

Business diversification and changes in perspective strategies for managing innovation activities during martial law

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Abstract. The purpose of this article was to study the changes in the directions of entrepreneurial activity and approaches to managing innovation in the context of the Russian-Ukrainian war. The analysis shows that during the Russian-Ukrainian war, the Ukrainian market for innovation and development suffered significantly. This is evidenced by both the global innovation index of Ukraine and the European innovation index. This deterioration has had a significant impact on the development of innovation at Ukrainian enterprises. In order for an enterprise to function effectively in the context of war, more effort and attention should be paid to innovation and changes in the long-term strategies for managing such activities. The author identifies ten areas that should be implemented by Ukrainian enterprises in the context of war: the development of a “business core”, the introduction of artificial intelligence, machine learning, augmented and virtual reality, blockchain technologies, the introduction of “smart solutions” using the Internet of Things, as well as the implementation of “green reconstruction”, genetic engineering or biotechnology, quality improvement, and the creation of their own ecosystem. The study found that the main role in this process is played by the effective management of innovation activities, so it is important for Ukrainian enterprises to change their long-term management strategies. The process of changing the strategy of innovation management and choosing a new way of business diversification for Ukrainian entrepreneurs should take place in five consecutive stages: formation of an individual innovation process, increasing attention to research and development, internal sources of innovation, promoting the interaction of internal and external sources of innovation, combining various components into a single innovation system, and effective management of the created innovation ecosystem. The study identifies the main aspects that should be present in the changed strategies to enable enterprises to function as efficiently as possible during martial law. These aspects include accelerating the emergence of innovations, creating motivation to invest, and developing partnerships in the investment process

Keywords: business adaptation; market situation; digitalisation; enterprise ecosystem; full-scale invasion

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● INTRODUCTION

One of the main tasks in the process of sustainable development of both the national economy in general and individual enterprises in particular, even during the war, is the effective implementation of innovations. Innovative productivity is the basis that ensures the competitiveness and development progress of each business entity. Prior to the full-scale invasion, Ukrainian entrepreneurs had well-developed and proven-effective systems of strategic management. However, after the full-scale invasion in 2022, the

systems that were previously effective in practice became irrelevant and ineffective. Since the beginning of the full-scale invasion, Ukrainian businesses have been operating with limited resources and less support from the state. Nevertheless, even in a time of war, the development of entrepreneurship and the national economy through innovation remains one of the main strategic objectives. At the same time, it is important not only to return to the pre-war level but also to strive to create innovative development.

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The business management systems that were effective in the past now require rapid changes in line with the new operating environment and the change in the long-term strategies for managing innovation. One of the possible ways to develop business in such conditions is to diversify its activities in various aspects.

In analysing the crisis response strategies of enterprises, M. Wenzel *et al.* (2020) concluded that innovation is one of the top four effective strategies for enterprises to respond to the crisis, along with cost reduction, market exit, and resilience strategies. Similar conclusions were reached by K. Beyer (2022), analysing the barriers created by the crisis situation for the innovation activities of the enterprise. Exploring business survival through innovation during the SARS-CoV-2 pandemic, Q. Liu *et al.* (2022) concluded that during a crisis, market competition is significantly intensified, which has a positive and significant impact on the performance of companies. Analysing the spread of innovations during crises in the world, A. Dilletta & S.S. Pongting (2021), based on an empirical study, determined that during crises, enterprises should change their strategies for operating in the market. It is advisable to develop new approaches to managing innovation at the enterprise. The interaction between innovation and the efficiency of enterprises was studied by I. Nemlioglu & S. Mallick (2021). In countries whose economies are still in the development stage, enterprises have limited resources. This affects management and performance, even if innovation is at a high level. Nevertheless, even in times of crisis, such as the economic crisis of 2008, innovation increases the profitability of enterprises, and innovation management in enterprises increases the efficiency of business activities. That is, enterprises that have a better management system in crisis conditions have better performance indicators.

Similar conclusions were reached by such scholars as Y. Kyrdoda *et al.* (2023), exploring the role of innovative capabilities as tools for the survival of firms in crisis conditions. Although global crises are destructive for businesses, they also present opportunities for improving business performance. It is innovation and business diversification that have a direct impact on the survival of businesses in a crisis environment. It is how companies cope with crises through improved innovation management that influences the establishment of internal processes and shows how these same companies can succeed in the long run. Such results also coincide with the findings of C.C. Guderian *et al.* (2021), who concluded that crisis phenomena, on the one hand, contribute to financial constraints and a reduction in innovation. On the other hand, the crisis provides an opportunity for an enterprise to succeed. In this case, entrepreneurs must respond quickly to changes, but such decisions must be balanced and therefore require a certain strategy. The crisis particularly affects small businesses. Such conclusions were made by researchers T. Clauss *et al.* (2022). The researchers noted that most business models are limited during a crisis, so it is advisable to introduce temporary innovative business models. However, a sudden and unexpected crisis can also unlock enormous potential for companies, provided they are open-minded and willing to look for potential opportunities. Businesses can recognise new opportunities in a rapidly changing environment and need to be aware of their core competencies to recognise opportunities.

Many researchers point out the positive impact of crisis phenomena on the innovation activities of entrepreneurs in crisis conditions, which can be used as an opportunity in practice. Most scholars refer to crisis phenomena as pandemics or crises for other reasons, but military actions as a crisis phenomenon are overlooked by scholars. In addition, no similar studies have been conducted for Ukrainian enterprises in the context of the Russian-Ukrainian war. For Ukrainian business, it is still unclear what these strategies should be, as well as what enterprises need to change in the management process in order to succeed, even during martial law. This is the reason for the relevance of this study. The purpose of this study was to analyse the feasible areas of business diversification and find effective strategies for managing innovation activities at enterprises in the context of the Russian-Ukrainian war. To achieve the research objective, the following tasks are necessary: to analyse the market for innovation in the context of the war in Ukraine; to identify the most promising strategies for managing innovation projects during martial law; and to analyse and determine the necessary aspects of restructuring management processes inside and outside the enterprise or startup in order to remain competitive in the market.

● MATERIALS AND METHODS

In order to analyse the possibilities of business diversification and changes in innovation management in Ukrainian enterprises during martial law, as well as to identify development prospects, the study was conducted using three consecutive stages. Since the basis for business diversification and changes in innovation management for each enterprise is the conditions created by the state, the study first analysed the development of the innovation market in the pre-war period and during the war years. To determine the state of Ukraine's innovation potential, the global innovation index for the period 2011-2023 was analysed. At this stage of the study, secondary data from the INSEAD (2011) and World Intellectual Property Organization (2014; 2017; 2020; 2022; 2023) was used. Ukraine's indicators were compared with the leading countries in innovation development, such as Switzerland, Sweden, and the United States, as well as with countries that are outsiders in the international arena, such as Burundi, Niger, and Angola. The comparison method helped to determine the state of innovation development in Ukraine and, accordingly, the conditions for improving the activities of enterprises in the country. The components of the global index for Ukraine for 2022-2023 were analysed to identify those parameters that have deteriorated significantly since the beginning of the full-scale invasion.

The development of the innovation market in Ukraine based on the European innovation index for the period 2016-2023 was analysed. At this stage of the study, secondary data was used (European innovation scoreboard..., 2023). Ukrainian indicators were compared both in terms of dynamics over the years and in comparison with the European average. Also, the components of the European innovation index for Ukraine were analysed to determine the country's innovation development potential and possible problems for Ukrainian enterprises. After analysing the potential of the Ukrainian market for the development of innovations, the article analyses the main

ways that may be appropriate for enterprises in the process of business diversification in the conditions of war, as well as the main components of promising strategies for managing the innovation activities of Ukrainian enterprises under martial law. Usually, the theory of innovation management is perceived by researchers as a theory that meets the prerequisites. However, in this study, innovation management is considered in terms of expanding such a theory. The change in innovation management strategies considered in this study is an overview and description of the most important areas of business diversification that require close attention. In fact, it is a strategic view with long-term positive consequences that has not yet been given due attention by Ukrainian entrepreneurs. The key choice in determining the research plan was to focus on the inductive method, which is appropriate for the work being carried out. Also, the induction method was used to study the reasons for the change in innovation management strategies for Ukrainian enterprises in martial law countries. Thanks to the abstract and logical method, the conclusions of the entire study were drawn.

● **RESULTS**

The innovation market in the context of the Russian-Ukrainian war

In the process of digitalisation, innovation is one of the main criteria for assessing the effectiveness of a country’s innovation policy on an international scale. A country’s innovative development is assessed and analysed using a certain system of indicators. Before analysing the effectiveness of changes in the innovation management strategies of Ukrainian enterprises, it is crucial to analyse the innovation potential of Ukraine after the full-scale invasion. Such an analysis will allow to conclude whether it is advisable or not to introduce changes to the management of innovation in Ukraine in the crisis environment as of 2024. The study of the

national innovation potential is the basis for analysing effective management strategies at each individual enterprise.

As of 2024, researchers in the international scientific field have not come to recognise a single correct way to determine a country’s innovation potential, so different indicators are used in practice. The most common in practice are the global innovation index and the European innovation index (Orlova *et al.*, 2023). The global innovation index was developed by the World Economic Forum and is a composite index of various indicators, which in turn consist of 80 variables that together allow assessing and analysing the potential of each country in the field of innovation compared to other countries on an international scale. The indicators that make up the global innovation index characterise both domestic research and scientific and technological development, infrastructure, and the country’s overall readiness for innovation. To compare the global innovation index of different countries, an international ranking is compiled to determine the place of each country in the list, from leaders to outsiders.

For comparison, the leaders in the world in 2023 according to the global innovation index were Switzerland (67.6 points and 1st place in the ranking), Sweden (64.2 points and 2nd place in the ranking), and the United States (63.5 points and 3rd place in the ranking). As of 2023, African countries became outsiders in the global innovation index, namely: Burundi (12.5 points and 130th place in the ranking), Niger (12.4 points and 131st place in the ranking), and Angola (10.3 points and 132nd place in the ranking) (World Intellectual Property Organization, 2023). As can be seen from Table 1, as of 2023, Ukraine’s global index was 32.8 points, which corresponds to 55th place out of 132 possible in the world ranking. Ukraine is characterised by indicators that are higher than expected for the level of development, but Ukraine is in the group of countries with lower-than-average income.

Table 1. Ukraine’s global index, 2011-2023

Year	Number of points	Place in the ranking
2023	32.8	55
2020	37	45
2017	37.6	50
2014	36.2	63
2011	35	60

Source: made by the author based on INSEAD (2011), World Intellectual Property Organization (2014; 2017; 2020; 2022; 2023)

For the first time since independence, Ukraine has been ranked among the top 3 most innovative economies in the group of lower-middle-income countries, based on data that mostly relates to the period up to 2022. Ukraine, which was ranked 55th, improved its position in 2023 compared to last year, when it was ranked 57th (World Intellectual Property Organization, 2022). The highest rating scores were given to the level of development of Ukrainian education (60.9 points) and information and communication technologies (72.6 points). The lowest scores were given to the state of the institutional field (17.2 points) and the state of infrastructure (16.3 points), which are the consequences of functioning under martial law (World Intellectual Property Organization, 2023). However, comparing the data for 2023 with the data from previous years, a negative trend can be

identified. Analysing Ukraine’s global innovation index score in the pre-war period and during the war, it can be concluded that before the start of martial law, the country’s place in the international ranking of the global innovation index was increasing, except for the 2014 score. However, after the start of the full-scale invasion, Ukraine’s place in the international ranking dropped significantly, and its score was lower than in 2011.

Another important indicator of a country’s innovation potential is the European innovation index. This indicator focuses on the innovative development of EU countries. The European innovation index characterises the country’s readiness for the nearest innovative changes in practice. The indicators that make up the European innovation index characterise both resource and structural aspects, as

well as achievements. To compare the European innovation index among different EU countries, a European ranking is compiled, which determines the place of each country in the list from leaders to outsiders (Orlova *et al.*, 2023). As of 2023, the European innovation index for Ukraine was 31% of the EU average out of 160 possible points. As of 2023, Ukraine was an emerging innovator. Over the period 2016-2023, the indicators slightly decreased and are lower than in the EU (by 8.5% points). It is important to note that the rate for 2016-2023 decreased by 0.2%, and the rate for 2022-2023 decreased by 0.7%. However, these are only growth rates, but if paying attention to the annual growth rates, it is possible to conclude that in the period 2016-2020, the European innovation index of Ukraine decreased from 100% points to 85% points.

In the following years, in the period 2020-2022, a similar indicator increased from 85% points to 100% points. With the start of the full-scale invasion, the index began to decline again. Having analysed the performance of Ukraine and other European countries, it can be concluded that the gap between the country's performance and that of the EU is growing. Ukraine's relative strengths in innovation are primarily in the export of knowledge-intensive services (105.6% points), environment-related technologies (87.8% points), employment in knowledge-intensive activities (80.7% points), venture capital expenditure (53.6% points), and expenditure on innovation not related to research and development (R&D) (53.6% points). Ukraine's relative weakness in the innovation area is primarily observed in the following indicators: product innovators (0% points), design applications (0.7% points), sales of innovative products (3.1% points), international scientific joint publications, and public sector R&D expenditure (11.8% points). Analysing individual indicators that represent relative strengths and relative weaknesses for Ukraine, it can be concluded that the country has sufficient potential for further development in the innovation sector (European innovation scoreboard..., 2023).

Both the global innovation index and the European innovation index group countries according to their results. As a result of the grouping, Ukraine was classified in 2023 as an emerging innovator. Emerging innovators as of 2023 are the lowest possible category. Ukraine ranked last in it (European innovation scoreboard..., 2023). This is a consequence of Russia's full-scale invasion of Ukraine, as well as population migration and the economic crisis. However, despite the martial law in the country, Ukraine is making efforts to improve its position in the innovation sector, as it has the potential, which is expressed in its geographical location, free trade with EU countries, and high level of human development (Orlova *et al.*, 2023).

Thus, by analysing Ukraine's performance in the global innovation index and the European innovation index, it is possible to understand the opportunities and risks in the innovation sector of Ukraine, as indicated by the indicators of the analysed indices. Based on these indicators, it is possible to develop strategic and effective directions for the development of innovations at enterprises in Ukraine, on the one hand, and to ensure the competitiveness of the national economy, on the other hand. The current state of innovation activity in the country at the macro level indicates that it is important to introduce changes in the

management of innovation processes at the micro level, i.e., at individual enterprises. It is determined that it is essential for Ukrainian enterprises to pay attention to the feasibility of introducing changes in business diversification aimed at economic, environmental, and social aspects of functioning. The main directions of business change towards the introduction of innovations in the functioning of enterprises during the war should simultaneously take into account the needs of the global market. The analysis of the country's innovation potential on an international scale is the basis for the innovation potential of Ukrainian enterprises and the development of management strategies to improve it, since the innovation activities of individual Ukrainian enterprises directly depend on government policy, scientific potential, infrastructure development, and other indicators that make up the global innovation index and the European innovation index.

New areas of innovation activity

Based on the analysis of the innovation market in Ukraine in the context of a full-scale invasion, it is possible to draw conclusions about changing the strategies of innovation management at Ukrainian enterprises and business diversification, focusing on the opportunities provided by the state and on innovative changes on a global scale. Changes in management strategies at individual enterprises in Ukraine should be in line with national and international needs. Such changes should further improve the efficiency of enterprises and increase their competitiveness in a competitive market. There are many appropriate strategies for the innovative development of an enterprise. Conventionally, all strategies can be divided into three groups based on environmental, economic, and social aspects.

In times of war, businesses should focus on producing goods and services that will be relevant in the market during wartime and in demand. This can be the production of food products, medical equipment, or equipment needed directly by the military in combat zones (Mykhailyk & Birak, 2023). For this approach, firstly, attention should be paid to an innovative strategy for developing a "business core". Such a strategy should focus on the core of the business. The actions of entrepreneurs should be focused on enhanced digital transformation, which should include changing the way business is conducted and managed on an online platform. In this case, services and goods should be provided through digital channels. This minimises physical interaction and ensures a higher level of business flexibility and responsiveness to external changes. This is especially useful in the context of a power outage. A striking example is the creation of the anti-cafe "What's the Game" in Kremenchuk, which positions itself as a co-working and entertainment venue where people can spend their free time. This establishment was created by refugees from the city of Kharkiv, focusing on different areas of the same institution (Perekrest *et al.*, 2021).

The strategy of using artificial intelligence and machine learning is another appropriate strategy for managing innovation in a country under martial law. With this strategy, all attention should be focused on analysis methods. In order to implement this strategy in practice, it is important to develop intelligent analytical systems that can automatically analyse the necessary data to identify

forecasts and understand how to meet the needs of potential and regular customers. In this case, it is advisable to use chatbots to automate customer service and support in order to effectively implement the strategy in practice (Orlova *et al.*, 2023). Artificial intelligence has many risks and disadvantages compared to human work when used in innovation management, but it is crucial to pay attention to its advantages. Innovations carry the risk of high implementation costs. In this case, managers need to be well-informed about the cost-effectiveness of their efforts. In this case, artificial intelligence has an informative advantage in information processing and can also bring real benefits to the enterprise by reducing risks in management and reducing the cost of innovation processes (Haefner *et al.*, 2021).

A separate type of innovation management strategy is the introduction of blockchain technologies into the company's operations. It is important to understand that the strategy of introducing chatbots and machine intelligence is not identical to the strategy of introducing blockchain technologies. In the case of this type of strategy, the main focus should be on sales channels. This should involve the development and implementation of decentralised platforms to enable secure financial transactions without third parties. It is the use of blockchain technologies in logistics activities to register all actions in the company's distribution channels that increases the level of trust in the company in the supply chain. In the process of managing innovation activities on the basis of blockchain technologies, confidentiality, data protection, and high-quality accountability are maintained. Blockchain technologies can radically change the experience of doing business in terms of customer-centricity by disclosing data and information and ensuring confidentiality. They form innovative mechanisms to meet consumer needs that can contribute to value creation (Wang *et al.*, 2022).

It is also possible to focus on the strategy of creating products or services using augmented or virtual reality. These technologies not only entertain and provide immersive experiences for users but also have significant potential to impact communities and society as a whole (Perekrest *et al.*, 2021). These can be both augmented reality and virtual reality applications that can allow current and potential consumers to try and test products or services virtually before making a decision to purchase a product or service (Orlova *et al.*, 2023). Since innovation activities should be aimed at the consumer of goods or services, there are examples of the use of augmented or virtual reality for businesses operating in various sectors of the economy. For example, in tourism, the practical use of augmented or virtual reality provides an advantage in terms of timely information for tourists. In education, the advantage is expressed in the ability to transform the learning process and create a more engaged and interactive experience for students. For urban planning and architecture, it is the ability to design and visualise buildings on a real scale in real locations. Given the expanding use of Internet of Things (IoT) technologies, it is advisable for Ukrainian entrepreneurs in wartime to implement such a strategy, the focus of which should be shifted to "smart solutions" in the management and operational activities. The advantages of such a strategy lie in its accessibility, as smart devices can be connected to smartphones, which facilitates the control

process. In addition, the advantage is that the IoT allows analysing performance.

Another appropriate strategy for Ukrainian enterprises is a strategy based on product quality and focused on its improvement. In today's environment, enterprises should pay attention to the environmental aspect of their operations, so eco-friendly goods and their packaging or services can reduce the level of negative environmental impact. Focusing on the environmental impact of business, it is also advisable to implement an environmentally friendly "green restructuring" strategy. This implies the introduction of renewable energy sources, such as solar panels and wind turbines, as well as the introduction of energy efficiency and energy-saving technologies for the efficient use of resources in the enterprise (Miller *et al.*, 2020). Corporate social responsibility does not have a direct impact but indirectly affects environmental performance in the presence of mediating variables such as environmental strategy and green innovation (Kraus *et al.*, 2020).

Another strategy based on environmental aspects is the strategy of using genetic engineering and biotechnology in the process of enterprise activity. This strategy is based on the use of various biotechnologies to create new types of goods or services. Analysing all the conditions for the functioning of Ukrainian enterprises, as of 2024, it is advisable to create their own ecosystems based on the integration of business processes (Talmar *et al.*, 2020). In other words, it is advisable to develop and implement platforms that will allow Ukrainian entrepreneurs to combine the interaction of Ukrainian entrepreneurs with consumers to obtain services or goods. In this case, it is advisable to expand business activities based on application software interfaces and create their own applications (Granstrand & Holgersson, 2020). Despite the fact that Ukraine is in a state of war, both the Ukrainian economy in general and Ukrainian enterprises in particular are still focused on sustainable development, which involves a system of economic, environmental, and social actions. As it has been identified that most strategies focus on economic and environmental aspects, it is also important to focus on the feasibility of a social strategy as a type of business diversification, which should include the creation of online communities to exchange ideas or issues that are relevant to Ukrainian society.

Peculiarities of forming new strategies for innovation management

Innovation management can be viewed in different ways. On the one hand, innovation management is the regulation of the process that results in innovation. On the other hand, innovation management is the management of the system in which innovation processes are implemented (Perekrest *et al.*, 2021). Hereinafter, innovation management refers to the management system and its features. When analysing these strategies for changing the functioning of Ukrainian business, it is critical to manage them efficiently and effectively. The management of the investment and innovation process involves primarily attracting financial resources, creating favourable conditions for business, and controlling their functioning (Mykhailuk & Birak, 2023). Furthermore, the main tasks of innovation management at the enterprise include the formation of innovation strategies, decision-making on the implementation

of innovation strategies, planning, analysis, and monitoring of strategy compliance. In other words, when talking about managing innovation at Ukrainian enterprises, it is primarily about creating an innovative culture at the enterprise, a system that will involve the creation of its own innovation ecosystem. It is these innovation ecosystems that convey to potential and regular customers a holistic offer that becomes effective in action as a result of the individual contributions of various participants. On the one hand, interdependence in ecosystem relationships constrains firms; for example, the launch of new products or services is delayed until additional elements from ecosystem participants are available. On the other hand, firms can leverage ecosystem relationships to create higher value by exploiting synergies and network effects that result from complementarities between actors (Talmar *et al.*, 2020).

Analysing the proposed business changes, it can be concluded that they are all aimed primarily at the survival of Ukrainian enterprises in the context of martial law and instability in the country. The above strategies are also aimed at developing innovation potential, improving their competitive position in a competitive market, and entering new markets after the end of hostilities. Such strategies offer the prospect of sustainable enterprise development and the development of innovations on an international scale. If analysing specific examples where such strategies can be put into practice, it is possible to identify such areas as R&D, start-ups, the development of certain types of goods or services at enterprises, and modernisation of production

processes. Each of these areas of activity has its own advantages and opportunities, as well as risks and disadvantages, but it is more expedient to invest in innovative projects in new markets, as such actions can quickly and effectively ensure a high level of competitiveness in the market.

However, not all sectors of Ukraine’s national economy can actively and seamlessly implement effective innovation management strategies under martial law. A striking example is the tourism industry. Even without martial law, innovations in this industry are much less frequent than in other sectors of the economy, as this is a specific feature of the functioning of tourism enterprises and depends on fragmentation and seasonality. In the context of the Russian-Ukrainian war, the situation has become even more complicated, as it is difficult to implement innovative approaches to tourism in dangerous areas of Ukraine that are under constant shelling, such as eastern and central Ukraine. One of the possible options for diversification could be the development of soft tourism infrastructure. The economic essence of infrastructure is that the higher the level of its development, the higher the investment and innovation attractiveness, and the attraction of highly skilled workers in the tourism sector (Pityulych & Feier, 2022). The most important thing for managing innovation activity in Ukraine under martial law is to focus the management strategy on three main components: accelerating the emergence of investments, creating motivation for investment, and developing partnerships and cooperation (Fig. 1).

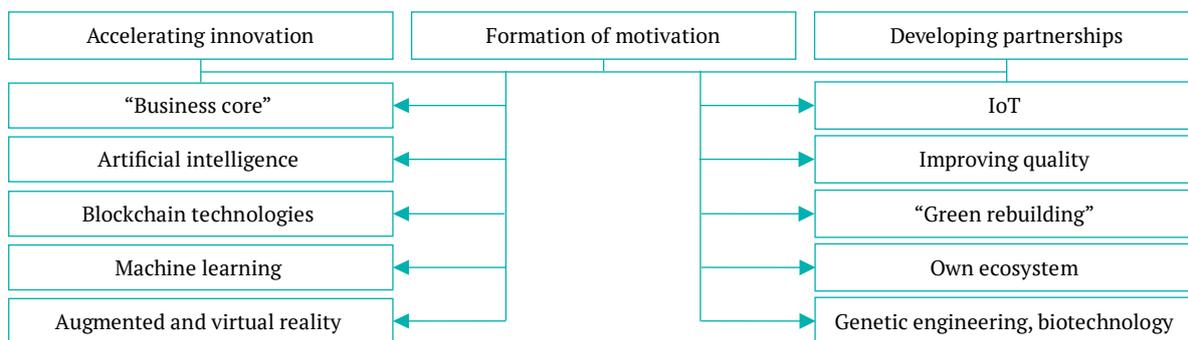


Figure 1. Changes in strategies and directions of innovation management of enterprises under martial law

Source: made by the author

Implementing the changes outlined in Figure 1 should help to accelerate the introduction of innovations that are tailored to market demand and national security needs. This may include developing new designs, improving production processes, or introducing new technologies. This is how businesses can diversify their activities during martial law. It is also important to attract investors to Ukrainian enterprises. These can include banks and investment funds, private and public investors, credit institutions, and grants. As the demand for goods in the national market may be reduced in times of war due to a decrease in the number of consumers and lower consumer incomes, an essential step in the innovation management strategy is to enter new alternative markets. At the same time, it is crucial to seek cooperation with other companies to improve the situation with the material or intellectual resources of the enterprise

(Trzeciak *et al.*, 2022; Mykhailuk & Birak, 2023). This process should take place in five main stages. At the first stage, the entrepreneur is the driving force at the individual level and shapes the individual innovation process. At the second stage, it is relevant to pay attention to R&D activities and focus on internal sources of innovation in the enterprise. At the third stage, it is important to form an interaction between internal and external sources of innovation. At the fourth stage, it is advisable to combine various components into a single innovation system. At the fifth and final stage, it is essential to focus on the management of the newly created innovation ecosystem (Wang *et al.*, 2022).

On the one hand, the consequences of a full-scale invasion pose significant risks and complicate the functioning of Ukrainian enterprises. On the other hand, digitalisation processes and Industry 5.0 contribute to an

increase in innovation activity. Since most enterprises face significant challenges in implementing the IoT in their innovation management processes, it seems that the implementation of this concept in practice is only an illusion. However, such a concept can be effective if it combines elements such as the innovation ecosystem, design thinking, and corporate strategy. The concept of absolute innovation management connects the innovation ecosystem with the corporate strategy of the company, which is adopted as an innovation strategy through design thinking management. In this case, innovations become customer-focused and technically feasible for implementation. During such implementation in practice, innovation management affects business activities, increasing their value as well as that of consumers. In this way, innovation can stimulate entrepreneurial activity and contribute to achieving better competitive advantage and economic growth to meet the needs of the IoT and Industry 5.0 (Aslam *et al.*, 2020). In addition, it is relevant that the innovation management strategy in enterprises is not just seen as an innovation in the process of developing software and related services in companies but as a new and competitive management strategy for organisations.

● DISCUSSION

Having analysed the innovation potential of Ukraine on a global scale using the global innovation index and the European innovation index, it was determined that, as of 2023, Ukraine has a critical state of innovation development. The analysis showed that although Ukraine has a good basis for innovation, there are obstacles at the country level that impede the development of innovation. These obstacles include insufficient infrastructure development and insufficient state support due to the impact of the Russian-Ukrainian war. As a result of the analysis, it is determined that the identified strategies for managing innovation activities consider the risks and problems that may arise in the context of war and in the context of Ukraine's readiness for innovative development. The main strategies for innovation management should be aimed at survival in conditions of instability and martial law. This includes the creation of flexible and adaptive management processes that can quickly respond to changes in the external environment.

The results obtained show that in the context of martial law in Ukraine, innovation management should take into account the specific challenges and opportunities of different industries. For example, in the tourism industry, innovation is significantly hampered by seasonality, fragmentation, and insecurity in regions subject to shelling. However, despite these challenges, the key components of effective innovation management include accelerating the emergence of investment, creating incentives for investment, and developing partnerships and cooperation. It is also important to adapt innovations to market demand and national security needs, attract investors, and enter new markets. P. Chaithanapat *et al.* (2022) also pointed out the importance of the above aspects in their study, which underlines the relevance of the conclusions drawn from the analysis. The results of the study indicate that the strategy of innovation management should be formed into an innovation ecosystem at the enterprise. After all,

this approach will enable enterprises in wartime to get the greatest benefits from such implementation in practice. These results were confirmed in the work of P. Yaghmaie & W. Vanhaverbeke (2020). In analysing innovation ecosystems, the researchers concluded through a systematic literature review that different actors participate in the ecosystem to maximise their value. This highlights the complexity of the ecosystem environment. Furthermore, the interdependence of actors and their influence on each other's performance indicates that analysing innovation ecosystems requires a holistic perspective. This conclusion emphasises the results obtained in this study.

The conclusions of the study differ from those of J. Chen *et al.* (2018). The researchers note that this approach to managing innovation activities at an enterprise does not consider vertical integration. As a result, such actions can lead to significant openness and a lack of key competencies and do not reflect the strategic direction of the enterprise. The researchers concluded that such a disconnect between innovation and strategy is undesirable, especially for technological and information innovations, as they cannot be considered a separate independent activity and should be embedded in the overall mission, vision, and goal of the enterprise's development and management process. Additional limitations of this model include that it tries to define innovation on the basis of total quality management. At the same time, it lacks tools and methods for implementation and does not explain how this model can be put into practice. This management model does not assign responsibility for innovation in the organisation; it simply states that everyone should innovate, and everyone should be an innovator, without explaining who will control and monitor the whole process. The interaction of such a governance model with corporate strategy is not specific or ambiguous, as it is not clear how such a governance model will be linked to corporate strategy.

The study found that the most significant thing for managing innovation activity in Ukraine under martial law is to focus the management strategy on three main components: accelerating the emergence of investment, creating motivation for investment, and developing partnerships and cooperation. The results of the study showed that a new strategy for managing innovation activities at Ukrainian enterprises in wartime should be aimed at consumers, which was confirmed by F. Gault (2018), who argues that the main task of innovation is to create a certain value for potential and regular consumers of goods or services. If innovations do not bring a certain value to consumers, they should not be recognised as innovations. A similar conclusion is reached by researchers V. Özdemir & N. Hekim (2018) and T. Keiningham *et al.* (2020). The researchers argue that it is the development of the IoT and Industry 5.0 that is pushing enterprises to introduce the combination of human and machine labour into their management activities. Such interaction brings greater efficiency to enterprises. This statement fully underlines the results of this study. However, the study did not take into account the aspect of the population's opposition to innovations from entrepreneurship in Ukraine. As a result of a systematic literature review, S. Talwar *et al.* (2020) concluded that this may include resistance to digital innovation, organisational resistance to technological innovation, resistance

to technological innovation in healthcare, and consumer resistance to innovation (offline). Some populations may find it difficult or unwilling to adopt digital technologies due to a lack of knowledge, experience, or access to the necessary resources. In companies, the introduction of new technologies may be met with resistance from employees and management, especially if they fear that innovation may lead to changes in workflow, job losses, or the need for additional training. In the healthcare sector, the adoption of new technologies can be difficult due to concerns about their reliability, safety, and effectiveness, as well as the need to comply with strict regulatory requirements. Some consumers may prefer traditional methods and approaches, feeling distrustful of new products or services due to a lack of habit or concerns about quality and safety. These types of resistance need to be considered when developing and implementing innovation strategies to ensure their successful adoption and implementation. Therefore, taking into account the results of this study, it can be concluded that in the current conditions of the functioning of Ukrainian enterprises, attention should be focused on the greater introduction and development of innovations, as well as changes in innovation management strategies that will meet market requirements during the Russian-Ukrainian war.

● CONCLUSIONS

In the conditions of the Russian-Ukrainian war, the main goal of Ukrainian entrepreneurs is to focus on the innovation activities of enterprises and their development. During the wartime period, Ukraine has significantly slowed down the pace of innovation development at the national level but has a high potential for development in this area. The corresponding situation at the macro level is reflected in the activities of business entities at the micro level. The study found that during the years of war in Ukraine, the country's innovation potential, although improved compared to the pre-war period, was in a crisis state. Accordingly, the investment activity in innovations by Ukrainian enterprises has decreased during the war due to the uncertainty and risks caused by the Russian-Ukrainian war. For individual enterprises, the development of innovations is driven by the tendency and ability to create new and improve existing products and technological processes, as well as new organisations and management systems, as well as other creative and imitative changes that lead to the creation of new enterprise values. The analysis shows

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that all strategies can be divided into three groups based on environmental, economic, and social aspects.

As a result of the study, ten promising and expedient changes in the activities of Ukrainian enterprises in wartime have been identified, and elements of changing the promising directions of innovation management strategies have been identified, namely: accelerating the emergence of innovations, creating opportunities for investment, and actively developing cooperation. Such a change in innovation management strategies will enable enterprises to operate efficiently and increase their competitiveness in the market. It is determined that the process of changing the strategy of innovation management and choosing a new way of business diversification for Ukrainian entrepreneurs should take place in five consecutive stages: the formation of an individual innovation process, increasing attention to R&D activities and internal sources of innovation, promoting the interaction of internal and external sources of innovation, combining various components into a single system of innovation, and effective management of the newly created innovation ecosystem.

This study and its results are not exhaustive, but the results show the most critical areas and concepts that are important in modern innovation management and offer a basis for further development. The study considers not just one direction of innovation management and diversification of Ukrainian business but several, since the choice and focus of business development on one strategy out of many offered will allow enterprises to choose the best option for implementation under martial law. As a result, such a choice will be effective not only in the short term but also in creating sustainable value for the company's stakeholders. This study has some limitations. It is a theoretical study and is not enriched with quantitative data from the annual reports of Ukrainian enterprises. A comprehensive quantitative study with a large sample of data would be advisable. It would also be useful and relevant to study the experience of those entrepreneurs who have already implemented changes in the strategy of managing innovation activities at the enterprise and determine their consequences, effectiveness, and risks.

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● CONFLICT OF INTEREST

None.

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Диверсифікація бізнесу та зміна перспективних стратегій управління інноваційною діяльністю під час воєнного стану

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Анотація. Мета даної статті полягала в дослідженні зміни напрямків підприємницької діяльності та підходів щодо управління інноваційною діяльністю в умовах російсько-української війни. У результаті аналізу визначено, що за період російсько-української війни значно постраждав український ринок інноваційного розвитку. Про це свідчать як глобальний індекс інновацій України, так і європейський інноваційний індекс. Такі погіршення значно вплинули на розвиток інновацій на українських підприємствах. Для того, щоб підприємству вдалось ефективно функціонувати в умовах війни, потрібно більше зусиль та уваги приділяти інноваційній діяльності та зміні перспективних стратегій управління такою діяльністю. Встановлено десять напрямків, які доцільно впровадити українським підприємствам в умовах війни: розроблення «бізнес-ядра», впровадження штучного інтелекту, машинного навчання, доповненої та віртуальної реальностей, блокчейн-технологій, впровадження «розумних рішень» із використанням інтернету речей, а також впровадження «зеленої перебудови», генетичної інженерії чи біотехнологій, підвищення якості, створення власної екосистеми. У результаті дослідження встановлено, що головну роль у такому процесі займає ефективне управління інноваційною діяльністю, тому українським підприємствам важливо змінити перспективні стратегії з управління. Процес зміни стратегії інноваційного менеджменту та вибору нового шляху диверсифікації бізнесу для українських підприємств має проходити в п'ять послідовних етапів: формування індивідуального інноваційного процесу, збільшення уваги до науково-дослідних та дослідно-конструкторських робіт, внутрішніх джерел інновацій, сприяння взаємодії внутрішніх та зовнішніх джерел інновацій, поєднання різних компонентів у єдину систему інновацій та ефективне управління створеною інноваційною екосистемою. У дослідженні визначено головні аспекти, які мають бути присутніми в змінених стратегіях, аби підприємства могли максимально ефективно функціонувати під час воєнного стану. До таких аспектів належить прискорення появи інновацій, формування мотивації до інвестування та розвиток партнерства в інвестиційному процесі

Ключові слова: адаптація підприємництва; ринкова ситуація; цифровізація; екосистема підприємства; повномасштабне вторгнення