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INNOVATIVE DEVELOPMENT OF ECONOMIC SYSTEMS IN THE DIGITALIZATION CONDITIONS

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Abstract
The purpose of the study is to substantiate the directions of activation of the innovative development of economic systems in the digitalization conditions. The methodological basis of the research is the systematic approach, which makes it possible to determine the effectiveness of the functioning of the innovation system in the digitalization conditionsas a quantity qualitatively and quantitatively greater than the effectiveness of the sum of its components, to investigate the interrelationships of the system elements and the possibilities of its development, taking into account changes in the external environment. The principles of innovative development of economic systems in conditions of digitalization are highlighted, which include adaptability, creativity and digital transformation. It has been proven that the majority of innovative processes use non-linear methods of innovative development due to the formation of network systems, the development of new global markets and the use of digital technologies. The general factors restraining the innovative development of economic systems in the digitalization conditions are singled out. The need for the formation of an innovative system based on the principles of digitalization and the main approaches to its formation, which adhere to the principles of its development, are substantiated.

Keywords: *innovative activity, innovative development, economic system, digitalization, digital transformation, sustainable development.*
JEL Codes: *D19, D23, E66.*

Introduction

It is difficult to imagine the modern world without digital technologies that change our lives and affect all spheres of social activity. Rapid scientific and technical development and the introduction of innovations create new opportunities and, at the same time, requirements for adaptation to such changes.

Today, the competitiveness of the country's economy depends on the functioning of the real sector of the economy, the implementation of innovations and digital technologies.

In the conditions of the globalization of the world and the development of the real sector of the economy in the conditions of Industry 4.0-5.0, the innovative component of the national economy becomes the basis of its independence and sustainable development, increases the level of protection of its interests in the foreign market and ensures the competitiveness of its business entities.

Innovative development is the main factor of market competition and allows enterprises to receive profits from intellectual rent based on

the use of innovations, and the introduction of innovative technologies and processes, the production of innovative products increases the competitiveness of economic entities in the domestic and foreign markets. Innovative and digital processes are interactive and mutually dependent because without innovative developments it is impossible to create digital technologies, and the introduction of digital technologies acts as an impetus for innovative development. Digital technologies provide an opportunity to develop innovative business ideas, spread innovative processes and technologies, and develop innovative production. Innovative development in the digitalization conditions is a key task for enterprises, organizations, regions, and states to ensure their competitiveness in the conditions of rapid technological development. The outline determines the relevance of the research in the direction of innovative development of economic systems in the digitalization conditions.

The purpose of the study is to substantiate the directions of activation of the innovative development of economic systems in the digitalization conditions. To achieve the goal, the authors of the study identified a systematic approach as the basis of the study and outlined and solved the following tasks:

- the expediency and timeliness of the research in the area of innovative development of economic systems in the digitalization conditions is substantiated;
- the activity of scientific intelligence in the direction of the activity of scientific intelligence relative to the object of this research is determined;
- the basis of scientific knowledge, which advocates a systemic approach, is highlighted and the principles of innovative development of economic systems in the digitalization conditions are clarified;
- the main directions of interaction of the innovation process in the conditions of digitalization, which involve non-linear relationships, are clarified;
- the main factors that hold back the innovative development of economic systems in the digitalization conditions are highlighted;
- the well-founded necessity of forming an innovative system on the basis of digitalization and the main approaches to its formation, observing the principles of its development;
- outlined and solved problems gave an opportunity to highlight the scientific novelty of the research and to summarize the general conclusions.

Literature review

The topic of research on the innovative development of economic systems and the peculiarities of the functioning of enterprises in the digitalization conditions is undeniably relevant. Scientists Marhasova V. et al. (2023); Popelo O. et al. (2022); Tulchynska S. et al. (2021); Lyeonov S. et al. (2022) devoted their scientific works to various aspects of innovative and informational diversity of micro- and macro-level economic systems. Within the framework of study Panchenko V. et al. (2022), a methodological toolkit for the processes of management of innovative and productive activities of enterprises is proposed. The main task of article Trusova N. et al. (2020) is a comprehensive assessment of the innovative development of agrarian business and the establishment of interdependence with the economic security of enterprises. The authors of the paper Roieva O. et al. (2023) carried out an economic and statistical analysis of the main indicators of Ukrainian enterprises' digitalization and provided relevant recommendations.

Noting the practical significance of the article by Balakayeva G. T. et al. (2022), it should be noted the presented innovative approach, which is aimed at remote activity, which will contribute to increasing the level of use of information and communication technologies several times.The results of study Gromova E. et al. (2020), where the authors analyzed the role of digitization of the system of economic relations as a factor in the development of small innovative enterprises. According to the authors Yankovoi R. (2023), in the current conditions of economic development, the question of diagnosing the state of innovative development of enterprises is of particular relevance. Considering research

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direction Mingaleva Z. et al. (2022) as practically interesting, it is appropriate to note the relevance of the researched processes, which are devoted to determining the ratio of personal and organizational values in an innovative company and the compliance of the main elements of the enterprise's organizational culture with the requirements of its innovative development. Article Prokhin E. (2022) emphasizes the importance of the factor of promoting innovation and development of the industry, as well as the features of effective use of resources and the establishment of mutually beneficial cooperation.

Taking into account the analysis of the conducted studies, we can state that the issues of innovative development of economic systems in the digitalization conditionsare important and relevant, as well as those that require further research.

Methodical approach

In order to substantiate the principles of activation of the innovative development of economic systems in the digitalization conditions, it is important to outline the methodological basis. The study of the innovative development of economic systems in the digitalization conditions involves the use of the methodology of the system approach. In this case, the methodology makes it possible, in accordance with the principles of this approach, to simultaneously investigate a set of institutions that ensure the generation, distribution, use and promotion of knowledge, information, innovations, as well as processes and phenomena that occur in society in the process of innovative development of economic systems of various levels in digitalization conditions. The methodology of the system approach makes it possible to investigate the non-linearity of the processes of innovative development, which becomes especially relevant in the conditions of social digitalization. Also, the systemic approach makes it possible to determine the effectiveness of the functioning of the innovation system in the digitalization conditions as a value qualitatively and quantitatively greater than the effectiveness of the sum of its components. When studying the innovative development of economic systems in the conditions of digitalization, from the methodological point of view of scientific knowledge, it is important to observe the principles. The principles of innovative development of economic systems in digitalization conditions should include:

- adaptability, which involves the construction of a flexible management system for innovative development in the conditions of digitalization, which is able to quickly respond to changes in the external environment and changes in the conditions of development of economic entities, which will increase the adaptability of economic entities to new conditions;
- creativity, the speed of changes and the weight of their consequences require economic entities to constantly search for innovation and creativity in decision-making, to apply new ideas to ensure their own competitiveness on the market;
- digital transformation, which involves the creation of an effective data management system at various levels of management, which, due to the collection, processing, interpretation, storage, coding of data and information, ensures the adoption of effective management decisions regarding innovative development in the digitalization conditions. The application of this principle is multifaceted and may involve the optimization of business processes, the creation of new products and services, the improvement of the efficiency of the use of resources, including financial ones, and the introduction of new business solutions.

The outlined principles make it possible to take into account the peculiarities of the processes and phenomena of the innovative development of economic systems in the conditions of digitalization.

Results

Innovations are an effective means of competitive struggle, as they make it possible to reduce production costs and their cost price, attract investments, create new social needs, and improve the image of the manufacturer. Digital technologies make it possible to open up new opportunities for economic entities, as well as internal and external markets. This leads to the simultaneous stimulation of innovative activity and digitalization of the economy.

For the effectiveness of innovative developments, scientific research must be reflected in technological knowledge and, as a result, be transformed into technology. Such a chain reflects the practical transformation of knowledge into an innovative product or service. In another direction, on the contrary, technology is considered as a basis for understanding fundamental laws, which makes it possible to improve technologies through scientific research and development in the future. Based on the use of such approaches, the countries of the EU, the USA, and Japan are leaders among countries in funding science, forming scientific and technical hubs, developing legislation in matters of intellectual property protection, and small and medium-sized businesses.

The peculiarity of modern innovation processes is that linear methods of creating innovations do not bring the effect that was expected and received earlier. Therefore, the majority of innovative processes today use non-linear methods of innovative development due to the formation of network systems, development of new global markets, etc. The innovative development of economic entities in the digitalization conditions is closely related to the state, education, science and business. The main directions of interaction in the innovation process can be represented in the form of interaction presented in Fig. 1.

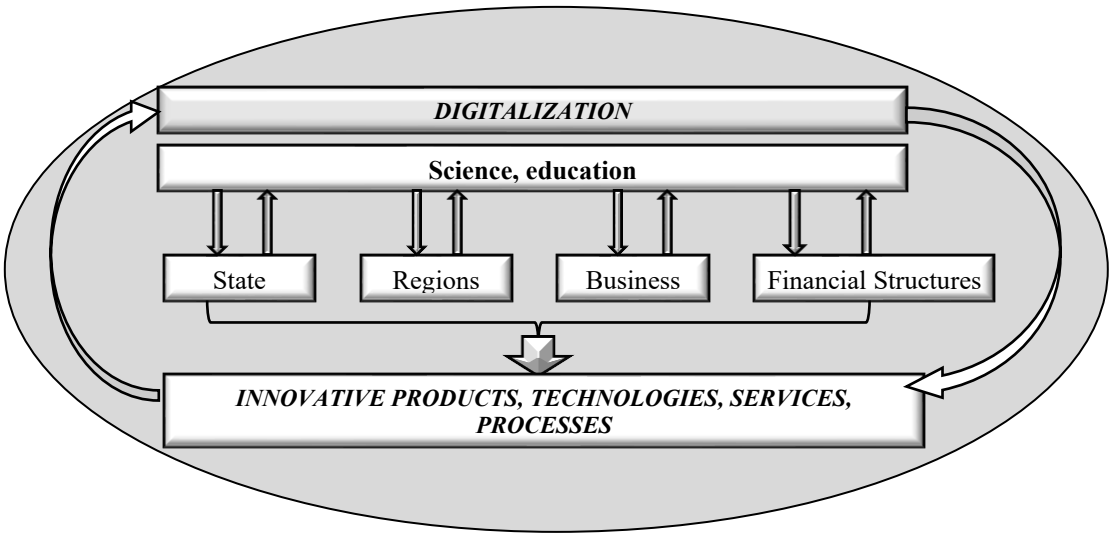

Figure 1. The main direction of interaction in the innovation process in the digitalization conditions

**Source: generated by the authors.*

The main direction of such interaction is related to the fact that all elements are not a closed system, but are in interaction with each other, which provides the required result. In this process, science is a key link that combines different levels of interaction (universities, scientific institutions, research laboratories at enterprises). Therefore, the interaction between all participants of the innovation process should be based on the performance of the respective functions of each participant, which in aggregate leads to obtaining a result. In addition to their direct functions, they can perform other functions depending on the implementation of the project. So, in addition to educational and scientific services, higher education institutions can also participate in joint projects with business structures, especially in matters of

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training the necessary specialists depending on the needs of the market for the future. Involvement of educators in production processes will make it possible to obtain the necessary practical skills that will help to expand the professional competences of both teachers and future specialists.

The state, for its part, can stimulate innovative development at the regional level based on the support and financing of projects depending on the needs of the regions, which will contribute to their socio-economic development. Today, the digital economy is actively developing, so such processes can be considered as a source of social production, which also acts as a factor in the economic growth of economic systems at various levels.

The main factors that hold back the innovative development of economic systems in the digitalization conditions include (Fig. 2):

- imperfection of regulatory and legal support in the field of intellectual property, innovative development and provision of regulation of relations that arise in the field of digital content use;
- lack of effective links that would promote close cooperation between education, science and business;
- underdevelopment of the directions of attracting banking and industrial capital to finance innovative developments;
- low level of tax incentives development for innovative enterprises and institutions;
- presence of a high level of risk of attracting investments in the field of innovative developments;
- insufficient level of digital awareness and culture among the population;
- inadequacy of the qualifications of specialists to the requirements of the current labor market in accordance with the pace of digitalization;
- lack of adequate protection of personal data at the state level, which causes the development of cybercrime, unfair competition.

The outlined general problems of the innovative development of economic systems in the digitalization conditions require the formation of an innovative system based on the principles of digitalization:

firstly, the analysis of the needs and opportunities of economic entities both in innovative development and in digital technologies in various spheres of social development;

secondly, the development of a strategy for the innovative development of economic systems in the conditions of digitalization, outlining the purpose, goals and tasks of digital transformation and innovative development;

thirdly, the creation of a digital infrastructure to ensure the development and implementation of information technologies necessary for the implementation of digital transformation projects and new digital technologies such as artificial intelligence, blockchain, the Internet of Things, virtual reality and others;

fourthly, creating an innovation system to provide a favorable environment for cooperation and exchange of ideas, establishing relationships between various entities of the innovation system, such as universities, research institutes, business structures, business incubators, investment funds and others;

fifthly, personnel training, which involves the organization of education and training of specialists in digital technologies that meet the requirements of the innovation system, personnel training for scientific and innovative activities;

sixthly, the stimulation of innovative activity and the protection of intellectual property, the introduction of a system of grants, targeted innovation projects, tax benefits for subjects of innovative activity, support for startups, the provision of preferential loans for innovatively active enterprises, the stimulation of venture financing, attracting investments, including through the use of the public-private partnership mechanism;

seventhly, systematic monitoring and evaluation of the results of the innovative development of economic systems in the digitalization conditionsin order to analyze the effectiveness of the strategy and its adjustment in order to achieve the set goals and objectives.

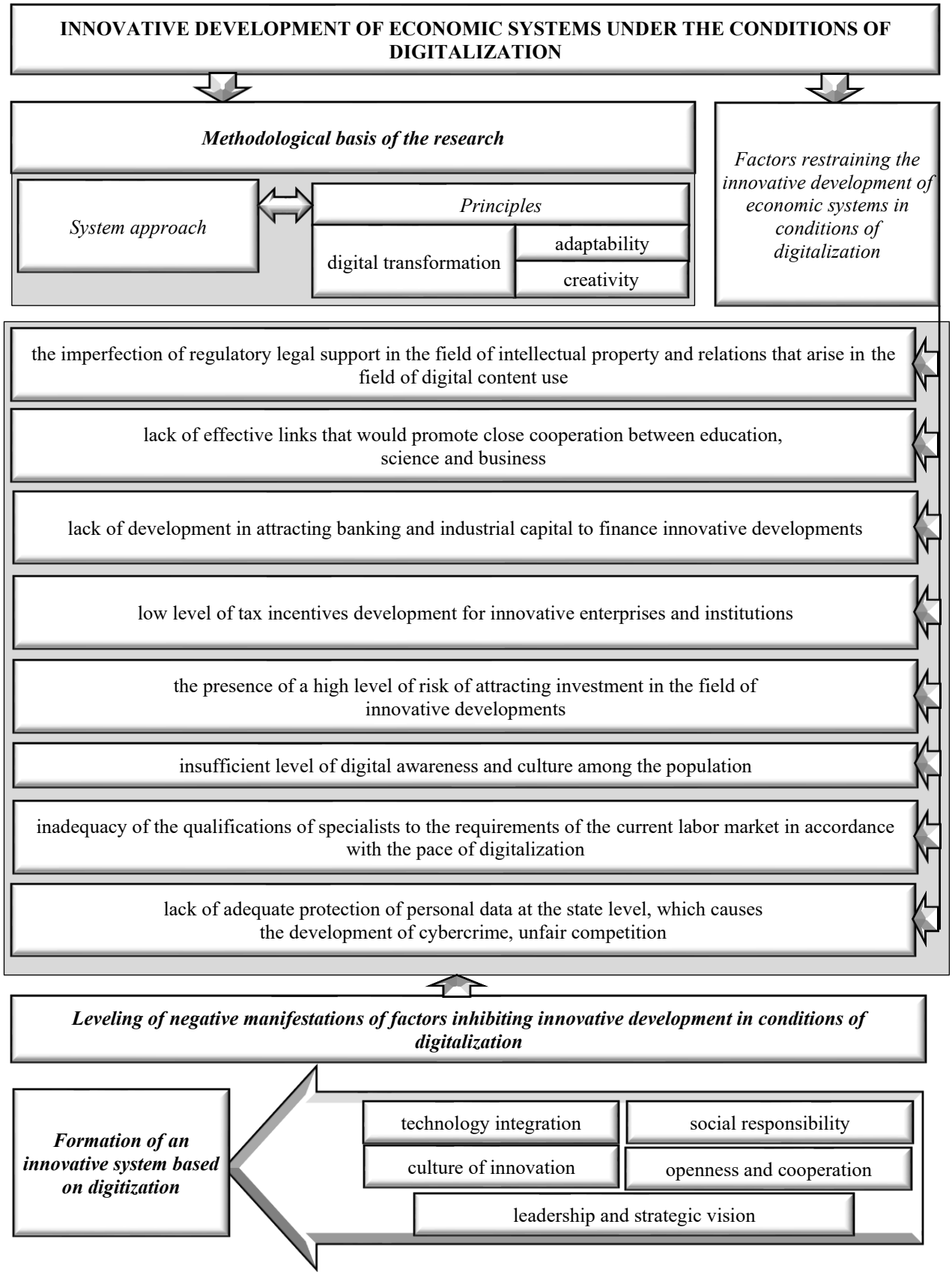

Figure 2. The main direction of interaction in the innovation process in the digitalization conditions

**Source: generated by the authors.*

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It is important for the innovative development of economic entities in the digitalization conditions to adhere to the principles, which should include:

- leadership and strategic vision, since to ensure innovative development, a certain potential and its direction are needed to ensure development processes, which is possible due to the formation of a strategic vision of innovative development of subjects in conditions of digitalization. Strategic vision, the presence of potential opportunities and their activation in innovative development will allow to determine the main goals and directions of development of economic entities, as well as to ensure appropriate coordination and management of the digital transformation process;
- integration of technologies, as it is able to ensure interaction and integration of various digital technologies, which will contribute to a complex, more active and full use of potential and interaction between different components of the innovation system;
- openness and cooperation, because the creation of open platforms and the promotion of cooperation between different subjects of the innovation system, such as universities, research institutes, business incubators, industrial parks, etc. This will allow to combine resources for the joint development of innovations;
- a culture of innovation, which involves the creation of a favorable innovation environment that encourages the constant search for new ideas and the development of innovative thinking. This includes supporting and rewarding innovative activities, creating mechanisms for stimulating and supporting startups and innovative projects, and will also increase the importance and prestige of scientific and innovative activities in society;
- social responsibility, based on taking into account social aspects in the process of digital transformation by ensuring the availability of digital technologies for all segments of the population, avoiding social exclusion and inequalities, as well as protecting the rights of consumers in the digital space.

Conclusions

The formation and development of an innovative system based on digitization will help economic entities to develop in conditions of rapid technological progress and changes. Digital technologies make it possible to use resources more efficiently, improve the quality and speed of work, improve communication and promote innovation. In turn, digital transformation gives impetus to innovative development, which makes it possible to introduce new digital technologies. Such duality conditions the innovative development of economic systems in the conditions of digitalization.

The scientific novelty of the research consists in substantiating the principles of activating the innovative development of economic systems in the conditions of digitalization, which, unlike the established ones, involves the application of the basis of the system approach and the principles of adaptability, creativity and digital transformation in relation to the innovative development of economic systems in the conditions of digitalization, based on the non-linearity of relationships of the innovation process in the conditions of digitalization, the elimination of factors that restrain the innovative development of economic systems in the conditions of digitalization, and the justified need for the formation of an innovative system based on the principles of digitalization and the main approaches to its formation, observing the principles of its development.

Further scientific research requires the development of theoretical-methodical and applied aspects regarding the identification of the tools for managing innovative development in the digitalization conditionsat different levels and its interaction to ensure the synergy of social development on the basis of its innovative direction in the conditions of digitalization.

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