódzkie	71	8,298,810.0	116,884.6
Zachodniopomorskie	58	7,676,239.3	132,349.0
Lubelskie	47	6,441,013.5	137,042.8
Podkarpackie	42	3,627,786.0	86,375.9
Dolnośląskie	36	5,256,931.0	146,025.9
Małopolskie	23	2,052,556.5	89,241.6
Świętokrzyskie	18	2,847,910.0	158,217.2
Śląskie	5	1,243,925.0	248,785.0
Opolskie	2	204,550.0	102,275.0
Poland	1,550	211,305,824.9	136,326.3

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

The data in Table 3 show that farmers in Pomorskie Province willingly use the RDP Measure, which is Support for Investments in Farms Located in *Natura 2000* Areas. This is an opportunity for farms that use permanent grassland in a designated area to modernize their machine park, and thus properly take care of environmentally valuable areas.

Another measure that enables partial financing of investments on a farm is Measure 4.1.2 "Investments aimed at protection of waters against pollution with nitrates from agricultural sources". There were 3 calls for proposals, under which 5,370 applications for aid were submitted throughout the country, of which 293 applications (5.5%) were applications submitted in Pomorskie Province. As regards the data from the entire country, the beneficiaries applied for an average of PLN 71,310.3 of aid, while those who submitted their applications to the Pomeranian Branch of the Agency for Restructuring and Modernisation of Agriculture applied for an average of PLN 58 867.0 (Table 4).

Table 4.*Number of applications submitted under Measure 4.1.2 in individual provinces*

Province	Number of applications submitted	Requested amount of aid [PLN]	Average requested amount of aid per 1 beneficiary [PLN]
Wielkopolskie	1,097	79,785,655.8	72,730.8
Mazowieckie	909	65,091,049.2	71,607.3
Podlaskie	909	70,640,099.8	77,711.9
Łódzkie	492	32,649,922.3	66,361.6
Warmińsko-mazurskie	462	34,005,366.6	73,604.7
Kujawsko-pomorskie	387	25,533,343.1	65,977.6
Pomorskie	293	17,248,020.9	58,867.0
Lubelskie	233	16,837,731.1	72,264.9
Opolskie	119	9,514,514.0	79,953.9
Świętokrzyskie	86	5,191,187.4	60,362.6
Śląskie	80	6,039,889.9	75,498.6
Małopolskie	70	3,469,883.9	49,569.8
Lubuskie	66	6,092,333.6	92,308.1
Zachodniopomorskie	64	5,049,608.7	78,900.1
Podkarpackie	53	2,658,824.9	50,166.5
Dolnośląskie	50	3,128,754.4	62,575.1
Poland	5,370	382,936,185.6	71,310.3

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

The aid limit under this measure is PLN 100,000, so, on average, farmers from Pomorskie Province used barely less than 60% of the limit available to them. Out of all the submitted applications, 2,912 were approved after verification by ARiMR employees (Table 5).

Table5.*Number of contracts concluded and percentage of applications approved under Measure 4.1.2*

Province	Number of concluded contracts granting aid	Percent of applications resulting in contracts [%]	Amount of contracts concluded [PLN]	Average aid granted per 1 beneficiary [PLN]
Podlaskie	686	75.4	55,084,908.6	80,298.7
Wielkopolskie	497	45.3	33,258,234.5	66,918.0
Mazowieckie	436	47.9	32,330,417.5	74,152.3
Warmińsko-mazurskie	285	61.6	20,699,812.5	72,630.9
Łódzkie	266	54.0	17,715,815.1	66,600.8
Kujawsko-pomorskie	193	49.8	12,345,362.7	63,965.6
Pomorskie	162	55.2	9,570,694.9	59,078.4
Lubelskie	159	68.2	11,244,699.6	70,721.4
Śląskie	43	53.7	2,965,123.6	68,956.4
Świętokrzyskie	42	48.8	2,536,072.5	60,382.7
Małopolskie	35	50.0	1,675,180.8	47,862.3
Opolskie	31	26.0	2,345,052.0	75,646.8
Zachodniopomorskie	30	46.8	2,005,257.0	66,841.9
Podkarpackie	25	47.1	1,452,318.0	58,092.7
Dolnośląskie	13	26.0	751,813.4	57,831.8
Lubuskie	9	13.6	784,181.8	87,131.3
Poland	2,912	54.2	206,764,944.4	71,004.4

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

162 contracts for granting aid were concluded in Pomorskie Province alone, with an average amount of PLN 59,078.4, which is about PLN 12,000 lower than the average amount of aid granted in the country. The highest percentage of applications whose processing resulted in the signing of an aid contract in relation to Measure 4.1.2 can be seen in Podlaskie Province (75.4%). Pomorskie ranks the 4th place in this respect, with the result of 55.2% (Table 5).

Only 14 payments were made with an average amount of PLN 53,508.9 in Pomorskie Province by the end of 2020. In this area, the largest amount was paid out in Podlaskie Province. It accounts for 44.9% of payments made nationwide (Table 6).

Table 6.

Number and amount of payments effected under Measure 4.1.2

Province	Number of beneficiaries	Amount of payments effected [PLN]	Average per 1 beneficiary [PLN]
Podlaskie	317	24,249,385.8	76,496.5
Mazowieckie	118	7,831,598.7	66,369.5
Wielkopolskie	104	5,625,596.0	54,092.3
Łódzkie	69	3,448,386.4	49,976.6
Warmińsko-mazurskie	57	4,115,776.9	72,206.6
Kujawsko-pomorskie	38	2,285,596.5	60,147.3
Lubelskie	35	2,263,986.5	64,685.3
Świętokrzyskie	16	865,900.5	54,118.8
Pomorskie	14	749,125.0	53,508.9
Małopolskie	12	535,169.2	44,597.4
Śląskie	12	697,732.0	58,144.3
Zachodniopomorskie	6	382,874.0	63,812.3
Lubuskie	5	384,181.8	76,836.4
Opolskie	5	264,650.0	52,930.0
Dolnośląskie	2	115,850.0	57,925.0
Podkarpackie	2	123,917.0	61,958.5
Poland	812	53,939,726.3	66,428.2

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

The most popular among the surveyed activities financed under the Rural Development Programme is the Modernization of Farms, including:

- Piglet production development (area a).
- Development of cow's milk production (area b).
- Development of beef cattle production (area c).
- Rationalization of production technology, introduction of innovations, change of the production profile, increase of the production capacity, improvement of production quality or increase in the added value of the product (area d).
- Irrigation (area e).

By the end of 2020, 5 calls for proposals were carried out under the areas a, b, c and 3 recruitment under the areas d and e. In total, ARiMR received 75,144 applications for aid, of which 2,977 applications were submitted in Pomorskie Province (3.9%). The beneficiaries applied for an average of PLN 204,254.8 (Table 7).

Table 7.*Number of applications submitted under Measure 4.1.3*

Province	Number of applications submitted	Requested amount of aid [PLN]	Average requested amount of aid per 1 beneficiary [PLN]
Mazowieckie	13,618	2,698,860,769.1	198,183.3
Wielkopolskie	11,359	2,675,912,821.3	235,576.4
Lubelskie	7,140	1,310,174,623.9	183,497.8
Podlaskie	6,728	1,524,568,479.9	226,600.5
Kujawsko-pomorskie	6,113	1,188,380,836.6	194,402.2
Łódzkie	5,535	982,912,672.7	177,581.3
Warmińsko-mazurskie	4,334	972,605,450.4	224,412.9
Świętokrzyskie	3,137	490,398,541.9	156,327.2
Pomorskie	2,977	678,390,447.8	227,877.2
Dolnośląskie	2,703	520,587,192.4	192,596.1
Zachodniopomorskie	2,528	577,216,825.0	228,329.4
Małopolskie	2,329	382,341,772.9	164,165.6
Opolskie	2,005	388,368,162.0	193,699.8
Podkarpackie	1,687	299,943,982.3	177,797.3
Lubuskie	1,501	378,060,681.2	251,872.5
Śląskie	1,450	279,803,037.9	192,967.6
Polska	75,144	15,348,526,297.2	204,254.8

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

By 31st December 2020, 30,293 aid granting agreements were concluded throughout the country, of which 1,257 were contracts signed with beneficiaries from Pomorskie Province. These constitute 4.1% of the signed contracts (Table 8).

Table 8.*Number of contracts concluded and percentage of applications approved and concluded with contracts under Measure 4.1.3. Modernisation of Agricultural Farms*

Province	Number of contracts concluded	Percentage of applications resulting in contracts [%]	Amount of contracts concluded [PLN]	Average aid granted per 1 beneficiary
Mazowieckie	4,136	30.3	806,354,775.1	194,960.1
Wielkopolskie	3,394	29.8	773,523,155.8	227,909.0
Lubelskie	3,263	45.7	577,023,069.2	176,838.2
Podlaskie	3,069	45.6	677,762,217.9	220,841.4
Łódzkie	2,603	47.0	435,802,846.3	167,423.3
Kujawsko-pomorskie	2,457	40.1	454,896,616.5	185,143.1
Warmińsko-mazurskie	1,911	44.0	411,388,773.2	215,274.1
Świętokrzyskie	1,379	43.9	213,041,842.0	154,490.1
Dolnośląskie	1,328	49.1	243,153,082.4	183,097.2
Pomorskie	1,257	42.2	267,414,526.2	212,740.3
Zachodniopomorskie	1,243	49.1	264,677,603.2	212,934.5
Małopolskie	1,205	51.7	197,230,372.4	163,676.7
Opolskie	968	48.2	182,134,487.1	188,155.5
Podkarpackie	857	50.8	148,511,599.4	173,292.4
Śląskie	672	46.3	123,687,060.6	184,058.1
Lubuskie	551	36.7	129,154,996.2	234,401.1
Poland	30,293	40.3	5,905,757,023.5	194,954.5

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

Farmers of Pomorskie Province obtained PLN 212,740.3 on average in co-financing. The provincial average is therefore higher than the average amount of aid obtained by farmers in the country. In Poland, only 40.3% of the submitted applications resulted in the signing of an aid agreement. Pomorskie Province was close to the national average, with the result of 42.2% of approved applications (Table 8).

As part of the submitted applications for payment, ARiMR paid a total of PLN 4,002,009,858.7, which went to 22,633 beneficiaries. The beneficiaries from Pomorskie Province received approximately 4.1% of this amount. In terms of the number of beneficiaries to whom aid was paid, Pomorskie Province ranks 12th among all provinces (Table 9).

Table 9.

Number and amount of payments effected under Measure 4.1.3

Province	Number of beneficiaries	Amount of payments effected [PLN]	Average per 1 beneficiary [PLN]
Mazowieckie	2,606	471,615,638.7	180,973.0
Lubelskie	2,503	407,884,388.0	162,958.2
Podlaskie	2,251	502,350,979.8	223,167.9
Wielkopolskie	2,177	441,640,509.9	202,866.6
Łódzkie	2,066	333,387,572.0	161,368.6
Kujawsko-pomorskie	1,846	307,528,820.1	166,592.0
Warmińsko-mazurskie	1,405	273,965,664.7	194,993.4
Świętokrzyskie	1,184	178,434,392.4	150,704.7
Dolnośląskie	1,144	181,335,880.6	158,510.4
Zachodniopomorskie	1,013	170,091,855.3	167,909.0
Małopolskie	984	153,363,004.4	155,856.7
Pomorskie	964	165,439,351.0	171,617.6
Podkarpackie	753	118,800,576.8	157,769.7
Opolskie	653	104,464,326.3	159,976.0
Śląskie	545	95,231,291.7	174,736.3
Lubuskie	543	96,475,607.3	177,671.5
Poland	22,633	4,002,009,858.7	176,821.9

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

By the end of 2020, the Agency for Restructuring and Modernization of Agriculture conducted 6 calls for proposals under Measure 6.1 - Young Farmers Bonus. In total, 29,408 applications for aid were submitted for the total amount of PLN 3,550,350,000.00. In Pomorskie Province, 1,132 applications were submitted for the average amount of PLN 118,507.1 (Table 10).

As part of six calls for proposals, the Agency for Restructuring and Modernization of Agriculture issued 18,729 approvals. In Pomorskie Province, 726 farmers received the decision to grant aid. In total, PLN 2,182,100,000.0 was disbursed throughout the country. The province with the highest percentage of approved applications is Małopolskie Province. On the other hand, in Pomorskie Province, 64.1% of the submitted applications were approved (Table 11).

Table 10.
Number of applications for Young Farmers Bonus under Measure 6.1

Province	Number of applications submitted	Requested amount of aid [PLN]	Average requested amount per 1 beneficiary [PLN]
Mazowieckie	5,491	662,750,000.0	120,697.5
Wielkopolskie	3,827	458,550,000.0	119,819.7
Lubelskie	3,590	441,250,000.0	122,910.9
Podlaskie	2,623	308,900,000.0	117,765.9
Łódzkie	2,394	291,100,000.0	121,595.7
Kujawsko-pomorskie	2,227	271,400,000.0	121,868.0
Warmińsko-mazurskie	1,504	184,200,000.0	122,473.4
Świętokrzyskie	1,501	177,700,000.0	118,387.7
Małopolskie	1,209	143,900,000.0	119,024.0
Pomorskie	1,132	134,150,000.0	118,507.1
Dolnośląskie	851	104,750,000.0	123,090.5
Zachodniopomorskie	738	88,500,000.0	119,918.7
Opolskie	719	87,450,000.0	121,627.3
Podkarpackie	684	84,350,000.0	123,318.7
Śląskie	490	59,000,000.0	120,408.2
Lubuskie	428	52,400,000.0	122,429.9
Poland	29,408	3,550,350,000.0	120,727.4

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

Table 11.
Number of application approvals and percentage share of approvals under Measure 6.1

Province	Number of application approvals	Percentage of approved applications [%]	Amount of approvals	Average aid granted per 1 beneficiary [PLN]
Mazowieckie	3,550	64.6	412,400,000.0	116,169.0
Wielkopolskie	2,408	62.9	280,250,000.0	116,382.9
Lubelskie	2,374	66.1	282,900,000.0	119,166.0
Podlaskie	1,828	69.6	206,600,000.0	113,019.7
Łódzkie	1,594	66.5	187,550,000.0	117,660.0
Kujawsko-pomorskie	1,432	64.3	168,050,000.0	117,353.4
Świętokrzyskie	998	66.4	113,400,000.0	113,627.3
Warmińsko-mazurskie	852	56.6	99,650,000.0	116,960.1
Małopolskie	846	69.8	97,800,000.0	115,602.8
Pomorskie	726	64.1	84,850,000.0	116,873.3
Dolnośląskie	492	57.8	57,700,000.0	117,276.4
Opolskie	432	60.0	50,600,000.0	117,129.6
Podkarpackie	366	53.5	43,100,000.0	117,759.6
Zachodniopomorskie	347	47.0	39,650,000.0	114,265.1
Śląskie	280	57.1	32,700,000.0	116,785.7
Lubuskie	204	47.6	24,900,000.0	122,058.8
Poland	18,729	63.6	2,182,100,000.0	116,509.2

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

Smaller farms, due to lower investment opportunities, can count on a bonus for the restructuring of small farms. Since the implementation of the RDP for 2014-2020, the Agency for Restructuring and Modernization of Agriculture has conducted 4 calls for proposals, under which 54,868 applications were submitted, of which only 1.467 applications were submitted in

Pomorskie Province. Such a small percentage of applications probably results from the fact that farms in Pomorskie Province are on average larger than farms in the country.

Table 12.

Number of applications, approvals and the amount of payments made – Measure 6.3 Restructuring of small farms.

Province	Number of applications submitted	Number of application approvals	Amount of payments effected [PLN]
Dolnośląskie	698	331	15,876,000
Kujawsko-pomorskie	1,979	1,037	50,652,000
Lubelskie	14,656	8,021	391,392,000
Lubuskie	413	165	7,596,000
Łódzkie	5,118	2,763	133,188,000
Małopolskie	4,426	2,631	127,728,000
Mazowieckie	9,476	4,852	233,628,000
Opolskie	315	123	5,844,000
Podkarpackie	2,380	1,284	61,032,000
Podlaskie	2,256	1,291	62,052,000
Pomorskie	1,467	737	35,676,000
Śląskie	839	419	20,364,000
Świętokrzyskie	5,252	3,234	158,628,000
Warmińsko-mazurskie	1,483	858	41,496,000
Wielkopolskie	3,424	1,759	84,204,000
Zachodniopomorskie	686	300	14,436,000
Poland	54,868	29,805	1,443,792,000

Source: Management Information System of the Agency for Restructuring and Modernisation of Agriculture.

By the end of 2020, ARiMR issued 29,805 decisions on granting aid, 737 of which came from Pomerania. Based on the submitted payment applications, a total of PLN 1,443,792,000 was paid out (Table 12).

5. Summary

Supporting investments in farms is extremely important from the point of view of the economy. Modern technologies make it possible to use agricultural land more efficiently, while at the same time focusing more and more on environmental protection. Correct use of the opportunities offered by EU funds to modernise Polish agriculture should therefore be a priority.

The research made it possible to deepen the knowledge about the role played by European Union Funds in farms located in Pomorskie Province. First of all, it should be noted that the beneficiaries who submit the applications do not fully use the aid limit available to them. The analysis of the data obtained from the ARiMR showed that the farmers receive the full amount of the aid only in the activities in which the so-called bonus is involved. This is due to the fact that in the case of bonus measures, it is impossible to apply for a lower amount of aid

than that specified in the respective regulation. In other measures, depending on their age and experience in running the farm, the beneficiaries receive 50 or 60% of the subsidy calculated on the basis of eligible costs approved in the aid application, which are net costs. However, the average amount of aid, both requested and disbursed, exceeds PLN 100,000. Therefore, the assumption was confirmed that European Union Funds would be used by farmers whose investment value exceeds PLN 100,000 net. Moreover, this assumption is confirmed by the responses of the surveyed farmers, 71.7% of whom indicated that the net value of the investment for which they applied for aid under the European Union Funds exceeded PLN 100,000.

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ECO-INNOVATIONS AS AN OPPORTUNITY FOR SUSTAINABLE DEVELOPMENT OF ENTERPRISES BASED ON THE EXAMPLE OF MAŁOPOLSKIE PROVINCE

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Purpose: The purpose of the author's research was the evaluation of activities related to eco-innovations of micro- and small-sized enterprises (MSSEs) in the Małopolskie Province.

Design/methodology/approach: The paper presents the results of the author's own surveys conducted in 2020 and 2021 based on a total sample of 524 micro- and small-sized entrepreneurs who declared their interest in taking part in the survey. The entrepreneurs answered questions regarding their companies' current operations, sources of financing and also assessed their activities in the context of eco-innovative solutions or partnerships with R&B institutions.

Findings: The paper presents the role of innovations in the process of sustainable development accounting for environmental aspects as implemented by entrepreneurs as part of investments.

Originality/value: research shows how important innovation is in the SME sector.

Keywords: innovativeness, eco-innovations, sustainable development, opportunities and barriers.

Category of the paper: Research paper.

Introduction

Currently economic development is, to a large extent, affected by the competitiveness of economy which is conditional upon, *inter alia*, innovations. Different definitions of the term "innovations" can be found in books of reference and one of the most popular ones can be found in Oslo Manual: *the implementation of a new or significantly improved product (good or service), or process, a new marketing method or a new organisational method in business practices, workplace organisation or external relations* (OECD, Eurostat, Oslo Manual, 2008). Ecological innovations or eco-innovations are a special kind of innovations that can yield

double benefits for the economy. On the one hand, they affect economic growth and, on the other, they help reduce adverse impact on the environment.

Sustainable development means building sustainable and competitive economy that efficiently relies on its resources, using, among other things, environmentally friendly methods in the process. Investing in innovations, entrepreneurs strive to use resources in a more efficient way which in a direct fashion benefits both traditional sectors of the economy and service-based economies. The implementation of modern environmental technologies has become an important challenge for contemporary economies; therefore, measures are required which aim at the rational use of the resources through, among other things, eco-innovations (Węgrzyn, 2013). Eco-innovations play a very important role in the process of minimizing the adverse impact of enterprises on their environment; they also foster entrepreneurship. The purpose of this paper is to describe activities taken by entrepreneurs in support of eco-innovations and to present advantages and disadvantages of the implementation of such activities.

1. The essence of eco-innovations

The concept of eco-innovations emerged in the 1990s when people became very broadly interested in problems related to innovations reducing environmental hazards which, in turn, led to significant growth of interest in that field among both entrepreneurs and local authorities.

The basic purpose of implementing innovations in enterprises is the desire to achieve a competitive advantage on the market. The process of constant improvement of the company management system points out to a wide scope of actions that need to be taken in order to achieve the level of competitiveness that enables occupying a strong position on the market (Grudzewski, Hejduk, 2004). It requires the application of diverse concepts, methods or manners of organizing and managing the company. Apart from the known ones, new concepts also appear, such as, for example, knowledge, innovation, technology or process management.

Such approach is the result of ecological problems which have become more and more apparent, and the search for more sustainable model of economic due to a global crisis (Szpor, Śniegocki, 2012). The concept of eco-innovations is defined in different ways and is continually improved thanks to growing recognition of a relationship between modern solutions and the natural environment.

In books of reference the concept of eco-innovations builds on of the classic theory of innovations. The implemented innovations are to ensure the enterprises' competitive advantage; however, in the case of eco-innovations, such advantage is to be achieved without compromise to or with minimal damage to the environment (Przychodzeń, 2015).

The concept of eco-innovations refers to the concept of sustainable development; that is why, among others, M. Charter and T. Clark (2001), build on that idea in their definition and use the term “sustainable innovation”. It is a process as part of which sustainable development aspects (economic, social and environmental ones) are integrated into a single system from industry, through research to implementation. Such concept can be referred to products, services and technologies as well as new ventures and organizational methods.

Table 1.
Selected definitions of eco-innovations

Author	Definition	Source
European Commission	Refers to all forms of innovations, including technical and non-technical ones, that create opportunities for enterprises and benefit the environment thanks to preventing or reducing the adverse effect on the environment or optimizing the use of natural resources	Eco-innovations, key to Europe’s future competitiveness
C. Fussler, P. James	The process of developing new products, processes or services that meet customers’ needs and the company’s values, however, with significantly reduced impact on the environment	Eco-innovation: a Breakthrough Discipline for Innovation and Sustainability
R. Kemp, A. Arundel	New and modified processes, devices, products, techniques and management systems that help avoid or reduce negative impact on the environment	Survey Indicators for Environmental Innovation
J. Carrillo-Hermosilla, P. del Río, T. Könnola	An innovation that helps improve the environment’s efficiency	Ecoinnovation. When Sustainability and Competitiveness Shake Hands
P. Klemmer, U. Lehr, et al.	Entities (companies, trade unions, associations, churches, private households) that develop new concepts, behaviors, products and processes (applied or introduced) which help reduce the environmental impact	Environmental Innovation. Incentives and Barriers
K. Rennings	The survey of entities that develop new ideas, behaviors, products and processes and help minimize the environmental impact or ecologically defined goals of sustainable development	Redefining Innovation an Eco-innovation Research and the Contribution from Ecological Economics
M. Charter, T. Clark	The process as part of which aspects of sustainable development are integrated into the company’s system from the idea/concept, through R&D and their implementation. The above refers to products, services and technologies as well as organizational models	Sustainable Innovation. The Centre for Sustainable Design
V. Oltra, M. Saint Jean	Innovations involving new or modified processes, practices, systems and products that benefit the environment and lead to environmental balance	Sectoral Systems of Environmental Innovation: an Application to the French Automotive Industry
F. Schmidt-Bleek	The development of new and competitively quoted goods, processes, systems, services and producers that can satisfy human needs and ensure living standards to all people, with the minimum use of natural resources (materials such as energy products and the surface of the Earth) per production unit and minimum emission of toxic substances	Eco-innovation, final report for sectoral innovation

Cont. table 1

D.K. Zuzek	The way of thinking and acting that sets basic development pathways related to sustainable development	The role of the sector of small-and medium-sized enterprises in the social and economic development of environmentally valuable areas in south-eastern Poland
GUS	An innovation that benefits the environment (eco-innovation) is a new or significantly improved product (a product or service), process, organizational or marketing method that benefit the environment vis-à-vis alternative solutions	Innovative activities of enterprises in 2006-2008

Source: the author's own study based on: K. Rennings, 1999, Bausteine einer Umweltinnovationstheorie und politik – neoklasische und evolutionsökonomische Perspektiven [in:] Innovation durch Umweltpolitik, Hrsg. K. Rennings, Nomos Verlagsgesellschaft, Baden-Baden [as quoted in:] M. Urbaniec, 2009, Wpływy innowacji ekologicznych na rozwój zrównoważony [in:] E. Sidorczyk-Pietraszko, Funkcjonowanie przedsiębiorstw w warunkach zrównoważonego rozwoju i gospodarki opartej na wiedzy, Wyd. WSE, Białystok; A. Pomykalski, 2001, Zarządzanie innowacjami, Wyd. Naukowe PWN, Warszawa-Lódź [as quoted in:] Ph. Kotler, S. Jatuspirak, S. Maesinee, *The marketing of nations: a strategic approach to building national wealth*, Profesjonalna Szkoła Biznesu, Kraków 1999, [as quoted in:] European Commission, Green Paper on Innovation, European Commission Supplement 5/95, 1996, Brussels, Luxembourg; European Commission, Competitiveness and Innovation Framework Programme (2007–2013), 2007, Brussels; C. Fussler, P. James, 1996, Eco-innovation: a Breakthrough Discipline for Innovation and Sustainability, Pitman Publishing, Londyn; R. Kemp, A. Arundel, 1998, Survey Indicators for Environmental Innovation. IDEA report. Step group. Oslo; K. Rennings, T. Zwick, 2003, Employment Impacts of Cleaner Production, ZEW Economic Studies, Bd. 21, Heidelberg; J. Carrillo-Hermosilla, P. del Río, T. Könnola, Eco-innovation. When Sustainability and Competitiveness Shake Hands, Palgrave, Londyn 2009; P. Klemmer, U. Lehr, et al., 1999, Environmental Innovation. Incentives and Barriers. German Ministry of Research and Technology (BMBF), Analytica-Verlag, Berlin; M. Charter, T. Clark, 2007, Sustainable Innovation. The Centre for Sustainable Design; V. Oltra, M. Saint Jean, 2009, Sectoral Systems of Environmental Innovation: an Application to the French Automotive Industry, Technological Forecasting & Social Change, No. 76; F. Schmidt-Bleek, Preface [in:] A. Reid, M. Miedzinski, Eco-innovation, final report for sectoral innovation - www.technopolis-group.com/resources/downloads/661_report_final.pdf (21-10-2008); F. Schmidt-Bleek, Preface [in:] A. Reid, M. Miedzinski, Eco-innovation, final report for sectoral innovation watch, www.technopolis-group.com/resources/downloads/661_report_final.pdf (21.06.2019); D. K. Zuzek, 2015, Rola sektora małych i średnich przedsiębiorstw w rozwoju społeczno-gospodarczym obszarów cennych przyrodniczo w Polsce południowo-wschodniej, Stowarzyszenie Naukowe Instytut Gospodarki i Rynku, Kraków – Warszawa; GUS (2009), Działalność innowacyjna przedsiębiorstw w latach 2006-2008, Notatka Informacyjna, GUS, Departament Przemysłu, Urząd Statystyczny w Szczecinie, Szczecin.

Eco-innovations help prevent and reduce environmental pollution that results from business activities, repair damage caused and identify and monitor the level of such pollution (Hemmelskamp, 1999). Those solutions are introduced with the aim of the actual improvement of the condition of the environment rather than to avoid a given problem (Macharzina, 1999). They can be limited to those innovations that produce effects compliant with the policy of environment protection which are aimed at achieving savings in raw materials' consumption, reducing emission and contribute to reducing the risk related to human activity.

Another important issue is also reducing the use of the environment, e.g. by energy savings, reducing soil overexploitation, emission and waste. As a result, eco-innovations may produce not only environmental effects but also economic and social ones which are important aspects of sustainable development. Eco-innovations are conditional upon many interrelated factors

which vary depending on the level of development, market position or a degree of a given company's technological advancement. Pro-environmental activities taken by small- and medium-sized enterprises are characterized by their highly complex nature as they depend not only on technological and market conditions, but also on general conditions related to politics or the environment protection law. It is generally acknowledged that eco-innovations lead to the development of new processes and products being the source of value to consumers and business, yet they significantly reduce the environmental impact (Jones et al., 2001).

An important factor that affects the speed of development and quality of eco-innovations is the interest in environment protection among consumers. Thus, eco-labelling and environmental standards play an important role as they help environmentally-friendly products and production methods stand out and support environmentally aware consumers in their market decisions. Individual preferences and behavior models are equally important as social, economic and political environment and technological possibilities (Klemmer et al., 1999). It is frequently pointed out that the following factors contribute to the development of eco-innovations as regards environmental technologies (Hemmelskamp, 1999):

- technological conditions – the current state of technology, existing know-how,
- defense mechanisms – conditions of granting patents, licenses,
- the market structure and the size of the enterprise – the existing market competition forces the entrepreneurs to seek new solutions allowing to achieve a competitive advantage,
- market demand – growing interest in environmentally-friendly goods among consumers leads to entrepreneurs' growing interest in implementing eco-innovations,
- information – possible access to internal and external sources of knowledge,
- expenses – the amount of expenses entailed by, e.g., required restructuring in the case of the implementation of eco-innovations, technical and economic risk – the higher the risk of the new technology's fault rate and the higher the ROI risk, the lower the interest in eco-innovations.

2. Advantages and barriers to implementing eco-innovations

The implementation of ecological innovations produces multiple benefits. Their application helps the enterprise build its positive market image as the introduction of such innovations shows that the enterprise is aware of threats to the climate and natural environment. Eco-innovations allow companies to strengthen their competitive position and reinforce their market position (Romańczyk, 2010). The most frequent advantages that stem from the implementation of eco-innovations include:

- reducing pollution and waste,
- improving the quality of life,
- market attractiveness,
- the enterprise's profitability,
- economic stability thanks to reducing the company's dependence on prices of natural resources.

Innovations, including eco-innovations, however, encounter many barriers to their implementation which are mostly related to high costs and the society's distrust of novelties. Barriers that accompany the implementation of eco-innovations include:

- lack of market knowledge,
- lack of sufficient knowledge of business opportunities available to enterprises,
- problems related to obtaining funds for the implementation of eco-innovations,
- lack of funds and difficulties with gaining access to capital,
- high costs of eco-innovative technologies,
- absence of economic or tax incentives,
- insufficient knowledge regarding environment protection and the impact of the company's operations on the environment, as well as economic benefits of eco-innovations (currently the majority of entrepreneurs consider eco-innovations as highly expensive).

A factor being an incentive for the entrepreneurs to implement eco-innovations is benefits for the environment. They can serve as a basic goal of such innovations or result from other goals. They can also emerge at the stage of the production of a given product or service or the use of a purchased product or service by end-users. Ecological benefits are important but not the most important factor that determines the introduction of eco-innovations. Also economic benefits are vital, however, they require high investment costs which sometimes are an excessive burden for the entrepreneurs despite their environmental awareness and their desire to take environmental initiatives.

3. Characteristics of the author's own research

To determine innovations taken by MSSEs and to show the relationship between those activities and environmental activities in reference to the idea of sustainable development, empirical research was conducted the results of which are presented in this paper. The research was conducted in the Małopolskie Province in 2020 and 2021 in the form of a survey. In total, in the two periods under research, 524 surveys were conducted addressed to both micro- and small-sized entrepreneurs, covering several thematic areas. The entrepreneurs

answered questions regarding their companies' current operations, sources of financing and also assessed their activities in the context of eco-innovative solutions or partnerships with R&B institutions.

The analysis of the results obtained in the course of the research allowed to verify the activities of the enterprises in the area of innovations with a special focus on eco-innovations. The main purpose of the analysis was to verify the research hypothesis regarding low interest in eco-innovations as an element supporting sustainable development in the MSSEs in the Małopolskie Province. From among all respondents participating in the survey, approx. 32% (168 entities) accounted for innovative entrepreneurs, including 7% which were engaged in eco-innovations. As regards the entities that did not introduce innovations, the research showed that, on average, 39.5% of all respondents would like to invest in such solutions in the near future.

On average, approx. 44% of the respondents stated that their companies introduced innovative products first that were subsequently followed by new technologies or ideas for a new business (approx. 19% and approx. 15% of entrepreneurs, respectively) (Figure 1). The awareness of the existence of environmental innovations is still insufficient. Only 12% of the respondents in the years in question invested in eco-innovations, in that way contributing to improving the condition of the environment.

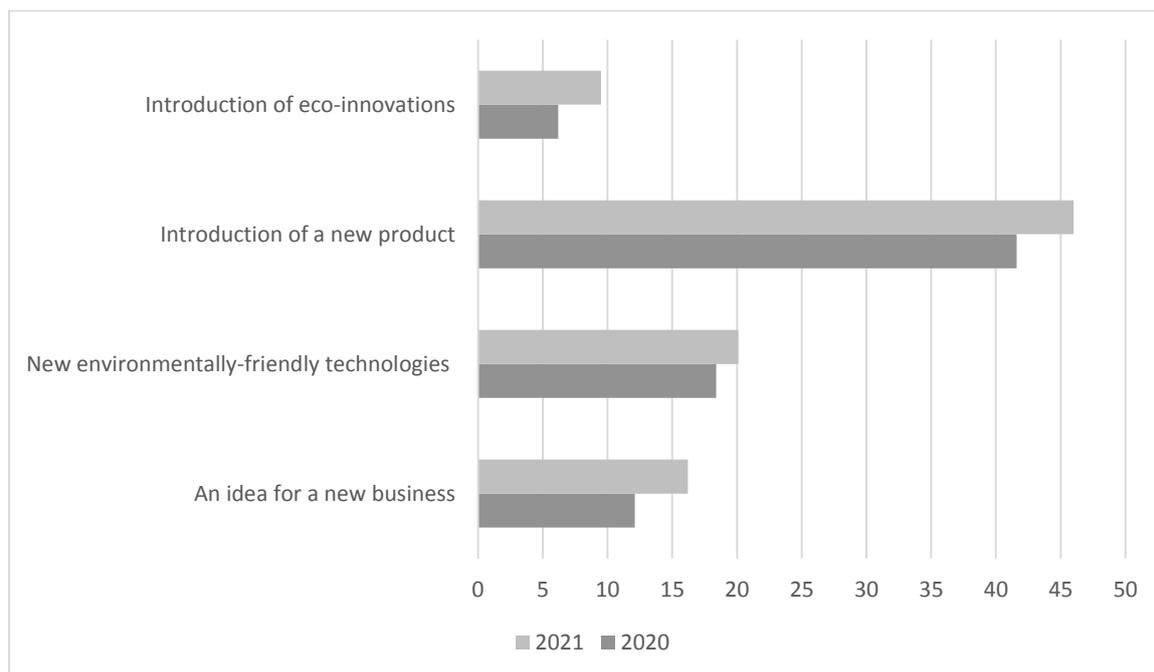


Figure 1. Introduced innovations by nature – 2020 and 2021 [%]. Source: the author's own research.

Major barriers specified by the respondents preventing them from making investment plans involving eco-innovations included insufficient financial and technical resources (on average, 36%), followed by the lack of expertise and qualified personnel (Figure 2). Also the absence of institutions that can help with the implementation of innovations was one of major features showing that such assistance is needed.

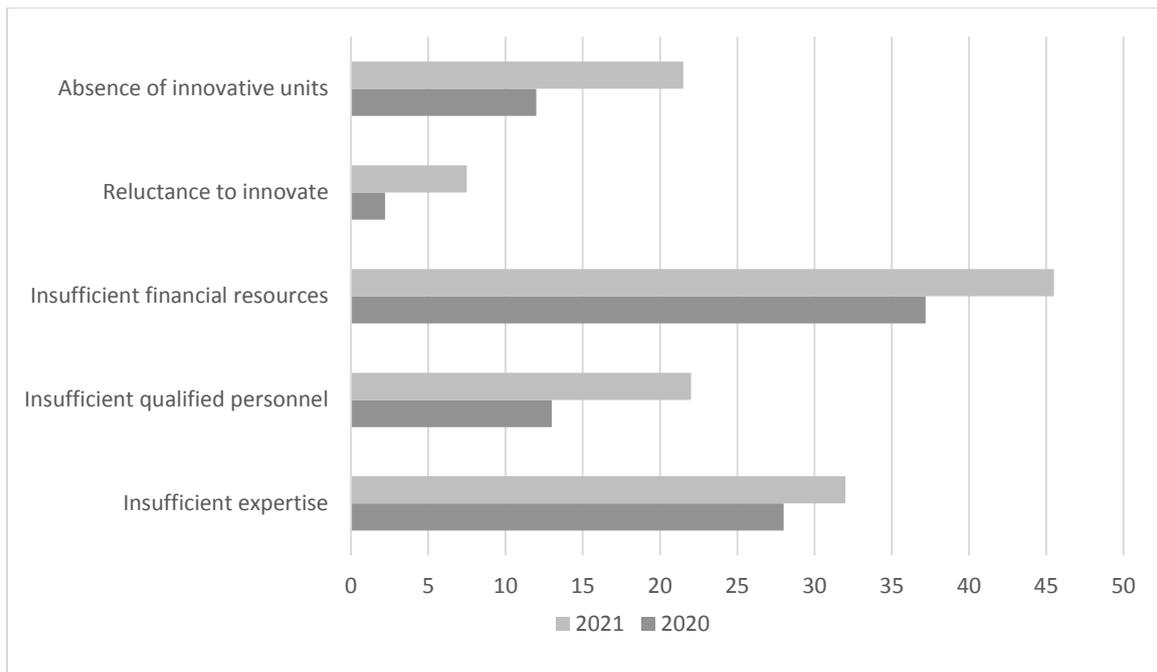
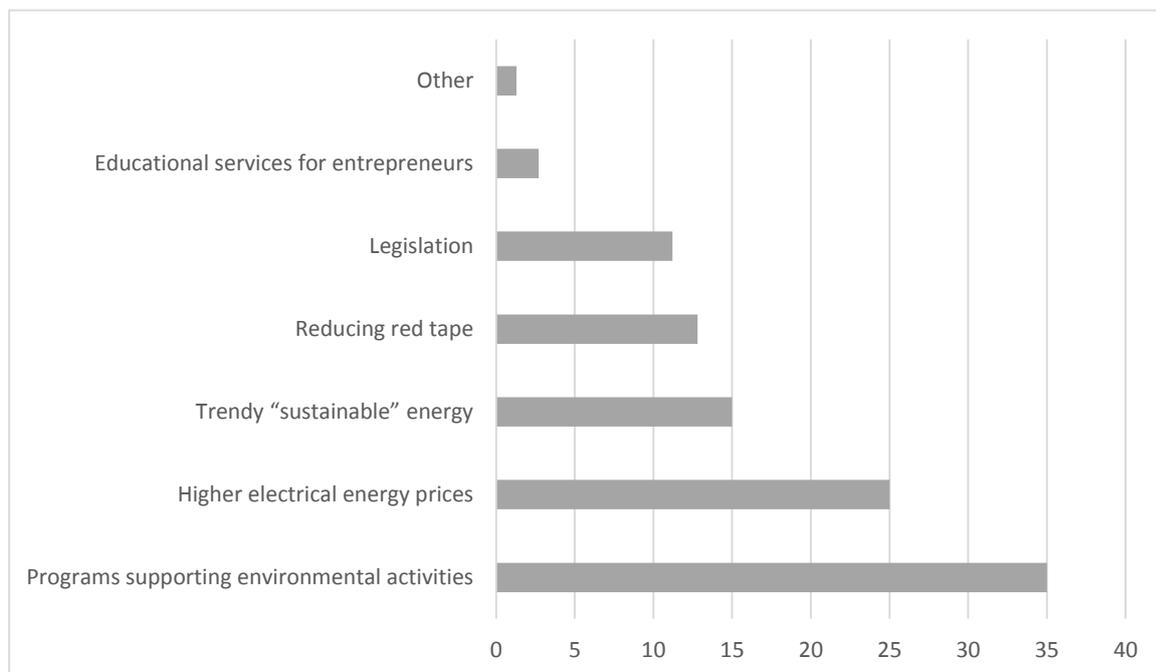


Figure 2. Barriers resulting in the entrepreneurs' reluctance to introduce eco-innovative solutions. Source: the author's own research.

Analyzing factors which encourage entrepreneurs to invest in eco-innovations, it can be observed that programs offering support in the form of subsidized investments or additional payments to “green energy” became most popular (nearly 35% of all responses). Increases in electrical energy prices (over 25%) ranked second, which were followed by trendy “sustainable” energy (approx. 15%) (Figure 3).



*values do not total 100%, more than one answer could be ticked.

Figure 3. Factors encouraging entrepreneurs to invest in eco-innovations. Source: the author's own research.

4. Summary and conclusions

The implementation of eco-innovations by entrepreneurs can yield numerous benefits that are mostly related to reducing operating costs and boosting companies' competitive advantage and, consequently, increasing their competitiveness vis-à-vis European or global economies. Measures should be taken to make entrepreneurs aware of benefits resulting from implementing the process, both for them and for the protection of the natural environment. Instruments supporting the innovations at a local or national level can become very useful in the process as they can help educate and obtain financial resources for eco-innovations. Therefore, it is crucial to have an effective pro-innovative policy in place, eliminate barriers to financing eco-innovations and continue to develop the system of supporting eco-innovations, including, among other things, engaging in activities the purpose of which is to increase environmental awareness.

1. The research conducted showed that approx. 32% of all entrepreneurs introduced innovations, including eco-innovations (approx. 7%).
2. On average, approx. 44% of the respondents stated that they introduced innovative products, 19% deployed innovative technologies (approx. 19%), and approx. 15% had ideas for a new business.
3. Major barriers specified by the respondents included: insufficient financial and technical resources (on average, 36% of respondents), or insufficient expertise and qualified staff.
4. Incentives to engaging in eco-innovations include: support programs offering subsidized investments or additional payments for "green energy" (approx. 35% of all respondents), followed by higher prices of electrical energy (over 25%), or trendy "sustainable" energy.

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