SILESIAN UNIVERSITY OF TECHNOLOGYPUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2022
ORGANIZATION AND MANAGEMENT SERIESNO. 163

STRATEGIC MANAGEMENT-RELATED FACTORS OF ENTERPRISE INNOVATIVENESS

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Purpose: The increase in the innovativeness of enterprises is conditioned by many external and internal factors. One of the internal factors on which an enterprise has significant influence is the management of the company. The objective of this paper is to identify the strategic management-related factors of enterprise innovativeness, understood as the most important internal factors in the area of management, which positively impact the innovativeness of enterprises in the strategic perspective.
Design/methodology/approach: Empirical studies were conducted on a purposive sample of N = 180 small and medium-sized innovative manufacturing enterprises in Poland. The Computer-Assisted Web Interview (CAWI) technique was employed. Data analysis was performed using exploratory factor analysis within the confirmatory factor analysis framework (E-CFA) and structural equation modeling (SEM).
Findings: In light of the results of the research - the identified strategic factors of enterprise innovativeness in the area of management are the managerial competencies of the company's executives in the implementation of innovation strategies, human resource management and building trust-based relationships, as well as openness to innovation.
Research limitations/ implications: A limitation of the study is the purposive selection of the research sample, preventing the generalization of the results. Further research should focus on the identification of strategic factors of enterprise innovativeness in the area of management in the age of development of Industry 4.0.
Practical implications: The results of the research serve as recommendations for leaders/managers interested in increasing the level of innovativeness of their enterprises.
Social implications: The inclusion of recommendations by leaders/managers should result in an increase in the innovativeness of enterprises.
Originality/value: The research results have cognitive value for the expansion of knowledge in the studied area. The presented procedure of empirical research is recommended for use by researchers in further scientific studies.

Keywords: strategic factors, enterprise innovativeness, management, factor analysis, structural equation modeling.

Category of the paper: research paper.

1. Introduction

The innovativeness of the European Union member states' economies is subject to annual assessment in a ranking known as the *European Innovation Scoreboard.* According to the results of the analyses, contained in a report published in 2022, Poland is once again seen as an "emerging innovator", ranking at the 24th position among 27 countries (European Commission 2022). Poland's results improved compared to the previous year but did not allow for the country to be promoted to the group of *moderate innovators*. Among the included indicators, the innovative activity of enterprises is also taken into account.

The increase in the innovativeness of enterprises is one of the important factors leading to a reduction in the country's innovation gap. In recent years, the search for factors positively affecting the innovativeness of enterprises, including both external and internal factors – in various areas, has become the subject of scientific studies. This search is frequently based on a strategic approach to innovativeness, which is seen as enabling the company to obtain a competitive advantage.

The present study focuses on the area of enterprise management. The objective of this article is to identify and indicate the strategic management-related factors of enterprise innovativeness, understood as the most important internal factors in the area of management, which positively impact the innovativeness of enterprises in the strategic perspective. It was assumed that **certain dimensions** would be selected within the indicated area, for which **observable primary variables would then be determined.** The factors (primary variables) became the basis of the utilized research tool – the survey questionnaire.

For the purpose of implementing the adopted objectives the author used and presented the results of her own research, conducted in 2014 on a purposive sample of 180 innovative small and medium-sized manufacturing enterprises. The results of the conducted own research allowed for the identification of the strategic factors of enterprise innovativeness in the area of management, as well as in other areas of functioning of enterprises (Rojek, 2015, 2018, 2021).

Contemporary changes related to the transformation of enterprises towards Industry 4.0, prompt the author to reflect on the timeliness of the selected strategic factors of enterprise innovativeness in the area of management. These considerations lead to the conclusion that it would be advisable to carry out repeated research leading to the identification of strategic managerial factors of the innovativeness of enterprises in the age of development of Industry 4.0. The results of own research presented in the article can, in the author's view, serve as an important point of reference for comparisons and analyzes in the explored scope.

The methodology of empirical research and data analysis methods used by the author are consistently recommended to other researchers for adaptation and use in their research efforts.

2. Enterprise innovativeness

In this article enterprise innovativeness is understood as the ability to systematically create and implement innovations as well as to absorb innovations.

For the purposes of statistical surveys in the scope of gathering and interpretation of data concerning innovation, Statistics Poland (Główny Urząd Statystyczny - GUS) adopted a definition assuming that an innovative company is one that implemented at least one innovation during a three-year period. According to Statistics Poland an innovation is the implementation of a new or improved product (article, service) or business process in the business practice, workplace organization, or in relations with the environment (GUS, 2021).

This approach results in distinguishing two types of innovation in the statistical research currently carried out by Statistics Poland: innovation within the product (product innovation) and innovation within the business processes.

In this study the author uses, as part of the research process, a classification of innovations distinguishing four types of innovations: innovations within the product (product innovation), innovations within the process (process innovation), organizational innovations, and marketing innovations.

Such a classification was used in studies carried out by Statistics Poland until 2018. It was therefore assumed that an innovation is the implementation of a new or significantly improved product (article, service) or process, a new marketing method or a new organizational method in the business practice, workplace organization, or in relations with the environment (GUS, 2018).

The innovativeness of an enterprise is conditioned by many external and internal factors. These factors can be grouped into certain areas in order to facilitate the implementation of the research process. The present study focuses on internal factors in the area of enterprise management.

3. Management-related factors of enterprise innovativeness – theoretical context

Managerial factors relate to the behaviors and decisions made by managers and members of the management boards of enterprises. Although these decisions relate to many levels of the organization's functioning (e.g., production, financial, human resources), the key ones are those that define the company's development strategy. The management process consists in performing managerial activities captured in the basic functions: planning, organizing, leading (motivating), controlling. The most important content of the planning function is the

formulation of the company's objectives, determining the ways of achieving them and the resources necessary for that. Access to information and the ability to process such information into decisions is crucial in this respect (Kożuch, 2018). In the conditions of a changing environment, including pressure from competitors, companies are forced to seek more effective management methods. The management system of an innovative organization requires a constant search for available internal and external sources of innovation and opportunities for innovation. Managers with a pro-innovation attitude make choices that will allow them to best support innovative processes. Management should foster the creation, implementation and absorption of innovations and facilitate a rapid response to emerging market signals, especially in today's context of strong competition and unexpected external events.

For the purposes of the study, in the area of management, the following dimensions were determined to be the most important in the strategic perspective: (1) **effective leadership,** (2) **innovation-based development strategies,** (3) **project management.** As part of these dimensions, discussed below, the author designated the following factors (primary variables) that became the core of the research questionnaire used within the framework of own quantitative research.

3.1. Effective Leadership

A manager who wants to support the innovativeness of a company should exhibit the ability to think strategically, to be flexible in their actions, and should also be willing to bear the risks associated with the implementation of innovations in an organization. The role of the manager is also to stimulate the innovativeness of the company by building employee engagement in innovative activities (e.g., by involving employees in the process of making key decisions).

Effective leadership, often taking the form of motivating employees, consists in inspiring employees to work towards the achievement of the company's goals. The processes taking place in modern enterprises correspond to the definition of the manager as a person who implements the adopted goals mainly through cooperation with other people (Kożuch, 2018). In practice, one can observe, among others, the leader’s support and the leader's behavior inspiring others to achieve better results.

Strategic leaders can influence idea elaboration by evaluating and developing innovation ideas to be pursued or by promoting a context where organizational members can participate in the elaboration and improvement of ideas (Cortes, Herrmann, 2021). Research suggests that strategic leaders can affect the implementation stage discretionally by making specific decisions on the implementation process and getting directly involved in its emerging concerns and challenges (Kiss, Barr, 2017). The key features of a leader, which are important for the innovativeness of a company, include (Deschamps, 2011):

- an extraordinary combination of creativity and discipline,
- the acceptance of uncertainties, risks, and failures, combined with the ability to inspire teams to use these experiences as lessons for the future,
- a high degree of personal commitment to the mission of promoting innovation and seeking out technologies and ideas externally,
- readiness to experiment, courage to terminate projects (and not only to launch them), combined with the ability to sense which of them should be continued, and which should be abandoned,
- talent for building and leading teams, including the ability to attract and retain innovators.

One feature of effective leadership is providing employees with support for risk-related activities in innovation processes, enabling experimentation without the fear of possible failure.

Among the distinguished types of leadership, it's worth recalling the concepts of *a transactional leader* and a *transformational leader*. **A transactional leader** is a leader who motivates their subordinates to perform their duties at the expected level by helping them to determine responsibility for tasks, identify goals, gain confidence in their ability to achieve results at the desired level, and additionally understand how the needs and remuneration of employees are related to the achievement of goals. On the other hand, a **transformational leader** motivates subordinates to perform their duties at a high level by inspiring employees to focus on a broader mission, which is supposed to ensure that they prioritize internal, ambitious goals over their own direct benefits (Kożuch, 2018). Transformational leadership involves, on the one hand, inspiring motivation and, on the other hand, individual treatment of subordinates.

Studies conducted in 2010-2011 among 278 employees of enterprises show that the following elements are important for inspiring employees to undertake innovative behaviors (Wojtczuk-Turek, 2012):

- leader's behavior - the ability to assess the employee's potential, the superior's use of their authority and position to support the employees at work,
- perception of the leader as a trustworthy person, as well as the belief that the superior will treat the employee well and fairly in the future.

Based on the results of the research, the quoted author states that "in the context of achieving the goals related to the innovativeness of companies, the only appropriate attitude of a leader is that of transformation" (Wojtczuk-Turek, 2012, p. 107). This view is also shared by other researchers. It is often suggested that transformational leadership will be more strongly associated with creative and innovative behaviors than transactional leadership (Kark, Van Dijk, Vashdi, 2018). Transactional leadership is unlikely to instill intrinsic motivation, unlike transformational leadership, which actively encourages experimentation (Lee et al., 2020).

According to the author of the study, leadership should involve conscious efforts to build trust. In order to base relationships with employees on trust, one should (Nikowska, 2011): familiarize employees with the goals and vision of the company and create a space for joint determination of challenges, encourage and enable employees to express their own opinions and suggest new solutions, organize joint meetings to solve specific problems and inspire new solutions. Trust can be understood as the expectation that a partner will act honestly in light of various possibilities. Among the features of a pro-innovation organization, attention is paid to participation and collegiality in management (decision-making), as well as the lack of detailed specification of the manner of performance of tasks entrusted to employees (Okoń-Horodyńska, 2016). Each of these features can be understood as an expression of relationships based on trust. The development of such relationships is promoted by continuity of the company's management, which is mentioned among the internal factors of the innovativeness of enterprises (Francik, Pocztowski, 1991).

Scholars have argued that leaders might need to adapt their characteristics to meet innovation's changing requirements (Zhang et al., 2017).

3.2 Innovation-based development strategies

An enterprise can formulate a general **strategy and an innovation strategy**, which often becomes a part of the company's general strategy (or one of the ways of achieving strategic goals, e.g., technological leadership). The integration of the innovation strategy into the company strategy helps in the implementation of this idea. The innovation strategy sets out how innovation should be used in order to achieve a strategic advantage.

Contemporary concepts of innovation strategies include the following strategies: blue ocean strategies, open innovation, and innovation niches.

The Blue Ocean strategy assumes that in strategic activities it is possible to bypass the area of the fiercest competition (the so-called red ocean) and find the so-called blue ocean as a place for the implementation of the company's strategy (Chan Kim, Mauborgne, 2005). The concept is based on the company discovering unoccupied market spaces and creating demand for new products in them. This is possible through the creation of new value for the buyer and for the company, i.e., so-called value innovation.

The strategy of open innovation consists in searching for and using innovation ideas emerging in the external environment. Open innovation involves cooperation with specialists from various professional backgrounds, as well as a wide range of products users, in search of new, innovative solutions. In addition to the aforementioned centripetal processes, it also includes centrifugal and mixed processes (cooperation in innovative processes).

The innovation niche strategy is one of the types of market niche strategies. The niche is created by an enterprise seeking to achieve a competitive advantage thanks to an innovation that is difficult for competitors to quickly imitate. The strategy of innovation niches is used by small and medium-sized companies, focused on continuously generating product and

technological innovations (Sosnowska, Łobejko, 2008).

An innovation strategy can also be one of the ways of achieving strategic goals, e.g., gaining technological leadership. This concept is associated with the classification of innovation strategies according to the criterion of the degree of the innovation's originality. In this respect the following types of strategies are distinguished (Robinson, Chiang, 2002):

- *innovation leadership* – assuming that the company's goal is to achieve the position of a technological leader by developing new technologies and introducing new products to the market,
- *innovation followership* – assuming the introduction of products to the market based on imitation and learning from the experience of innovation leaders.

A strategy of technological leadership requires adequate resources, entails high risks associated with uncertainty regarding the market acceptance of the innovation. However, if an innovation is successful, the company will want to create barriers to entry for imitators. Technological leadership strategies can address strategic challenges, e.g., concerning market leadership. The first company to enter the market with a given product obtains an advantage resulting from the temporary monopoly on the new product or the loyalty of users.

3.3 Project management

The implementation of projects is currently perceived as a manifestation of a modern approach in management. A project can be identified as an undertaking that is new, unusual, and therefore different from routine activities. These features are closely matched to initiatives within a company's innovative activity. Project management is characterized by complexity and comprehensiveness. In the aspect of innovativeness, the role of project management is indicated by J. Brilman, who emphasizes that the rapid introduction of an increasing number of new products to the market requires project management (Brilman, 2002).

When considering the importance of project management, it is impossible to ignore the role of *project champions* in creating effective solutions in innovation processes. They take responsibility for the project and seek support and resources for the work they direct (Pichlak, 2012). These people use management methods to inspire team members to operate efficiently, provide support, and monitor the progress of works within the project.

Project management tools and techniques enable the managers to respond flexibly to changes, new information, and to manage under uncertain conditions to meet the basic goals of each project - to meet the requirements of limited time and budget (Novotna, Volek, 2018; Vrchota, Řehoř, 2021).

4. Research methodology

Author's own quantitative empirical research was aimed at identifying the strategic factors of enterprise innovativeness - understood as the most important internal factors positively impacting the innovativeness of enterprises in the strategic perspective. The research process presented in the article relates to the area of management.

Research sample and course of research

The purposive sample covered 550 small and medium-sized innovative enterprises operating in Poland whose core business falls within Section C of the Polish Classification of Activities 2007 - Manufacturing. The author adopted the definition of small and medium-sized enterprises on the basis of the criterion of the number of employees (respectively: 10-49 and 50-249). The category "innovative enterprise" was assigned to companies which introduced at least one innovation within the product, within the process, or a marketing or organizational innovation, within the studied three-year period.

Quantitative research was carried out with the technique of Computer Assisted Web Interview (CAWI) in the second quarter of 2014, with the use of a proprietary survey questionnaire. The respondents included individuals managing the studied enterprises: management board members, directors, owners. As a result, 180 correctly completed survey questionnaires were obtained (N = 180), and the achieved response rate was 31%. In the studied group of enterprises, there were 76 small enterprises, which accounted for 42.2%, and 104 middle-sized companies, which accounted for 57.8%. The implementation of the CAWI study was carried out by the Warsaw-based research company EMAR Marketing Research, in cooperation with the author of the article.

Research tool

The survey questionnaire was developed using the results of literature studies, as well as own qualitative research - *Individual In-Depth Interviews* (IDIs) with members of the companies' management boards.

The core element of the questionnaire survey is a set of 15 (observed) primary variables, marked with the symbols Z1-Z15. The respondents were asked to assess the strategic importance of variables on a scale of 1 to 5 wherein: 1 - the factor doesn't have strategic importance for enterprise innovation, 2 - the factor has little strategic importance, 3 - it is hard to say, 4 - the factor has significant strategic importance, 5 - the factor has great strategic importance. Another important element of the research questionnaire were also the questions concerning the effects of innovative activities, used as measures of enterprise innovativeness, and presented as part of the description of the research results.

Methods of Empirical Data Analysis

In addition to descriptive statistics, the author used the method of exploratory factor analysis within the confirmatory factor analysis framework, the use of which is promoted by scholars(Asparouhov, Muthen, 2009), followed by structural equation modeling. The following stages have been adopted:

1. *Exploratory Factor Analysis* – the Principal Component Analysis method: narrowing down the number of primary variables to a smaller set of "variable groups", that is, latent (hidden, unobserved) variables.
2. *Confirmatory Factor Analysis*: designation of latent variables of the potential strategic factors of enterprise innovativeness - in the area of management.
3. *Structural Equation Modeling*: construction of a structural equation model; analysis of the nature and strength of the relationships between the identified potential strategic factors in the area of management and enterprise innovation (described with a set of primary variables).
4. Identification of the strategic factors of enterprise innovativeness in the area of management, as the most important among the potential strategic factors.

5. Selected research results and analysis

Data analysis was performed using the IBM SPSS Statistics software. The results of the individual indicators' assessment by the respondents are presented in Table 1.

Table 1.
Assessment of the strategic importance of management factors (primary variables) for enterprise innovativeness

No.	MANAGEMENT-RELATED FACTORS - *PRIMARY VARIABLES*		Average assessment	Standard deviation
1	Z 4	Search for niche markets for new products	4.33	0.76
2	Z 12	Positive attitude of the company's management personnel towards the conduct of research and development works	4.01	1.10
3	Z 9	Effective use of the workers' key (most important for the company) competencies	3.97	1.18
4	Z 14	Willingness of executives to take risks associated with the introduction of new products/processes	3.96	1.13
5	Z 13	Prioritizing innovation in the company	3.90	1.08

Cont. table 1.

6	Z 5	Familiarization of employees with the development strategy based on innovation	3.88	0.98
7	Z 6	Integration of the innovation leader's goals with the company's goals	3.83	0.97
8	Z 1	The implementation of a development strategy based on (product, process, organizational, marketing) innovation	3.76	1.20
9	Z 8	Building trust-based relationships within the company	3.74	1.30
10	Z 15	Continuity of the company's management personnel	3.72	1.28
11	Z 2	Differentiation from the competition through the search for customer value innovation (“blue ocean” innovation)	3.69	1.03
12	Z 11	Having a bonus system rewarding employees for innovation	3.66	1.20
13	Z 7	The use of project management methods	3.63	1.15
14	Z 10	Inspiring employees to seek new solutions	3.63	1.24
15	Z 3	Development based on the realization of the idea of open innovation	3.38	1.18

Source: Own elaboration based on the results of the carried-out research (N = 180).

Phase 1. The conducted exploratory factor analysis based on the *Principal Component Analysis* method allowed for the extraction of five main components, that is, new, uncorrelated “groups of factors”, that have eigenvalues greater than 1 and explain a total of 61.8% of the factor variance. The significance of the major components is illustrated by a “scree” plot (Figure 1).

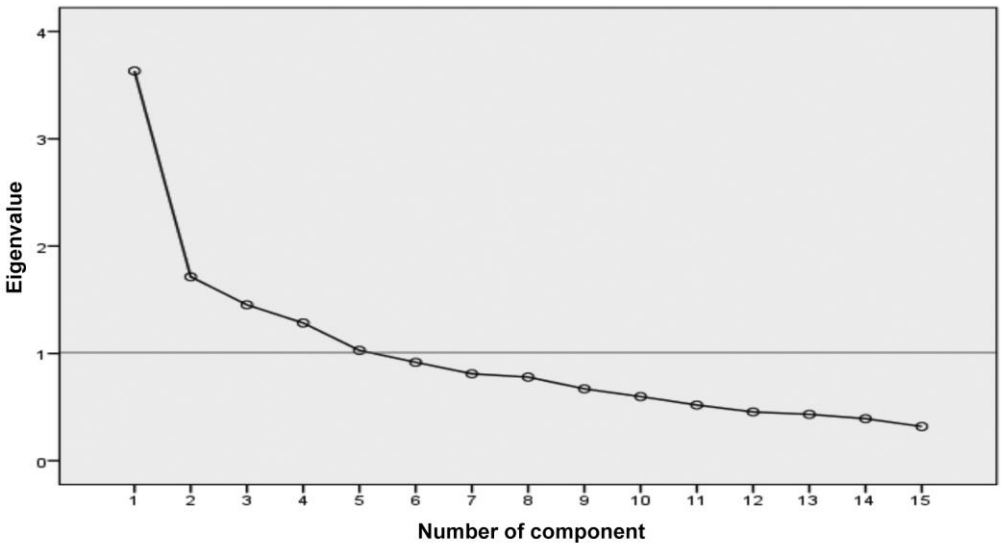


Figure 1. Scree plot - the main components in the area of management-related factors.

Source: Own elaboration based on the results of the carried-out research (N = 180).

The horizontal cutoff line plotted on this chart shows that for the subsequent components starting from the sixth there are already minimal declines in the eigenvalues, so they are not retained.

Summary of the total variance explained after the separation of the main components and after *Varimax* rotation is presented in Table 2.

Table 2.
Matrix of Rotated Components in the exploratory factor analysis of the strategic factors of enterprise innovativeness - management-related factors

MANAGEMENT-RELATED FACTORS - *PRIMARY VARIABLES*	**PRELIMINARY POTENTIAL STRATEGIC MANAGEMENT-RELATED FACTORS**				
	1	**2**	**3**	**4**	**5**
Z 10. Inspiring employees to seek new solutions	**0.753**	-0.113	0.156	-0.250	-0.051
Z 9. Effective use of the workers' key (most important for the company) competencies	**0.678**	-0.024	0.042	0.403	0.017
Z 1. The implementation of a development strategy based on (product, process, organizational, marketing) innovation	**0.660**	0.280	-0.194	0.386	0.065
Z 8. Building trust-based relationships	**0.595**	-0.046	0.423	-0.009	0.187
Z 11. Having a bonus system rewarding employees for innovation	**0.586**	0.247	0.037	0.049	0.201
Z 13. Prioritizing innovation in the company	-0.051	**0.817**	-0.065	0.151	0.064
Z 3. Development based on the realization of the idea of open innovation	0.110	**0.617**	0.295	-0.345	0.053
Z 5. Familiarization of employees with the development strategy based on innovation	-0.166	**0.165**	0.771	0.033	0.204
Z 14. Willingness of executives to take risks associated with the introduction of new products/processes	0.201	-0.083	**0.667**	0.090	0.083
Z 7. The use of project management methods	0.300	0.476	**0.556**	0.077	-0.072
Z 4. Search for niche markets for new products	0.046	-0.002	0.143	**0.805**	0.088
Z 2. Differentiation from the competition through the search for customer value innovation ("blue ocean" innovation)	0.368	0.431	0.092	**0.447**	-0.072
Z 15. Continuity of the company's management personnel	-0.017	-0.200	0.174	0.209	**0.719**
Z 6. Integration of the innovation leader's goals with the company's goals	0.088	0.140	0.127	-0.205	**0.696**
Z 12. Positive attitude of the company's management personnel towards the conduct of research and development works	0.365	0.253	-0.040	0.254	**0.528**
Source: Own calculations based on the results of the survey in the IBM SPSS software. Factor extraction method – principal components analysis. Rotation method - Varimax with Kaiser normalization.					
Rotation converged in 18 iterations.					

Source: Own elaboration based on the results of the carried-out research (N = 180).

The created factors form 5 unobservable (latent) variables. They were designated as the *preliminary potential strategic factors of enterprise innovativeness - management-related factors (CZ1 - CZ5),* all of which group specific primary variables (Table 3).

The greater the value of the factor loading (correlation coefficient), the greater the impact of the primary variable on the *preliminary* potential strategic factor of enterprise innovativeness.

Table 3.
Preliminary potential strategic factors of enterprise innovativeness - management factors, obtained on the basis of the carried out exploratory factor analysis

Factor CZ1. Managerial competencies of the company's executives in the implementation of innovation strategies, human resource management and building trust-based relationships		
	Z 10	Inspiring employees to seek new solutions
	Z 9	Effective use of the workers' key (most important for the company) competencies
	Z 1	The implementation of a development strategy based on (product, process, organizational, marketing) innovation
	Z 8	Building trust-based relationships
	Z 11	Having a bonus system rewarding employees for innovation
Factor CZ2. Openness to innovation		
	Z 13	Prioritizing innovation in the company
	Z 3	Development based on the realization of the idea of open innovation
	Z 5	Familiarization of employees with the development strategy based on innovation
Factor CZ3. Modern project-based management		
	Z 14	Willingness of executives to take risks associated with the introduction of new products/processes
	Z 7	The use of project management methods
Factor CZ4. Proactive behavior on the market		
	Z 4	Search for niche markets for new products
	Z 2	Differentiation from the competition through the search for customer value innovation ("blue ocean" innovation)
Factor CZ5. Company management personnel that is stable and exhibits a positive attitude towards research and development works		
	Z 15	Continuity of the company's management personnel
	Z 6	Integration of the innovation leader's goals with the company's goals
	Z 12	Positive attitude of the company's management personnel towards the conduct of research and development works

Source: Own elaboration based on the results of the carried-out research (N = 180).

Phase 2. The conducted confirmatory factor analysis confirmed the significance of three factors: **CZ1**, **CZ2** and **CZ5**. They constitute important factors positively affecting enterprise innovativeness and were therefore recognized as the potential strategic factors of enterprise innovativeness in the area of management.

The primary variables, explaining each of the designated potential strategic factors of the innovativeness of enterprises - management-related factors, are presented in Table 3 in order from the strongest to the weakest link with the given factor.

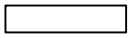
Phase 3. Results of structural equation modeling (SEM)

In the framework of **structural equation modeling** the author tested many models, searching for those that best reflect the complex cause and effect relationships, that is, the impact of strategic management-related factors on the innovativeness of enterprises. Three potential strategic factors of enterprise innovativeness were designated on the basis of the confirmatory analysis: **(CZ1) Managerial competencies of the company's executives in the implementation of innovation strategies, human resource management and building trust-based relationships, (CZ2) Openness to innovation, (CZ5) Company management personnel that is stable and exhibits a positive attitude towards research and development works**. They were subsequently used for the development of a structural equation model. The objective is to assess the impact of these factors (as exogenous latent variables) on enterprise innovativeness (as an endogenous latent variable).

The structural model presents the cause-and-effect relationships between these variables. Meanwhile, the measurement models represent the relationships between the latent variables and the observable variables that explain them.

Markings

The structural equations model is presented in the form of a graphical scheme (Figure 2). The following markings have been adopted:

 - observable variable,

 - unobservable (latent) variable,

 - cause and effect relationship,

- the value over the arrow means the path coefficient,
- the value next to the observable variable means the coefficient of determination R^2,
- INN means the INNOVATIVENESS of the enterprise,
- e - means the random component of the variable.

It was assumed that innovativeness of enterprises (as an endogenous latent variable) is explained by three factors: **F1**, **F2** and **F3**, wherein:

- **the variable F1**, signifying the results of the enterprise as measured by the number of innovations implemented in the years 2011-2013, is explained by: P1.1 - the total number of product innovations; P1.2 - the total number of process innovations; P1.3 - the total number of organizational innovations; P1.4 - the total number of marketing innovations;
- **the variable F2**, signifying financial activity in the scope of innovation as measured by the average share of expenditures on innovation in the enterprise's revenues in the years 2011-2013, is explained by: P2.1 - the average percentage share of overall expenditures on innovative activities in the enterprise's revenues; P 2.2 - the average percentage share of expenditures on research and development activities in the expenditures on innovative activities;
- **the variable F3**, signifying intellectual property, as measured by the total number of patents, industrial design registration rights, protective rights for utility models obtained in the years 2011-2013, is explained by: P3.1 - the total number of patents obtained; P3.2 - the total number of industrial design registration rights obtained; P3.3 - the total number of protective rights for utility models obtained.

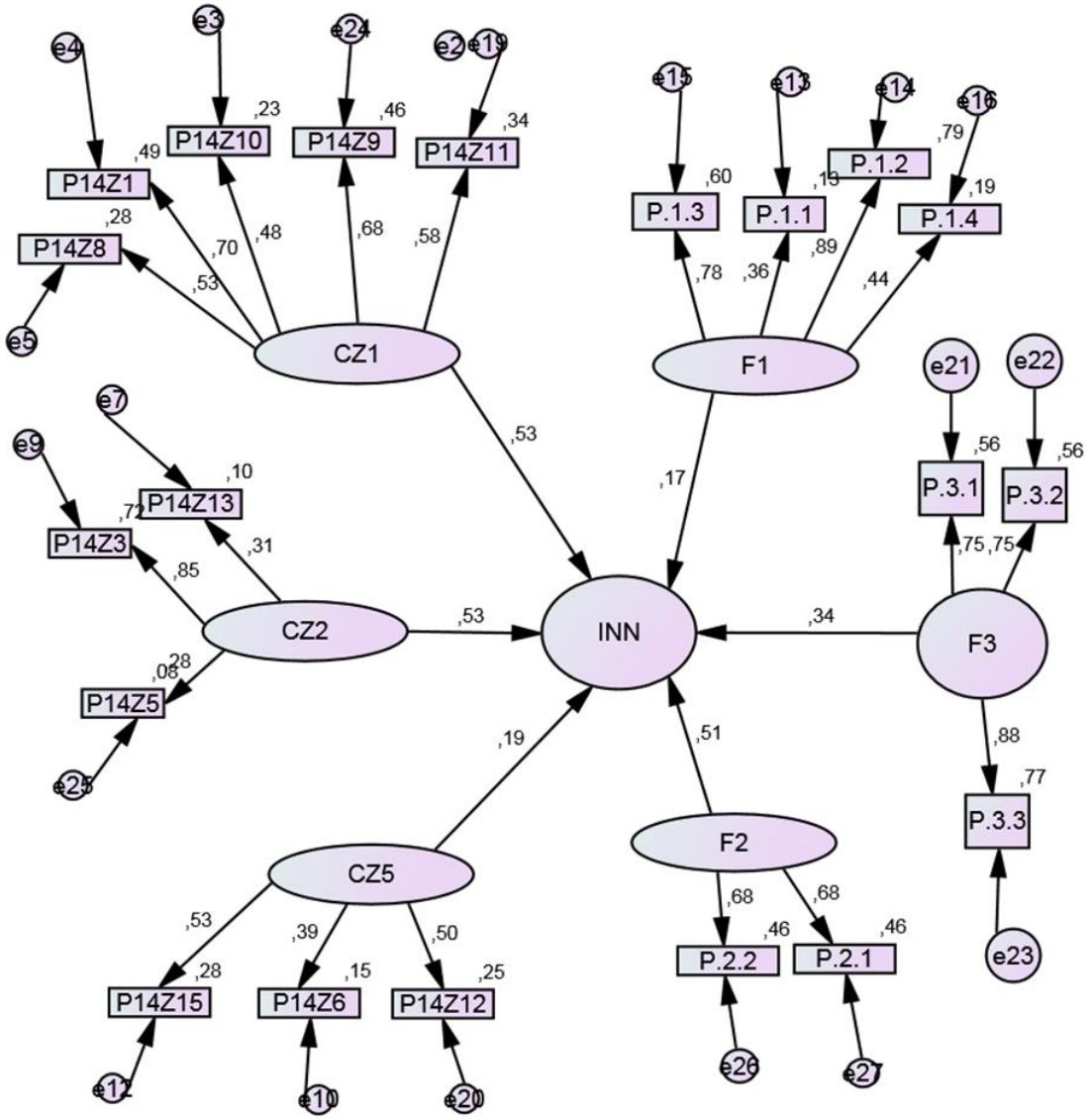


Figure 2. MODEL - The impact of potential strategic management-related factors on the innovativeness of enterprises.

Source: Own elaboration based on the results of the carried-out research (N = 180), with the use of the IBM SPSS Statistics AMOS software.

A comparison of the quality assessments of the estimated model with the assessments of the saturated model (best) and the independence model (worst) facilitates a general assessment of quality of the estimated model. In light of the indicators adopted for assessing the model, we assume that the model is sufficiently matched.

In the MODEL (Figure 2), in the framework of the measurement models there are relatively strong and statistically significant relationships - between each of the exogenous variables (CZ1, CZ2, CZ5) and the primary variables explaining them. We also have to positively interpret the relationship between the innovativeness of an enterprise (the endogenous latent variable) and its factors F1, F2, F3 (the adopted measures of innovativeness), explained by the observable variables describing the innovativeness of the enterprise.

The structural model refers to the main problem of modeling, i.e., the potential impact of strategic technological factors on the innovativeness of enterprises, reflecting the causal relationships between each of the factors: CZ1, CZ2, CZ3 and the innovativeness of an enterprise.

Phase 4. The analysis of the relationships leads to the conclusion that the factors with the most significant positive impact on the innovativeness of enterprises include: CZ1 – "Managerial competencies of the company's executives in the implementation of innovation strategies, human resource management and building trust-based relationships" (path coefficient 0.53) and CZ2 - "Openness to innovation" (path coefficient 0.53). On the other hand, there is a causal relationship between factor CZ5 - "Company management personnel that is stable and exhibits a positive attitude towards research and development works" and the innovation of enterprises, but it is much weaker (path coefficient 0.19) than in the case of factors CZ1 and CZ2 (Figure 2).

On the basis of the obtained results, we should therefore assume that in the area of management factors**, the strategic factors of the innovativeness of enterprises**, that is, the factors that have the most significant positive impact on innovativeness in the strategic perspective, include:

- **CZ1 - "Managerial competencies of the company's executives in the implementation of innovation strategies, human resource management and building trust-based relationships"**, explained by following variables: *implementation of a development strategy based on (product, process, organizational, marketing) innovation, effective use of the workers' key (most important for the company) competencies, having a bonus system rewarding employees for innovation, building trust-based relationships, inspiring employees to seek new solutions,*
- **CZ2 - "Openness to innovation"** , described by the explanatory variables: *development based on the realization of the idea of open innovation, prioritizing innovation in the company, familiarization of employees with the development strategy based on innovation.*

In the case of factor CZ1, the variables most important for its description included: Z1 - *implementation of a development strategy based on (product, process, organizational, marketing) innovation* (path coefficient 0.70) and Z9 - *effective use of the workers' key (most important for the company) competencies* (path coefficient 0.68). The indicated primary variables explain the largest percentage of variance: 49% and 46%, respectively.

The analysis of the relationship between factor CZ2 and its explanatory variables shows that variable Z3 - *development based on the realization of the idea of open innovation* has the greatest significance for its description, reflected with a path coefficient of 0.85. This variable explains the variability of factor CZ2 to the greatest extent (72%).

Conclusions

Innovation, as a multidimensional phenomenon, requires a comprehensive approach at every level of enterprise management. The adoption of a strategic perspective implies the recognition of innovation as a condition of competitive advantage.

In the light of the research results presented in the article – strategic factors of innovation of enterprises in the area of management concern, on the one hand, managerial competences of the executives in the implementation of a development strategy based on (product, process, organizational, marketing) innovation, as well as the effective use of workers' key competences, motivating and inspiring workers to seek new solutions, building trust-based relationships. On the other hand, these factors are related to the openness of innovation processes, based on the *Open Innovation* model and the priority treatment given to innovation in the enterprise.

These factors should have priority in managing the development of an innovation-oriented enterprise. Recommendations for managers are listed below:

1. Small and medium-sized enterprises should strive to develop and then implement and monitor their own innovation strategy. However, a strategy alone is not in itself a sufficient condition for achieving market success.
2. It is also necessary to develop competences in the management of human resources that enable both their efficient utilization and the skillful development of these resources. One important element of human resources management are effective incentive schemes, successfully rewarding employees who are creative and involved in the development of product, process, organizational, and marketing innovation.
3. It is very important to build relationships based on trust both at the team level and between the management personnel and the employees. Trust is a prerequisite for effective management of innovation in an enterprise.
4. Small and medium-sized industrial enterprises should be open to innovation. The adoption of the idea of open innovation will allow for activity in the scope of centripetal, centrifugal, and mixed processes, based on cooperation with other entities. In order for such plans to be implemented, it is necessary for the enterprise's own unique innovation strategy to be known to the employees and accepted by them.

These recommendations are confirmed by the views of contemporary researchers. Currently, innovations and the attitude towards innovations to a great extent determine the positioning of companies. Implementation of an innovation strategy is supplemented with the processes of transforming and renewing content and use of various resources, and with a redesigning of the existing business processes, subject to novelties in managing and forming the organizational structure of the company. These transformations imply a transition from the innovation strategy to implementation of the innovation project (Krall, Janoskova, 2020).

Researchers emphasize the importance of trust for innovation. Having a human-centered focus throughout the innovation implementation process is thus understood as equally important for enhancing trust and the pace of innovation adoption, as the innovation itself (Mitcheltree, 2021). The idea of Open Innovation is still valid and recommended for enterprises. It is the subject of research and analysis justifying its importance for the implementation of innovative processes in an enterprise. Various types of strategies based on the idea of Open Innovation are also proposed, which are supposed to lead to increases in enterprise innovativeness (Pihlajamaa, 2021).

The presented recommendations for managerial practice, derived from the carried-out research and analyzes, indicate the way in which managers should stimulate the growth of enterprise innovativeness. In the opinion of the author, the implementation of the indicated recommendations by managers should promote the growth of innovativeness of small and medium-sized industrial processing companies. Higher levels of enterprise innovativeness will contribute to the closing of the gap between Poland and the EU's most innovative countries.

One limitation of the discussed studies is the nature of the adopted research project, which does not allow for the generalization of the results as purposive sampling eliminates the assumption of statistical representativeness. The topic of strategic factors of enterprise innovation remains an open question and requires further studies. The research procedure and the results of the studies presented in the article could provide inspiration as well as a basis for comparisons for such further research. These studies should be renewed and continued, i.e., by expanding the set of internal factors (primary variables) of the innovativeness of enterprises in the area of management in the age of transformation of enterprises towards Industry 4.0.

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