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The Impact of Innovation on the Digital Transformation Process of International Enterprises

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ABSTRACT

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The article is devoted to an in-depth analysis of the impact of innovation on the digital transformation process of international enterprises, which in the current conditions of global competition is becoming a determining factor in their strategic development. The paper emphasizes that digitalization encompasses not only technological changes, but also shapes new approaches to management, production organization and business model development. Particular attention is paid to the fact that innovation is the driving force behind the formation of digital ecosystems, which enable enterprises to respond quickly to changes in the external environment and increase the efficiency of their operational activities. An analysis of key technologies – blockchain, 5G networks, digital twins, the Internet of Things, and cloud platforms – demonstrates their comprehensive impact on supply chain optimization, business process transparency, routine operation automation, and the creation of new channels of interaction with consumers. The article emphasizes that innovation plays a central role in shaping new digital products, markets, and production methods, contributing to the emergence of servitudes models focused on data and long-term customer value. Considerable attention is paid to digital culture as a structural element of transformation that ensures the integration of technological tools with staff competencies and organizational changes. It is noted that innovation determines the pace and depth of digital transformation, creating the basis for long-term competitive advantages for international companies, modernizing their operations and forming sustainable digital ecosystems in the global business environment. The authors argue that the combination of technological and managerial innovations creates the basis for increasing the flexibility and sustainability of international companies. It is concluded that innovation-based digital transformation shapes a new logic of business development, provides long-term strategic advantages, and determines the prospects for the functioning of enterprises in the global digital economy.



KEYWORDS

innovation, digital transformation, international enterprises, business, digitalization.



Вплив інновацій на процес цифрової трансформації міжнародних підприємств

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СТАТТЯ

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Стаття присвячена поглибленому аналізу впливу інновацій на процес цифрової трансформації міжнародних підприємств, що в сучасних умовах глобальної конкуренції стає визначальним фактором їхнього стратегічного розвитку. У роботі підкреслюється, що цифровізація охоплює не лише технологічні зміни, а й формує нові підходи до управління, організації виробництва та побудови бізнес-моделей. Особливу увагу приділено тому, що інновації виступають рушійною силою формування цифрових екосистем, які забезпечують підприємствам можливість швидко реагувати на зміни зовнішнього середовища та підвищувати ефективність операційної діяльності. Аналіз ключових технологій – блокчейну, мереж 5G, цифрових двійників, Інтернету речей та хмарних платформ – демонструє їхній комплексний вплив на оптимізацію ланцюгів постачання, прозорість бізнес-процесів, автоматизацію рутинних операцій та створення нових каналів взаємодії зі споживачами. У статті наголошено, що інновації відіграють центральну роль у формуванні нових цифрових продуктів, ринків та виробничих методів, сприяючи появі сервіталізованих моделей, орієнтованих на дані та довгострокову клієнтську цінність. Значна увага приділена цифровій культурі як структурному елементу трансформації, що забезпечує інтеграцію технологічних інструментів із компетентностями персоналу та організаційними змінами. Відзначено, що саме інновації визначають темп і глибину цифрової трансформації, створюючи основу для довгострокових конкурентних переваг міжнародних компаній, модернізації їх операційної діяльності та формування стійких цифрових екосистем у глобальному бізнес-середовищі. Автори доводять, що поєднання технологічних і управлінських інновацій створює підґрунтя для підвищення гнучкості та стійкості міжнародних компаній. Зроблено висновок, що цифрова трансформація, заснована на інноваціях, формує нову логіку розвитку бізнесу, забезпечує довгострокові стратегічні переваги та визначає перспективи функціонування підприємств у глобальній цифровій економіці.



КЛЮЧОВІ СЛОВА

інновації, цифрова трансформація, міжнародні підприємства, бізнес, цифровізація.

1. Introduction

In today's global economy, digital transformation has become not only a broad technological trend, but also a key strategic factor in the development of international enterprises. It determines the ability of companies to adapt to a rapidly changing market environment, implement new formats of business organization and ensure long-term competitive advantages. However, the speed and depth of these changes directly depend on the level of innovativeness of enterprises, since it is innovations that underlie technological, managerial and organizational shifts. Despite significant progress in the study of digital transformation, the issue of the integrated impact of innovations on its content, dynamics and results for international companies still remains insufficiently researched, especially in the context of the formation of digital ecosystems, the transformation of business models and changes in global market structures.

The importance of the topic is due to the growing complexity of the digital environment, where various technologies are combined – blockchain, artificial intelligence, digital twins, the Internet of Things, cloud services and 5G networks. Each of them individually has the potential to change business operations, but their synergistic application creates a new logic for the functioning of international enterprises. At the same time, in practice, there is a significant gap between theoretical models of digital transformation and real processes of innovation implementation: companies often integrate individual technologies without a systematic analysis of their impact on the organizational structure, logistics processes, interaction with consumers and the formation of new market opportunities. Thus, there is a need for a comprehensive study of innovations as a driving force of digital transformation, covering the entire spectrum of changes – from technological to managerial.

Important for scientific intelligence is the increasing turbulence of the international business environment. Geopolitical conflicts, disruption of global supply chains, increased cyber threats and instability of financial markets encourage enterprises to look for new ways to increase resilience and adaptability. Innovative technologies in this context act as key mechanisms for reducing risks and ensuring business continuity. At the same time, digitalization also creates new challenges, in particular related to information management, data protection, system integration and modernization of internal personnel competencies. Not all companies are able to provide the appropriate level of digital culture necessary for the effective implementation of innovations, which forms an additional dimension of the problem. Another aspect of the scientific significance of the topic of the impact of innovations on international business activities is the structural change in market competition: traditional business models are giving way to platform and servitized ecosystems, in which data, digital services and analytical tools become the central resource. Innovations in such conditions are no longer an element of technological development – they are turning into the strategic basis of the activities of international enterprises. However, for many companies, the optimal strategy for the transition to such models remains uncertain, as well as ways to combine innovative technologies with new value creation schemes. This creates a need for analytical understanding of how innovations shape new markets, transform production processes, and contribute to the emergence of digital products that can provide competitive advantages at the global level.

The importance of research is also enhanced by the lack of research on different types of innovation in the context of digital transformation. Although supporting and disruptive innovations have fundamentally different implications for business, their conscious use is not always observed in the practice of international companies. Disruptive innovations have the potential to completely change the industry structure, but their implementation is accompanied by high risks and the need for organizational readiness, which is often lacking. This creates a need to determine which innovative approaches are most effective in the digital economy and how they affect the internal and external processes of international enterprises. Finally, the problem of insufficient theoretical and methodological certainty regarding the relationship between innovation and digital transformation in international business is critically important. Although individual aspects of this issue are studied in the global scientific literature, a comprehensive approach to assessing the impact of innovations on all levels of enterprise functioning – technological, managerial, cultural, strategic and market – is still insufficiently developed. The lack of generalized models and systemic approaches limits the possibility of effective planning of digital transformation and the creation of guidelines for international companies seeking to ensure sustainable development in the digital environment.

Thus, the importance of the study lies in the need for a comprehensive scientific analysis of innovations as a strategic factor in the digital transformation of international enterprises, identifying the mechanisms of their influence on business processes, management models and market activities, as well as substantiating the conditions under which innovations can ensure the long-term competitiveness of companies in the global digital economy.

2. Literature Review

Recent scientific research on the topic of innovation and digital transformation of international enterprises demonstrates a significant deepening of the theoretical and methodological approach to assessing the role of innovation in the development of global business.

Researchers such as A. Bogush, I. Voronenko, O. Voronenko, O. Nagorna emphasize that digital transformation is considered not only as a technological trend, but as a complex change that encompasses the managerial, economic and organizational aspects of enterprise activities [1, p. 83]. The authors note the growing attention to innovative technologies in international business and emphasize their decisive influence on the modernization of business processes and the development of global competitiveness [1, p. 83]. They pay particular attention to the narrative that innovations are becoming a key tool for optimizing logistics systems, automating management decisions and increasing the adaptability of enterprises in an environment of digital risks and high market volatility [1, p. 83].

S. Pyrig focuses on the relationship between the level of business digitalization, the scale of innovation implementations and the formation of the country's digital competitiveness [2, p. 136]. The author notes that innovations in the context of international activity take on the character of systemic strategic decisions: they determine the ability of an enterprise to technologically upgrade, integrate digital platforms, use big data, analytical systems and intelligent automation [2, p. 136]. She also emphasizes that innovation processes are usually accompanied by the modernization of organizational culture, the expansion of digital competencies of personnel and changes in management models – and accordingly, such trends allow international companies to form long-term competitive advantages, increase intellectual capital and invest in the development of new digital products and services [2, p. 136].

G. Dergacheva and Y. Koleshnya analyze such innovative solutions as blockchain, virtual production models (digital twins), the Internet of Things, cloud services and artificial intelligence [3, p. 184]. The authors emphasize that these technologies provide not only technical renewal of the enterprise, but also contribute to the formation of new business models focused on data, proactive management, product personalization and integrated digital ecosystems – and accordingly, international enterprises that comprehensively implement innovations can ensure high speed of decision-making, transparency of operations, reduction of transaction costs and creation of value at all stages of the supply chain [3, p. 184]. They also separately emphasize the growing importance of digital leadership and the role of managers in implementing transformational changes [3, p. 184].

O. Dyugovanets and T. Bilousko reveal the strategic and organizational aspects of implementing innovations in international companies [4, p. 9]. The authors emphasize that innovation processes cannot be considered separately from issues of economic security, digital risk management, and the formation of sustainable organizational systems [4, p. 9]. In their opinion, innovations become a mechanism for increasing the resilience of enterprises in the global environment, allowing them to adapt to instability, strengthen cyber defense, and form effective channels of interaction with partners and consumers in the digital space [4, p. 9]. The researchers also emphasize that digital transformation is not a reaction to modern challenges, but an innovative strategy for long-term development [4, p. 10].

In general, it can be stated that innovations constitute the fundamental basis of the digital transformation of international enterprises, ensuring the modernization of business processes, increasing management efficiency, strengthening competitive positions, and forming new sources of economic growth. At the same time, there is a lack of research that concerns international business entities, which is why this topic is important for further scientific exploration.

3. Problem Statement

The purpose of the article is to study the impact of innovations on the process of digital transformation of international enterprises, identify their key technological and organizational

mechanisms, and substantiate the role of innovations in the formation of new business models, digital ecosystems, and strategic competitive advantages in the global business environment.

4. Methods and Materials

The methodological basis of the study is a complex of general scientific and special methods of scientific knowledge. The method of theoretical generalization and systematization was used to study the essence of digital transformation and the role of innovations in the development of international enterprises. The system approach was used to analyze the relationship between technological, managerial and organizational factors of digital transformation. The methods of comparative and logical analysis were used to generalize modern scientific approaches to assessing the impact of innovative technologies on the activities of international business and identifying key areas of digital modernization of enterprises. The information base of the study was scientific works of domestic and foreign scientists, analytical materials and modern publications devoted to issues of innovative development, digital transformation and international business.

5. Results and Discussion

Innovation has gradually become a fundamental factor in the digital transformation of international enterprises, as it is they that create the basis for the emergence of new formats of business modeling and strengthening of strategic advantages in global markets. In modern scientific discourse, it is increasingly emphasized that digital technologies have fundamentally rethought the logic of innovative development, giving it greater openness, flexibility and network interaction [5]. As a result of such changes, innovation processes have ceased to be exclusively an internal function of companies, but have transformed into multi-level and decentralized systems.

This shift has contributed to the formation of new formats of innovative activity, in particular platform and ecosystem innovations, which are gradually becoming key for international corporations in their desire to integrate into digital economies. Platform models allow companies to expand interaction with partners and users, creating a common space for value generation, while ecosystem innovations ensure the formation of expanded networks of cooperation necessary for rapid adaptation to changes in the external environment. That is why the role of innovation is increasingly seen not only as a tool for technological renewal, but also as a strategic mechanism for ensuring the sustainability and competitiveness of international enterprises in the digital era.

The sphere of digital transformation is rapidly evolving under the influence of a wide range of technological innovations that fundamentally change the ways of organizing business processes, customer interaction models and approaches to creating added value. Among the key driving forces of this evolution, a special place is occupied by blockchain technology, which offers a fundamentally new logic for conducting accounting operations, based on decentralization, transparency and data security. As D. Tapscott and A. Tapscott emphasize, blockchain is able not only to radically reduce transaction costs, but also to strengthen the level of trust in global business networks, which is becoming critically important in the context of international economic interactions [6].

The practical application of blockchain in the field of international business is becoming increasingly multidimensional. In particular, among the most common areas of use can be distinguished:

1. Transparency and control in supply chains, which provides more accurate tracking of the movement of goods and minimizes the risks of fraud in global logistics systems.
2. Cross-border financial transactions, which, thanks to blockchain, become faster, cheaper and less dependent on intermediaries, which is especially important for companies operating in a multinational environment.
3. Smart contracts, which automate the execution of the terms of agreements and help reduce legal risks in different jurisdictions, ensuring greater reliability and predictability of international trade relations.

Analytical assessments confirm the scale of the potential of this technology: the World Economic Forum report notes that by 2027 about 10% of global GDP can be stored in blockchain systems [7, p. 8], which indicates the depth of its impact on the future architecture of global business operations.

Along with blockchain, other new generation technologies play a significant role in the digital transformation of international enterprises, forming a comprehensive infrastructure for digital

development. In particular, the deployment of fifth-generation (5G) networks significantly expands the capabilities of enterprises by increasing data transfer speed, reducing latency, and increasing connection reliability. Such technical advantages create the prerequisites for the implementation of mobile models of work organization, intensive use of augmented and virtual reality technologies, as well as the scaling of the industrial Internet of Things. All these changes contribute to the optimization of production, management, and logistics processes, providing international companies with a higher level of efficiency and flexibility in the face of global competition [8].

The modern approach to business organization is increasingly based on the formation of an innovative environment that provides for a high level of development of digital transformation services. It is such services that create the opportunity to deeply rethink and modify key business processes, introducing new management formats and improving existing organizational models. In this context, digitalization is not only a technological tool, but also a catalyst for strategic changes, allowing companies to adapt to the dynamic conditions of the competitive environment and increase their own resilience. The central element of such transformations is digital culture, which provides the possibility of applying a holistic, systemic approach to the formation of business values [9; 10]. Its role is to harmoniously combine information management tools, innovative management models and expanded personnel competencies, which allows creating an effective and adaptive organizational ecosystem. As shown in Figure 1, digital culture acts as a kind of foundation that connects technological capabilities with management practices, ensuring the sustainable and predictable implementation of digital changes in the activities of the enterprise [9; 10].

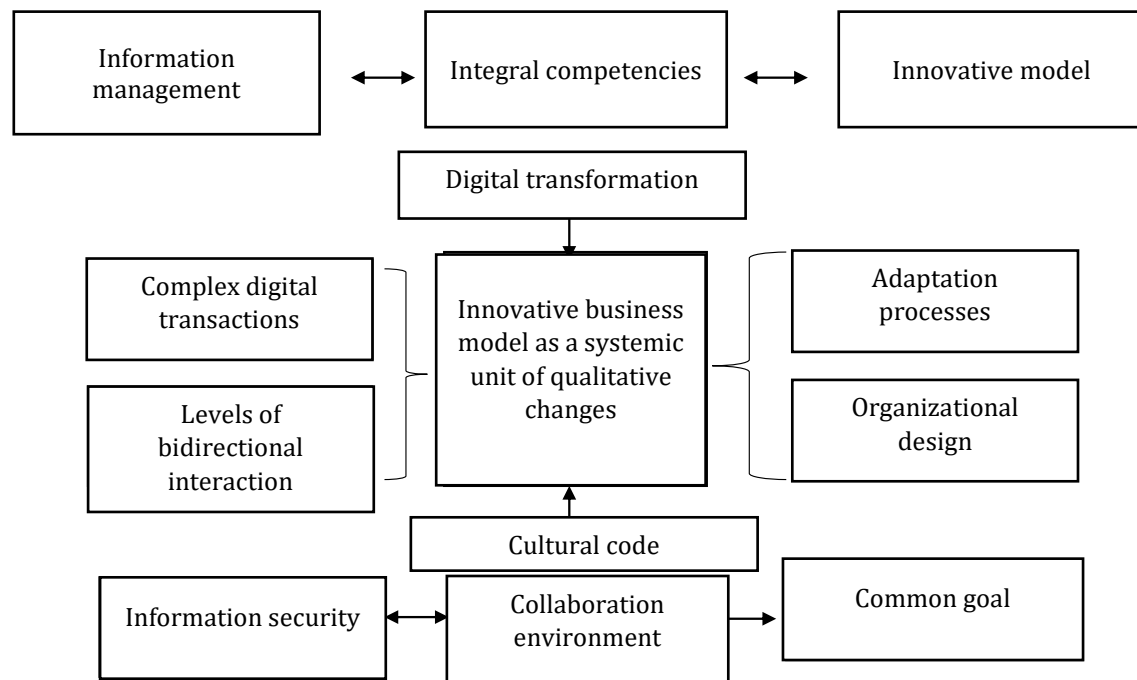


Figure 1. Formation of an innovative model of enterprise development based on digital transformation

Source: Compiled by the authors based on [9; 10].

The presented scheme reflects the logic of forming an innovative model of enterprise development in the context of digital transformation, emphasizing the relationship between information management, competence development and the implementation of innovative models. Its upper level demonstrates three key elements: information management, competence integration and innovation model, which set strategic guidelines for digital change. It is these components that determine the ability of international companies to adapt the organizational structure, modernize business processes and create new products or services.

The central part of the scheme reveals the content of digital transformation through several structural elements: strong digital tools, levels of digital interaction, innovative business models and assessment of the life cycle of changes, adaptation processes and organizational design. This demonstrates that innovation is not a separate component, but a complex system of influence on all

areas of the enterprise's activity. For international companies, the scalability of digital tools and the ability to quickly adapt to changes in the global market are especially important.

The lower level of the scheme reflects the foundation on which digital transformation is based: information security, a collaborative environment and a common goal, which together form the cultural code of the organization. This indicates that digitalization is impossible without the formation of common values, trust and readiness of personnel for innovations. In international business, such an approach becomes critically important, since transnational teams must work in a single digital environment, supporting information security and coordinating innovative development processes. At the same time, leading international corporations are increasingly actively moving to the use of platform business models and integrated systems of products and services, in which physical goods are organically complemented by digital solutions and intelligent services [11, p. 382]. Thanks to this combination, companies form a more sustainable and flexible model of interaction with consumers, creating long-term value within their own digital ecosystems. The expansion of the service component not only changes the sales logic, but also allows you to significantly increase profits: according to research, companies that implement such solutions record revenue growth within 5–10% [11, p. 382].

Such practical experience convincingly demonstrates that digital transformation has long gone beyond the implementation of individual technological tools. Instead, it appears as a comprehensive and multidimensional business development strategy, within which technologies, services, processes and business models operate in an interconnected environment. A single digital ecosystem ensures consistency of operations, increases the efficiency of resource management and opens up opportunities for scaling innovations. It is the integration and complementarity of solutions that become the basis for the formation of new competitive advantages that determine the success of companies in the global digital economy. Digital transformation significantly strengthens each of the areas of international business development, providing enterprises with not only a set of technological solutions, but also a set of strategic opportunities that open the way to a deep modernization of business activities. In such an environment, innovations act as the central driver of change and can be implemented in various forms. Supporting innovations are aimed at gradually improving existing products, services or processes, increasing their efficiency and quality without radically disrupting the established logic of competition [12, p. 38]. In contrast, breakthrough innovations are able to completely change market conditions, transform consumer expectations and destroy traditional approaches to doing business, creating space for the emergence of fundamentally new business models [12, p. 38]. The experience of leading international corporations demonstrates that it is breakthrough innovations that are becoming a key factor in survival and growth in a globalized economy [12, p. 38]. Their implementation provides companies with the ability to respond more quickly to structural changes in the market, adapt to unpredictable external challenges and effectively use windows of opportunity that open in conditions of high turbulence. In addition, breakthrough innovations contribute to the formation of new competitive advantages, which are based not only on technological solutions, but also on the ability of the enterprise to flexibly restructure its operating model, culture and strategic approaches to development [12, p. 38]. As a result, digital transformation not only supports innovative activity, but also creates conditions for its scaling and reorientation to future challenges of the global economy.

The above diagram reflects the key results of digital transformation and demonstrates how innovations change the structure and dynamics of international business. At the center of the model is the concept of "Digital Transformation Outcomes", which acts as a generalizing element to which all transformational effects are reduced. This component sets the direction of analysis, and also emphasizes that digitalization is not just a technical process – it forms a new logic of value creation in the global business environment.

The first structural block of the diagram combines three main groups of results – new digital products, new digital production methods and new digital markets. Each of these categories reflects a separate dimension of innovative impact. New digital products are the result of the introduction of technologies and experimentation with business models; new production methods provide increased productivity, automation and optimization of resources; the formation of new digital markets opens up access to globalized ecosystems of data exchange and e-commerce for international enterprises. It is the combination of these innovations that creates the basis for the sustainable development of transnational companies.

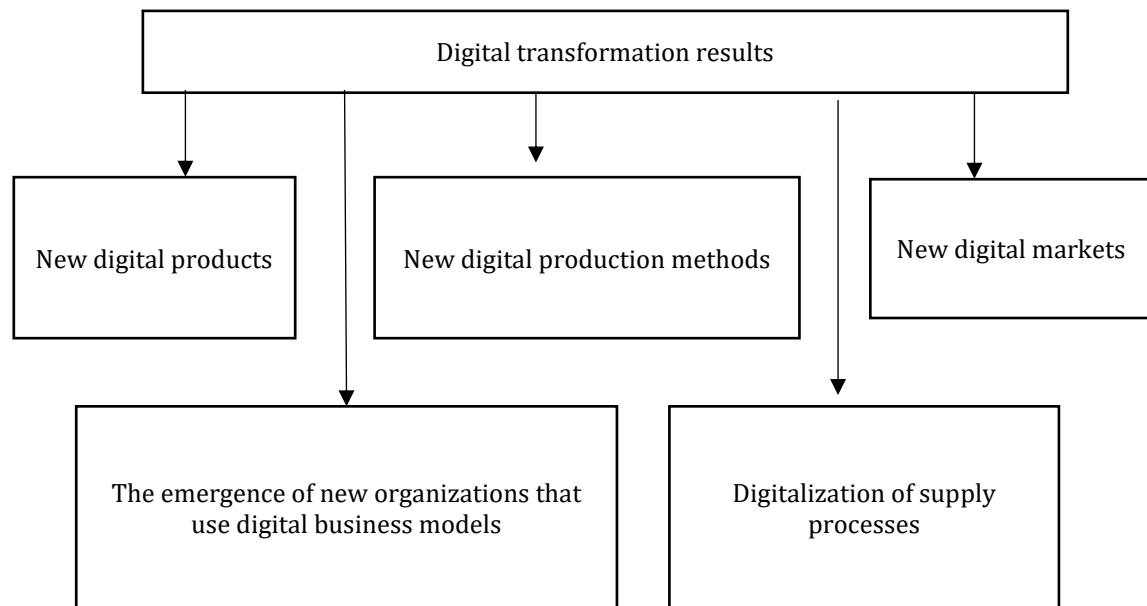


Figure 2. The impact of digital transformation on areas of international business innovation

Source: Compiled by the authors based on [12].

The second level of the diagram details the structural changes that accompany digital transformation: the emergence of new organizations that use digital business models, as well as the digitalization of supply processes. These elements demonstrate that digital transformation penetrates the deep management and logistics systems of international enterprises, changing the ways of interacting with consumers, partners and suppliers. As a result, innovations form a multi-level impact: from the modernization of individual processes to the complete renewal of the business ecosystem, which allows international companies to increase competitiveness, flexibility and adaptability in a rapidly changing global environment.

6. Conclusions

Innovation is the fundamental basis of the digital transformation of international enterprises, determining the pace, content and results of changes in the global economy. Innovative technologies no longer serve as auxiliary tools for modernization, but form the architecture of digital ecosystems within which business processes are managed, new markets are created and organizational models are transformed.

The use of blockchain, 5G networks, digital twins, cloud platforms and the Internet of Things demonstrates the systemic impact of innovations on optimizing operational activities, reducing transaction costs, forming transparent supply chains and accelerating management decision-making. International companies that integrate innovative solutions into strategic processes achieve higher productivity, resilience and flexibility in conditions of high market turbulence.

Digital transformation is manifested not only in technological renewal, but in a comprehensive change in the logic of enterprise functioning. It includes the development of digital competencies of personnel, rethinking organizational structures, forming a culture of innovation and creating new formats of interaction between departments. Digital culture is becoming a determining factor in successful transformation, as it ensures the integration of technological tools with behavioral models, management practices and strategic goals of the enterprise.

In general, innovations affect all key aspects of international business – from the creation of new products and production methods to the development of digital markets and the transformation of logistics systems. Significantly, it is innovations that provide the opportunity to scale business processes, increase the efficiency of resource management and form new formats of interaction with consumers, based on data and personalized services.

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