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The organizational and economic mechanism of attraction of digital technologies in the innovation activity of companies in the conditions of international competition

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ABSTRACT

The article is dedicated to the analysis of the organizational and economic mechanism of the participation of digital technologies in the innovative activities of companies in conditions of international competition. The theoretical and methodological basis of the study are the provisions of economic theory, the theory of innovations, the digital economy; as well as the special methods of analysis and synthesis, induction and deduction, scientific generalization, which allowed to obtain a conceptual holism of the investigation. It has been studied that the concept of organizational and economic mechanism must be understood as a system of really functional organizational, economic and legal instruments, which in a complex way determine the result of the companies' activities, and which includes the regulation of the internal economic mechanism, the general operating mechanism of companies and their innovative component with the participation of digital technologies.

KEYWORDS: Organizational-economic mechanism, digital technologies, digital transformation, digital economy, digitalization, international competition, innovative activity, enterprises.

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El mecanismo organizativo y económico de atracción de tecnologías digitales en la actividad de innovación de las empresas en las condiciones de la competencia internacional

RESUMEN

El artículo está dedicado al análisis del mecanismo organizativo y económico de la participación de las tecnologías digitales en las actividades innovadoras de las empresas en condiciones de competencia internacional. La base teórica y metodológica del estudio son las disposiciones de la teoría económica, la teoría de las innovaciones, la economía digital; así como los métodos especiales de análisis y síntesis, inducción y deducción, generalización científica, los cuales permitieron obtener un holismo conceptual de la investigación. Se ha estudiado que el concepto de mecanismo organizativo y económico debe entenderse como un sistema de instrumentos organizativos, económicos y jurídicos realmente funcionales, que de forma compleja determinan el resultado de las actividades de las empresas, y que incluye la regulación del mecanismo económico interno, el mecanismo general de funcionamiento de las empresas y su componente innovador con la participación de tecnologías digitales.

PALABRAS CLAVE: Mecanismo organizativo y económico, tecnologías digitales, transformación digital, economía digital, digitalización, competencia internacional, actividad innovadora, empresas.

Introduction

In today's conditions of digital transformation and increasing the level of efficiency, accessibility and simplicity of communications, the improvement of existing business processes and models of the functioning of enterprises due to the involvement of digital technologies in innovative activities is gaining relevance. Nowadays, digital technologies occupy a very important place in the modern economic system and exert a powerful influence on all spheres of human life without exception.

Digital technologies contribute to increasing the efficiency of enterprises, in particular, by reducing the amount of paper data, simplifying the management structure, improving and speeding up interaction and communication both between company employees and with elements of the external environment, such as suppliers, intermediaries, consumers, competitors, etc., which in general, contributes to the improvement of the business reputation of enterprises in modern conditions of intensifying international competition.

The involvement of digital technologies in the innovative activity of enterprises today should be considered a competitive advantage, an opportunity for their successful functioning and development, as well as the creation of an exceptional format of digitization of the economy. In view of the above, it is necessary to emphasize the relevance of questions regarding the formation of theoretical foundations and the development of practical recommendations for the formation of an organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in modern conditions of international competition, which determined the direction of this research, outlined its purpose and tasks.

The purpose of the scientific work is to study the theoretical foundations and develop practical recommendations regarding the process of forming an organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of intensified international competition.

1. Literature Review

The rapid development of technological innovations has brought the digital economy to a completely new level - it has become one of the most important sectors of the national economy (Djakona et al., 2021). In the era of globalization, the digitalization of production has become a necessary condition for the active participation of countries in more efficient global production and sales chains and obtaining benefits from global connectivity (Dubyna et al., 2022).

The combination of technological advances from advances in digital technologies to the creation of new materials opens up new opportunities for socio-economic growth and industrial development (Matiukh et al., 2022). According to the results of scientific works (Abramova et al., 2021; Popelo et al., 2021; Zhavoronok et al., 2021), the application of new technologies received such names as "Industrialization 4.0", "The Next Industrial Revolution", "Third Wave" or "Smart production".

The impact of digital technologies on enterprises is very diverse and includes shorter innovation cycles, mass customization, on-demand production and optimization of development, distribution and service processes (Andriushchenko et al., 2020; Grigoraş-Ichim et al., 2018; Grosu et al., 2021; Ivanova et al., 2022). Virtual modeling, digital duplicates and 3D-printing allow us to increase the level of experimentation and optimize innovation

The study of attracting digital technologies in the innovative activity of enterprises dates back to 1988 (1 publication), after which a rapid growth of research in this field began in 2017 and reached its maximum in 2021 - 46 publications. Today, the global centers of concentration of publishing activity in this field are: China, Ukraine, England, Poland, Germany, USA, Italy, Romania, Spain, Japan, Slovakia and Denmark and other.

Figure 1 presents the graphic map of key words in publications, in which titles the words “digital technologies”, “innovation activity of enterprises” and “international competition” is met. Most scientific works by scientists in the field of digital technologies in the innovation activity of enterprises in the conditions of the international competition were carried out within the following sciences: Management, Business, Economics, Computer Science Information Systems and Education Educational Research and other.

The outlined analysis also gives reasons to assert the existence of a small number of scientific works within which the issues of digital technologies in the innovation activity of enterprises in the conditions of the international competition in countries would be studied more systematically and in depth. However, the need to determine the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition remains insufficiently studied.

2. Methodology

The theoretical and methodological basis of the research is the provisions of economic theory, the theory of innovations, digital economy and digital transformations, as well as special methods of analysis and synthesis, the harmonious combination of which made it possible to obtain the conceptual holism of this scientific work. The methods of analysis and synthesis, induction and deduction were used in order to study the content and understanding of such categories as "mechanism", "organization", "organizational-economic mechanism", "organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises". Methods of scientific generalization, abstraction and synthesis, grouping, comparison, system approach was used by the authors to highlight approaches to understanding the definition of "organizational-economic mechanism", clarifying, distinguishing and characterizing the features of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions international competition. A visual presentation of approaches to the

interpretation of the concept, essence and content of the category "organizational-economic mechanism" and the scheme of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition was carried out on the basis of the application of a graphic method.

3. Results

At the current stage of the functioning of enterprises, the issue of the introduction of digital technologies into their innovative activities is becoming more and more relevant and important, especially in the context of intensifying international competition.

Conceptual and structural aspects of the mechanism include primarily organizational and economic, legal and social foundations. It should be noted that the organizational-economic mechanism is a complex, multifaceted phenomenon and should be studied as a holistic combination of a system of methods, principles and forms of functioning, which are based on the components of state regulation in the economic sphere.

In our opinion, in order to clarify the concept and the essence of the definition of an organizational-economic mechanism, it is necessary to examine the concepts of which it consists - the concepts of "mechanism" and "organization". A mechanism in research is mostly understood as such a toolkit that contributes to the gradual development of a system on which a purposeful influence of the environment takes place. The substantive and structural aspect of the mechanism reflects the transformation in the process of formation and development of social production, that is, a specific, fully appropriate mechanism is suitable for a certain socio-economic system. Taking into account the interaction and interdependence of the complex of related components and their steadfastness, the content and essence of the mechanism under study illuminates ways of solving the problems and tasks of compliance of these components, as well as goals in the context of a specific stage of development of the economic system and society. Some scientists include in it the concept of only individual components, without rejecting the understanding that this concept is complex and multifaceted. Modern researchers believe that the definition of "mechanism" is a complex and multifaceted system containing a large number of structural elements.

Regarding the concept of "organization", it means giving an expressive likeness to some object or phenomenon, a certain arrangement. However, over time, this category acquired a transformation not only of its essence and meaning, but also of its state and

position. A complex of certain components that become an effective, successfully working system based on a well-established organization. Therefore, the organization should be understood as a planned systematization and arrangement of the components of the system and its processes that take place in it. At the same time, the organization of material systems is its formation from a set of necessary material resources. Some scientific sources give such an understanding of the definition of "organization" as an ordered, deliberate arrangement or system. Thus, based on the study of a number of scientific works, we can say that an organization is a set of certain processes or activities that are directed at connecting the components into a single whole, forming a real, practically possible, stable system, characterized by internal planning and relations between independent elements of integrity.

The need for organization implies the internal structural construction of system components and the presence of their properties, such as mutual adaptability, on the one hand, and the ability to resist their combination, on the other. In the event of a clash of interaction and resistance of elements in the system, in the event of a predominance of activity and a decrease in the degree of contradictions, the level of organization increases and moves to a higher level.

The study of scientific works allows us to note that scientists mostly pay attention to the study of individual mechanisms, such as organizational, economic, market, etc., while their practical application and implementation is almost not carried out. In view of this, the basis of this research is to study the essence and content of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises, since this concept is not sufficiently and thoroughly researched.

The study of various scientific works on this topic made it possible to reveal the lack of a unified approach to the interpretation and understanding of the essence and content of the concept of "organizational-economic mechanism". According to a group of scientists, the organizational-economic mechanism should be understood as a system of really working organizational, economic and legal tools that collectively form and determine the results of enterprises, and which includes the regulation of the internal economic mechanism, the general mechanism of the functioning of enterprises and their innovative component with the involvement of digital technologies. In accordance with the purpose of the research, a set of organizational components that have an impact on the efficiency of the enterprises was

determined. There is also an interpretation of the organizational-economic mechanism as a system of goals and motivational aspects, with the help of which, during the labor process, the material and immaterial needs of people are transformed into means of production, which is defined as satisfying the demand of customers and consumers. It is necessary to note the existence of a similar understanding of the organizational-economic mechanism as a set of systems aimed at coordinating and harmonizing the economic interests of enterprises, authorities and the population of a certain territory in order to meet their common needs. In this case, the structural components of the organizational-economic mechanism include the following: organizational, managerial, economic, and regulatory components. Another approach to the interpretation of the organizational-economic mechanism is to understand it as a system of organizational, economic and technological components and their elements. There is also a scientific opinion of researchers that the organizational-economic mechanism is a relationship that arises between various economic objects, phenomena, things and processes. The main approaches to understanding the essence of the organizational-economic mechanism are shown in Fig. 2.

It should be noted that despite the lack of a single approach to the interpretation of the category of "organizational-economic mechanism", it is generally understood as a certain system that, firstly, causes and directs the movement of economic systems and processes; and secondly, a system that combines economic, organizational and legal methods, principles and forms of enterprise management. The conducted studies on the specified problem show that the category of "organizational-economic mechanism" is more often used to characterize the organizational components of the economic mechanism, which is absolutely acceptable and correct, since the concept of "economic mechanism" is quite broad and includes various techniques and aspects of economic regulation, such as organizational actions, management decisions, etc. The manifestation of the organizational-economic mechanism in the modern conditions of the digital economy looks like a system of relations and interconnections of economic phenomena and processes that appear as a result of the existence of objective market economic laws.

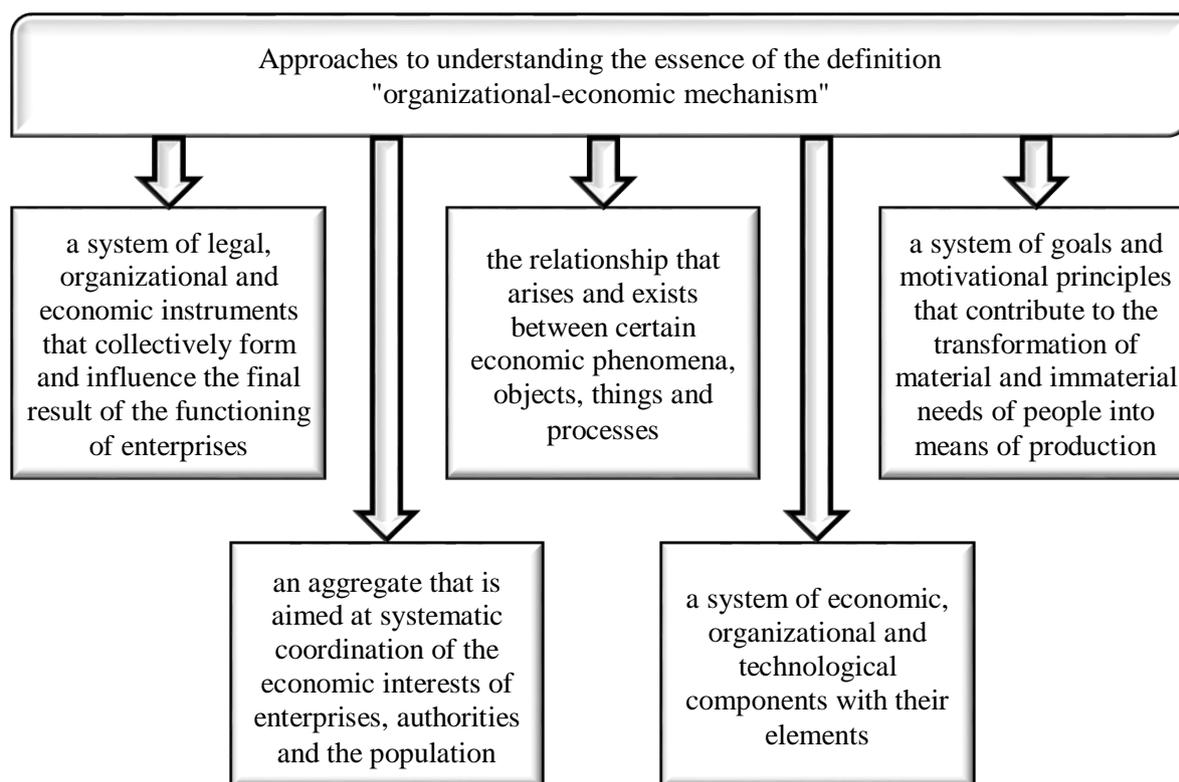


Figure 2. Approaches to understanding the concept, essence and content of the category "organizational-economic mechanism"

Source: generated by the authors

The organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises is implemented, firstly, by self-regulation of market conditions and situations, and secondly, based on the use of tools of state influence on the operation and manifestation of market laws in order to achieve defined goals. The leading aspect of the organizational-economic mechanism aimed at the effective functioning of enterprises in modern conditions of international competition is their motivation for successful activity and obtaining effective results based on the involvement of digital technologies, which is the most adequate and operational tool for transformations and a catalyst for the formation and effective development of enterprises according to using digital technologies and obtaining competitive advantages.

The organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of intensifying international competition will be defined by us as a structured system aimed at the process of development and (or) introduction of digital technologies in the innovative activity of enterprises, taking into

account their goals, tasks, principles, methods, tools, levers for reducing the cost of business entities, speeding up and simplifying access to information resources, forming high-tech production systems and increasing international competitiveness.

Taking into account the above regarding the concept and essence of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition, we will highlight its features:

- firstly, the complex nature of the mentioned mechanism is achieved due to the combination of organizational and economic components, that is, it should be considered as a certain set of organizational and economic blocks that form a holistic system, leading principles and methods aimed at the effective and successful functioning of the enterprise;

- secondly, the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises is implemented through management decisions regarding further functioning in the conditions of transformational processes with the aim of achieving successful and effective activities;

- thirdly, the main goal of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises is to ensure the organizational and economic conditions for successful functioning and achieving positive results;

- fourthly, the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises is a set of all its components, taking into account the possible consequences, the final result and the peculiarities of the processes of digitization of economic entities.

Thus, the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition should be considered as a complex of components that are interconnected and interact with each other and include methods, tools, levers, means of an information, technical and digital nature that influence on the organizational and economic characteristics of the mechanism, allowing it to function and develop successfully, manage its internal and external relations, use its potential, including digital, and increase competitive advantages in the international market (Fig. 3).

With regard to the organizational-economic mechanism of attracting digital

technologies in the innovative activity of enterprises, the economic block of this mechanism includes not only methods, but also the goals of its functioning. The organizational unit has a broader understanding and meaning as a process of organizing the achievement of economic goals, which does not contain only organizational methods, but also includes social and administrative aspects.

The organizational block of the mechanism of attracting digital technologies in the innovative activity of enterprises consists in separate methods and processes of regulating the innovative activity of enterprises, as well as their justification. The economic block takes care of the economic aspects of the implementation of the mechanism of attracting digital technologies in the innovative activity of enterprises and takes care of the resource needs of enterprises, the implementation of the verification of the functioning of enterprises, the reduction of the riskiness of their activities, and the evaluation of the effectiveness of the innovative activities of economic entities. The main task of the functioning of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition is to achieve and maintain at a given level the stable growth of all components of both the mechanism itself and its elements. Thus, the organizational-economic mechanism of the involvement of digital technologies in the innovative activities of enterprises is a complex formation that harmoniously combines clearly defined components and appropriate tools.

The stages of implementation of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition are presented in Fig. 4.

The algorithm for the implementation of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition includes: study of the current state of innovative activity of the enterprise; analysis of the available intellectual, scientific, educational potential and readiness for the implementation of digital technologies; outline of the directions of innovative activity of the enterprise, taking into account the available opportunities for the introduction of digital technologies; development of alternative strategies for the introduction of digital technologies in the innovative activities of enterprises in the

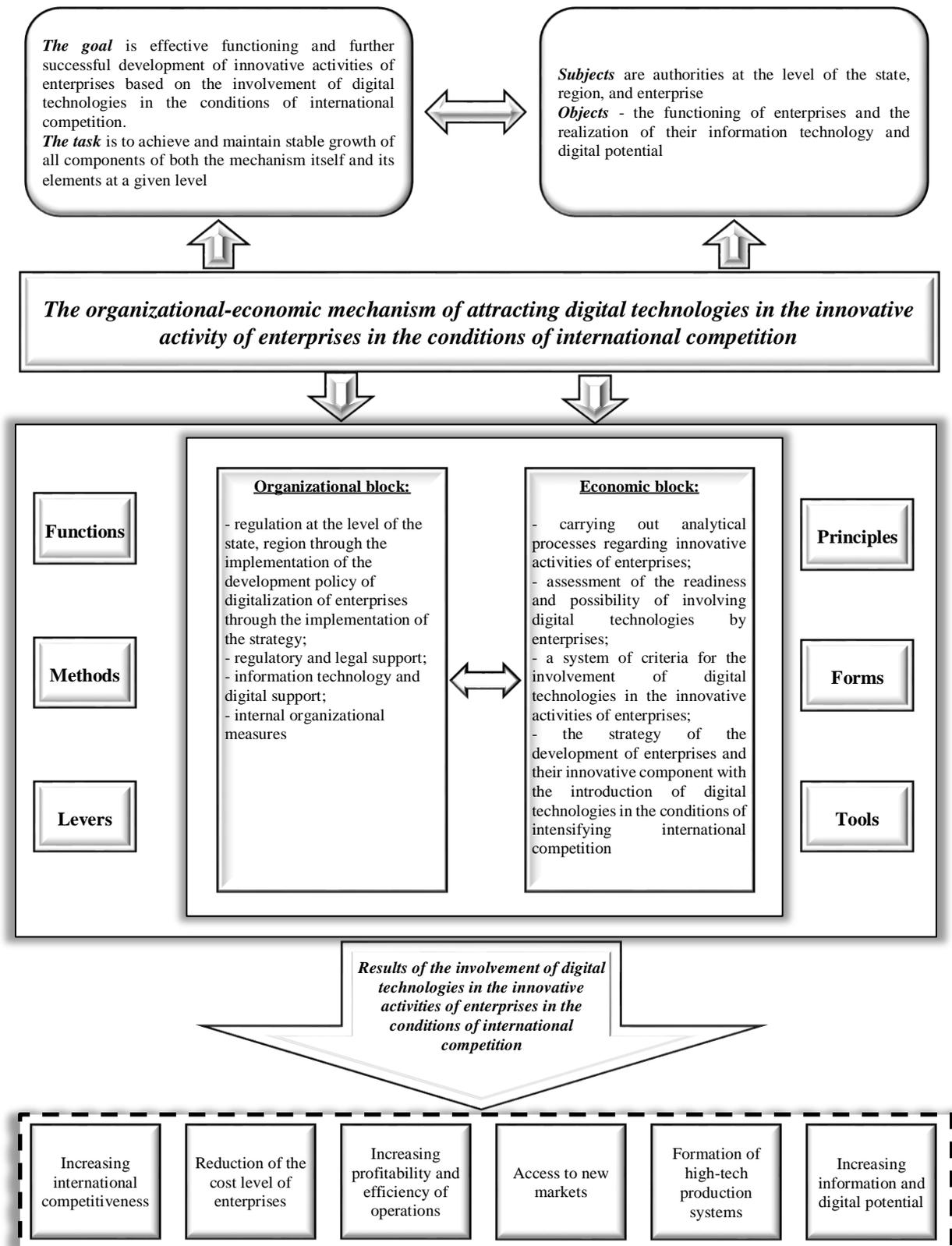


Figure 3. Organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition

Source: generated by the authors

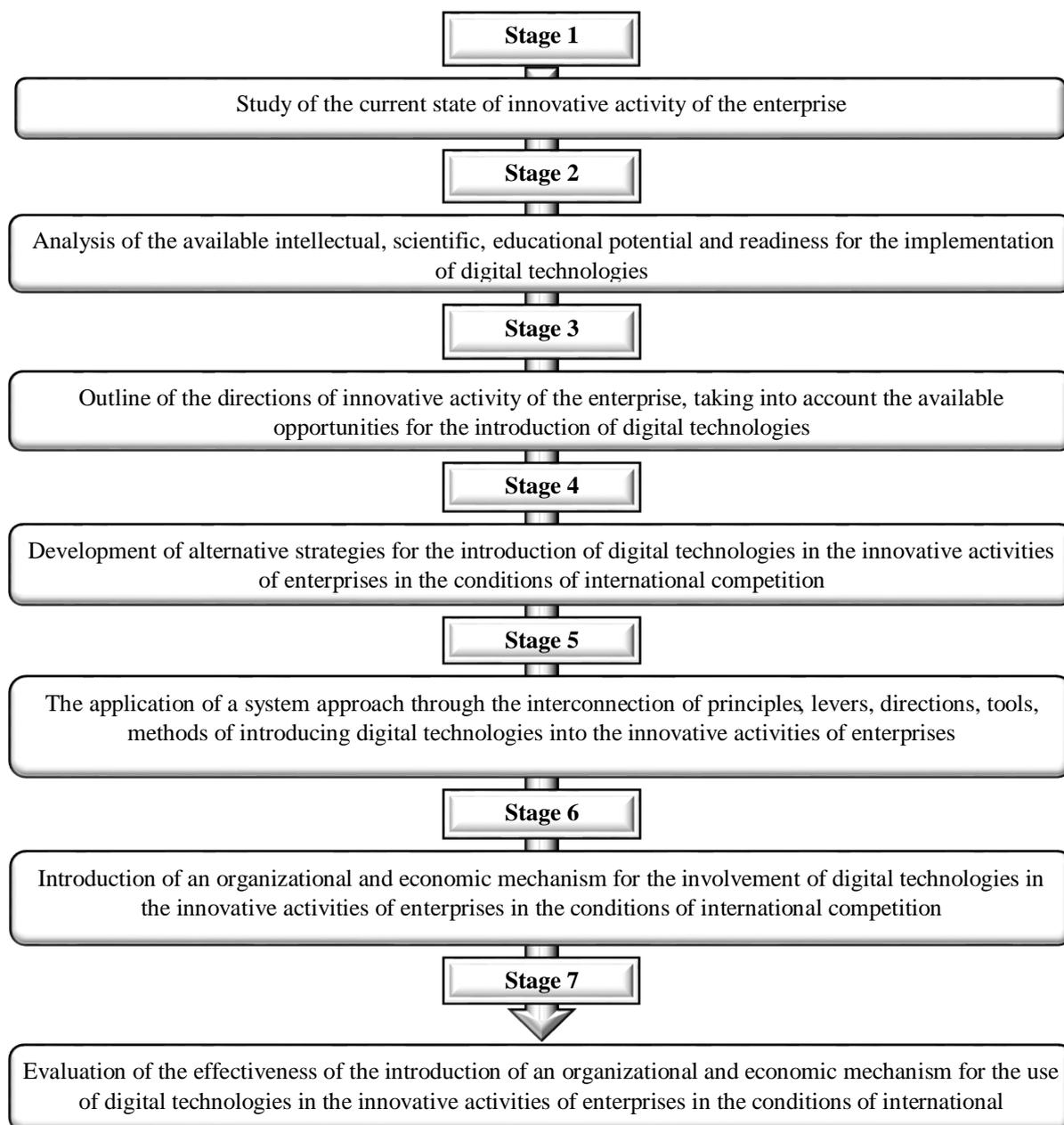


Figure 4. Algorithm for the implementation of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition

Source: generated by the authors

conditions of international competition; the application of a system approach through the interconnection of principles, levers, directions, tools, methods of introducing digital technologies into the innovative activities of enterprises; introduction of an organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in the conditions of international competition; evaluation of the effectiveness of the introduction of an organizational-economic mechanism for the use of

digital technologies in the innovative activities of enterprises in the conditions of international competition.

4. Discussion

We fully agree with the opinion of Yu Li (2021) that information and communication technologies and their development have changed the way of information transmission, reduced the cost of communication and expanded the space of information dissemination.

Lazebnyk L. & Voitenko V. (2022) believe that artificial intelligence can be used to identify patterns in existing databases, thereby laying the foundation for formulating conclusions about the current and future behavior of production systems. This is especially valuable in complex environments where identifying the cause of problems can be very difficult. Machine learning can identify risks associated with failed internal processes, human error, and external factors, and inform decision-making before the negative consequences manifest in full. In addition, AI-based algorithms can reduce cycle time and optimize resource utilization.

The acceleration of innovation processes contributes to the scientific capacity of production, which determines the need to invest significant financial resources in the innovation sphere. Tulchynska S. (2021) cites in detail the main phenomena in the field of investment attraction in innovation, the importance of which will grow in the future: the relevance of innovative tools for investment attraction in the innovation sphere is increasing; large individual companies are replaced by systems of innovation projects that combine different participants; the timing of innovation processes is distorted (on the one hand, the life cycles of individual innovative solutions are shortened, which exacerbates the problem of return on investment, on the other hand, the complexity of the system of innovative relations allows the implementation of chains of long-term multi-stage innovation projects).

World economic trends demonstrate the objective need to ensure the innovativeness of the enterprise's development as a prerequisite for its survival in a global competitive environment. For domestic enterprises, ensuring innovative development is, in fact, the only prerequisite for their survival and potential entry into world markets. In this context, we are talking not only about technological or product innovations, which, due to the lack of resource support for activities, pose considerable problems in terms of implementation, but also about management, marketing and organizational innovations. This type of innovation

can become not only an effective prerequisite for their sustainable development, but also a catalyst for increasing all components of innovation potential, which in the future will ensure comprehensive innovative development of the enterprise.

However, it is also necessary not to leave aside the involvement of investments in innovative activities, because as the processes of digitalization increase, the role of non-standard tools for attracting investments in the field of innovations will grow. We should expect a decrease in the price both on the market of investment in innovation and risks associated with the organization of the investment process.

Conclusion

In the process of the research, the vagueness of the interpretation of the concepts "organizational-economic mechanism" and "organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises" was clarified due to their complexity and multifaceted nature. This state of affairs opens up, on the one hand, a wide field for research, but, on the other hand, leads to the complication of the process of forming the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises in modern conditions of intensifying international competition. The identified features of the organizational-economic mechanism of attracting digital technologies in the innovative activity of enterprises, as well as the characteristics of its components, form theoretical provisions on this topic and lay the foundations for further research on the practical implementation of the specified mechanism, its characteristics, signs, and qualities for the purpose of successful and effective functioning of enterprises and their innovative component under the conditions of joining advanced digital technologies in modern conditions of intensifying international competition.

The perspective of further research is the analysis of the current state of innovative activity of enterprises, problems and prospects of using digital technologies in their activities.

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