

Innovativeness in Enterprise Strategies Value Creation and Innovation Multidimensionality

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Abstract

This article focuses on the issue of innovation within enterprise strategies, with a particular emphasis on the value-creation process and the multidimensional nature of innovation. To analyze this, the focal point was the overall structure of business operations, with a particular emphasis on the involvement of employees. It was also noted that economic entities are subject to generic, market, and HR conditions.

The main objective of this article is to highlight the relationships between innovation within enterprises and the conditions under which they operate. This includes the challenges faced by employees in generating creative and innovative ideas and implementing new solutions. Two research hypotheses were put forward in this article. The first hypothesis, H1, assumes that a company's overall profile is a crucial determinant in creating value through innovation within organizations. The second hypothesis, H2, assumes that market requirements in terms of creating customer value will drive employees to implement innovation defined in the company's strategies. The importance of open innovation in business strategic decisions was also highlighted. Using statistical methods, these hypotheses were verified through a survey conducted in various enterprises.

Keywords

Innovativeness; Strategy; Closed innovation; Enterprise value creation; Multidimensionality of innovation.

Introduction

The problem issue of innovativeness in enterprise strategies is the subject of many different theoretical concepts and empirical research. Theoretical concepts considered in the management and quality sciences primarily concern the strategic dimension since the innovativeness of enterprises is an important decision-making issue in the long-term perspective of the company's market operation. The market, affecting the strategy of enterprises, provides opportunities for survival, while simultaneously allows allowing for the sustainable and harmonious development of economic entities. These entities, inspired by the market laws, are obliged to introduce innovative projects as the consequences of consumer expectations. Their objective is to answer the question concerning the way of creating value for potential customers. Equally important

is the question of how the enterprise will gain some of the value, generated by the innovation implemented.

The responses to such questions require incorporation into the company's innovation strategy. On the other hand, innovativeness requires the creativity of staff providing the company with the implementation of new concepts and thinking about the future of the organization. The strategic concept then makes it possible to create value for customers as a consequence of innovative activities.

For the implementation of new concepts, the following are important: generic structure of enterprise activities as well as types of implemented innovation. The division of enterprises into production, service, and production-service companies enables the adjustment of innovation to particular types of enterprise activity. In the second classification, when distinguishing innovation types, i.e., open and closed innovation, it is justified to define the conditions and challenges to implement the above innovation types.

The processes of creating innovative concepts in enterprise strategies, and their implementation in practice require the activity of employees who, identifying customer value creation, accomplish the objectives of economic entities.

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Innovation in enterprise strategies and value-creation processes

The strategy of enterprises subjected to the analysis in terms of innovativeness requires considering very important challenges facing economic entities. Innovation determining the existence and development of enterprises stands out among these challenges. The literature deals with the complexity of the innovation issue by discussing various concepts in terms of its essence, relations, and condition of the organization, i.e., its stability and variability. The innovation strategy contains long-term thinking about the factor increasing "... opportunities not only for survival but also for sustainable harmonious development" (Mączyńska, 2020). The company's use of opportunities is possible due to innovative activities based on the paradigms of modernity defined within the organization strategy implemented in management processes.

In management, the strategic nature of innovation aims at the creation, organization, exchange, and sharing of intellectual resources in the process of organizational development.

It is then justified to refer to the company's innovation strategy incorporated into management mechanisms. Their essence can be identified with the three levels of management. The first one is the level of risk and experiment generating innovation. Responsibility for the effective commercialization of innovation focuses on the second level. The third level is responsible for generating income from innovation (Niemczyk et al., 2016).

Strategies and innovations can also be analysed in the multidimensionality context, taking into account risk. The risk concept in innovative activity can be identified with the uncertainty of achieving positive results in the enterprise operations when the management and employees implement product, technological, and organizational changes. Risk is loss probability as a result of a threat (Regan, 2003).

The idea of uncertainty as an inherent feature of the enterprise's activity resulting from its complexity and based on the integration and synergy of tangible and intangible resources in economic organizations operating in the external environment. This type of environment often eludes precise rules and requires decisions to be made by the enterprise's human resources.

The term risk refers then to decisions and, in more detail, to steps undertaken in decision-making processes. Regarding decision risk, the emphasis should be on the dimension of uncertainty in the enterprise's operations and the management staff's propensity

towards making decisions with a high level of risk. Therefore, decisions to implement innovations belong to the group of management activities that require specific risk analysis. The risk problem in innovative activity significantly extends the multidimensionality of enterprise analyses. Furthermore, K. Jajuga and T. Jajuga (1995) in their approach to risk in investments, highlighted its importance and substantive complexity. Expanding upon the risk problem may be the subject of absorbing but separate research Jajuga & Jajuga, (1995).

The research by I. Steinerowska-Streb and T. Kraśnicka (2022) elaborated on the possibility of assessing the attitude of the managerial staff towards undertaking high-risk projects. The data showed that nearly 45% of managers are supporters of high-risk projects, while approximately 26% undertake low-risk projects (Steinerowska-Streb & Kraśnicka, 2022). If we assume that the above behaviour can also be referred to as the decisions of the managerial staff in innovation, which are generally made under conditions of uncertainty, then enterprises should aim at increasing the pro-innovation activity of managers. Preferring greater activity in the field of innovation should be reflected in the strategies of enterprises, defining the long-term goals of innovation, means and methods of their implementation, including tasks performed by the enterprise's staff.

Their source is the acceptance of modern products by the market. The basis for the innovation strategy is an increase in consumer requirements in terms of presented needs (De Luca & Atuahene-Gima, 2007). Due to growing consumer expectations, producers modernize manufacturing processes, implement innovative solutions and present new offers in the market (Nogalski & Niewiadomski, 2019). Innovative offers are the consequence of implementing an appropriate strategy in enterprises (Surowiec, 2018).

Pisano (2015) believed that innovation strategies should respond to the questions: In what way will innovation create value for potential customers? In what way will the company acquire some of the value generated by its innovation? What types of innovation will allow the company to create and register value and what resources should be addressed to the company to create value? (Pisano, 2015).

The above questions indicate direct relationships between innovation in enterprise strategies and value-creation processes.

The essence of the above processes is expressed by the view that the company "... engaged in the innovation process wants to create or maintain value. Value is, therefore, the implicit goal of innovation, but cannot be guaranteed ex-ante because the out-

comes of innovation are uncertain and heterogeneous' (Wojnicka-Sycz, 2021). Consequently, the problem of innovation risk needs to be taken into account in the strategy of enterprises.

Business entities in the innovation strategy, using the resources and competences of the organization, create a new market offer, which in a successful situation provides the company with great value. The idea and innovation are therefore about generating value as the goal of innovation is to improve and increase the provision of overriding importance and the highest value to the customer while making it relevant, different, or new and valuable from the customer's point of view (Soltysik, 2021).

As a result of innovation, customers get the benefits of tailored products to their individual needs. Thus, the efficiency of the company's operation increases thanks to innovative activity in solving many customer problems formulated in strategic perspectives (Gebauer et al., 2013). Then it is reasonable to simultaneously conduct a structural analysis of the market offer, which is the result of production, service, or production and service activities. The structure of activity requires diversified resources to create values defined in innovation strategies.

In innovation strategies in the area of value creation, it is necessary to simultaneously emphasize the generation of value with its capture. The value creation will not translate into profits for the company that cannot capture a significant part of it. Theoretically, it is assumed that value is created along with the development of innovative products that meet the extreme requirements of consumers. However, the economic practice provides evidence that there is a process of eliminating innovators by competitive enterprises whose share in creating value was small in many situations. Economic entities – creators of innovation – should therefore take into account innovation strategies not only the processes of creating value but also its potential capture. In the context of capturing value, important tasks are assigned to the management staff, which should have the following skills: identifying opportunities and threats from competing entities, assessing resources to coordinate existing opportunities, and resource integration to create organizational capabilities (Dyduch & Bratnicki, 2015).

Value can be considered in two aspects. One of them is the value for the customer, the other is the value for the company. In the first aspect, the company undertakes activities to generate a product characterized by the highest value for the customer due to success in the competitive struggle (Hisrich & Ramadani, 2017). The second aspect is determined by the company's need to obtain appropriate material and intangible

resources from the environment for its proper functioning.

Given this consideration, it is essential to emphasize the importance of motivation systems in creating and capturing value in relation to the strategic tasks of the managerial staff.

It should be pinpointed that the implementation of strategic tasks requires the creation of appropriate conditions. To create innovative conditions, the enterprise needs creativity and execution. In fact, the number of management components in the system requires logical integration with soft factors playing an important role in the strategy. The strategy in terms of innovation determines a significant role of the company's staff.

Their role in the area of innovation is focused on (Leśniak-Łebkowska, 2020):

- new concepts and ambitions,
- entrepreneurship,
- volatility (flexibility of attitudes),
- openness to thinking about the future of the organization,
- readiness to eliminate threats and future good education,
- to stop trying to know everything and become a professional,
- to stop bad ideas.

Moreover, some efficient and effective decision-making systems in terms of innovation are necessary for the organizational strategy, and they concern (Gigol, 2018).

- recruitment of candidates for work, displaying creative predispositions,
- incentive scheme for innovators,
- organizational culture in terms of innovativeness,
- organizational structure, directed to innovativeness,
- implementation works of unusual new projects developed by managers,
- free and creative flow of information,
- building the principles of identification with the organization.

The above challenges, pointing to the diversity of innovative activities, in relation to the organization, consequently require: availability in terms of new concepts and entrepreneurship, thinking about the future of the organization. It is also important to eliminate threats using the flexibility of employee attitudes. Then, the organization may implement tasks in terms of value creation.

Task performance is determined by the conditions for the implementation of the innovation strategies concerning (Soltysik, 2021):

- ensuring the coherence of innovation systems with the implemented overall strategy of enterprises,
- building relations of innovation subsystems with other subsystems of the organization enabling the creation of synergy effects from innovative activity, indicating the impact of the motivation subsystem on the innovativeness of enterprises,
- focusing on improving the entire organization's efficiency, especially in the value area.

The research into innovation's role in customer value creation indicates the possibility of hierarchization of the areas of inspiring new values. Among the areas of major importance, the following were distinguished (Bartkowiak, 2016):

- the openness of the company's managers to the concept of extending the offer as a result of cooperation with stakeholders in the field of production and service activities,
- open innovation enabling the company's development and value creation,
- an increased level of customer satisfaction as a result of the joint integrated offer of the enterprise and customers,
- an opportunity to identify the sources of competitive advantage by co-creating value for customers in products and services.

However, it should be also pinpointed that the distinguished hierarchization of innovative creativity shows close integration with the type of enterprise activities. It is particularly possible to relate innovation to production, service, or production-service companies. The above reference point allows for the formulation of Hypothesis H1 that the generic profile is a relevant determinant of value creation as a result of innovation in organizations.

Innovation processes are multi-dimensional. The multidimensionality of innovation was therefore the basic premise for searching for significant relationships. In addition, the development and implementation of innovations pose a challenge for employees. Generic differentiation of business activities affecting innovation is one of the issues of management and quality sciences.

The second issue focuses on indicating the inspiration of close cooperation of individual company resources, which are bound to be effective in the implementation of innovative goals.

However, this requires the company's staff's creative involvement in implementing innovation, consequently enabling the creation of new values (Daniluk, 2018). The reference to this relationship is the statement that innovation is a driver of value for customers (Wang & Kafouros, 2009). Therefore, it is possible to formulate Hypothesis H2 that market requirements

in terms of the need for customer value creation activate staff to implement innovation defined in enterprise strategies. Value creation in organizations diversified in terms of the activity type requires therefore appropriate creativity and innovative efficiency (Ejdys et al., 2015). Efficiency in the value creation strategy indicates the need to search for new areas of operation of innovative activities in enterprises. Innovative activities are the result of the involvement of a large group of employees who identify themselves with the constant need to improve their knowledge (Olko & Wodarski, 2019). The company's strategy means that knowledge at some managerial positions requires the dominance of innovation underpinned by the perfection of routine activities, while in others the concentration of standard activities, the selection of which is the result of the former. Knowledge improvement processes enable the implementation of innovations of a diverse nature resulting primarily from the multidimensionality of new projects generated in the enterprise.

Open innovations in strategic decisions of organizations

Innovation constituting a complex problem in enterprise management requires ontological considerations. Innovation affects the company's strategic decision-making processes (Dyduch, 2013). "In the suggested division of open innovation activities one can thus distinguish between sourcing activities, market path (commercialization), and shared innovation" (Öberg, Alexander, 2018).

In the processes of innovative decisions, as a result of the company's strategy, it is required to indicate the issues of multidimensionality. A broad spectrum of innovation in enterprise strategies determines the problem of multidimensionality. Assuming that the strategy should create the highest value for the customer due to the implemented innovations is the basis for considering multidimensionality. Two dimensions of innovation were consistently indicated. One of them is managing customer value.

The innovation strategy then requires three emerging perspectives in the area of managing customer value. The following stand out among them: managing customer engagement, customer networks, and customer experience (Schmitt et al., 2011). In terms of management, in the first perspective, the progressing processes of consumer relationality, and especially new media forms, influence the behavior of customers who formulate requirements toward enterprises. Their

task is the need to take into account the changing requirements of consumers in the strategies of the organization. The second perspective on managing customer networks fits into the above context. The dissemination of the internet has increased the information base in the field of purchasing products, creating strategic areas of business activity. The third perspective based on customer experience sets the basic conditions for many enterprises. They include global solutions found in corporate missions (Verhoef & Lemon, 2013; Kumar et al., 2010).

The second dimension is a consequence of the increase in the importance of innovation in the last few decades, in which changes in the model of the innovation process took place. The nature of changes since the 1950s included: supply, demand, interactivity, networking, and openness (Rothwell, 1992).

In the concepts of innovation, taking into account the criterion of openness, two basic types of model approaches are distinguished. The first of them is the closed innovation model based on the theory of using only the company's own resources while maintaining the principles of strong protection against competitive entities and continuous control. The above model can be implemented only in large and highly profitable enterprises that have funds allocated for innovative activities. For the characteristics of closed innovations, several principles must be applied by organizations focused on this type of innovation. These rules include (Kozioł-Nadolna & Suchocka, 2020):

- employing the best staff with predispositions for creative solutions;
- enabling employees to implement original ideas in the area of creating new products,
- independent creation of innovations in the enterprise ensures the market primacy effect,
- the company introducing innovations to the market as the first usually benefits from the winning position,
- allocating maximum R+D expenditure by the company should result in the best and the largest number of concepts setting up a given organization as a market leader,
- there should be continuous control in the field of intellectual property in the enterprise to root out the capture of profits (value) by competitors.

Closed innovation is a traditional pattern of innovation. In this traditional view, companies necessarily consider the innovation phenomenon to be an endogenous phenomenon and emphasize the need for the company to control the innovation process (Zhuang & Zhao, 2020).

In the assessment of closed innovations, it is emphasized that an important problem is the tightness

of the company's borders in the area of knowledge transparency, which affects the fact of limiting the outflow of innovative concepts outside the company where the systematic elimination of ideas is carried out. The subsequent stages of verification of ideas mean that many of them will not become the subject of a wider discussion on the market (Kozioł-Nadolna & Suchocka, 2020). Prospects for developing these concepts are closed by employees who assess some ideas as non-developmental and redundant with a simultaneous decision to end innovative work on poorly evaluated projects.

To extend the analyses of the essence of the above innovation types in the strategy of enterprises it is justified to take into account the level of differentiation in the degree of formalization of cooperation between organizations (Lember et al., 2019). The low level of formalization causes the flow of knowledge to be limited and results in a lower number of open innovations. The opposite situation occurs with the high level of formalization of cooperation of enterprises, organized in value chains or other network forms.

The flow of knowledge, based on a high level of openness, results in a wide potential for the implementation of open innovation in organized network structures.

Formalized network structures create the premises for the selection of strategies directed to the absorption of open innovation (Ruijie et al., 2020). Extending the problems of the above innovation is possible by distinguishing the forms (Sopińska & Dziurski 2018):

- centripetal, with the dominant process of the flow of knowledge from the environment to the enterprise,
- centrifugal, in which the process of the transfer of knowledge from the enterprise to the environment dominates,
- mixed, characterized by the flow of knowledge as a result of the cooperation of organizations creating business networks or strategic alliances.

The closed model of creating innovation is characterized by the activities of the impact of knowledge and ideas considered by the enterprise to be of little value or there is currently no potential for their implementation. The above nature of activities was considered to be the cost of conducting research and development activities (Sopińska & Dziurski 2018). However, generated innovation success is important Brzóska and Knop (2020). It is assumed that the success of open innovation requires the adoption of an interdisciplinary strategy (Dahlander & Gann, 2010).

In relation to the strategic aspect, one should agree with the concept by Sopińska and Mierzejewska (2017), which is based on the statement that

“... within the framework of open innovation, in their activities, enterprises should increasingly use external ideas and technologies and allow other enterprises to use not implemented own ideas” (Sopińska, Mierzejewska, 2017). The authors, examining the above problem, indicate that the initiative to create open innovation in Poland is undertaken by the enterprises concerned. External entities are primarily engaged among suppliers and customers. The participation of other entities, such as scientific and research institutions, network structures, or local government can be described as insignificant (Sopińska, Mierzejewska, 2017). In these operations of entities, the multidimensions of cooperation concerning external subject relations, impulses of new concepts, and places of innovation are important (Heinonen & Strandvik, 2021).

The diffusion of innovation and technologies from abroad, extending the model approach in open innovation, is significant (Pyka, 2020). Moreover, the studies by Pellegrino and Piva (2020) indicate that innovative partnership plays a very important role in the company's development.

The rank of problem concerns open innovation in technologically advanced industries. Open innovation is then treated as an appropriate instrument to replace internal competences (Pellegrino & Piva, 2020). Competence and knowledge properly identified in the strategy ensure the success of innovation in the company (Sliwińska & Stobiecka 2021). Some very interesting concepts are presented by S. Philipson, who distinguished 10 phenotypes in the company's strategy, concerning cooperation in terms of innovation with other organizations (Philipson, 2020). The characteristics of individual phenotypes illustrate the essence, features, and subjects of cooperation within the company's strategy. The role of the customer, supplier, and other cooperating organizations was distinguished, particularly in the context of open innovation. This type of innovation provides the basis for creating value for customers, predicted in the company's strategy.

Strategic decisions in enterprises require considering customer satisfaction with solving their problems, especially by acquiring value (Niemczyk et al., 2016). The ongoing change in the role of the customer from a passive buyer to the prosumer formulating their expectations in terms of the value of the purchased goods creates new challenges for innovative activities, including particularly open innovation. This innovation placed on certain levels of management processes extends the decision-making space, including new organizational structures of entities cooperating within the framework of open innovation (Seroka-Stolka, et al. 2017).

The effectiveness of innovation requires the commitment of managers and employees in the process of constructing the company's strategy. Operational decisions allowing the implementation of the adopted strategies through relevant management processes to increase value are equally important (Jaki & Rojek, 2022). To assess the relationships in terms of innovativeness in the subject concerned, the pilot empirical study survey of enterprises was carried out, and presented in the subsequent part of the study.

Methodological procedure of the research into the innovativeness of enterprises in terms of multidimensions

Defining the subject of research was an important research problem. Given that closed innovations can be implemented in large and highly profitable enterprises, and the surveys were addressed to the sector of micro, small, and medium-sized enterprises, the choice of open innovations as the subject of research was fully justified.

250 questionnaires were sent to micro, small, and medium-sized enterprises in the Silesian Voivodeship in 2022. 161 completed questionnaires were returned.

Research on the innovativeness of enterprises requires an appropriate research procedure. Its bases account for the objectives and hypotheses adopted in this study.

The starting point is to define the paradigm, which was drafted in the form of a statement that innovation in the strategy of enterprises enables value creation. The level of value creation is determined by the generic structure of enterprises and the involvement of the staff of business entities. The generic variety of activities as well as the scale of involvement are the basic problems subjected to empirical research – pilot studies to verify research concepts. The verification was carried out using a methodology implemented in stages in the context of multidimensionality.

The first step was to define the subject of the research. In the second stage, a questionnaire was assumed to be a research tool. The third stage identified the questions in the survey. In the fourth stage, data from the surveys were aggregated and a preliminary analysis was performed. The fifth stage made it possible to choose the statistical method, which was used for analyses, results, and verification of hypotheses.

The above methodology made it possible to carry out research in the area of verification of hypotheses, constituting a premise for pilot empirical research (Figure 1).

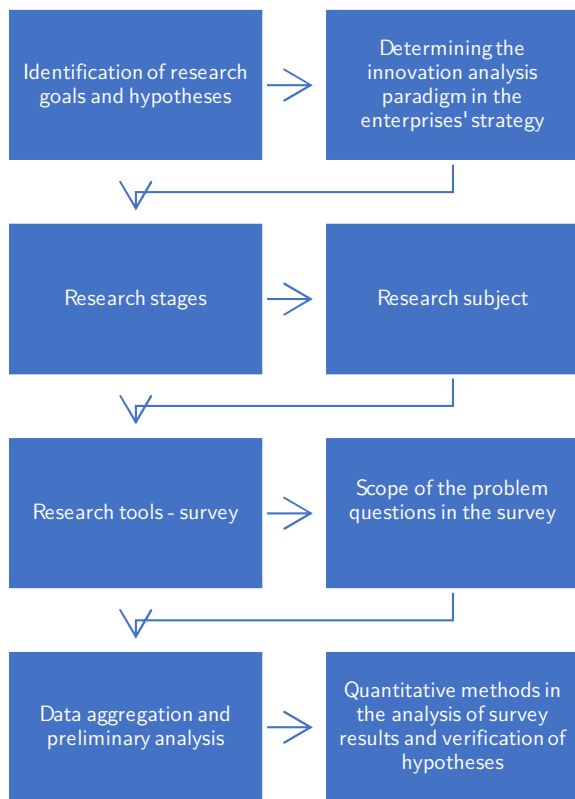


Fig. 1. Scheme of proceeding in the research process
Source: own study

The research employed the Kruskal-Wallis non-parametric test method for independent groups. This test was applied to qualitative data that are expressed on an ordinal scale. This is a limitation to the adoption of an alternative parametric test. In addition, the test does not require the normality of the distributions of the studied groups.

The procedure was conducted in three steps:

1. Study of the significance of differences using the Kruskal-Wallis test.
2. Conducting a selected post hoc test to verify between which pairs of variables there is a significant difference in means, only for variables with 3 categories.
3. Analysis of numbers and graphs to indicate exact differences between selected pairs of variables.

For the purposes of the study, the following research hypotheses were defined:

Research hypothesis H1: The determinant of differentiation of the level of innovativeness of enterprises is the type of their activities (production, services, or production and services).

Research hypothesis H2: Market requirements in terms of the need to create value for customers activate staff to implement innovation defined in enter-

prise strategies. In their area, open innovation plays a significant role¹.

For the purposes of the research, the following variables were defined:

1. Dependent variable – the level of innovativeness (question 2) – the quantitative variable, where 1 means no innovation and 5 – a very high level of innovation
2. Independent variables, i.e., grouping:
 - nature of activities – the nominal variable with three categories, where 1 – production company, 2 – service company, and 3 – production and service company;
 - activities of management staff in innovation creation processes in the company (question 3) – a binomial variable expressed on a nominal scale Yes/No;
 - activities enabling an increase in innovation, conducted by the company’s employees (question 4) – a binomial variable expressed on a nominal scale of Yes/No;
 - most important skills – a multiple-choice variable expressed on a nominal scale (question 5);
 - type of implemented innovation (question 6) – a binomial variable expressed on a nominal scale, where 1 – open innovation, 2 – closed innovation;
 - using the incentive scheme in the company’s strategy – a binomial variable expressed on a nominal scale of Yes/No.

Verification of Hypothesis H1

To test the hypothesis about the difference in the level of innovativeness broken down by the nature of the company’s activities, the non-parametric Kruskal-Wallis test for independent groups was carried out. This test is based on the ranks of observation (Table 1) and is expressed by the formula (<https://www.statystyka.az.pl/test-anova-kruskala-wallisa.php>):

$$T = \frac{12}{n(n+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(n+1) \quad (1)$$

where: R_i – the sum of ranks in the i -th group, n_i – the size of the i -th group, n – total size of all groups.

¹Comment: In questions 3, 4, 6, and 7, the option of “I have no opinion” was removed from the further research. This indication may serve for the research into the knowledge/lack of knowledge of the respondents concerning the strategy, it will not be useful here. Questions 2 and 6 repeat in terms of the lack of innovation, therefore, option 3 for question 6 is not taken into account in question 2.

Table 1
Mean ranks for the observation of the level of innovativeness

	Nature of the company activities	N	Mean rank
Level of innovativeness	Production company	78	57.67
	Service company	17	35.71
	Production and service company	10	46.00
	Total	105	

Source: Own study based on the survey data

In the surveyed group, the vast majority are production companies, followed by service and production and service companies (Table 2).

Table 2
Test value results

Kruskal-Wallis H	8.651
df	2
Asymptotic significance	0.013
Median	3.000

Source: Own study based on the survey data

The significance $p = 0.013$ amounts to less than 0.05, which means that the obtained result is statistically significant. This allows the rejection of the null hypothesis that there are no differences between the studied groups of enterprises. There are significant differences in terms of the level of innovativeness between the examined groups.

To find out which pairs of mean ranks significantly differ from each other, the post hoc test was conducted. Due to the lack of variance homogeneity, small

sample size, and inequality of the groups studied, the Games-Howell test was chosen for further research with these pairs of variables. The test results are included in Table 3.

The pairs of the compared grouping variables are marked with the letters I and J. It is observed that a statistically significant difference in terms of the level of innovativeness occurs only between the groups of production and service companies ($p < 0.05$). A positive difference in mean ranks indicates that the first mean rank is higher than the other. To learn their exact values, it is necessary to analyze the sizes concerning the studied variables (Table 4).

Table 4
Size of individual groups assessing the level of innovativeness of enterprises diverse generically

Level of innovation	Type of activity			
	Production company	Service company	Production and service company	Total
No innovation	5	1	1	7
Low	11	7	3	21
Average	30	8	3	41
High	27	1	3	31
Very high	5	0	0	5
Total	78	17	10	105

Source: Own study based on the survey data

Production companies differ from service companies in terms of an average and high level of innovativeness. Smaller differences between these groups occur with no innovation or its low or very high level.

Table 3
The Games-Howell test results

(I) Question 1	(J) Question 1	Mean difference (I - J)	Standard error	Significance	95% interval	
					Lower limit	Upper limit
Production	Service	0.67572*	0.20668	0.007	0.1668	1.1846
	Production and service	0.40513	0.34512	0.491	-0.5245	1.3347
Service	Production	-0.67572	0.20668	0.007	-1.1846	-0.1668
	Production and service	-0.27059	0.37006	0.749	-1.2376	.6965
Production and service	Production	-0.40513	0.34512	0.491	-1.3347	0.5245
	Service	0.27059	0.37006	0.749	-0.6965	1.2376

Source: Own study based on the survey data

Moreover, production companies indicate a high level of innovativeness more often than service ones.

Based on the box plot (Figure 2), one may distinguish homogeneous groups in terms of the level of innovativeness: the groups of production companies and production and service ones (A) and the group of service companies and production and service ones (B). These are not however completely separated groups since production and service companies belong to both groups. Group A is enterprises that assess their level of innovativeness as relatively high, in turn, enterprises from Group B rate this level more often as average.

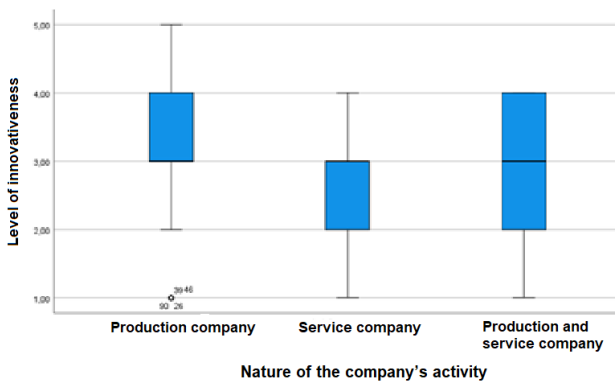


Fig. 2. Box plot of the distribution of the value of the studied groups of managerial activity. Source: Own study based on the survey data

It should be assumed that production companies declare an average or high level of innovativeness of activities implemented in their entity significantly more often than service companies. This may be due to the more resource-intensive nature of production companies and the related technical and technological solutions implemented.

The verification of Hypothesis H2 – to test the hypothesis on the impact of market requirements in terms of customer value creation on innovative activation of enterprise staff in the perspective of the strategy. Open innovation is particularly important within its framework. The non-parametric Kruskal-Wallis for independent groups was carried out (Table 5).

The studied groups are not equinumerous. Over 60% of indications are positive responses (Table 6).

The significance $p < 0.001$ proves a high level of statistical significance of the tested relationship. This allows for the rejection of the null hypothesis that there are no differences between the studied groups in terms of the commitment of management staff. There are significant differences between the examined groups in terms of the level of innovativeness of the enterprise.

Table 5
Assessment of managerial activities in the processes of creating innovativeness

		Frequency	Percentage	Percentage of valid	Cumulative percentage
Valid	yes	65	61.9	68.4	68.4
	no	30	28.6	31.6	100.00
	total	95	90.5	100.0	
No data	Systemic data gaps (category: I have no opinion)	10	9.5		
Total		105	100.00		

Source: Own study based on the survey data

Table 6
Test value results for the level of innovativeness depending on staff activities (question 3)

Kruskal-Wallis H	40.192
df	1
Asymptotic significance	< 0.001

Source: Own study based on the survey data

The post hoc tests are not carried out for groups of categories smaller than three. Due to the two categories of the independent variable managerial activity, it was sufficient to use the box plot to assess the differences between the groups.

Based on the box plot (Figure 3), it is possible to distinguish two homogeneous groups in terms of the

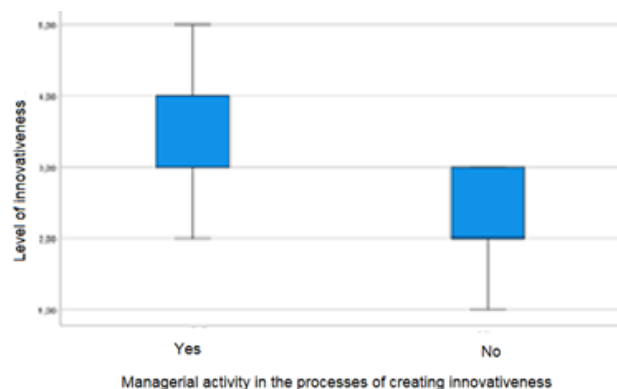


Fig. 3. Box plot of the distribution of the value of the studied groups of managerial activity Source: Own study based on the survey data

level of innovativeness: the group of enterprises with a high level of innovativeness, in which management staff are involved in innovation processes (A), and the group of enterprises with a low level of innovativeness, in which management staff take such actions at a lower level (B). The entities where staff are involved in innovation processes have a higher level of innovativeness.

Based on the cross table (Table 7), it is observed that, in companies where management staff are involved in innovation activity, the level of innovativeness of enterprises is average or high, in turn, in companies where such activity is not observed, the level of innovativeness is at most average. Therefore, it should be assumed that the commitment of management staff to innovation processes has a significant impact on the level of innovativeness of the company, determined in the strategy.

Table 7

Sizes of individual groups assessing the impact of activation of management staff on the level of innovativeness

Level of innovativeness	Activity of management staff		
	Yes	No	Total
No innovation	0	4	4
Low	3	13	16
Average	26	13	39
High	31	0	31
Very high	5	0	5
Total	65	30	95

Source: Own study based on the survey data

In addition to the commitment of management staff, the involvement of other employees in activities enabling an increase in entity innovation is also important. For this purpose, the significance of the differences between the studied groups was verified, i.e., employee activity towards innovation and its lack and the level of innovativeness (Table 8).

The surveyed groups are almost equivocal. Negative indications constitute slightly more indications (Table 9).

Testing the mean ranks with the Kruskal-Wallis test showed a strong statistical significance for the studied groups. This means that there are significant differences in terms of the level of innovativeness of the enterprise between the surveyed groups, i.e., employee activity and its lack in the company's innovation activities.

Table 8

Assessment of employee activity in pro-innovation activities

		Frequency	Percentage	Percentage of valid	Cumulative percentage
Valid	yes	42	40.0	47.7	47.7
	no	46	23.8	52.3	100.00
	total	88	83.8	100.0	
No data	Systemic data gaps (category: I have no opinion)	17	16.2		
Total		105	100.00		

Source: Own study based on the survey data

Table 9

Test value results for the level of innovativeness depending on employee activity (question 4)

Kruskal-Wallis H	50.800
df	1
Asymptotic significance	< 0.001

Source: Own study based on the survey data

Due to the two categories of the independent variable, which employee activity is, to assess the differences between the groups, it was sufficient to use the box plot.

Based on the box plot (Figure 4), one may distinguish two homogeneous groups in terms of the level of innovativeness: the group of enterprises where employees are involved in innovation processes in enti-

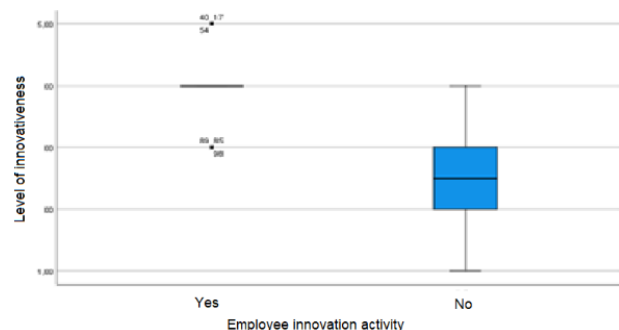


Fig. 4. Box plot of the distribution of the value of the studied groups of employee activity
Source: Own study based on the survey data

ties. These are entities with a high level of innovativeness (A) and the group of enterprises with a low level of innovativeness, in which employees are not involved in such activity (B). The cross table was used for accurate observation (Table 10).

Table 10

Size of individual groups assessing the level of innovativeness in the context of employee activity

Level of innovativeness	Employee activity		
	Yes	No	Total
No innovation	0	4	4
Low	0	19	19
Average	10	21	31
High	27	2	29
Very high	5	0	5
Total	42	46	88

Source: Own study based on the survey data

It is observed that, in companies where employees are involved in innovation activities, the level of innovativeness of enterprises is most often high, slightly less often average, or very high. In turn, in enterprises where such activity is not observed, an average and low level of innovativeness of enterprises predominates.

Therefore, it should be assumed that employee activity allowing for an increase in innovation statistically significantly contributes to an increase in the innovativeness of the entire company.

In the area of the strategy affecting the level of innovativeness of the company, the type of implemented innovation was also taken into account, i.e., open or closed. For this purpose, the significance of the differences between the studied groups was verified, i.e., innovation types and the level of innovativeness of the company (Table 11).

Most innovation implemented in the surveyed companies is open (Table 12).

Testing the mean ranks with the Kruskal-Wallis test indicated strong statistical significance for the studied groups. This means that there are significant differences in terms of the level of innovativeness of the company between the examined groups, i.e., two types of innovation.

Due to the two categories of the independent variable innovation type, it was sufficient to use a bar chart to assess the differences between the groups (Figure 5).

Table 11

Types of innovation implemented in the company

		Frequency	Percentage	Percentage of valid	Cumulative percentage
Valid	Open	40	38.1	64.5	64.5
	Closed	22	21.0	35.5	100.00
	Total	62	59.0	100.0	
No data	Systemic data gaps (category: no innovation or I have no opinion)	43	41.0		
Total		105	100.00		

Source: Own study based on the survey data

Table 12

Test value results for the level of innovativeness depending on employee activity (question 4)

Test value	
Kruskal-Wallis H	31.547
df	1
Asymptotic significance	< 0.001

Source: Own study based on the survey data

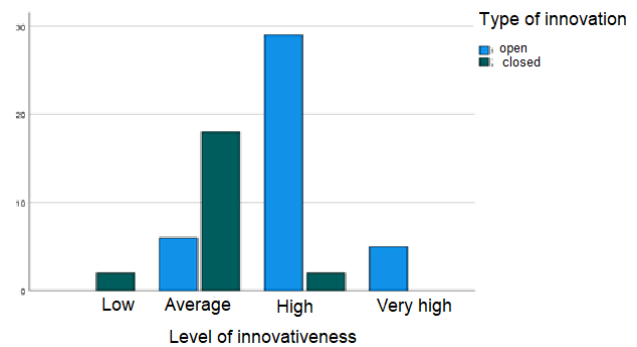


Fig. 5. Bar chart of the distribution of the value of the surveyed groups of the innovation type
Source: Own study based on the survey data

Based on the chart one may distinguish two homogeneous groups in terms of the level of innovativeness: the group of enterprises that use exclusively closed innovation and have a low level of innovativeness (A) and the group of enterprises that apply only open innovation and have a very high level of innovativeness. Moreover, it is also possible to distinguish two hetero-

geneous groups: the group of enterprises that use primarily closed innovation and have an average level of innovativeness (C) and companies that apply mostly an open type of innovation and have a high level of innovativeness (D). For the purposes of accurate observation, a cross table was used (Table 13).

Table 13

Size of individual groups assessing the level of innovativeness in the context of open and closed innovation

Level of innovativeness	Type of innovation		
	Open	Closed	Total
Low	0	2	2
Average	6	18	24
High	29	2	31
Very high	5	0	5
Total	40	22	62

Source: Own study based on the survey data

It is observed that, in economic organizations that more often apply an open type of innovation, the level of their innovativeness is most frequently high, on the other hand, in companies where a closed type of innovation is more often used, an average level of innovativeness of enterprises dominates.

Therefore, it should be assumed that the applied type of innovation differentiates the level of innovativeness of enterprises, which is significantly higher with open innovation.

To investigate what operations are declared by enterprises to update the innovation strategy in relation to their level of innovativeness, further differences between the groups were subsequently tested in aggregate form.

In the area of the strategy affecting the level of innovativeness of the company, the incentive scheme being a component of the innovation strategy was considered (Table 14).

The level of positive and negative indications is similar; therefore, the studied groups are almost equivocal, with a slight advantage of positive indications. This means that the surveyed enterprises most often support the use of such a solution at home (Table 15).

Testing the mean ranks with the Kruskal-Wallis test indicated strong statistical significance for the studied groups. This means there are significant differences in terms of the level of innovativeness of the enterprise between the examined groups, i.e., the application of the incentive scheme or not in the strategy of the organization.

Table 14

Impact of the application of the incentive scheme on the level of innovativeness of the company

		Frequency	Percentage	Percentage of valid	Cumulative percentage
Valid	yes	44	41.9	50.6	50.6
	no	43	41.0	49.4	100.00
	total	87	82.9	100.0	
No data	Systemic data gaps (category: I have no opinion)	18	17.1		
Total		105	100.00		

Source: Own study based on the survey data

Table 15

Test value results for the level of innovativeness depending on employee activity (question 4)

Test value	
Kruskal-Wallis H	45.159
df	1
Asymptotic significance	< 0.001

Source: Own study based on the survey data

Due to the two categories of the independent variable, a box plot was applied to assess the differences between the groups (Figure 6).

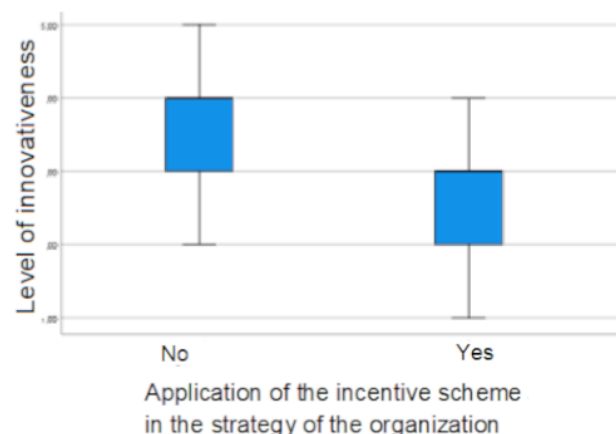


Fig. 6. Box plot of the distribution of the value of the studied groups of the application of the incentive scheme or its lack, source: Own study based on the survey data

Based on the chart, one may distinguish two homogeneous groups in terms of the level of innovativeness: the group of enterprises in which the incentive scheme is applied in the strategy of the organization and they have a high level of innovativeness (A), and the group of enterprises that do not use the incentive scheme and have a low level of innovativeness. For the purposes of accurate observation, a cross table was used (Table 16).

Table 16

Size of individual groups assessing the level of innovativeness in the context of the application of the incentive scheme for employees

Level of innovativeness	Application of the incentive scheme		
	Yes	No	Total
No innovation	0	1	1
Low	1	15	16
Average	11	26	37
High	27	1	28
Very high	5	0	5
Total	44	43	87

Source: Own study based on the survey data

It is observed that enterprises that more often use the appropriate incentive scheme most frequently indicate a high level of innovativeness, in turn, organizations that do not apply the proper incentive scheme usually have an average level of innovativeness. Therefore, it should be assumed that the use of the relevant incentive scheme differentiates the level of innovativeness of the company, which is significantly higher when entities apply such a system.

To examine what operations are declared by enterprises to update the innovation strategy in relation to the level of their innovativeness, further differences

between the groups were subsequently tested in aggregate form (Table 17).

Most often enterprises believe that they should include external R+D organizations in cooperation (48% of indications) and extend cooperation with suppliers (47% of indications) (Table 18).

Table 18

Test value results for the level of innovativeness depending on employee activity (question 4)

Question 4	Test value			
	4a	4b	4c	4d
Kruskal-Wallis	12.014	22.035	27.122	18.416
df	1	1	1	1
Asymptotic significance	< .001	< .001	< .001	< .001

Source: Own study based on the survey data

Testing the mean ranks with the Kruskal-Wallis test indicated strong statistical significance for all the studied groups concerning the components of the future innovation growth strategy. This means that there are significant differences in terms of the level of innovativeness of the company between the examined groups, i.e., the application of individual components of the innovation strategy or not (Table 19).

The results presented in Table 19 indicate that the largest group of employees assessed the level of innovation as high and the next largest group is employees who stated that innovation is at an average level. It is observed that enterprises that believe they should establish cooperation with external R+D entities want to build their own facilities and improve the system of employee competences, most often possess a high level of innovation. In turn, enterprises in which operations are directed to extending cooperation with suppliers, usually have a low and average level of in-

Table 17

List of actions that should be tested in updating the innovation strategy in the enterprise (question 8)

	Frequency	Percentage	Percentage of valid	Cumulative percentage
Inclusion of external R+D organizations in cooperation	48	45.7	45.7	100.0
Building own innovation facilities	36	34.3	34.3	100.0
Improving employee competences through the incentive scheme	30	28.6	28.6	100.0
Extending cooperation with suppliers	47	44.8	44.8	100.0

Source: Own study based on the survey data

Table 19

Size of individual groups in the assessment of the level of innovativeness

		8a	8b	8c	8d
Level of innovativeness	No innovation	1	1	1	5
	Low	6	1	0	17
	Average	17	12	7	17
	High	20	17	18	7
	Very high	4	5	4	1
Total		105	36	30	47

Source: Own study based on the survey data

novativeness. At the same time, the examined groups are heterogeneous.

Therefore, it should be assumed that the direction of development of the innovation strategy differentiates the level of innovativeness of the enterprise – those directed to the development of cooperation with suppliers have a lower level of innovativeness than the ones that want to focus on the cooperation with R+D organizations, the greater commitment of management staff, and the building of innovation facilities. One of the most important conclusions resulting from the research is stressing the importance of the enterprise’s staff in the development of innovative activity. Pro-innovative attitudes properly targeted, taking into account various threats, e.g., risk, should be reflected in the strategies of enterprises. The author assumes further innovation research, especially in the context of risk.

Conclusions

The theoretical analyses of the issues of innovativeness in enterprise strategies in terms of generic, market, and HR conditions indicated the existence of a variety of concepts in terms of their essence and decision-making area. As a reference point, it was assumed that the innovation strategy requires the long-term thinking about opportunities not only to survive but also to ensure the sustainable and harmonious development of the company. The above context required proving two adopted research hypotheses. According to Hypothesis H1, it was stated that the generic profile of activities significantly determines value creation processes as a result of innovation in enterprises, defined in strategies. Hypothesis H2 confirms that value creation requires the activities of em-

ployees properly prepared and motivated in innovative operations. The role of open innovation, based on the company’s creative concepts implemented into the market should be pinpointed.

Moreover, the pilot empirical and statistical studies indicate that:

- the company’s high level of innovativeness is a result of the high commitment of management staff, whereas low activity results in a low level of innovativeness;
- similar dependencies occur in relation to employees of enterprises; significant activity of employees allows for an increase in innovation in the company; little interest reduces the level of innovativeness,
- the type of the implemented innovation in the strategy, i.e., open or closed, affects innovativeness; open innovation is dominant in the activities of enterprises,
- the incentive scheme significantly influences the level of the company’s innovativeness.

The conducted research also results in the conclusions for enterprises to improve the level of innovativeness. Strategic operations may include:

- inclusion of external R+D organizations in cooperation,
- building own innovation facilities,
- improving employee competences through the incentive scheme,
- extending cooperation with suppliers.

In conclusion, it can be stated that the assumed research objective was accomplished, and the adopted hypotheses were positively verified. At the same time, the research results indicate the directions of strategic operations enabling an increase in the level of innovativeness of enterprises.

The following conclusions can be formulated in the outcome of the research methodology. Type-differentiated enterprises, i.e., production, service, and production-service enterprises indicate significant differences in the level of innovation. Employee evaluations show that the most significant differences in the area of innovation occur between production and service enterprises. Production enterprises are characterized by a higher level of innovation in the average and high-level groups. Differences in the remaining groups, i.e., no innovation, low and very high levels, are more minor.

Due to the lack of distributive property in their assessments, production and service enterprises show implicit assessments in relation to the group of production and service enterprises. The results of the research can therefore be considered a positive verification of hypothesis H1.

The results of the study positively verified hypothesis H2 because, in enterprises where employees were involved in innovative activities, the level of innovation was defined as high. The lack of staff involvement resulted in a lower level of innovation.

The research sample was selected in a purposeful manner based on the type of activity criterion.

Summarizing the pilot empirical research results, it is reasonable to formulate integrated conclusions of the theory of management sciences with economic practice. The level of integration concerned:

- strategic innovation,
- creating value through innovation,
- multidimensionality of innovation, with an indication of the generic structure of business activity and the activation of employees in the process of creating and implementing innovations.

The results of empirical research in the context of literature analyses indicate the directions of prospective scientific works. The author considers the search for a new research concept in the area of enterprise innovation and the impact of resource capital on the business results of economic entities as the most important direction. Given the high importance of risk in innovation, research into the staff of enterprises implementing pro-innovation strategies is also justified. The planned study may include taking up the problems of preferring decisions with high innovative risk and personnel support systems implementing complex innovative projects resulting from the strategy of enterprises. The above future research structure will be integrated with the current research results, which should be extended to include pro-innovative aspects of enterprise strategies.

According to the author, it is reasonable to develop incentive systems to increase innovation in enterprises. Considering the strategic nature of innovations, such systems should concern short-term and long-term achievements of staff based on the effects of developed and implemented innovations.

The conclusions from the empirical research substantiate the relevant need for its continuation.

Appendix Questionnaire

1. What is the nature of your business?
 - a) production company
 - b) service company
 - c) production and service company
2. How to create the current level of innovation of the company
 - a) very high
 - b) high
 - c) average
 - d) low
 - e) lack of innovation
3. Is the management staff active in the process of creating innovation in the company?
 - a) yes
 - b) no
 - c) I have no opinion
4. Do employees of enterprises take actions aimed at increasing innovation?
 - a) yes
 - b) no
 - c) I have no opinion
 - d) I have not enough knowledge
5. What are the most important skills required from employees in an innovative company? (you can choose up to four answers)
 - a) having concepts
 - b) entrepreneurship
 - c) variability (attitude flexibility)
 - d) openness to thinking about the future of the organization
 - e) readiness to eliminate obstacles
 - f) striving for professionalism
 - g) retaining bad ideas
6. What kind of innovation in the enterprise strategy?
 - a) open
 - b) closed
 - c) lack of innovation
 - d) I have no opinion
7. Does the incentive system in the organization of the strategy affect the level of innovation in the enterprise?
 - a) yes
 - b) no
 - c) I have no opinion
8. What actions should be used to improve the company's innovation strategy? (up to 3 answers can be selected)
 - a) inclusion of external research and development organization in cooperation
 - b) building own innovative facilities
 - c) improving employee competences through the incentive scheme
 - d) extending cooperation with suppliers

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