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DIGITALIZATION AS A DIRECTION OF INNOVATIVE DEVELOPMENT OF UKRAINIAN UNIVERSITIES IN THE CONDITIONS OF TECHNOLOGICAL TRANSFORMATIONS

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The article is devoted to determining the prospects of digitalization as a direction of innovative development of Ukrainian universities in the conditions of technological transformations to solve the problems caused by them in the market of scientific and educational services, as well as to develop on this basis, an approach to the justification of relevant, innovative projects. The motivational reasons for the digitalization of the university as a way of its response to technological transformations are outlined and systematized according to the areas of activity. The prerequisites and specifics of the accelerated digitization of Ukrainian universities in the conditions of quarantine restrictions of COVID-19 and war and post-war recovery are determined. An analysis of the practice of using digital technologies in the educational process of some departments of universities in the North-East of Ukraine, operating in the front-line zone, was carried out. The authors clarified the digital structure of the university and the scheme of interaction of its subsystems in the digital economy in the conditions of technological transformations. In particular, in terms of determining the characteristics of external and internal channels of information and knowledge, the interaction initiates innovative changes in the university's activities through digitalization. An approach to the analysis and substantiation of the expediency of the implementation of innovative development projects of the university has been developed depending on the level of its readiness for digitalization. The authors formed a system of indicators for its evaluation, by analogy with the Network Readiness Index, which characterizes various aspects of the university's digital readiness to implement innovative development projects. In particular: technological, human, and managerial aspects of digital readiness, as well as its expected effectiveness (usefulness). The obtained results develop the principles of innovation management in the field of higher education, in terms of the development and justification of the approach to the management of digitalization of the university, as a prerequisite for its innovative development in the conditions of technological transformations and the formation of the digital economy.

Keywords: digitalization, innovative development, university, scientific and educational services, fourth industrial revolution, digital economy, technological transformations.

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Introduction and statement of the problem

Information and communication technologies (ICT) of the fourth industrial revolution (Industry 4.0) are rapidly penetrating almost all areas of human activity. On their basis, the digital (network) economy is being formed, the defining feature of which is the digitization of various spheres of human activity and its transfer to the Internet network. Digitization opens up new opportunities for human society's social and economic development but also creates new problems requiring urgent solutions. In particular, technological transformations caused by ICT Industry 4.0 require the actualization of existing and acquisition of new knowledge and skills in almost all spheres of human activity: production, service provision, state and regional administration, consumption, etc. There are constant changes in the needs for areas and specialties of training specialists. In these conditions, the role of universities as elements of the scientific and educational knowledge market infrastructure and, simultaneously, as elements of the innovative infrastructure is growing. Modern universities are scientific and educational institutions in which the following elements are combined into a single system: a) research activities aimed at the production, use, and distribution (commercialization) of new knowledge; b) training of highly qualified specialists capable of using acquired knowledge and skills in selected fields of activity, as well as producing (acquiring) and using new knowledge. Global practice shows that digital technologies significantly expand the capabilities of universities, in particular, concerning: increasing the efficiency of management of the university and its divisions; effectiveness of internal and external communications; information saturation, and instrumental provision of the management system and scientific and educational process; operational transformation of the forms and methods of the educational process by the needs of the market, as well as changes in the conditions of the external environment (the COVID-19 pandemic, military actions, and post-war recovery); prompt response to changes in the relevance of scientific research areas, as well as training areas and specialties and much more. Accordingly, the problem of digital transformation of universities' activities as a prerequisite for innovative development in technological transformations is actualized. This problem is especially acute for Ukrainian universities. They have been operating in crisis conditions for several years, first caused by the quarantine restrictions of COVID-19 and then by the war. To them should be added post-war recovery and further functioning in the permanently changing conditions of Industry 4.0, which is rapidly gaining strength. The solution to the specified problem will contribute to a significant increase in the adaptive capabilities of universities in the context of the deployment of Industry 4.0 and the formation of a digital economy, the growth of the competitiveness of universities on the domestic and international markets of scientific and educational services, the growth of the intellectual capital of the state as one of the main prerequisites for the transition of the national economy to the path of innovative anticipatory development.

Analysis and research of publications

Foreign and domestic scientists investigate the problems of the article. Among the publications of recent years, which investigate the actual problems of digitization of university activities, we want to highlight the following. Dнaz-Garcнa et al. [8] presented the results of a bibliometric analysis of a sample of 469 articles devoted to the issue of university digitization included in the Web of Science database. Based on it, the authors made conclusions about the interdisciplinary nature of research. They determined that the digitalization of universities passed three stages:

– digitization of certain aspects of the university's activities and acquisition of digital competencies;

– mass use of digital technologies in the conditions of Covid-19;

– response to existing and future Industry 4.0 challenges, adaptation to technological transformations of Industry 4.0, and participation of universities in their programming.

The authors characterize the current period of digitization as using new tools to implement old (traditional) activities. They note that the further development of digitalization requires a rethinking of approaches to the scientific and educational activities of universities or even the entire system of higher education.

Rodrнguez-Abitia et al. [13] proposed an integrated model for assessing educational institutions' maturity level before digital transformation and comparing them with other industries. They highlighted particular uses of the proposed model for higher education institutions. They showed that higher education institutions lag behind organizations in other sectors of the economy in digitalization, probably due to a lack of effective leadership and differences in organizational culture. Mohamed et al. [10] considered digital transformation to form sustainable competitive advantages in the global economy, which is

developing under the influence of the ICT of Industry 4.0. The proposed scheme for managing the process of forming competitive advantages for the university is based on digitalizing the educational process.

Terдs et al. [15] presented the results of a study of the opinions of university teachers with extensive experience regarding the impact of digitalization of the educational process on their professional activities and the working atmosphere. They showed the growing feeling of alienation and the decreasing role of teachers in the educational process. The obtained results indicate the need to make significant changes in the scientific and educational activities of teachers and adjust or change the model of the educational process. Sбnchez-Caballй and Esteve-Mon [14] analyzed the self-perception of the digital competence level of 910 teachers in Spanish and Polish universities by gender, professional level, and field of knowledge. In general, teachers rated their level of competence as average, while young teachers rated their level of competence higher than experienced teachers. Finally, Morze et al. [11] presented the results of developing and implementing the system of digital professional development of teachers of the Borys Grinchenko Kyiv University. They developed a model of the organization of this system based on self-assessment, self-education, and micro-learning. Its structural elements are a diagnostic test and sets of mini-courses.

Zancajo et al. [16] investigated the impact of the COVID-19 pandemic on the digitalization of educational systems in countries worldwide. They considered the role of national education systems in countries' response to common external challenges caused by COVID-19. Coral and Bernuy [7] studied the digital transformation problems of university activities in the context of the COVID-19 pandemic. The obtained results can be used to ensure the effectiveness of transformational processes. Marquez-Ramos [9] investigated the ability of digitization of university activities to overcome the gap between academia and industry, which restrains the commercialization of innovative developments. At the same time, the experience of using digital technologies in the conditions of COVID-19, when digital communications between them replaced personal contact between subjects of scientific and educational activities of the university, is taken into account.

Chernovol et al. [6] considered the prospects of digitalizing higher education institutions in Ukraine and specific aspects of implementing these prospects. Silkova et al. [4] identified the main threats to the higher education system of Ukraine caused by the war with Russia. We explored the possibilities of countering them by digitizing the activities of higher education institutions. We considered the prospects of the post-war development of higher education institutions based on digitalization. Buynytska et al. [1] highlight the experience of digitalization of Borys Grinchenko Kyiv University, in particular, the implementation of the "digital campus". They revealed its essence and role in increasing the efficiency of the university's activities. Also, they considered the approaches to solving individual tasks of managing scientific and educational activities within the framework of the university management system.

Summarizing the results of the analysis, despite significant progress, the issues of digitalization of university activities in the context of technological changes caused by Industry 4.0 and the formation of a digital economy based on ICT of Industry 4.0 remained insufficiently researched. Accordingly, it does not allow purposefully managing digitalization as a strategic direction of innovative development of domestic universities in the national and international markets of scientific and educational services in the conditions of technological transformations.

The purpose of the article

The purpose of the article is to determine the prospects of digitization as a direction of innovative development of Ukrainian universities in the conditions of technological transformations and to develop on this basis an approach to the justification of relevant, innovative projects.

Main material

We formulated the following set of tasks to achieve the goal of the research:

– first, to determine the driving reasons for the digitalization of a modern university as a scientific and educational institution operating in the conditions of technological transformations caused by Industry 4.0;

– second, to determine the prerequisites and specifics of the accelerated digitalization of Ukrainian universities in COVID-19, war, and post-war recovery;

– third, to analyze the modern practice of using digital technologies in the educational process of universities;

– fourth, to clarify the interaction scheme of university subsystems in the digital economy in the conditions of technological transformations;

– fifth, to develop an approach to substantiating projects of innovative development of the university based on digitalization.

We identified the main challenges of Industry

4.0 to the higher education system and universities in particular (their scientific, educational, and managerial activities) and proposed ways to respond to them (Table 1).

As follows from the table. 1, these response methods provide for introducing a complex of innovations (mainly processes) based on Industry 4.0 digital technologies. Thus, the motivating reasons for digitalizing universities as scientific and educational institutions are outlined.

Table 1

Motivating reasons for digitalization of university activities

Challenges initiated by Industry 4.0	Reaction methods
Research activities	
Changes in the relevance of scientific research directions	Provision of remote access to knowledge bases and databases of scientific and technological information, libraries, patent funds, databases of indexing and referencing of scientific journals, databases of materials of scientific conferences, etc. Providing opportunities for remote communication with fellow scientists, business representatives, grant providers, etc.
Expanding the practice of joint implementation of scientific research	
Prompt presentation of research results to the scientific community, business, and other interested groups of persons	
Expanding the practice of using digital technologies in scientific research	Use of ICT of Industry 4.0 for planning, conducting, and analyzing the results of scientific research: cloud computing technologies; Artificial Intelligence; databases and knowledge; computer information and search systems; virtual and augmented reality, etc.
Education activities	
Permanent changes in the relevance of existing professions and the emergence of new ones	Operational updating of directions, specialties, and specializations of training
	Operational updating of personnel potential, methodical and information support, software and hardware support of the university
	Improvement of existing and introduction of new forms and training methods: in classrooms, at the virtual workplace, accelerated retraining courses, distance learning, etc.
Digitization of various spheres of human activity	Ensuring a high level of digital training of specialists, which requires the use by teachers and students in the educational process of ICT of Industry 4.0 and relevant software and hardware complexes for designing, creating, studying, testing objects, technologies, processes, etc. (computer simulation, virtual objects, and processes, etc.). Information saturation of the educational process: electronic libraries and knowledge bases, open courses of disciplines, etc.
Management system	
Permanent changes in the external macro- and microenvironment	Application of digital technologies for operational adaptation of the system of management of scientific and educational activities to changes in conditions on the market of scientific and educational services; ensuring high quality and efficiency of specialist training; ensuring the effectiveness of external and internal communications; increasing efficiency and productivity of activities; promoting the realization of the potential of teachers, support staff and students
Intensification of competition in the market of scientific and educational services	
The spread of the practice of using self-managed systems combining human intelligence, ICT of Industry 4.0, and automated production in various spheres of activity requires appropriate adaptation of universities to ensure technological compatibility	Transformation in the perspective of universities into self-managed systems that combine and ensure mutually coordinated interaction with the help of ICT of Industry 4.0 of their human potential, resource potential, processes (management, scientific and educational, intra-organizational interaction, interaction with external contractors, etc.) [2]

Source: authors' development

It should be noted that the quarantine restrictions of COVID-19, the conditions of war, and the predicted conditions of the expected post-war recovery of Ukraine, caused the acceleration of digitization in almost all spheres of human activity, including in the field of education. Among them, it is necessary to single out those that are more characteristic of universities that are (were) located in war zones or the front-line zone, surrounded or under temporary occupation [2,3]:

a) limitation of contact between people during the COVID-19 pandemic, which initiated the transition to distance learning using digital technologies;

b) significant damage to the material base of several universities due to military operations made it impossible to conduct a stationary educational process in their classrooms. At the same time, the damage practically did not affect (or affected to a small extent) their software and hardware complexes, databases, and knowledge bases on digital media, contributing to the application of digital distance learning technologies;

c) limitation of business trips in war conditions (within the country or abroad), evacuation of some employees (teachers, support staff) and students to relatively safe regions of Ukraine or outside the country, as well as the residence of some employees and students in the zone distance learning technologies, which were developed during the quarantine restrictions of COVID-19, were updated in combat operations, in the front-line zone or the temporarily occupied territory;

d) the reasons specified in paragraphs 1-3 actualized digital technologies for remote participation of employees: in scientific conferences (in Ukraine or abroad); in conducting dissertation defenses (Ph.D., doctor of sciences); when communicating with colleagues during the preparation and implementation of joint scientific projects; when conducting scientific research, analysis and presentation (publication) of their results, etc.;

e) the specified reasons initiated the application of digital technologies for internal and external document circulation and internal and external communications related to the management of scientific and educational as well as other activities of universities.

Considering the significant damage to the material base of universities that are (were) in the war zones, it is possible to predict the continuation of the use of digital distance learning technologies in the post-war period (until the material base of universities is restored). They can also be used to attract Ukrainian citizens who work, including abroad, as well as citizens of other countries, to study. In general, using digital technologies for distance learning, retraining, or upgrading working people's skills is advisable per the concept of «lifelong learning». Moreover, it is relevant from the point of view of the adaptation of the workforce to the conditions of the widespread implementation of ICT of Industry 4.0 and the formation of a digital economy in Ukraine.

In achieving the research goal, the practical aspects of using distance learning technologies were considered in detail using the example of a popular set of software solutions from Microsoft – "Microsoft 365", as well as some social networks. Table 2 presents the characteristics of applying the main of them in war conditions.

The «+» sign indicates the mode of application presented in the Table 2 digital technologies in the educational process at some departments of universities in the North-East of Ukraine. However, the experience of the practical application of the mentioned technologies showed that most students joined the educational process in an asynchronous mode. The main reasons for this are frequent power outages; problems connecting to the Internet (including mobile); staying in a war zone or even temporarily occupied territories; staying in evacuation where living conditions did not allow working in synchronous mode, etc.

Figure presents a variant of the university's digital structure, which functions under Industry 4.0 technological transformations. It reflects the consolidated scheme of interaction of university subsystems (as a scientific and educational institution) in the digital economy in responding to challenges caused by technological transformations (see Table 1). The double-sided arrows in Figure indicate the exchange of information and knowledge flows between subsystems of the university during the implementation of scientific and educational activities and its management. Volumetric arrows indicate the flows of input and output information and knowledge during the interaction of university subsystems with the external environment, in particular: economic counterparties and contact audiences of the market of scientific and educational services (subjects of the innovation process), as well as subjects of the labor market.

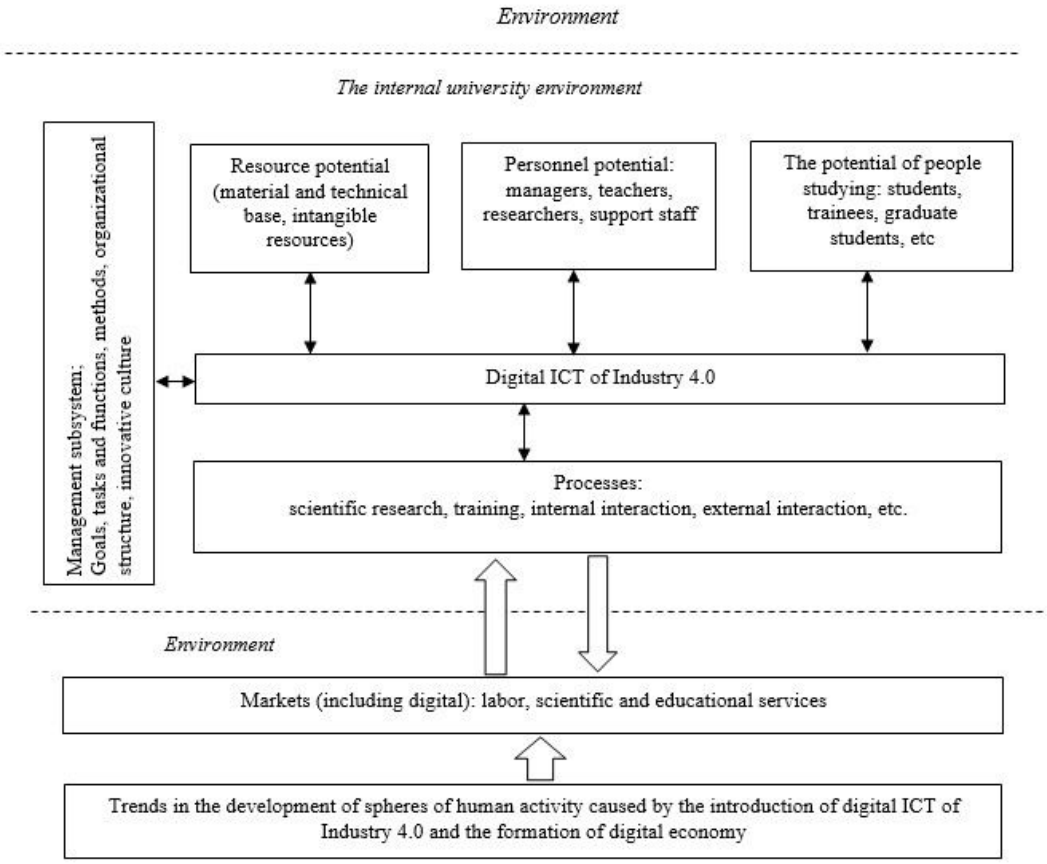
Input flows characterize the changes occurring in the external environment under the influence of Industry 4.0, as well as the challenges initiated by them for the activities of universities in the conditions of technological transformations. Output flows are

Table 2

Application of digital technologies in distance learning

Application		Purpose of application	Learning mode	
			Synchronous (Online)	Asynchronous (Offline)
Microsoft 365	Teams	Lectures and practical/laboratory classes according to the class schedule (additional classes – as needed)	+	-
		Chat, file sharing, and links to educational and methodological materials in cloud storage (OneDrive) or the OneNote application.	+	+
	Forms	Current and final controls, tests to check the level of knowledge	+	+
	OneNote	Placement of educational and methodical materials, joint work during training on tasks, verification of completed tasks	+	+
	OneDrive	Communication, file sharing, links to educational and methodological materials in cloud storage (OneDrive) or the OneNote application	-	+
	Outlook	Communication, file sharing, links to educational and methodological materials in cloud storage (OneDrive) or the OneNote application	+	+
Telegram, Viber, WhatsApp		Communication, file sharing, links to educational and methodological materials in cloud storage (OneDrive) or the OneNote application, voice communication	+	+

Source: authors' development



Scheme of interaction of university subsystems in digital economy in the conditions of technological transformations

Source: [2], modified and supplemented

the results of implementing measures to respond to calls. As follows from the Table 1, these measures provide for introducing innovative changes in the activities of universities through digitalization.

Thus, digitalization is considered a promising direction for the innovative development of universities in the conditions of technological transformations. Based on the university's readiness for digitalization and conditions on the target market of scientific and educational services, one of the following types of innovative development can be chosen as a specific university:

– innovative catch-up development, which involves the digitization of certain aspects of scientific and educational activities in order to protect its market positions;

– leading innovative development involves following the digitization strategies of the leaders of the scientific and educational services market in order to ensure compliance with existing development trends;

– innovative anticipatory development involves implementing digitization strategies that respond to existing and projected challenges of ICT of Industry 4.0, which allow to form and strengthen sustainable competitive advantages, take the position of a market leader, or even create a new market.

To analyze the state (level) of the university's readiness for digitalization within the selected type of innovative development, we used indicators similar in content to the Network Readiness Index (technology, people, management, impact) [12]. In addition, however, we adapted them to evaluate scientific and educational institutions. In this case, they respectively characterize:

– technological readiness: availability of technologies - the ability to purchase or develop the necessary digital technologies independently; the relevance of their application for solving tasks in the conditions of technological transformations; progressiveness (compliance with NTP trends in the field of ICT); the possibility of using digital technologies in the scientific and educational process, based on technical and technological conditions;

– human readiness: the ability of staff and students to use digital technologies in scientific activities and the educational process; their readiness and ability to actualize their level of knowledge and skills; willingness and ability to find and implement ways to improve the efficiency of using digital technologies;

– management readiness: the degree of digitization of the university management system in general and its scientific and educational activities in particular; adaptability of the management system to technological transformations of Industry 4.0 and development trends of the digital economy; the efficiency of using digital technologies in the management system; the effectiveness of the organization of university activities in conditions of digitalization; motivation of staff and students to use digital technologies in scientific and educational activities; orientation of the organizational culture of the university towards digitalization;

– the effectiveness (usefulness) of digitalization: increasing the effectiveness of scientific and educational activities; strengthening of market positions and positive impact on the image of the university; formation and consolidation of positive development trends in the conditions of technological transformations Industry 4.0; improvement of working and rest conditions of staff and students, etc.

To assess the university's level of readiness to implement a specific project of innovative development (catch-up, leading, or anticipating types) based on digitalization, we propose the following approach.

First, perform an expert assessment of readiness for digitization separately for each of the above four indicators on a scale of 1-100. At the same time, a score of 1-50 indicates a low level of readiness, 51-80 is medium, and 81-100 is high. Employees of the university of the corresponding phase can be involved as experts and specialists invited from the outside.

Second, perform a critical assessment of digital readiness for the entire set of indicators as a ratio of the sum of the four assessments received to the maximum possible value (400). For example, the integral estimate can take values of 0.01-1.0.

Third, determine the expediency of implementing the analyzed type of innovative development project according to the Table 3.

For projects excluded from consideration (in the case of their importance for the analyzed university), the possibility and ability (in an acceptable time frame and with an acceptable level of costs) of increasing the level of digital readiness according to the relevant characteristics should be considered. If such an ability exists, then after implementing a system of measures to increase digital readiness, evaluation, and analysis are performed repeatedly.

Conclusions

First, by the specifics of the main types of activities, the motivating reasons for the digitalization of the modern university were determined and systematized as a way of its response to the

Table 3

Table of decisions on the feasibility of implementing an innovative project based on digitization

Integrated assessment	Decision
0,81–1,0	The readiness level is high. The project should be implemented
0,51–0,8	The readiness level is average. The project can be started, but the ability to increase the level of readiness should be analyzed according to individual characteristics
0,01–0,5	The readiness level is insufficient. The project should be excluded from the consideration

Source: authors' development

technological transformations of Industry 4.0 in order to ensure the conditions of sustainable development in the market of scientific and educational services in the digital economy.

Second, the prerequisites and specifics of the accelerated digitization of Ukrainian universities in the conditions of quarantine restrictions of the COVID-19 pandemic, as well as war and post-war recovery, are determined. We showed that the digital transformation of scientific and educational activity is more characteristic of universities that are (or were) located in the war areas, the front-line zone, surrounded or temporarily occupied. In these conditions, digitization is the only opportunity for them to conduct scientific and educational activities.

Third, an analysis of the modern practice of using digital technologies in the educational process of some departments of universities in the North-East of Ukraine operating in the front-line zone was carried out. Digital technologies from the complex of Microsoft 365 software solutions and social networks were studied. We noted that most students study in an asynchronous mode (even in the presence of a synchronous mode), which is caused by various aspects of the influence of military actions.

Forth, the digital structure of the university and the scheme of interaction of its subsystems in the digital economy in the conditions of technological transformations have been clarified. In particular, in determining the characteristics of external (input and output) and internal streams of information and knowledge. We showed that the interaction of internal information and knowledge flows in responding to external incoming flows initiates innovative changes in the university's activities through its digitalization. Accordingly, we considered digitalization as a direction of innovative development of the university in the conditions of technological transformations of Industry 4.0, reflected in the output flows of information and knowledge.

Fifth, we developed an approach to the analysis and substantiation of the expediency of the implementation of innovative development projects of the university based on digitalization, depending on the level of its digital readiness. By analogy with the Network Readiness Index, a system of indicators has been created that characterizes various aspects of the university's digital readiness for implementing innovative development projects of various types: catching up, following the leader, and ahead. In particular: technological, human, and managerial aspects of readiness for digitalization, as well as its expected effectiveness (usefulness). The sequence and content of analysis and evaluation procedures and a table for making appropriate management decisions are proposed.

The obtained results develop and deepen the principles of innovation management in the field of higher education, in terms of the development and justification of the approach to university digitization management, as a prerequisite for its innovative development in the conditions of technological transformations caused by ICT of Industry 4.0 and the formation of a digital economy.

We will aim further research at forming the foundations of the organizational and economic mechanism for managing the innovative development of the university based on digitalization in the context of Industry 4.0 deployment.

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ЦИФРОВІЗАЦІЯ ЯК НАПРЯМ ІННОВАЦІЙНОГО РОЗВИТКУ УНІВЕРСИТЕТІВ УКРАЇНИ В УМОВАХ ТЕХНОЛОГІЧНИХ ТРАНСФОРМАЦІЙ

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Статтю присвячено визначенню перспектив цифровізації як напряму інноваційного розвитку університетів України в умовах технологічних трансформацій для вирішення спричинених ними проблем на ринку науково-освітніх послуг, а також розроблення на цій основі підходу до обґрунтування відповідних інноваційних проектів. Окреслено і систематизовано за напрямами діяльності спонукальні причини цифровізації університету, як способу його реагування на технологічні трансформації. Визначено передумови і специфіку прискореної цифровізації університетів України в умовах карантинних обмежень COVID-19, а також війни і повоєнного відновлення. Виконано аналіз практики застосування цифрових технологій в навчальному процесі низки кафедр університетів Північного Сходу України, що функціонують в прифронтовій зоні. Уточнено цифрову структуру університету і схему взаємодії його підсистем в цифровій економіці в умовах технологічних трансформацій. Зокрема, в частині визначення характеристик зовнішніх і внутрішніх протоків інформації та знань, взаємодія яких ініціює інноваційні зміни у діяльності університету шляхом її цифровізації. Розроблено підхід до аналізу і обґрунтування доцільності реалізації проектів інноваційного розвитку університету залежно від рівня його готовності до цифровізації. Для її оцінювання сформована система показників, за аналогією з індексами Network Readiness Index, що характеризує різні аспекти цифрової готовності університету до впровадження проектів інноваційного розвитку. Зокрема: технологічні, людські, управлінські аспекти цифрової готовності, а також її очікувану результативність (корисність). Отримані результати розвивають засади інноваційного менеджменту в сфері вищої освіти, в частині розроблення і обґрунтування підходу до управління цифровізацією університету, як передумовою його інноваційного розвитку в умовах технологічних трансформацій і формування цифрової економіки.

Ключові слова: цифровізація, інноваційний розвиток, університет, науково-освітні послуги, четверта промислова революція, цифрова економіка, технологічні трансформації.

DIGITALIZATION AS A DIRECTION OF INNOVATIVE DEVELOPMENT OF UKRAINIAN UNIVERSITIES IN THE CONDITIONS OF TECHNOLOGICAL TRANSFORMATIONS

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The article is devoted to determining the prospects of digitalization as a direction of innovative development of Ukrainian universities in the conditions of technological transformations to solve the problems caused by them in the market of scientific and educational services, as well as to develop on this basis, an approach to the justification of relevant, innovative projects. The motivational reasons for the digitalization of the university as a way of its response to technological transformations are outlined and systematized according to the areas of activity. The prerequisites and specifics of the accelerated digitization of Ukrainian universities in the conditions of quarantine restrictions of COVID-19 and war and post-war recovery are determined. An analysis of the practice of using digital technologies in the educational process of some departments of universities in the North-East of Ukraine, operating in the front-line zone, was carried out. The authors clarified the digital structure of the university and the scheme of interaction of its subsystems in the digital economy in the conditions of technological transformations. In particular, in terms of determining the characteristics of external and internal channels of information and knowledge, the interaction initiates innovative changes in the university's activities through digitalization. An approach to the analysis and substantiation of the expediency of the implementation of innovative development projects of the university has been developed depending on the level of its readiness for digitalization. The authors formed a system of indicators for its evaluation, by analogy with the Network Readiness Index, which characterizes various aspects of the university's digital readiness to implement innovative development projects. In particular: technological, human, and managerial aspects of digital readiness, as well as its expected effectiveness (usefulness). The obtained results develop the principles of innovation management in the field of higher education, in terms of the development and justification of the approach to the management of digitalization of the university, as a prerequisite for its innovative development in the conditions of technological transformations and the formation of the digital economy.

Keywords: digitalization, innovative development, university, scientific and educational services, fourth industrial revolution, digital economy, technological transformations.

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