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The Role of Knowledge-Based Resources in Building Organizational Flexibility

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Abstract

Theoretical background: Contemporary conditions for managing organizations are particularly difficult due to the variety of changes taking place in the environment, which is why they require the search for behaviors appropriately adapted to existing market conditions. The resources held by companies may not be sufficient in highly competitive markets. At this point, there is a need to look for adaptive behaviors that can be expressed through the imperative of organizational flexibility. The dynamic capabilities of enterprises are reflected in the dimensions of organizational flexibility, which have various conditions related to, among others, company resources. Organizational flexibility results from, among other things, opportunities,

abilities, skills and practices that allow us to anticipate future market changes. These capabilities, in turn, depend on organizational resources, including knowledge-based resources that enable organizations to act strategically and tactically. The appropriate level of knowledge-based resources allows you to achieve the appropriate level of flexibility necessary in a difficult and turbulent environment. It is therefore important to present recommendations that will help achieve this state of affairs on the market.

Purpose of the article: The purpose of the paper is to identification the level of knowledge-based resources in enterprises and their impact on the organizational flexibility.

Research methods: The analysis and conclusions are based on the results of research on a group of Polish enterprises. The study used an original survey questionnaire with a 5-point Likert scale. In order to verify the validity of the research and the constructed research tool, its reliability was tested using the Cronbach's alpha coefficient. The level of variables was identified using descriptive statistics, while the linear relationship between variables was examined using Kendall's tau correlation coefficient.

Main findings: The research results indicated that the level of knowledge-based resources positively correlates with the level of organizational flexibility of Polish enterprises, and there is a positive, statistically significant relationship between the level of knowledge-based resources and individual dimensions of flexibility, including operational, financial, structural, and technological flexibility. The positive relationship between the variables also indicates the synergy effect, which allows for a higher level of organizational flexibility overall than in individual dimensions of the enterprise. The conclusions from the analysis made it possible to designate recommendations in the area of activities for building organizational flexibility, which is currently a necessary condition for the functioning of enterprises.

Introduction

According to the literature assessment, firm competitiveness development and the creation of value in operational, production, and technology strategies depend heavily on organizational flexibility (Lyu et al., 2022; Bhupendra & Sangle, 2022). It is important to stress that businesses nowadays must have organizational flexibility, i.e. the dynamic capacity to adapt to changes in the market due to unfavorable business circumstances (Schoemaker et al., 2018). Market changes force the company to respond quickly to unpredictable and unexpected environmental conditions (Peng et al., 2015; Chatterjee et al., 2023). The organizational flexibility of an enterprise results not only from the internal conditions of the organization and the external conditions of the environment but also, and perhaps primarily, from the possibilities resulting from the resources it possesses, including knowledge-based resources, processes, and dimensions of the organization (Moroz, 2013, p. 55). To obtain specific skills, organizations use their resources and digital technology to create value that influences competition, including defining their networks, improving channels of interaction with enterprise stakeholders, and increasing organizational flexibility and capabilities (Vial, 2019).

The purpose of the paper is to identification the level of knowledge-based resources in enterprises and their impact on the organizational flexibility. The conclusions are based on the results of my own research on a group of Polish micro, small, medium-sized, and large enterprises. The developed research tool, subjected to reliability analysis, allowed for the collection of data that allowed for the verification of the relationships between variables. Moreover, it made it possible to designate recom-

mendations in the area of activities for building organizational flexibility, which has become a necessary condition for the functioning of enterprises. Furthermore, according to Wright and Snell (1998), one of the dynamic qualities that gives an organization the ability to react and act upon environmental changes is flexibility. Therefore, the article contributes to the literature by showing the relationship between the level of knowledge-based resources and the level of organizational flexibility in enterprises. Additionally, the relationship between the level of knowledge-based resources in the enterprise and the level of flexibility in four dimensions of the organization's functioning, i.e. the level of operational flexibility, the level of financial flexibility, the level of structural flexibility, and technological flexibility, was indicated. Moreover, the research allowed for the identification of recommendations regarding activities in enterprises leading to an increase in the level of knowledge-based resources, which determine the level of desired organizational flexibility.

Literature review

Today's business environment in which enterprises operate is extremely difficult and demanding environment for entities. This is because it is turbulent and unpredictable and requires companies to be able to deliver long-term customer value. Achieving a competitive advantage becomes possible thanks to new skills and resources necessary for the development and success of the enterprise (Wu, 2010; Santos-Vijande et al., 2012). According to the resource-based view of the enterprise, the competitive strategy of an enterprise depends largely on how the organization maximizes the value created by allocating the company's resources. These resources are specific in nature and therefore ensure inevitable heterogeneity (Barney, 2000; Ouriques et al., 2019). It can be inferred that dynamic capabilities are a complex set of skills based on Teece et al.'s (1997, p. 516) theory, which defined dynamic capability as an enterprise's capacity to integrate, develop, and reconfigure internal and external competencies in order to quickly adapt to changing conditions. These competencies enable firms to adjust their resources and competencies in a methodical manner, so enabling them to effectively adapt to the dynamic demands of the market (Zollo & Winter, 2002; Schoemaker et al., 2018). Enterprises that have resources should control them because they are identified with the capabilities and capabilities of activities within the functioning of the enterprise (Kaya & Patton, 2011). The enterprise can more accurately predict the nature and potential of changes in the organizational environment and assess the suitability of both strategic and tactical actions by utilizing knowledge that integrates information and technology practices with dynamic capabilities and abilities (Wiklund & Shepherd, 2003). An organization's most valuable asset is its knowledge, which also gives it a long-lasting advantage over competitors (Lam et al., 2021). Within the literature, resource and ability are frequently used interchangeably. Within the field of knowledge management, intricate relationships between distinct components of

enterprise resources give rise to processes that rely on information and human abilities (Tsai & Jhang, 2010; Chmielewska-Muciek, 2018). Higher knowledge management competency levels boost an organization's likelihood of being more competitive. Given that they impact organizational flexibility by determining an enterprise's organizational capabilities, knowledge-based resources are an especially significant category of organizational resources (Gao et al., 2018). A firm's competitive advantage can be derived from its employees' intangible knowledge, which is a valuable resource classified as knowledge-based. According to Miller and Shamsie (1996) and Ouriques et al. (2019), they manifest as specialized abilities, such as technical, creative, and collaborative abilities, which are in turn directly related to the integration and coordination of interdisciplinary teamwork.

The flexibility of enterprises is characterized by building a selection of variants at various levels in the organization, expanding opportunities and resources to modify variants, and guaranteeing the independence of choice for individual entities. The key elements of flexibility are, as Sushil (2001) emphasizes, freedom of choice, action options, level of resources and changes. The need for flexibility is the result of the scope and frequency of changes in the enterprise. The changes are related to individual elements, i.e. its resources, intra-organizational structure, processes, and the market environment. A necessary condition for achieving the planned flexibility of the enterprise is a high level of flexibility in all dimensions of the enterprise's operations, and the overall level of organizational flexibility is not the sum of partial flexibilities due to the synergy effect (Moroz, 2013, p. 55). The dimensions of organizational flexibility in enterprises depend on many variables, both those resulting from the specificity of a given enterprise, as well as the activities of a given entity and environmental conditions. The basis for distinguishing dimensions or types of organizational flexibility was the model of Koste and Malhotra (1999), where organizational flexibility can be considered at the level of the enterprise's resource hierarchy. The authors used Yeniaras et al.'s (2021) research methodology, which identified four dimensions of flexibility: operational (OP_F), financial (F_F), structural (S_F), and technological (T_F), that contribute to organizational flexibility overall. This approach allows for the segregation of knowledge-based resources through the prism of specific dimensions of organizational flexibility of enterprises. It turns out that the development of competitiveness (Lyu et al., 2022; Bhupendra & Sangle, 2022) and innovativeness in enterprises (Abubakar et al., 2019) as well as the creation of value in operational, production, structural, and technological strategies all depend on organizational flexibility. We can access all forms of organizational flexibility by viewing it through the lens of its dimensions, or partial flexibility (Khin et al., 2012).

Due to the above, the main research hypothesis and four detailed hypotheses were formulated. The main hypothesis is: The level of organizational flexibility increases with the increase in the level of knowledge-based resources in the enterprise. Detailed hypotheses are as follows:

H1. The level of knowledge-based resources in an enterprise positively determines the level of operational flexibility.

H2. The level of knowledge-based resources in an enterprise positively determines the level of financial flexibility.

H3. The level of knowledge-based resources in the enterprise positively determines the level of structural flexibility.

H4. The level of knowledge-based resources in an enterprise positively determines the level of technological flexibility.

Research methods

The purpose of the paper is to identification the level of knowledge-based resources in enterprises and their impact on the organizational flexibility. The research took place in several stages. In the first stage, selected literature on the topic was reviewed, and then pilot research was carried out in 2021. This allowed the author's research tool to be verified and proper research to be carried out in 2022. While the actual study was conducted on a group of 355 enterprises operating in southern Poland, pilot research was conducted on a group of 20 enterprises from the Silesian Voivodeship. The research tool was an original survey questionnaire, which consisted of closed questions. This allowed for the collection of precise data. The tool uses a 5-point Likert scale (Sheng et al., 2011), where 1 indicates *definitely not* and 5 – *definitely yes*. Participation in the study was anonymous and consisted of managers and/or owners of enterprises completing a paper questionnaire.

Its reliability was assessed in order to confirm the validity of the study and the research tool that was created. For this purpose, internal consistency analysis was used using the Cronbach's alpha coefficient (Taber, 2018). Then, the level of knowledge-based resources was identified in the surveyed enterprises in general and in groups of enterprises due to the size of the entity, i.e. the level of employment in the company, and due to the age of the entity. Similarly, the level of organizational flexibility of the surveyed enterprises was identified using the above criteria, as well as the level of organizational flexibility in four distinguished dimensions: operational, financial, structural, and technological, which build overall organizational flexibility. In the following analysis step, it was examined whether there is a linear relationship between the variables, using Kendall's tau correlation coefficient. Kendall's tau coefficient is used to analyze the monotonic relationship between two quantitative variables. This coefficient is resistant to the non-normality of the distribution and to outliers. The null hypothesis of the Kendall correlation test assumes that there is no relationship between the analyzed variables. We reject the null hypothesis and accept the alternative, which postulates that the variables are related, if the *p*-value for this test is less than 0.05. Next, the potential relationships' strength is evaluated (Schober et al., 2018).

Characteristics of the surveyed companies

A total of 410 entities participated in the study, but 355 questionnaires were completed correctly. The surveyed enterprises were dominated by enterprises employing up to 9 employees (42.54%), i.e. microenterprises, then small enterprises (25.35%), and then large enterprises employing over 250 employees (17.74%). Medium-sized enterprises participating in the survey constitute 14.37% of all respondents. Mature enterprises with more than 11 years of market experience made up the largest group, accounting for 59.44% of the total number of enterprises; young enterprises that have been operating on the market for up to 5 years constitute 21.12% of the respondents, including 2.53% of companies that have entered the market and have been operating for no longer than 1 year. The respondents indicated production and trade, production, and services as the main business profiles. All surveyed enterprises operated in Poland.

Results

The first step in analyzing the results of research was to determine the level of validity and reliability of the study. Cronbach's alpha coefficient was used to measure the internal consistency of a group of items. The analysis showed that the composite reliability of knowledge-based resources (K-BR) was 0.910, so it was excellent reliability. However, the composite reliability of organizational flexibility (OF) amounted to 0.812 in total, so it was good reliability (Table 1). It turns out that the original research tool designed to examine the level of knowledge-based resources and organizational flexibility meets the criteria (George & Mallery, 2016, p. 240) and its use is justified in the study.

Table 1. Reliability and validity

Variables	Cronbach's α
Knowledge-based resources (K-BR)	0.910
K-BR_1	0.668
K-BR_2	0.731
K-BR_3	0.795
K-BR_4	0.758
K-BR_5	0.783
K-BR_6	0.679
K-BR_7	0.741
K-BR_8	0.574
K-BR_9	0.733
Organizational flexibility (OF)	0.812
OP_F	0.669
F_F	0.769
S_F	0.565
T_F	0.801

Source: Authors' own study.

Then, the level of total knowledge-based resources was identified, including the level of technical knowledge, IT knowledge, in the field of product or service development, in the field of marketing, specialized knowledge in the field of customer service, and specialized knowledge in the field of organization management. According to the data analysis, the surveyed Polish enterprises' average declared level of knowledge-based resources was 3.943, and this level deviates from the average value by +/- 0.699 points. The minimum value for this variable was 1.67, and 75% of the respondents assessed that the level of knowledge-based resources in their organization was 4.44 or lower on a 5-point scale (Table 2).

Table 2. Descriptive statistics for the level of knowledge-based resources of enterprises

Variable	Mean	SD	Min	Q25	Q75	Max
K-BR	3.943	0.699	1.67	3.44	4.44	5.00

Source: Authors' own study.

The next stage involved evaluating the surveyed enterprises' level of knowledge-based resources while accounting for their size and age. The size of the enterprise was determined based on the declared number of employees. In the case of enterprise size, no significant differences were identified in the level of knowledge-based resources. In the case of enterprises employing up to 9 employees, the level of knowledge-based resources was 3.953, in the case of small enterprises it was 3.935, in the case of medium-sized enterprises, the level of knowledge-based resources was 3.911; and in the case of large companies, i.e. those employing over 250 employees, this level was 3.954 on a 5-point scale (Figure 1). This is quite an interesting research result, which shows that the surveyed Polish enterprises declare a similar level of knowledge-based resources, regardless of whether they are small or large entities.

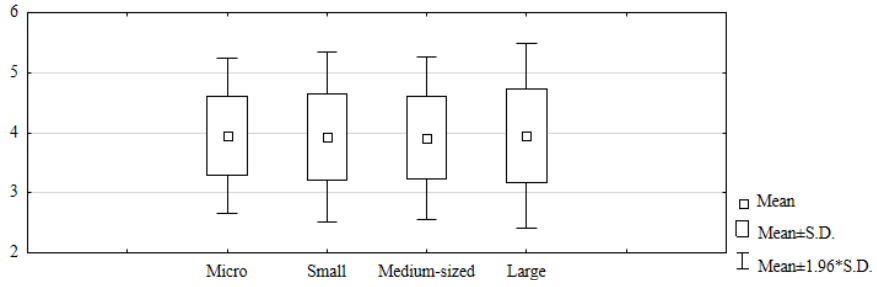

Figure 1. The level of knowledge-based resources and the size of the enterprise (n = 355)

Source: Authors' own study.

Taking into account the age of the surveyed enterprises, the differences in the level of knowledge-based resources are not large, but they show a certain relationship. The highest level of knowledge-based resources is possessed by young enterprises that have been operating for over a year but not longer than 20 years. In this group of enterprises, the highest level of knowledge-based resources is recorded in enterprises operating for 1–5 years, at a level of 4.058. After this period, the level of knowledge-based resources decreases slightly. The lowest level, as expected, is declared by enterprises entering the market and operating for no longer than a year, at the level of 3.778 on a 5-point scale (Figure 2).

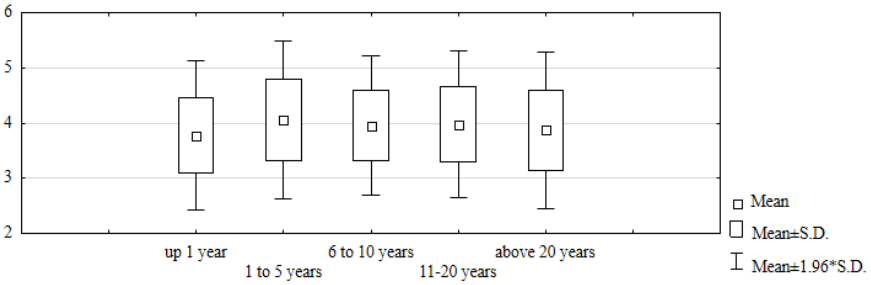

Figure 2. The level of knowledge-based resources and the age of the enterprise (n = 355)

Source: Authors' own study.

Then, the level of organizational flexibility was identified in general and in all distinguished dimensions, i.e. the level of operational flexibility, the level of financial flexibility, the level of structural flexibility, and the level of technical flexibility, which create the organizational flexibility of the enterprise in general. According to the research, the average organizational flexibility level across all Polish enterprises surveyed was 3.752, and this level deviates from the average value by +/- 0.704 points. The minimum value for this variable was 1.42, and 75% of respondents assessed that the level of organizational flexibility in their enterprises was 4.25 or less. Analyzing the level of organizational flexibility in the four distinguished dimensions, the highest level was identified in the area of operational flexibility, at a level of 3.939, and the lowest in the area of financial flexibility, at 3.383 on a 5-point scale (Table 3).

Table 3. Descriptive statistics for the level of organizational flexibility of enterprises

Variables	Mean	S.D.	Min.	Q25	Q75	Max
OP_F	3.939	1.052	1.00	3.00	5.00	5.00
F_F	3.383	0.951	1.00	2.67	4.00	5.00
S_F	3.790	0.855	1.33	3.33	4.33	5.00
T_F	3.895	0.984	1.00	3.33	4.67	5.00
Total OF	3.752	0.704	1.42	3.33	4.25	5.00

Source: Authors' own study.

In the next step, the level of organizational flexibility in the surveyed enterprises was examined, taking into account the age and size of the examined enterprises. As the literature review indicates, organizational flexibility may result not only from the size of the enterprise (Buko, 2011), but also from the phase of the organization's life cycle (Ścianowska, 2011). Interesting conclusions can be drawn by analyzing data on the level of organizational flexibility in groups of enterprises depending on their size. It turned out that the highest level of organizational flexibility is declared by small enterprises at the level of 3.891, and in microenterprises this level is the lowest and amounts to 3.620 on a 5-point scale (Figure 3).

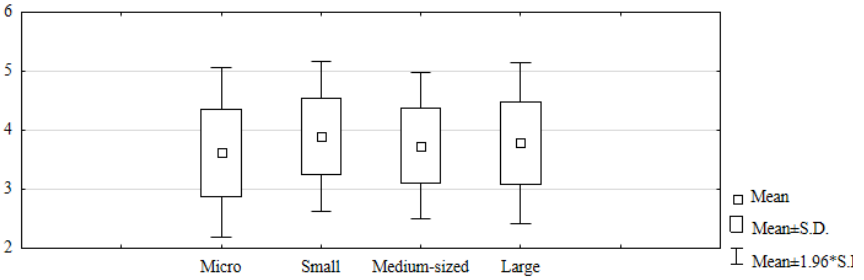

Figure 3. The level of organizational flexibility and the size of the enterprise (n = 355)

Source: Authors' own study.

In the next step, the level of organizational flexibility of the surveyed enterprises was identified in groups depending on the age of the company, i.e. the time spent running a business. Enterprises that have been operating for over 11 years, i.e. mature enterprises, declared the highest level of organizational flexibility, at 3.846, while those that have been operating for over 20 years had a level of 3.789. The lowest level of flexibility was declared by the youngest enterprises, i.e. who have been running their business for no longer than 5 years, at a level of 3.554 on a 5-point scale (Figure 4).

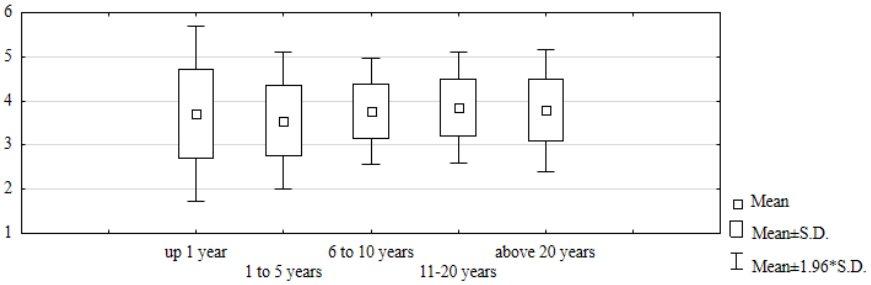

Figure 4. The level of organizational flexibility and the age of the enterprise (n = 355)

Source: Authors' own study.

Subsequently, a linear relationship between the variables was examined; Kendall's tau correlation index was used for this purpose (Table 4). Initially, correlations were identified between the K-BR level and individual dimensions of organizational flexibility, i.e. the OP_F level, the F_F level, the S_F level, and the T_F level, and between the K-BR level and the overall level of organizational flexibility. The analysis showed that there is a statistically significant relationship between the level of knowledge-based resources and the level of overall flexibility, which is positive and is at the level of 0.457, which is a moderate relationship. It can therefore be indicated that the higher the level of knowledge-based resources in an enterprise, the higher the overall level of organizational flexibility. Similarly, in the case of partial flexibilities, all distinguished dimensions of the enterprise's organizational flexibility that create total flexibility show a statistically significant relationship, with a p-value < 0.001, with the level of knowledge-based resources in the enterprise. In the case of the relationship between the K-BR level and the levels of operational flexibility, financial flexibility, and structural flexibility, the correlation is low and positive, while in the case of the relationship between the K-BR level and the level of technological flexibility, the correlation is positive at a moderate level, approaching high. It can therefore be indicated that the higher the level of knowledge-based resources in an enterprise, the higher the level of organizational flexibility it will achieve in the operational dimension, similarly in the financial dimension, similarly in the structural dimension, and similarly in the technological dimension.

Table 4. Correlation analysis (n = 355)

Variables	K-BR
	Kendall's tau correlation
OP_F	0.388*
F_F	0.400*
S_F	0.347*
T_F	0.413*
Total OF	0.557*

* $p < 0.001$
Source: Authors' own study.

Discussions

The interdisciplinary nature of the determinants shaping organizational flexibility affects their diversity; therefore, it can be concluded that they concern many areas of the company's activity. An effective and quick response to changes requires an efficient organization to be able to adapt all elements of the enterprise to unexpected changes. Among them, there are primarily organizational resources, including all types of technological resources and knowledge-based resources owned by the enterprise, especially information resources related to the speed of obtaining information, employee qualifications, and the ability to use their competences, which provide free-

dom in terms of market adaptation (Zvirblis & Buracas, 2012; Miszczak & Stawasz, 2018). The organization's key competencies combined with the enterprise's flexibility in the strategic dimensions of its activities create unique resources that, according to Hitt et al. (1998), influence the competitive flexibility of enterprises. Therefore, in highly volatile and turbulent environments, companies must develop a unique set of resources to build competitive advantage (Schoemaker et al., 2018). This unique set of resources is related to skills and abilities that are referred to as basic organizational competencies, i.e. knowledge-based resources. While there is evidence that knowledge-based resources are effective in providing competitive advantage, from a general point of view, each industry field has different levels of resources, including knowledge-based resources. Therefore, enterprises are challenged to increase their competitiveness in various ways (Ouriques et al., 2019).

The level of organizational flexibility is not the same in all enterprises, as shown by the authors' research. Research on entrepreneurship shows that the number of employees, which most often reflects the size of the enterprise, determines the level of market adaptation of companies, the quality of communication with the environment, as well as the level of innovations and new solutions introduced (Więcek-Janka, 2015). Moreover, research by Dex (2003) confirms that organizational flexibility in the dimensions of the organizational management function is at a lower level in smaller enterprises due to the limited resources of this type of enterprise and personnel limitations. Also, the results regarding the level of organizational flexibility of enterprises due to their age are confirmed by research by other authors; they indicate that organizational flexibility is a derivative of the pace of changes in the environment, and the level of flexibility indicates the maturity of the organization and its capabilities in terms of appropriate acceptance of changes (Grajewski, 2012, p. 14).

The study results also show that there is a synergy effect in case of the relationship between the level of knowledge-based resources and the level of flexibility in individual dimensions. In the case of organizational flexibility, this synergy effect can be defined as the excess of benefits resulting from the flexibility in individual dimensions compared to the total flexibility, while flexibility in individual dimensions builds organizational flexibility for the entire enterprise. As the literature shows, combining partial flexibilities, i.e. in selected dimensions, gives a synergy effect (Moroz, 2013; Karman, 2020).

Conclusions

To sum up, it can be indicated that the conducted research and the analysis allowed to identify the level of knowledge-based resources in the enterprise, including, among others, the level of technical knowledge, IT knowledge, in the field of product or service development, in the field of marketing, specialized knowledge in the field of customer service, specialized knowledge in the field of organization management.

It turned out that the average level of knowledge-based resources was 3.943, and this level was the highest in large enterprises, i.e. those employing more than 250 employees, and in young enterprises that have been operating for more than 1 year but no longer than 5 years. The research conducted also allowed for the identification of the level of organizational flexibility in general and in the distinguished dimensions of enterprises. It turned out that the average overall level of organizational flexibility in the surveyed enterprises was 3.752; in the case of operational flexibility, it was 3.393; in the case of financial flexibility, it was 3.383; in the case of structural flexibility, it was 3.790; and in the case of technological flexibility, it was 3.895. Generally, the highest level of flexibility was declared by small enterprises, i.e. those employing from 9 to 49 employees, and mature enterprises that have been operating for over 11 years but no longer than 20 years. The analysis of the research results showed that the level of knowledge-based resources in an enterprise determines the level of its organizational flexibility and, what is more, the level of the distinguished dimensions of flexibility. Therefore, the adopted main hypothesis can be confirmed, as well as detailed hypotheses.

In connection with the above, recommendations can be made regarding activities in enterprises leading to an increase in the level of knowledge-based resources, which determine the level of organizational flexibility in general and in the dimensions of operational flexibility, financial flexibility, structural flexibility and technological flexibility, which is the novelty of this article. Among the recommendations, attention should be paid primarily to enriching the knowledge of enterprise employees through its appropriate distribution, supporting team work, activities aimed at strengthening the knowledge sharing policy, and also focusing activities on the development of specific skills, including technical, creative, and cooperation skills, which in turn they are directly relevant to the integration and coordination of interdisciplinary teamwork. Achieving a higher level of organizational flexibility in general or in selected dimensions of the enterprise is becoming a necessity in today's turbulent environment, which has been shaped by, among others, the COVID-19 pandemic or market disruptions caused by high levels of inflation, and the economic crisis in general.

There are certain limitations to the research that have been conducted, including the fact that it only included 355 enterprises from the southern region of Poland. Conducting research on a representative group would allow conclusions to be drawn and applied to the entire population. In the future, it is worth planning research in individual sectors for which the level of knowledge-based resources is significantly different. Moreover, the organizational flexibility examined was only in four distinguished dimensions; it is worth expanding the range of dimensions because the greater the knowledge about the level of flexibility in various areas of the enterprise's functioning, the more precisely the overall organizational flexibility can be indicated. In the future, the authors plan to extend the research to a group of enterprises operating outside Poland.

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