# CHAPTER «MANAGEMENT OF NATIONAL ECONOMY DEVELOPMENT»

**Natalia Bobro**
*Candidate of Economic Sciences, Doctor of Philosophy,*
*Director of the Digital Department*
*Private Higher Education Institution «International European University»;*
*Director of the «NooLab & AI» Scientific Laboratory of the*
*Private Higher Education Institution «International European University»*

DOI: https://doi.org/10.30525/978-9934-26-565-5-1

## INNOVATIVE POTENTIAL OF DIGITAL UNIVERSITIES IN THE DEVELOPMENT OF MODERN BUSINESS

***Summary***

*The article examines the role of digital universities in developing the innovative potential of modern business in the digital economy. The essence of the digital competitiveness of educational institutions is analyzed, the key factors that ensure the effective integration of digital technologies into educational, scientific, and innovative activities are highlighted. The main directions of influence of digital universities on the innovative development of enterprises are outlined: generation of new knowledge, formation of personnel potential, development of innovative culture, incubation of startups, and establishment of communications with the business environment. The specifics of transformation processes in universities within the "triple helix" model of education-business-state are considered. The results obtained can be used to improve the efficiency of interaction between universities and enterprises and the formation of sustainable educational and business ecosystems in the digital age.*

### Introduction

In recent years, the active development of hardware, software, and computer technology has become one of the key factors in the accelerated digital transformation of society and the economy. The rapid improvement of digital solutions, platforms, and information and communication technologies (ICT) has not only expanded their application, but also created new opportunities for modernizing business processes, improving organizational activity efficiency, and developing new business models. The growing availability of digital technologies has led to the intensive inclusion of digitalization in the strategic priorities of enterprises and institutions of various industries.

The international scientific community's attention to the problems of digital development has increased significantly, as evidenced by the inclusion of digitalization in the strategic documents of organizations such as the United Nations, the World Bank, the World Economic Forum, and others. However, despite the active regulatory and political promotion of digital transformation ideas, the actual adaptation of digital innovations by individual enterprises faces numerous challenges. The main challenges include insufficient readiness of organizations to change established business models, limited personnel potential in the field of digital technologies, and low adaptability to new technological trends.

The formation and implementation of new models of enterprise development in the digital economy requires a new generation of management personnel – specialists who not only have in-depth knowledge of modern technologies but are also able to creatively rethink business processes, make non-standard decisions, initiate and implement innovative projects. At this stage of technological development, managers are required not only to possess traditional administrative skills but also to have developed innovative thinking and the ability to form visions of the development of organizations according to dynamic changes in the global environment.

In this context, effective interaction between higher education institutions and businesses in the field of personnel training capable of generating new knowledge, producing creative ideas, and integrating them into the practice of innovative development of enterprises is of particular importance. Modern digital universities aim not only to impart basic knowledge to students but also to develop critical thinking, creativity, the ability to work in multidisciplinary teams and adapt to rapidly changing technological conditions.

The aim of the research is to determine the place and role of digital universities in the processes of forming the innovative potential of modern business, as well as to analyze the main mechanisms of their influence on the development of business structures in the digital economy. The scientific novelty of the research lies in the systematization of modern theoretical and applied approaches to understanding the role of scientific and educational institutions in stimulating the innovative activity of enterprises, as well as in identifying the key factors and conditions for effective interaction between education, science, and business to ensure sustainable economic growth in the digital age.

## Chapter 1. Digital competitiveness

The rapid development of the information and technology infrastructure in recent years has had a significant impact on the formation of an economy in which data has become one of the most important strategic assets – the digital economy. In world practice, the digital economy is considered as an economic

activity in which the key factor of production is data in digital form, processing of large amounts of information, and use of the results of their analysis, which, compared to traditional approaches, can significantly increase the efficiency of production processes, technologies, equipment, storage, sale, and delivery of goods and services [1, p. 721].

In recent years, the digital economy has become one of the main drivers of high-quality economic development at the macroeconomic, industry, and organizational levels, forming a convincing evidence base in favor of the implementation of information technologies. Researchers note that the impact of the digital economy is multifaceted: information and communication technologies contribute to the creation of new types of interactions, the development of services and business practices, speed up various operations, overcome barriers to market access, eliminate spatial restrictions, create alternative commercial platforms and new industries, which in turn open up new employment opportunities [2, p. 76-77].

More and more countries, regions, and cities are initiating digitalization processes, aiming to obtain economic and social benefits from the active use of digital technologies [3, p. 256]. Empirical research shows that differences in the levels of economic development and global competitiveness of countries today largely depend on the level of implementation, accessibility, and use of information and communication technologies [4, p. 7].

At the same time, the development of the digital economy has a downside: there is a risk of increasing the “digital divide” and economic inequality between countries and regions, as well as between households, individuals, and companies [5, p. 64]. UNCTAD researchers have also found that the widespread implementation of advanced Industry 4.0 technologies in developed countries may lead to a decrease in the competitiveness of economies that are currently at a lower level of development [6]. This requires developing countries to actively implement digital technologies in the economic and social spheres, create a favorable environment for the development of high-tech business, increase national competitiveness in the global market, strengthen economic security, and improve the quality of life of the population.

It is worth noting that in modern economic science, there are no common approaches to the interpretation of the “digital competitiveness” category, its content, and assessment methods. For example, the Digital Riser report by the European Center for Digital Competitiveness analyzes changes in the digital competitiveness of countries but does not offer a clear definition of this concept [7, p. 5].

Digital competitiveness can be considered as the ability of an economy to implement and effectively use digital technologies, which leads to the transformation of business models, public administration, and society as a

whole. In this context, digital competitiveness is a measure that reflects a set of characteristics that ensure the stable functioning of the socio-economic system in the digital economy.

The key aspects of digital competitiveness include processes and phenomena that affect its level. They can be divided into internal and external.

Internal aspects, such as financial position, personnel potential, and management efficiency, determine the system's ability to implement digital solutions. External aspects – the level of competition, institutional environment, economic policy, and information security – affect the conditions of the system's functioning, but are not directly controlled by it [8, p. 109].

Internal factors form the resource potential and determine the efficiency of using digital tools. External factors, on the other hand, can both strengthen and weaken digital competitiveness, acting as both advantages and risks for the socio-economic system.

The scientific literature has formed a number of methods for analyzing the competitiveness of socio-economic systems that can be successfully adapted to assess the innovative potential of digital universities in the development of modern business. One of the most promising approaches is the use of matrix methods. The basic principle of matrix analysis is to assess the current state of the subject (in this case, a digital university) in comparison with other similar structures. The most competitive are those objects that have a significant share in the creation of innovative products, demonstrate active digital transformation, and successfully interact with the business environment [9, p. 1223].

The advantage of matrix methods is their visibility and relative simplicity: they allow for assessing innovative and digital development in dynamics and ensuring sufficient accuracy of analysis if relevant data are available.

Well-known models such as GE/McKinsey, Hofer/Schendel, Shell/DPM, BCG, and other matrices can be used as part of this approach. The peculiarity of their application in the context of analyzing digital universities is the need to focus on specific digital indicators: the level of implementation of EdTech solutions, the number of startups and business incubators, cooperation with innovative companies, the volume of educational services in digital format, etc.

The disadvantage of matrix methods is a certain difficulty in analyzing the cause-and-effect relationships between individual elements of digital competitiveness, which can make it difficult to build a complete analytical model [1; 6].

The use of matrix methods is especially appropriate for evaluating the activities of digital universities in cooperation with innovative businesses, in particular when studying startup ecosystems, corporate education programs, joint research projects, and the development of technological solutions.

Methods based on the analysis of the results of the activity proceed from the assumption that the level of innovative potential of the object is determined by

the competitiveness of the products and services created by it [3, p. 260]. In the case of digital universities, such products include not only classical educational programs, but also digital learning platforms, startups, innovative research, and technological services for business and society.

Marketing research methods, such as analysis of the "quality-cost" ratio of digital educational services, indicators of commercialization of scientific developments, and graduate success rates in the digital economy, can be used for evaluation. In addition, competitiveness can be determined through special indices of digital activity, the number of technology startups created, or the amount of investment in development.

The advantage of this approach is to focus on the quality, efficiency, and innovation of the final results of the digital university's activity. At the same time, it should be noted that this method does not cover all internal processes of the university's digital transformation (in particular, management models or strategies for the development of digital infrastructure).

It is also important to note that methods based on product analysis are traditionally more suitable for evaluating classical universities, where traditional educational products dominate. Instead, digital universities need to adapt the evaluation criteria to consider the specifics of their digital services, the flexibility of educational models, and the ability to form startup ecosystems and generate technological innovations.

Methods based on the theory of effective competition. According to the provisions of the theory of effective competition, the most competitive are those socio-economic systems in which the activities of individual units are organized as efficiently as possible [10, p. 43]. The effectiveness of the units is assessed by the level of use of various types of resources – financial, human, information, technological, etc.

In the context of analyzing the innovative potential of a digital university, this approach involves evaluating the effectiveness of individual structural elements: educational platforms, research centers, startup incubators, business schools, administrative units, etc.

At the same time, the sum of effective elements does not always guarantee high overall efficiency of the university's digital ecosystem, as both the effect of synergy, which enhances the interaction of subsystems and the effect of mutual weakening due to inconsistency or competition between them are possible.

The advantage of this approach is the comprehensive consideration of the activity of the entire digital university system. Analyzing digital competitiveness through synthesizing subsystems allows for identifying new properties of the digital ecosystem, determining the points of growth of innovative potential, and identifying bottlenecks in the organizational structure.

The comprehensive approach involves consideration of the innovative potential of a digital university as an integral characteristic formed on the basis of a system of quantitative and qualitative indicators. The set of relevant indicators is determined depending on the specific tasks of the analytical study or management needs [11, p. 190]. For evaluation, quantitative methods are used, including scoring, rating, and ranking according to selected criteria, such as the level of digitalization of educational programs, the number of innovative projects, the success of graduates in the digital economy, the amount of investment attracted in startups launched at the university, etc.

The advantages of a comprehensive approach include the possibility of obtaining a quantitative assessment of innovative potential, ease of interpretation of the analysis results, and the ability to track the dynamics of changes over a certain period.

At the same time, a comprehensive approach has certain limitations. In particular, there is a risk of losing important information about certain aspects of a digital university's activity due to the aggregation of indicators. In addition, determining weights for different indicators can be complicated and require expert agreement.

Thus, digital competitiveness is emerging as a key characteristic of socio-economic systems in the age of the digital economy, which determines their ability to implement digital technologies and effectively integrate them into business models, educational practices, and social processes. Considering the specifics of the study, we propose that the digital competitiveness of an educational institution should be understood as *an integral characteristic of its ability to implement, develop, and effectively use digital technologies in educational, scientific, innovative, and management activities to improve the quality of educational services, create competitive advantages in the national and global education markets, ensure sustainable innovative development and adaptability to the challenges of the digital economy.*

A comprehensive analysis of internal and external factors, the use of matrix, product, resource-efficient, and multi-criteria evaluation methods allow us to more fully identify the features of digital competitiveness and determine strategic directions for its improvement, in particular in the development of the innovative potential of digital universities as new centers of knowledge generation and technological changes.

## Chapter 2. Digitalization and digital innovations

In the context of the rapid development of the digital economy, there is a growing activity of organizations in the processes of digital transformation, which are implemented through the introduction of the latest technologies. The increased interest in advanced digital solutions from the scientific community, managers, and innovators is largely due to the economic and social

pressure that has intensified as a result of the COVID-19 pandemic [3, p. 253]. The spread of the coronavirus infection has exposed critical vulnerabilities in traditional business models and led to a significant increase in costs associated with the use of inefficient procedures and processes in a turbulent economic environment.

During this period, digital services such as online healthcare, distance learning, collaboration platforms, etc. became widespread, radically changing the nature of work and the way of life of society. At the same time, an important reason for the growing interest in digital innovations – that is, products, services, and processes that are created or significantly improved using digital technologies to form new value for organizations and their customers – was the global crisis context caused by the pandemic.

Crisis events have stimulated the need to develop new products and services, master new sales channels, and improve internal processes [12, p. 30]. In response to the challenges, many organizations have not only not reduced but even increased their investments in digital innovations [3, p. 254].

However, despite high expectations, investments in digitalization do not always have an immediate positive effect. In terms of costs, digital transformation often requires significant capital investment and causes an increase in operating costs, which can have an uncertain impact on the financial performance of organizations or even worsen it [13, p. 108].

For example, the results of the research by D. Zhou et al. show that digitalization in the financial services sphere does not in itself guarantee an increase in the efficiency of companies [14, p. 123]. Similarly, H. Chae and a group of researchers in a study covering the period 2001-2007 found that companies with higher information technology capabilities did not demonstrate consistently higher profitability or lower costs compared to others, and did not gain sustainable productivity advantages [15, p. 307].

The main reason for these results is that digitalization significantly increases the internal management costs of organizations, which can offset some of the potential advantages if digital transformation is carried out without proper strategic planning and process optimization.

At the same time, it is worth noting that, unlike automation, digitalization and related digital transformation often involve the formation of fundamentally new business processes for an organization, i.e. the implementation of digital innovations. Thus, digital transformation not only increases the management costs associated with its implementation but also provokes a number of other management challenges specific to the management of innovative activity. Among them are the need to adapt corporate culture to new values and processes, overcome resistance to changes on the part of employees, and form new digital competencies necessary for effective work with information technologies.

In other words, the required level of innovation of the organization and the formation of digital competencies among its staff are important factors that significantly increase the likelihood of successful digital transformation.

Along with the technological aspects of digitalization, organizational and cultural changes play a special role in the digital transformation process. The formation of a corporate environment open to innovation, the development of flexible project management models, and the creation of mechanisms to support entrepreneurial initiatives within organizations are critical conditions for the successful implementation of digital solutions. In this context, it is important to move from hierarchical structures to networked, adaptive management models that provide a quick response to changes in the environment and stimulate the development of digital competencies of staff.

Moreover, it should be noted that effective digital transformation requires a holistic strategic approach that includes not only the implementation of new technologies, but also the formation of the organization's digital strategy, change management, systematic development of digital infrastructure, and continuous monitoring of the effectiveness of transformation processes. The lack of consistency between technological innovation and business strategy can lead to a gap between the expected and actual results of digitalization, which emphasizes the need to integrate digital initiatives into the overall development management system of the organization.

Therefore, digitalization and digital innovations today are not only catalysts for technological upgrades, but also complex factors in the transformation of organizational structure, culture, and business processes. The effectiveness of digital transformation largely depends on the ability of organizations to adapt to new conditions, develop digital competencies, integrate innovative approaches into all areas of activity, and ensure strategic coherence of changes. Accordingly, the digital competitiveness of modern organizations is formed at the intersection of technological capabilities, management decisions, and institutional capacity for innovative development.

## Chapter 3. The role of digital universities in the innovative development of enterprises

The ability to create innovations and, as a result, innovative products is a critical success factor for the growth and long-term activity of enterprises and is considered by many researchers as one of the main sources of maintaining competitive advantages [16, p. 54]. In the context of organizational development, an innovation is an idea, product, process, system, or device that is successfully implemented and has a significant impact on individuals, groups of people, organizations, industries, and society as a whole.

Thus, although innovative activity is intellectual in nature, it involves much more than just the creation of new ideas, ways of doing things, or technologies.

It involves a full cycle of activities: scientific research, construction, technology, production, marketing, and other stages. In the innovation sphere, effectiveness depends on individual abilities, experience, and competence of employees to a much greater extent than in other industries.

From the point of view of state policy, the development of the innovative potential of the manufacturing sector is a guarantee of national security. Achievements in science and technology directly affect the competitiveness of the national economy, the standard and quality of life of the population, and the country's technological sovereignty. The state of the economy and the level of technological development of the state determine its ability to form high-quality, competitive goods and services, to use its own scientific and technical potential to solve internal and external socio-economic problems and to integrate into the international market of innovations and technologies [17, p. 103].

Enhancing the role of scientific education and personnel potential has become especially relevant in the context of current global challenges and the instability of world markets. Research confirms that the formation of highly qualified personnel, especially through the higher education system, is the basis for technological and organizational innovation in countries with developed economies [1; 3]. The effective diffusion of innovation also depends on the availability of a sufficient number of specialists with modern professional competencies to implement new knowledge and technologies [13, p. 108]. Human capital is a key factor in stimulating the innovative development of organizations in all areas of activity.

In the world practice, higher education institutions influence the innovative development of enterprises in four main ways:

– First, a significant part of research and development efforts, both fundamental and applied, is carried out in the higher education system. Universities play a key role in the creation of new knowledge and technologies, which later become the basis for the development of entrepreneurial initiatives and industry innovations.

– Second, the majority of specialists working professionally in the field of research and development (R&D) have higher education. Thus, universities are not only centers of knowledge production but also institutions for forming personnel potential for scientific and innovative activities.

– Third, higher education institutions train the majority of potential employees for enterprises, and their graduates make a special contribution to the process of innovation both through the creation of new knowledge and through the adaptation and application of the latest developments in practice. The ability to effectively integrate innovations into production processes contributes to personal and overall business productivity.

– Fourth, business incubators operating at universities are an important mechanism for transferring innovative technologies and ideas from the academic environment to business to commercialize research results. They support the development of startups at the early stages by providing a wide range of services: management consultations, access to financing, technical assistance, and expert support.

In modern conditions, more and more universities are transforming into new types of research institutions that integrate education, science, and entrepreneurship. The so-called "triple helix" of interaction between universities, businesses, and the state is being formed, which ensures accelerated reproduction of innovative potential and contributes to the modernization of national economies (Figure 1). Educational and scientific ecosystems built on this principle create conditions for generating technological breakthroughs and sustainable economic development.

Within this model, digital universities act as a platform that unites the interests of public administration and the business environment. The state provides regulatory support, stimulates innovative processes through financing and creating favorable conditions, business defines the requests for competencies and innovations, and digital universities act as providers of knowledge, technology, and personnel. Such interaction creates conditions for the sustainable development of the innovative economy and for strengthening the competitiveness of national businesses.

The modern approach to understanding the innovative development of enterprises emphasizes the importance of the innovative behavior of personnel as a key success factor. In this context, digital universities play a strategic role in training innovatively active specialists capable of generating and implementing new ideas in various areas of enterprise activities. It is not only about specialists in research and development departments but also about general employees who have digital competencies and the ability to innovate activities.

In the digital age, the economy is largely based on human creativity, and creativity is becoming a determining factor in economic growth [13, p. 110]. That is why digital universities should not only transfer ready-made knowledge, but also actively develop students' ability to create new knowledge, critical thinking, and innovative activity. Traditional educational models focused on the passive consumption of knowledge are gradually giving way to interactive and project-oriented approaches that stimulate students' creative activity and their readiness to implement innovations in practice.

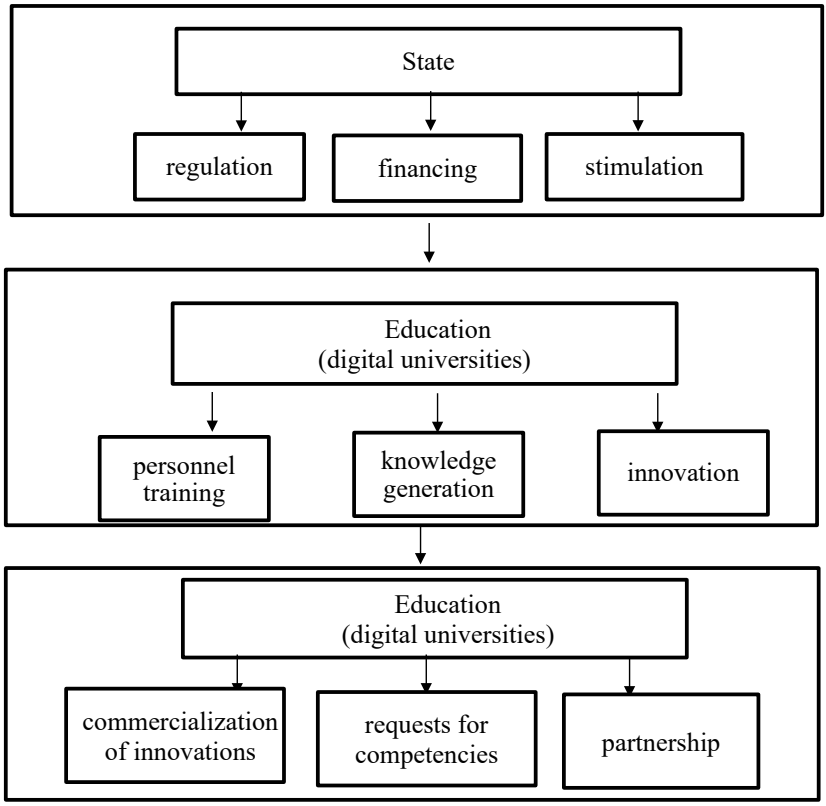


**Figure 1. Triple interaction: education – business – state in an innovative environment**

*Source: compiled based on [1; 7]*

In this regard, the development of students' innovative competence, including the ability to generate, adapt, and implement new ideas, is becoming a priority for educational institutions. Digital educational environments, immersive technologies, business incubators, startup studios, and modeling of real production processes using simulation platforms create unique opportunities for forming the innovative potential of future specialists.

One example of the integration of education and business is the practice of involving students in simulation business games that recreate real-life scenarios of enterprise functioning. In such programs, senior and master's students work in teams with business representatives to solve complex management problems,

which helps develop their creativity, decision-making, teamwork, and leadership skills. Enterprises, in turn, get the opportunity to assess the potential of students and engage those who best meet the requirements of the modern innovative economy.

It is worth noting that the transition of educational processes to distance and electronic formats, which has recently become a common practice, has had little impact on the need for regular interaction between universities and employers. Finding an effective mechanism for such interaction remains an extremely urgent task. In this context, the digital educational environment creates new opportunities for fast two-way communication, which allows for flexible formation of the competence profile of students according to the current needs of the real sector of the economy.

It is important to emphasize that the participation of business representatives in cooperation with universities should not be limited to defining the required set of competencies for graduates. It is extremely important to directly involve students in interaction with business representatives at the stage of study, which contributes to the development of professional communication skills with key stakeholders – skills that are critical for the successful implementation of innovative activity in the modern economy.

A common but false stereotype is that the innovative economy is based exclusively on the activities of a small number of outstanding inventors and entrepreneurs. Recent research shows that innovation is rarely the result of purely individual creativity. On the contrary, the most significant creative ideas usually arise in teams consisting of representatives from different areas of business processes [2; 6]. Moreover, empirical research shows that even individual organizations rarely implement innovations on their own [1, p. 720].

These facts emphasize the particular value of professional communication and collaboration skills in the digital economy. It is digital universities that, through the active integration of students into networks of interaction with business, can effectively prepare future specialists to work in innovation-oriented team environments, thereby contributing to the development of enterprises and the national economy as a whole.

To systematize the main areas of influence of digital universities on the innovative development of enterprises, the results are summarized in Table 1.

Therefore, the role of digital universities in the development of enterprises goes far beyond the traditional educational function, covering research, human resources, innovative entrepreneurship, and communication. This contributes to the building of sustainable educational and business ecosystems that ensure sustainable development in the context of the digital transformation of the economy.

Table 1

**The grouping of approaches to the "economic sustainability" concept**

| The main area of influence | Content of influence | Expected results for enterprises |
|---|---|---|
| 1. Generation of new knowledge and technologies | Conducting basic and applied research in a university environment | Access to advanced developments and technological solutions |
| 2. Formation of personnel potential | Training of highly qualified specialists with digital and innovative competencies | Attracting employees capable of implementing innovations |
| 3. Development of innovative culture | Developing skills of creative thinking, critical evaluation, and interdisciplinary cooperation | Increasing the level of internal innovative initiatives |
| 4. Incubation of startups and business ideas | Establishment of business incubators, startup studios, and acceleration programs at universities | Commercialization of innovative projects and development of new markets |
| 5. Establishing professional communications | Engaging students in interaction with business through project activities, simulation games, and internships | Developing skills of professional interaction, teamwork, and adaptation to business needs |

*Source: compiled based on [1 ;4; 8; 10; 12; 14]*

## Conclusions

In a rapidly changing global environment, many organizations face challenges in realizing their economic potential due to both growing competition from globalization and accelerated technological development. Adapting to these changes requires not only prompt response to external challenges, but also rethinking organizational models, developing new management strategies, and actively investing in innovation. The pace of change in society and the economy necessitates continuous updating of products, technologies, and market approaches, which increases the demand for specialists capable of effectively organizing innovative processes in an unstable environment.

Effective management of innovative activities of enterprises should be based on making reasoned management decisions aimed at continuously updating product lines, developing new market segments, optimizing the use of production resources, and increasing investments in technological and innovative development. A key factor in successful innovative activity is the availability of formed human capital that combines innovative competencies,

entrepreneurial thinking, and skills of interaction with external and internal stakeholders in an open economy.

The role of higher education institutions, and in particular digital universities, in this process, is of fundamental importance. Universities are not only a source of new knowledge, but also active agents of change capable of promoting economic transformation by training specialists with a high level of innovation readiness, generating applied research, and commercializing technological developments. The emerging knowledge economy significantly exceeds the economic models of the twentieth century in its dependence on intellectual capital and global mobility of innovative solutions.

Therefore, digital universities are strategic actors in the processes of innovative development of business and society as a whole. Their activities should be aimed not only at providing quality education, but also at actively participating in the formation of innovative ecosystems, integration into global scientific and technological networks, and creating favorable conditions for realizing the potential of creative and entrepreneurship-oriented students and graduates. Successful interaction between digital universities and businesses is a prerequisite for sustainable economic growth in the context of the digital transformation of the world economy.

**References:**

1. Verina N., Titko J. (2019) Digital transformation: conceptual framework. *In Contemporary Issues in Business, Management and Economics Engineering*, pp. 719–727. DOI: https://doi.org/10.3846/cibmee.2019.073.

2. Kaku M. (2019) Robots, artificial intelligence, and the future of work. Environmental Health and the US Federal System: Sustainably Managing Health Hazards, p. 254.

3. Kubiv S.I., Bobro N.S., Lopushnyak G.S., Lenher Y.I., Kozhyna A. (2020) Innovative potential in European countries: analytical and legal aspects. *International Journal of Economics and Business Administration*, vol. 8(2), pp. 250-264. DOI: https://doi.org/10.35808/ijeba/457.

4. Lopushnyak H., Chala N., Poplavska O. (2021) Socio-economic determinants of the ecosystem of sustainable development of Ukraine. *IOP Conference Series: Earth and Environmental Science*, vol. 915, pp. 1-9. DOI: https://doi.org/10.1088/1755-1315/915/1/012019.

5. Bobro N.S. (2024) Tsyfrova platforma yak suchasna orhanizatsiina innovatsiia [Digital platform as a modern organizational innovation]. *Investytsii: praktyka ta dosvid*, no. 1, pp. 63-66. DOI: https://doi.org/10.32702/2306-6814.2024.1.63. (in Ukrainian)

*6.* UNCTAD. (2021) Catching technological waves: Innovation with equity. Technology and Innovation Report 2021. *United Nations publication*. 196 p. DOI: https://doi.org/10.18356/9789210056588.

7. Meissner P., Poensgen C., Schweinsberg K. (2021) Digital Riser Report 2021: Assessing the Digital Competitiveness of Countries Worldwide. European Center

for Digital Competitiveness by ESCP Business School, 20 p. Available at: https://digital-competitiveness.eu/digitalriser/ (accessed 28.04.2025).

8. Huk P.V., Sklyarenko O.V. (2022) Ekonomichna dotsilnist modernizatsii pidpryiemstv z vykorystanniam avtomatyzovanykh system [Economic feasibility of enterprise modernization using automated systems]. *Ekonomika i upravlinnia*, no. 2, pp. 103-112. DOI: https://doi.org/10.36919/2312-7812.2.2022.103. (in Ukrainian)

9. Khomenko O.O., Paustovska M.V., Onyshchuk I.A. (2024) Vplyv interaktyvnykh tekhnolohii na protses navchannia i rozvytok zdobuvachiv vyshchoi osvity [The impact of interactive technologies on the learning process and the development of higher education students]. *Naukovi innovatsii ta peredovi tekhnolohii*, no. 5(33), pp. 1222-1231. DOI: https://doi.org/10.52058/2786-5274-2024-5(33)-1222-1231. (in Ukrainian)

10. Dushchenko O. (2021) Suchasnyi stan tsyfrovoi transformatsii osvity [The current state of digital transformation of education]. *Fizyko-matematychna osvita*, no. 28(2), pp. 40-45. DOI: https://doi.org/10.31110/2413-1571-2021-028-2-007. (in Ukrainian)

11. Karpliuk S.O. (2019) Osoblyvosti tsyfrovizatsii osvitnoho protsesu u vyshchii shkoli [Features of digitalization of the educational process in higher education]. Informatsiino-tsyfrovyi osvitnii prostir Ukrainy: transformatsiini protsesy i perspektyvy rozvytku: Materialy metodolohichnoho seminaru NAPN Ukrainy, pp. 188-197. (in Ukrainian)

12. Kozhyna A. (2022) Reducing Poverty, Inequality and Social Exclusion in European Countries Based on Inclusive Approaches to Economic Development. Economics and Management of the National Economy, The Crisis of National Models of Economic System, pp. 29-32. DOI: https://doi.org/10.30525/978-9934-26-269-2-7.

13. Williamson B., Eynon R., Potter J. (2020) Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency. *Learning, Media and Technology*, vol. 45(2), pp. 107-114. DOI: https://doi.org/10.1080/17439884.2020.1761641.

14. Zhou D. (2021) Exploring how digitalization influences incumbents in financial services: The role of entrepreneurial orientation, firm assets, and organizational legitimacy. *Technological Forecasting and Social Change*, pp. 121-129.

15. Chae H.C., Koh C.E., Prybutok V.R. (2014) Information technology capability and firm performance: contradictory findings and their possible causes. *MIS Quarterly*, no. 1, pp. 305-326.

16. Sklyarenko O.V., Yahodzinskyi S.M., Nikolaevskyi O.Yu., Nevzorov A.V. (2024) Tsyfrovi interaktyvni tekhnolohii navchannia yak nevidiemna skladova suchasnoho osvitnoho protsesu [Digital interactive learning technologies as an integral part of the modern educational process]. *Innovatsiina pedahohika*, no. 68(2), pp. 51-55. DOI: https://doi.org/10.32782/2663-6085/2024/68.2.51. (in Ukrainian)

17. Yahodzinskyi S.M. (2015) Hlobalni informatsiini merezhi u sotsiokulturnii perspektyvi: monohrafiia [Global information networks in a sociocultural perspective: monograph]. Kyiv: Agrar Media Grup, 276 p. (in Ukrainian)