



Adaptive Innovation Management: A Resilience Approach in Uncertainty

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ABSTRACT

This paper looks at the characteristics of adaptive innovation oversight amidst increasing ambiguity. Conventional methods for managing innovation are not sufficiently potent amid swift shifts, necessitating the adoption of adaptable and nimble governance frameworks. In this setting, the resilience perspective holds special significance, as it secures the steadfastness of enterprises and their capacity to rebound and progress during turbulent times. The objective is to theoretically validate and formulate the tenets of adaptive innovation governance rooted in the resilience concept, alongside pinpointing methods for boosting the firmness and productivity of organizations amidst the imperceptibility and unpredictability of the outer surroundings. The study seeks to discover methods to enhance adaptive innovation governance by incorporating the resilience perspective to boost the steadiness and adaptability of entities amid unpredictability and obscurity in the external environment. Conceptual frameworks for innovation oversight are examined, and their shift under conditions of mounting uncertainty is ascertained. The core of adaptive direction is unveiled, and its function in guaranteeing the potency of organizations' inventive endeavors is affirmed. The notion of resilience as a governance model is explored, and its main attributes in the scope of novel progress are defined. The setting of obscurity is described, and its effect on administrative selection-making procedures is established. Current instruments and methods (Agile, Lean, adaptable frameworks) that guarantee the flexibility of innovation direction are examined. Ways for incorporating the resilience perspective into a company's innovation management structure are established. The effect of corporate resilience on the rivalry and success of inventive endeavors is evaluated. Methodological strategies for judging the performance of flexible innovation management amid unpredictability are created. Actionable suggestions for applying the resilience concept in business operations are drafted, considering contemporary difficulties. Subsequent study ought to target elaborating the examination of real processes for applying the fortitude strategy in the innovation oversight framework. It is sensible to focus particular importance on examining industry-specific traits of employing such methods and how digital advancements affect augmenting corporate durability.



KEYWORDS

technological changes, digitalization, management, uncertainty, flexibility, adaptive management, innovation management, resilience approach, transformation.



Адаптивний інноваційний менеджмент: Resilience-підхід в умовах неочевидності

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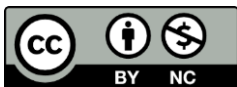
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У статті вивчено аспекти адаптивного інноваційного управління в умовах зростаючої невизначеності. Традиційні методи до інноваційного менеджменту виявляються недостатньо дієвими в умовах швидких змін, що вимагає запровадження адаптивних та гнучких моделей управління. Особливої ваги набуває resilience-підхід, який гарантує стійкість організацій та їх здатність до відновлення й розвитку в умовах турбулентності. Метою є теоретичне обґрунтування та розвиток засад адаптивного інноваційного менеджменту на основі resilience-підходу, а також визначення механізмів підвищення стійкості й ефективності функціонування організацій в умовах неочевидності та невизначеності зовнішнього середовища. Дослідження спрямоване на пошук шляхів удосконалення адаптивного інноваційного менеджменту шляхом інтеграції resilience-підходу для підвищення стійкості та гнучкості організацій в умовах невизначеності та неочевидності зовнішнього середовища. Проаналізовано теоретичні підходи до інноваційного менеджменту та визначено їх трансформацію в умовах зростаючої невизначеності. Розкрито сутність адаптивного управління та обґрунтовано його роль у забезпеченні ефективності інноваційної діяльності організацій. Досліджено концепцію resilience як управлінську парадигму та визначено її ключові характеристики в контексті інноваційного розвитку. Охарактеризовано середовище неочевидності та визначено його вплив на процеси прийняття управлінських рішень. Проаналізовано сучасні інструменти та підходи (Agile, Lean, гнучкі методології), що забезпечують адаптивність інноваційного менеджменту. Визначено механізми інтеграції resilience-підходу в систему інноваційного менеджменту підприємства. Оцінено вплив організаційної стійкості на конкурентоспроможність і результативність інноваційної діяльності. Розроблено методичні підходи до оцінювання ефективності адаптивного інноваційного менеджменту в умовах неочевидності. Майбутні дослідження мають бути спрямовані на поглиблення аналізу практичних механізмів впровадження resilience-підходу в систему інноваційного менеджменту. Особливу увагу доцільно приділити дослідженню галузевих особливостей застосування таких підходів та впливу цифрових технологій на підвищення організаційної стійкості.



КЛЮЧОВІ СЛОВА

технологічні зміни, цифровізація, управління, невизначеність, гнучкість, адаптивний менеджмент, інноваційний менеджмент, resilience-підхід, трансформація..

1. Introduction

The modern socio-economic environment of enterprise functioning is characterized by an increase in the level of uncertainty, complexity and unpredictability of changes that significantly affect the effectiveness of management decisions. Globalization processes, the rapid development of digital technologies, the transformation of market structures and periodic crisis phenomena create new conditions in which traditional approaches to innovation management lose their full effectiveness. At the same time, there is an increasing need to introduce new management approaches, including the resilience approach, which allows organizations to increase resilience, recover quickly from crises and support innovative development. That is why the study of adaptive innovation management in a turbulent environment is especially important both from a theoretical and practical point of view [1, p. 49].

Of particular importance in the modern scientific and practical plane is the concept of resilience, which implies the ability of organizations not only to withstand external challenges but also to quickly recover and transform in accordance with new conditions. In combination with innovation management, this approach forms a new management paradigm focused on increasing the sustainability, adaptability and long-term competitiveness of organizations. The problem of the study lies in the growing discrepancy of traditional approaches to innovation management with modern conditions of uncertainty, complexity and non-obviousness of the external environment. Most classical management models are focused on relatively stable conditions and predictable development scenarios, while modern realities are characterized by a high speed of change and low predictability [2, p. 157]. In many cases, enterprises react to changes reactively rather than proactively, which reduces their competitiveness in the long term [3]. The key scientific problem is the need to develop and substantiate adaptive innovative management approaches that would combine flexibility, resilience and the ability to continuous transformation in conditions of uncertainty. In such conditions, the ability of organizations to quickly adapt, learn and restructure internal processes in accordance with changes in the external environment becomes especially important.

2. Literature Review

Modern scientific discourse in Ukraine demonstrates a significant increase in interest in the problems of adaptive innovation management in conditions of uncertainty, which is due to the consequences of a full-scale war, post-COVID transformation of the economy and digitalization of the business environment. In scientific works, an interdisciplinary base is gradually formed, which combines the concepts of adaptability, resilience, digital transformation and innovative development. Thus, K. V. Protsak [1, p.49] substantiated the need to transition from traditional management models to adaptive systems based on the digital maturity of enterprises and scenario risk modeling. The author argues that the modern environment is characterized by "high turbulence, multiplicity of risks, and technological changes," which requires the integration of IT tools to respond to crisis signals promptly. At the same time, the study focuses mainly on the technical and instrumental aspect of adaptation, without sufficient attention to behavioral, organizational and cultural factors of resilience. An important contribution to the development of the resilience approach is the work of S. V. Filippova and P. V. Vugelman [2, p. 157]. It forms the conceptual basis of strategic resilience, which is based on the ideas of Resilience Engineering and the theory of "weak signals". The authors emphasize the importance of dynamic configuration of resources and functional redundancy as conditions for ensuring the ability of the enterprise to adapt and anticipate changes. However, the study is mainly conceptual in nature and does not contain enough applied models for the implementation of innovations within the framework of resilience logic.

In the works devoted to the transformation of management in wartime, in particular in the study of O. S. Verbova [3], the emphasis is placed on the role of self-management and the development of soft skills as factors of adaptability of organizations. The author proves that emotional intelligence, stress resistance and digital competencies of personnel form the basis of innovative flexibility of the enterprise. At the same time, these approaches are considered fragmentarily, without integration into the integral system of innovation management. With the introduction of innovations in the context of sustainable development and economic recovery. V. I. Voronenko, V. A. Omelyanenko [4] substantiate

the need to integrate digital technologies, data analytics and platform solutions into risk management and recovery systems. The authors emphasize the importance of transparency, decentralization and community involvement as factors for increasing the resilience of systems. O. I. Dodon and A. V. Synichenko [5, p. 40] focused on the fact that the modern environment of functioning of enterprises is characterized by a high level of instability, which requires flexible, fast and situationally dependent management decisions. A strong point of the work is its focus on the decision-making process as a central element of adaptive management, which distinguishes it from many studies that are limited to general characteristics of adaptability.

L. Li, J. Zhang, C. Liu, Y. Guan, W. Kang [6] investigated the resilience of innovation networks in crisis conditions. They proposed a static-dynamic model for assessing the resilience of innovation systems, taking into account both the structure of the network and its evolution. W. Gao [7, p. 251], the author proves on the basis of a meta-analysis that organizational resilience directly affects the innovative behavior of employees. The author finds that in the VUCA environment, resilience acts as a catalyst for innovation, but this effect decreases in environments with high avoidance uncertainty. J. Machnik-Słomka, E. Pawłowska, M. Penkala [8, p. 287] investigated the relationship between innovation management and the sustainability of organizations. The author emphasized that innovation management is a tool for the formation of resilience, but there is no universal theoretical model that combines these concepts. C. Toro-Gallego, J. Sapena-Bolufer, M.-A. Plaza-Navas, J. Torres-Pruñonosa [9] carried out a bibliometric analysis of the development of the theory of organizational resilience; systematized the evolution of the Resilience concept and noted that modern research is moving towards integration with innovation management and digital transformation. H. Łobejko [10] investigated the role of dynamic abilities in business recovery after crises. The author proves that innovation, digitalization and strategic flexibility are key factors in the adaptability of enterprises. The existing works create a theoretical basis for further research, but they need to be deepened in the direction of integrating the resilience approach with innovative activity in conditions of non-obviousness, which determines the scientific novelty and relevance of the research.

3. Problem Statement

The purpose of this study is to theoretically substantiate and develop the principles of adaptive innovation management based on a resilience approach in conditions of uncertainty and non-obviousness of the external environment. The main attention is paid to the study of the mechanisms for the formation of organizational stability, ensuring the flexibility of managerial decisions and the integration of adaptive tools into the system of innovative management of enterprises.

4. Methods and Materials

In the process of the study, a set of general scientific and special methods was used, which provided a comprehensive analysis of the problem of adaptive innovation management under conditions of uncertainty. In particular, the methods of analysis and synthesis are applied to study theoretical approaches to innovation management and the concept of resilience, as well as the method of generalization to form a holistic view of modern management models.

The system approach made it possible to consider innovation management as a complex dynamic system that functions under the influence of external and internal factors. Comparative analysis is used to compare traditional and adaptive approaches to management, as well as to determine their advantages and limitations in conditions of non-obviousness. In addition, elements of structural and functional analysis are used to study the mechanisms of formation of organizational stability.

The material base of the study was the scientific works of domestic and foreign authors on innovation management, the theory of complex systems, organizational resilience, as well as analytical publications on management in conditions of uncertainty and turbulence. Additionally, generalized data from international research and conceptual models of modern management are used.

5. Results and Discussion

The modern business environment is increasingly operating in a mode of great uncertainty. Geopolitical shifts, technological gaps, information shocks, and market volatility are shaping a new governing reality in which adaptation becomes the core capacity of organizations. In this context, a paradigm of variable innovation management is being formed, the central core of which is a resilience approach. Adaptive innovation management can be defined as a set of management principles focused on the continuous updating of products, procedures and business models in accordance with changing external circumstances [7, p. 251].

The organization ceases to be a "plan execution machine" and turns into a system that is constantly being rebuilt under the influence of external signals. Theoretical approaches to innovation management have traditionally been formed within the rational-planning paradigm, where the innovation process was considered as a sequential and structured cycle — from the generation of an idea to its commercialization. Classical models (stage-gate, functional-hierarchical management systems) were based on the predictability of the market environment, the stability of resources and the possibility of long-term planning. With the development of market dynamics and technological changes, there has been a transformation to more flexible approaches, in particular, interactive and networked models of innovation [10]. In these concepts, the emphasis shifts to the interaction of participants in the innovation process, open innovation, as well as rapid testing and adaptation of solutions in real time. This was a response to the increasing complexity of the external environment.

In the conditions of modern uncertainty and non-obviousness, there is a further evolution of innovation management in the direction of adaptive and resilience-oriented approaches. Their key feature is the rejection of rigid planning in favor of continuous adaptation, the development of organizational resilience and the ability to quickly recover from shocks. Thus, there is a transition from controlled and predictable innovative models to dynamic systems operating in a constant uncertainty mode [6]. Adaptive management is a modern approach to the organization of management processes, based on the ability of the system to constantly change its parameters, structures and decisions in accordance with changes in the external and internal environment. Its essence lies in the rejection of rigidly determined plans in favor of flexible strategies that involve continuous monitoring of operating conditions, rapid training and adjustment of actions in real time [11].

In the context of innovation activity, adaptive management acquires special importance, since innovation processes by their nature are high-risk, uncertain and poorly predicted. It is adaptability that allows organizations to quickly respond to market changes, technological shifts and consumer behavior, reducing the time between the identification of new opportunities and their practical implementation [9]. Adaptive management contributes to the formation of an environment of continuous learning and experimentation, which is a key condition for the successful generation and implementation of innovations. As a result, organizations gain the ability not only to respond to changes, but also to proactively form new market opportunities [12, p. 98].

The concept of resilience as a new management paradigm takes on a new meaning. It allows organizations not only to respond effectively to external challenges, but also to ensure sustainable innovative development. For a better understanding of the essence of this approach, it is advisable to systematize its key characteristics and determine their manifestation in the innovation management system (Table 1).

The above characteristics indicate that resilience is a complex property of an organization that combines adaptability, flexibility, the ability to recover and innovative transformation. Its implementation contributes to increasing the efficiency of innovation activity. Resilience acts as a holistic management paradigm that integrates the principles of flexibility, adaptability, and innovation. Its implementation allows organizations not only to resist external challenges, but also to use them as a source of new development opportunities [7, p. 251].

Another important one is the resilience-oriented model, which focuses on the organization's ability to withstand crises, recover from shocks, and transform its activities [19, p. 872]. The innovation-ecosystem model is also becoming widespread, which provides for the active interaction of the organization with the external environment — partners, startups, scientific institutions. [20]. The agile model is based on an iterative approach to management, rapid testing of ideas and constant feedback. It helps to increase the speed of innovation processes and reduce the risks of erroneous decisions [21, p. 142]. Modern models of the formation of sustainable organizations combine adaptability, innovation

and the ability to transform, which allows them to function effectively in conditions of uncertainty and ensure long-term development.

Table 1. Key characteristics of resilience as a management paradigm

Characteristics	Contents	Manifestation in innovation management
Adaptability	The ability of an organization to change behavior according to environmental conditions	Rapid adjustment of innovative strategies and business models
Flexibility	Variability of management decisions and structures	Using Agile, Lean, and Experimental Approaches
Risk resilience	Ability to withstand external shocks	Reducing the impact of uncertainty on innovation processes
Training capacity	Ability to accumulate experience and knowledge	Continuous improvement of innovation through error analysis and experimentation
Proactivity	Focus on anticipation of change	Identification of new opportunities and trends for their mass distribution
Transformationality	Ability to profound changes	Transition to new business models and innovation ecosystems
Balance of stability and change	Combination of reliability and ability to develop	Maintaining business continuity in the implementation of innovations

Source: Formed by the authors based on [15-18].

At the same time, innovation enhances resilience, as the introduction of new technologies, management practices, and business models expands the organization's adaptive capabilities. Thus, a mutually reinforcing effect is formed: sustainability promotes innovation, and innovation increases the level of sustainability. In addition, the relationship is manifested in the formation of the organization's dynamic abilities, which allow it to respond effectively to changes, rethink strategies and create new competitive advantages. This is especially important in conditions of non-obviousness, where the ability to learn and adapt quickly becomes a key factor in success. Uncertainty conditions significantly change behavioral management models, since the traditional rationality of decision-making is limited by the lack of information and the unpredictability of consequences [6]. In such conditions, the role of behavioral factors, in particular intuition, experience, cognitive attitudes and psychological readiness for risk, increases.

The environment of non-obviousness is characterized by a high level of complexity, dynamism and unpredictability, in which there are no clear cause-and-effect relationships between events, and the available information is incomplete, contradictory or quickly loses its relevance. Unlike risk conditions, where the probabilities of events can be estimated, non-obviousness implies situations in which such estimates are limited or even impossible. This environment is formed under the influence of globalization processes, technological shifts, geopolitical instability and rapid changes in market conditions [21, p. 142].

The modern management environment is characterized by a high level of complexity, dynamism and unpredictability. To describe it, the concepts of VUCA and BANI are used, which allow systematically structuring the key challenges faced by organizations (Table 2).

Table 2. Characteristics of the non-evident environment (VUCA / BANI)

Elements	Contents	Impact on management
VUCA		
Variability	Rapid and unstable changes in the environment	The need for operational solutions
Uncertainty	Limited information	Use of adaptive approaches
Difficulty	A large number of interrelated factors	The need for systems thinking
Ambiguity	Lack of clear cause-and-effect relationships	Increasing the role of experience and intuition
BANI		
Fragility	Vulnerability of systems to minor changes	Building reserves and increasing resilience
Anxiety	Psychological instability of management entities	The growing role of behavioral factors
Nonlinearity	Disproportionality of cause and effect	The need for scenario analysis
Obscurity	Impossibility of a complete explanation of phenomena	Use of experimental approaches

Source: Formed by the authors based on [22-23].

The VUCA and BANI models demonstrate that today's environment is multidimensional and unstable. They emphasize the need to develop adaptability, flexibility, and resilience in organizations. Thus, understanding these characteristics is a basic condition for the formation of effective innovation management in conditions of non-obviousness [22].

Conditions of high uncertainty require the use of specialized management tools that reduce risks and increase the validity of decisions. Traditional planning methods are not effective enough, so the use of adaptive, analytical and experimental approaches is actualized. Table 3 systematizes modern decision-making tools used in an unstable environment.

Table 3. Decision-making tools in conditions of high uncertainty

Tools	Contents	Dignity	Scope of application
Scenario planning	Development of alternative development scenarios	Increased readiness for change	Strategic management
MVP and experimentation	Testing ideas through minimal products	Reducing the risks of innovation	Innovation Management
Risk analysis	Assessment of possible threats and their impact	Increasing the validity of decisions	Project Management
System analysis	Taking into account the interrelations of system elements	Comprehensive vision of problems	Organizational management
Agile management	Iterative approach to decision-making	Flexibility and speed of reaction	Innovation Management
Data-driven approach	Using Data and Analytics to Make Decisions	Increased accuracy and objectivity	Digital control
Design Thinking	User Centricity and Creative Problem Solving	Generation of innovative solutions	Product Development
Foresight and forecasting	Exploring future trends and scenarios	Formation of long-term strategies	Strategic planning

Source: Formed by the authors based on [24, p. 390; 25, p. 47; 26; 27, p. 148; 28, p. 96].

The introduction of a resilience approach into the system of innovation management of an enterprise involves the formation of a holistic mechanism aimed at increasing organizational stability, adaptability and the ability to quickly recover in conditions of uncertainty. Such a mechanism includes analytical, managerial, organizational and digital tools that interact with each other and ensure the continuity of innovative development [27, p. 148]. Diagnostics of the level of organizational resilience is the initial and key stage of the implementation of the resilience approach, as it allows you to assess the ability of the enterprise to counteract external and internal challenges and effectively recover from crises. It involves a comprehensive analysis of the current state of the organization according to a number of parameters that reflect its resilience and adaptability. The authors [29] note that in the conditions of global precariousness, change management becomes a relentless process that directly affects the degree of organizational sustainability. It is also important to consider human capital, in particular, the ability of personnel to acquire knowledge, adapt and work in the conditions of transformations. The study [30, p. 133] emphasizes that the effective management of human capital is a determining factor in the growth of organizational stability and innovation potential of firms.

The results of the diagnostics are the basis for the formation of further management decisions to increase the resilience of the organization, in particular, the identification of weaknesses, the development of adaptation strategies and the implementation of innovative changes. Diagnostics of the level of organizational stability is a fundamental stage in building an adaptive system of innovation management, as it provides an objective understanding of the current state of the enterprise and determines the directions of its further development [21, p. 142].

The main directions of digital transformation of management are the use of Big Data, artificial intelligence, business intelligence (BI) systems, cloud technologies and digital platforms. According to the study [31], digital resilience of business is a key factor in ensuring resilience, since digital technologies form the basis for the adaptability of organizations in crisis conditions. In addition, digital platforms contribute to the development of collaborative management models, which is an important element of innovation activity. The digital transformation of management creates a technological basis for the implementation of a resilience approach, providing the organization with the ability to quickly adapt to changes and maintain the stability of innovation processes [13].

Integration of the resilience approach into the system of innovation management of an enterprise requires a comprehensive combination of organizational, process, cultural and technological changes. This is due to the need to ensure the resilience and adaptability of businesses in the face of uncertainty and rapid transformations of the external environment. Table 4 systematizes the key mechanisms for

the implementation of the resilience approach and determines their practical significance for the innovation activity of the enterprise.

Table 4. Mechanisms for integrating the resilience approach into the system of innovation management of the enterprise

Mechanisms	Contents	Practical application	Expected result
Organizational and structural adaptation	Transition to flexible management structures	Use of design, matrix, network structures	Quick response to changes, efficient allocation of resources
Adaptive management processes	Use of iterative approaches to management	Agile, Lean, Scrum, fast decision-making cycles	Reducing risks and increasing the speed of innovation
Organizational culture of resilience	Formation of values of adaptability and learning	Support for experimentation, tolerance to errors	Increasing the innovative activity of staff
Digital transformation of management	The use of digital technologies in management	Big Data, AI analytics, digital platforms	Data-driven operational decision-making
Risk management system	Identification and minimization of risks	Scenario planning, risk analysis, modeling	Reducing the negative impact of uncertainty
Development of dynamic abilities	Ability to constantly update and learn	Innovative learning, transformation of business models	Long-term competitiveness
Interaction with the external environment	Integration into external innovation networks	Partnerships, Open Innovation, Ecosystems	Expansion of sources of innovation and knowledge

Source: Formed by the authors based on [9; 11; 29; 30, p. 133].

The implementation of the resilience approach in innovation management is based on the integrated use of interrelated mechanisms that cover the management structure, business processes, organizational culture and digital technologies. Their combination provides an increase in flexibility, speed of response to changes and the ability of the organization to recover and develop. Thus, the resilience approach acts as a system-forming factor in the formation of a modern innovative enterprise [8, p. 287].

The analysis of the practice of leading companies demonstrates that the implementation of a resilience approach and adaptive innovation management is a key factor in their resilience and competitiveness in conditions of uncertainty. Successful organizations are distinguished by the ability to quickly transform business models, effectively manage risk, and continuously generate innovation. The analysis of the practice of leading companies demonstrates that the implementation of a resilience approach and adaptive innovation management is a key factor in their resilience and competitiveness in conditions of uncertainty. Successful organizations are distinguished by their ability to quickly transform business models, effectively manage risks and constantly generate innovations (Table 5).

Table 5. Cases of implementation of the resilience approach in Ukraine

Facility/Company	Scope of activity	Manifestations of resilience and innovative adaptation	Result
Diia (GovTech)	Digital public services	Full digitalization of services, quick restoration of systems, online access to public services	Continuity of public administration even in times of crisis
Brave1	Defense-tech / defense innovations	Rapid testing and implementation of military technologies, interaction between startups, the state and the army	Accelerating Defense Innovations, Developing the Technology Ecosystem
Grammarly, MacPaw, Preply (IT sector)	IT & Digital Services	Distributed teams, cloud technologies, adaptation to crisis conditions and global markets	Maintaining growth and international competitiveness
Ukrainian startups	Innovative business	Transition to remote work, use of backup infrastructure, quick attraction of investments	Survival and development in crisis conditions
AgriTech companies	Agriculture and Technology	Use of drones, GPS monitoring, AI analytics, and process automation	Improving production efficiency and sustainability of the agricultural sector

Source: Formed by the authors based on [32-33; 34, p. 775].

The above cases confirm that Ukrainian organizations are actively implementing the principles of resilience through digitalization, innovation, and management flexibility. This allows them not only to

maintain functioning in a crisis, but also to develop and enter international markets. Thus, the resilience approach is becoming a key factor in the sustainability and competitiveness of Ukrainian enterprises. Organizational stability has a direct impact on the competitiveness and effectiveness of innovation activities of enterprises, as it determines their ability to function effectively in conditions of uncertainty and rapid changes in the external environment. Enterprises with a high level of resilience adapt better to new market conditions, respond faster to changes in demand and technological transformations, which allows them to maintain or strengthen their competitive positions [30, p.133]. In addition, organizational resilience contributes to increasing the efficiency of innovation processes, as it creates conditions for rapid testing of ideas, experimentation and implementation of new solutions. Such organizations are less prone to losses in case of unsuccessful innovations and are able to adjust their actions faster based on the experience gained.

It is also important that resilience ensures the continuity of innovation activities even in crises, allowing enterprises to recover faster from external shocks. As a result, a sustainable organizational culture is formed, focused on learning, development and continuous improvement. Organizational stability is a key factor in increasing the competitiveness and effectiveness of innovation activity, as it provides flexibility, adaptability and the ability to continue development of the enterprise [29].

Modern economic conditions require enterprises to introduce new approaches to management, which ensure their stability and ability to quickly adapt. The resilience approach involves complex changes in the organization of activities, management processes, culture and technological support. Table 6 systematizes the main practical recommendations for its implementation, taking into account modern challenges.

Table 6. Directions for the effective implementation of the resilience approach in the activities of enterprises

Directions of implementation	Contents	Practical tools	Expected effect
Organizational structure	Transition to agile management models	Project, matrix, network structures	Quick adaptation to changes in the environment
Management processes	Implementation of adaptive methodologies	Agile, Lean, Scrum	Shortening the decision-making cycle
Organizational culture	Building a culture of resilience and learning	Support for initiatives, tolerance for errors, training programs	Increasing the innovative activity of staff
Digital transformation	Use of digital technologies in management	Big Data, AI, BI systems, digital platforms	Improving the quality and speed of solutions
Risk Management	Systematic risk assessment and forecasting	Risk analysis, scenario planning	Reducing the impact of crises
Innovation activity	Support for experimentation and rapid testing of ideas	MVP, Prototyping, A/B Testing	Improving innovation efficiency
External relations	Expanding engagement with partners and ecosystems	Open innovations, partnerships, startup ecosystems	Access to new knowledge and technologies

Source: Author's development.

The implementation of the resilience approach requires an integrated and systematic approach that covers all key aspects of the enterprise. The implementation of these recommendations helps to increase the flexibility, innovation and sustainability of organizations. As a result, enterprises gain the ability to function effectively in conditions of uncertainty and ensure long-term development. The formation of a strategy for adaptive innovative development should be based on the principles of flexibility, scenario thinking and continuous updating of strategic priorities. Enterprises should abandon rigid long-term plans in favor of dynamic strategies, which are regularly reviewed depending on changes in the external environment [7, p. 251]. For Ukrainian enterprises, it is especially important to accelerate digital transformation and introduce innovative management models in an unstable external environment.

6. Conclusions

During the study, the essence of adaptive innovation management was revealed and its importance in the context of increased uncertainty and unpredictability of the external environment was proved. We found out that classical management methods are gradually losing their effectiveness

due to the variability and unpredictability of modern economic phenomena, which entails the need for a transition to more flexible and adaptive management systems.

The resilience approach is a modern management paradigm that ensures organizational resilience, the ability to quickly recover and continuous development. Adaptive innovation management based on the resilience approach is an effective tool for ensuring the resilience and development of organizations in the face of modern challenges. Further research should be directed to deepening the practical mechanisms of its implementation and evaluating its effectiveness in various sectors of the economy.

Further research should focus on an in-depth study of practical mechanisms for implementing a resilience approach in various sectors of the economy, taking into account their specifics and level of digital maturity. It is advisable to pay special attention to the development of methods for quantitative assessment of organizational stability and its impact on the innovative effectiveness of enterprises. Another promising direction is the study of the role of artificial intelligence, big data and digital platforms in increasing the adaptability of control systems in the face of growing uncertainty.

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