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MECHANISMS FOR ENHANCING THE FINANCIAL AUTONOMY OF UNIVERSITIES: THE DIGITAL DIMENSION

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ABSTRACT

The problems of digitalization in the higher education system are considered in the paper; modern digital tools as the mechanisms for enhancing the financial autonomy of universities in Ukraine are revealed.

The authors assume that the main direction of digitalization and development of digital technologies is the creation of digital infrastructures (e-infrastructures), which provide primary processing, storage and data exchange, distributed computing, and automated analytics of a higher education institution activity. However, it is noticed that in the digital world data maturity – the compliance of data with the requirements of the mentioned digital infrastructures – is essential.

Digital tools for the financial sector of the economy are commonly called FinTech. This term is used to describe the technological innovations in financial services, which can lead to the emergence of new business models, applications, processes, and products; they also may have a corresponding material impact on financial markets, institutions, and ways of providing financial services.

The authors are based on the main provisions of institutionalism and neo-institutionalism, financial capitalism as the theoretical foundations of modern economic relations of universities. The author's definition of the institutional autonomy of a university as an institutional unit of the modern economy, as well as the main mechanisms and instruments for regulating the limits of their institutional autonomy, are proposed. In this context, the authors describe the main FinTech technologies, which have significant prospects as components of the mechanisms of Ukrainian universities' financial autonomy, i.e.: cloud technologies, artificial intelligence technologies, the internet of things, peer-to-peer transaction technologies, digital banking, and blockchain. Analyzing the features of digital financial technologies, much attention is paid to the blockchain, in particular, smart contracts as the most accessible for Ukrainian universities in the near future. The perspective directions of introducing blockchain technology in the digital systems of Ukrainian universities are outlined.

It is noted that digitalization in the university sphere stipulates establishing mandatory rules (standards), the creation and functioning of digital technologies, which act as institutional constraints to almost all the proposed mechanisms and instruments of university institutional autonomy, including the university funding mechanism.

Keywords: digital dimension, universities, financial autonomy, fintech, IoT, blockchain

JEL Classification: C88, I21, I22, C89, G20

INTRODUCTION

Over the last decade, digital technologies have transformed the economy and society affecting all the spheres of human activity and everyday life. The electronic technologies for storing and processing digitized data underly this process and the amount of data increases every year. The European Commission pointed out that "data-driven innovation will bring enormous benefits for citizens, for example through improved personalized medicine, new mobility and through its contribution to the European Green Deal" [1]. At the same time in a society, where people and automated systems will produce

ever-increasing amounts of data, during data collection and usage the individual's interests should be put first according to European values, fundamental rights and rules. The accordance of personal data exchange with the strict international rules on data security is crucial for perceiving and trusting in digital data-driven innovations. Meanwhile, increasing non-personal industrial and public data in the world combined with technological changes in the way of data storage and processing will be a potential source for economic growth and innovations to be used.

In the case of realizing the opportunities to make better decisions based on analytical data, received from open sources and depersonalized, these data should be available to all (regardless they are public or private institutions, large or small, etc.). Digital technologies can help society to receive the most from innovations and competition and ensure that everyone benefits from digital dividends [48].

The ability to build strong legal and technological bases, which would support and regulate digital technologies in terms of data security, ensuring fundamental human rights and freedoms, security and cybersecurity has become important in the context of joining the European Education Area. Digitalization will be essential in enhancing the mechanisms of financial autonomy of universities. Every higher education institution should act and coordinately solve issues concerning connection to infrastructures of data processing and storage, technologies of distributed computing and cybersecurity. Furthermore, they need to improve their governance structures under the data collection and processing, be ready for data sets increase and ensure data maturity, which should be available for use and re-use.

The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Mid-Term Review of the Capital Markets Union Action Plan [35] emphasize that innovations in finance are not new and investment in technology and the pace of innovation itself has increased significantly. However, recently increased focus on FinTech, which is grounded on using digital identification, mobile applications, cloud computing, big data analysis, artificial intelligence, blockchain and distributed computing technologies.

LITERATURE REVIEW

The problems of elaborating and implementing the conception of higher education institutions' financial autonomy are actualized at the times of significant modernization in 2012-2020 the Ukrainian legislation in the sphere of higher education: preparation, adoption, and implementation of the Laws of Ukraine "On Higher Education" [32], "On Education" [33], decrees of the Cabinet of Ministers of Ukraine [17], [18], [19], [20], [21] and the National Bank of Ukraine [16].

Active attention is paid to digital technologies in the economic sphere in the documents and analytical reports of the World Bank [48], UNESCO [39], [40], and European Commission [1], [9], [35].

The issues of university autonomy (in particular, financial) are actively studied in the works of foreign researchers: T. Estermann [29], [38] on the comparative analysis of university autonomy in different national higher education systems, D. Smith [43] – the conception of the entrepreneurial university; S. Slaughter, L. Leslie [42] – the theory of academic capitalism, etc. Special attention is paid to studying financial autonomy by the researchers of the Institute of Higher Education of the National Academy of Education Science of Ukraine [24].

The works of V. Bykov [13], [14], [15], O. Spirin [15], etc. are dedicated to the theoretical aspects of using digital technologies in education, in particular, higher. In higher education digital transformations were studied by V.Areshonkov [5], O. Kaminskyi, Y. Yereshko, S. Kyrychenko [31], V. Hrytsenko [29] in particular blockchain technologies in education are enlightened in the works of S. Agadzhanova, O. Viunenko, A. Tolbatov, O. Tolbatova [2].

AIMS AND OBJECTIVES

Purpose: To reveal the processes of digital transformation and the further development of digital technology innovations using them and digital tools in the infrastructure of higher education institutions, which will significantly reduce operating costs due to the introduction of the latest business models in the field of higher education of Ukraine and ensure the implementation of institutional (including financial) autonomy of higher education institutions.

METHODS

The following methods were used for the scientific analysis of the phenomenon: comparison of scientific facts and generalization of pedagogical experience with extrapolation of the analyzed scientific principles and empirical ideas to the theory and methodology of higher education; analysis of documentation and results of higher education institutions activity; pedagogical observation and self-observation, etc.

RESULTS AND DISCUSSION

Speaking about digital technologies, it should be understood, that it is a pool of information and communication technologies, which creates in its entirety a new quality. The global process of digitalization presupposes four main technological directions:

- highspeed internet (Internet, HyperNet);
- sensors and automated data collection systems (IoT);
- storage and primary data processing systems (Big Data, Lake of data);
- automated analytical systems (Management Systems, AI, NeuroNet) [7].

A number of researchers [31], making assumptions that the general aim of digital transformations in the higher education system is a transformation of services produced in this sphere and accompanying business processes, defined three possible directions:

- transformation and redefinition of services in the sphere of higher education according to changes in the university business processes system;
- transformation of business processes aimed at the creation of new and improvement of existing IT-based business processes as a basis for further analysis and transformation of services in the sphere of higher education;
- combination of the first and second directions to integrate the simultaneous transformation in both directions (Figure 1).

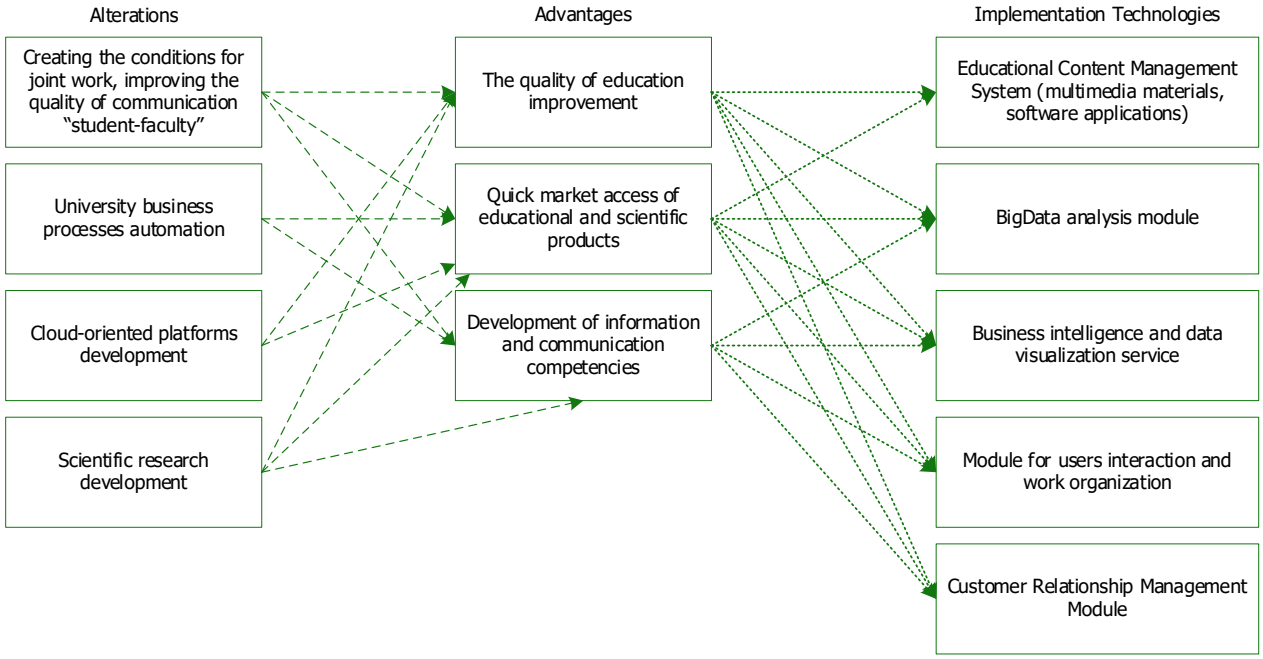

Figure 1. Implementation of digital technologies in higher education institutions. *(Source: [31])*

New technologies are changing the financial sector and the way consumers and companies access services creating opportunities for solutions based on FinTech to ensure better access to finance and improve financial inclusion for digital access of citizens.

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With the help of digital technologies, the client becomes the main manager of financial processes which allows to maintain operational efficiency and additionally increases the competitiveness of the EU economy. It also becomes helpful in the processes of deepening and expansion of capital markets in the EU by integrating digital technologies to change business models using data-driven solutions, for example in asset management, intermediary investment, product distribution, etc. [35].

FinTech is a concept used to describe technological innovations in financial services which can lead to new business models, applications, processes, and products, and may have a corresponding material impact on financial markets and institutions, and the way of providing financial services [27]. FinTech is a wide comprehensive concept that primarily applies to banks and financial institutions seeking full use of existing hardware and software capabilities as well as links to the systems themselves [11]. At the same time, FinTech as a set of digital services has long ago gone beyond banking institutions and is widely used in other spheres relating to financial support. In our context, these are components of mechanisms for enhancing the financial autonomy of higher education institutions. Meanwhile, using the mentioned technologies in the sphere of higher education in Ukraine is insufficient, therefore it becomes important to understand the opportunities of FinTech and which digital technologies are available.

The tools of online budgeting, expenditure tracking, and even automated bots for customer service are digital tools through which Fintech changes the landscape of financial services. At each level (for instance, budgeting, customer service) the problems are solved in fast and efficient ways often using automated technologies and machine learning algorisms. Previously suspicious payment in the account could cause a phone call from a representative of a financial institution, but now such calls are made automatically when the transaction is performed (the corresponding decision is made automatically, in many cases, based on the analysis of client's previous actions) [8].

Describing the innovations caused by Fintech P. Bora emphasizes that financial technologies allow institutions "to serve customers in novel and unexpected ways" [10]. The financial sector, according to the analyst, experiments with automation, predictive analytics, new delivery platforms, digital-only banking, blockchain and more. These changes assist institutions in providing higher-quality services at lower price points. As a result, a higher education institution in the financial sector can better coordinate business strategies with consumer expectations. The emphasis is made on creating better digital processes which consumers can personalize. These digital improvements of FinTech cause a more positive experience for consumers.

We will consider some FinTech digital technologies which directly affect the relationship between consumers and institutions taking into account their capabilities in the context of enhancing the mechanisms of universities' financial autonomy.

Cloud technologies. Fintech has accelerated significantly due to the transition to cloud technology. In general, the possible problems with data compromise were considered as the greatest danger to finances. However extensive experience in implementing a number of cloud technologies argued for financial institutions the safety of their use. Using cloud solutions has many benefits for financial institutions, for instance, the cloud ensures a faster way to provide customer services, and companies need to invest less capital in building or upgrading infrastructure. Cloud technology allows to put in order activities and helps to build consumer-oriented processes. According to the PwS report [37], cloud technologies will be the main infrastructure model for financial services. This becomes an important factor in the functionality of a wide range of internal processes, including financial. The transition from locally-based models to cloud-based ones will require a significant restructuring of all internal processes.

So, cloud technologies ensure an operating environment of digital services functioning, as well as in their entirety become a basis for mechanisms of standardizing a university activity, funding and financial activity of a university, capable in real-time to measure higher education institution's performance.

Technologies of artificial intelligence (AI) and machine learning. Significant spread and permanent increase in computing power of digital devices (primarily smartphones), opportunities for permanent stay on the Internet, and rapid spread and improvement of artificial intelligence technologies simplified the implementation of chatbots and virtual assistants. Nowadays institutions started to use effectively Fintech of training virtual assistants, such as Alexa (Cortana or Siri), in creating content for consumers and taking into account their wishes and needs. Virtual assistance technology allows for optimizing answers to common questions of consumers (with small variations) and to help them quickly. Previously, universities created FAQ webpages, however, due to their number and volume, it was difficult for consumers to use them, and therefore, they proved ineffective. Virtual assistants and chatbots have greatly simplified access to the necessary information and increased the effectiveness of interaction with higher education institutions, especially concerning financial information.

Besides chatbots and virtual assistants, artificial intelligence (AI) is used to perform multidimensional analytics, primarily forecasting financial trends and development vectors. Analyzing large data sets using artificial intelligence algorisms and machine learning, it becomes possible to receive all data on a particular consumer and make financial decisions in real-time.

The strong influence of digital technologies has already changed the traditional model of banking processes with issuing checks, savings, and loan management. Simultaneously, artificial intelligence technologies in addition to improving the interaction with clients can prevent financial fraud. Banks and companies working with credit cards use complex algorisms to prevent financial fraud [50]. Suspicious activity can trigger a phone call from a bank or insurance company. Today Microsoft introduced an AI solution to detect fraudulent actions (and take action) in less than two seconds [30]. J. Lewis considers that such protection becomes necessary, especially considering that in 2016 cybercrime cost the world $600 billion, or 0.8 per cent of global GDP, compared to the 2014 report, which put global losses at close to $445 billion [34].

Detecting fraud is not the only way to use artificial intelligence and machine learning. Complex algorisms, created from huge amounts of data, give insight on consumer's behaviour, provide investment analysis in real-time, compliance with the law, etc. Complex analytical models able to implement artificial intelligence will create additional opportunities for enhancing the mechanisms of financial autonomy of universities, however, this will be possible if the technological transition to cloud-oriented digital systems is realized.

The mentioned properties become essential for realizing the mechanisms of regulating social and labour relations in a university, in particular with students as consumers in the sphere of higher education.

Internet of Things (IoT). The Internet of Things is a general traditional name for the technology of automated digital data collection and transfer in a convenient for further storage and analysis manner. According to researchers from the portal Deloitte [28], despite the fact that most financial companies do not use IoT currently, there exist many possibilities for their application. IoT is mainly different constantly connected to Internet devices which in real-time transmit information to the data storage of a particular service. The technologies enabling the Internet of Things are presented in Figure 2.

Technology	Definition	Examples
Sensor	A device that generates an electronic signal from a physical condition or event	The cost of an accelerometer has fallen to 40 cents from $2 in 2006.[2] Similar trends have made other types of sensor small, inexpensive, and robust enough to create information from everything from fetal heartbeats via conductive fabric in the mother's clothing to jet engines roaring at 35,000 feet.[3]
Networks	A mechanism for communicating an electronic signal	Wireless networking technologies can deliver bandwidths of 300 Megabits per second (Mbps) to 1 gigabit per second (Gbps) with near- Ubiquitous coverage.[4]
Standards	Commonly accepted prohibitions or prescriptions for action	Technical standards enable processing of data and allow for interoperability of aggregated data sets. In the near future, we could see mandates from industry consortia and/or standards bodies related to technical and regulatory IoT standards.
Augmented intelligence	Analytical tools that improve the ability to describe, predict, and exploit relationships among phenomena	Petabyte-sized (10^{15} bytes, or 1,000 terabytes) databases can now be searched and analyzed, even when populated with unstructured (for example, text or video) data sets.[5] Software that learns might substitute for human analysis and judgment in a situation.
Augmented behavior	Technologies and techniques that improve compliance with prescribed action	***Machine-to-machine*** interfaces are removing reliably fallible human Intervention into otherwise optimized processes. Insights into Human cognitive biases are making prescriptions for action based on Augmented intelligence more effective and reliable.[6]

Figure 2. The technologies enabling the Internet of Things. *(Source: [22]).*

As more devices connect to the Internet, this opens up new opportunities for financial institutions. For universities, special modules of learning management systems, etc. become important tools, that provide automated monitoring and logging of user actions. Such an approach to data collection allows Ukrainian higher education institutions to make financial decisions based on objective, unbiased data, which becomes decisive in the implementation of financial autonomy mechanisms. Furthermore, the speed of accumulation, analysis, and volume of data received with the help of IoT will allow more accurate and long-term financial planning.

Peer-to-peer transaction technologies (P2P). The P2P digital payment methods, such as Venmo and Zelle, increase their market share [4]. This is a sign that consumers are ready to apply these financial technologies for everyday use. A great

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advantage of the payment method P2P is eliminating intermediaries and reducing transaction costs. Direct payments set a precedent when mediation in payment processes is levelled. This leads to rapid decentralization of financial flows and significant changes in the economy. So, using P2P transactions is connected with the mechanisms of enhancing the financial autonomy of the higher education institutions in Ukraine as transactions of this kind can become its technological basis.

Digital banking. To provide the mechanisms for expanding the universities' financial autonomy digital banking technology is a direct opportunity to experience the benefits of the digital world in real life. Previously interaction between a financial institution and a client was based on the old approach which required the physical presence of a client; nowadays in a digital world, these functions are transferred to the virtual space. A modern higher education institution must have a mobile application in which, in addition to educational information, it would be possible to track and control costs, pay bills, etc. Thus, digital banking is a "new norm" [23], [49]. Now in addition to easy access to your account online, digital banks increase coverage and accessibility. This trend is important for the mechanisms of enhancing the higher education institutions' financial autonomy as it indicates a gradual transition from face-to-face (real) interaction to interaction between educational process participants, mainly in cyberspace.

Blockchain. One of the most important financial technologies, which was first perceived in an educational environment, is definitely blockchain. Contrary to significant doubts about the future of cryptocurrencies, which is the subject of heated debates and still not regulated in Ukraine at the legislative level [25], there is a consensus on the blockchain [16]. The extra weight of this technology is given by meticulous attention and its use by such powerful financial institutions as JP Morgan [47], Wells Fargo [3], Bank of America [6] and others.

Blockchain technology is frequently associated with bitcoins and other cryptocurrencies, but it proposes great opportunities for other areas, i.e. for enhancing the mechanisms of universities' financial autonomy. The blockchain registry system uses strict controls, which allows easy data verification. This determines the emergence of new management tools that have prompted the emergence of smart contracts and the storage of auditable data. This blockchain property allows to secure the mechanism of university institutionalization transition to the digital environment and to safely carry out the processes regulating social and labour relations. However, in our opinion, the most effective in the near future will be the provision of mechanisms for funding and financing the activities of the university.

At the end of 2016, the Board of the National Bank of Ukraine approved the Cashless Economy roadmap, which outlined plans to use blockchain technology in Ukraine [36]. In April 2017, the Cabinet of Ministers of Ukraine agreed with an American technology company "Bitfury Group" about the creation for Ukraine of a full-scale blockchain-based system of electronic management and approved the introduction of blockchain technology in the State Register of Property Rights to Immovable Property and System of Electronic Trade in Seized Property [44].

We shall note that blockchain is a shared digital infrastructure which is used for secure data storage and ensuring the exchange of data with third parties. Blockchain technology is a specific type of distributed database. There are various implementations of blockchain, but the basic principles can be considered duplicated storage; decentralized control and consensus; immutability, authentication and timestamping [15].

As part of the study of digital transformations of university education in Ukraine [2], [31] researchers emphasize that blockchain technology by integrating the learning management systems of different Ukrainian universities will ensure the creation of a single, secure and transparent basis for developing a global cloud platform of the higher education systems. There are three main advantages of such a project:

- firstly, it is content sharing. Teachers and researchers share ideas and upload their learning materials to the cloud so that others can use them freely;
- secondly, it is the emergence of content-based innovation, where teachers collaborate on interdisciplinary and inter-university projects to jointly create new learning materials using global databases and other tools;
- thirdly, universities and colleges are becoming part of a global network of teachers, students and educational institutions, who study together within a common cloud platform while preserving their identity, financial policy, etc.

Confirmation of this trend is the publication of the Science for Policy report by the Joint Research Centre (JRC), the European Commission's science and knowledge service [9], in which the research results on possibilities of the blockchain technology application in education are considered, in particular in the accreditation, certification, and digital transfer of educational documents. The report states that these processes are at an early stage but when used correctly blockchain technology can provide significant positive results to educational activities. The European Commission report was based

on successful experiments in blockchain technology implementation at the Massachusetts Institute of Technology, University of Nicosia, Open University UK, and within some educational institutions in Malta. These include providing loans for training, student identification, payment for educational services, distribution of student scholarships, and grants.

However, blockchain technology is not just about the financial aspects of higher education. As a component of the mechanism of regulating social and labour relations of university activity's participants, this technology has a possibility of close integration with the educational process, especially in terms of recording students' academic progress, as all student activities, should be documented and implemented within an individual schedule and study time, as well as meet specific interests and responsibilities within the task.

Any operation performed by a student can be registered in the appropriate database, which is subject to verification and ongoing analysis. It is also advisable to use blockchain technology as a basis for building LMS modules.

To develop the mechanisms of universities' financial autonomy in terms of standardization of their activities, blockchain is the technological basis for smart contracts. Smart contracts can be implemented in different programming languages (for example, Solidity for Ethereum) and automate a number of financial and organizational processes. At the same time, smart contracts, as a means of automation, require a high level of data quality assurance (testing, model testing, vulnerability analysis, etc.), whereas in the future they are expected to play a leading role as the main means of automation and digital market transformation, as well as an important means of decentralization.

We shall notice, that processes of enhancing the financial autonomy of higher education institutions in Ukraine and processes of decentralization of finances in the digital society become interconnected and possible for technical implementation. In addition, these processes have a significant interinfluence and due to the digital transformation can be a catalyst for global change in the social role of universities.

Experts point out that smart contracts are increasingly used in various case studies [15]. At the same time, smart contracts often have difficulty understanding programming models and structures. This becomes a major obstacle to their implementation in the university environment. However, the introduction of smart contract technology in education will help to reduce the cost of registration and issuance of certificates, that is, students will be able to automatically obtain a defence certificate for individual courses, modules, and other results of their training. With the help of smart contracts, agreements between students and universities will be concluded without any intermediaries, which will make education cheaper and more affordable [2], [46].

Currently, we can identify the following promising areas for the introduction of blockchain technology in digital systems of higher education institutions:

- creation of temporary working groups of students;
- formation of a competitive environment and support of the ranking system;
- monitoring of income received by students on the basis of skills acquired in the learning process and the use of such data for the formation of new training courses;
- verification and analysis of the professional skills of applicants for employers.

The implementation of blockchain in Ukraine is constrained by a number of objective and subjective factors – the inertia of users, lack of developed legal framework and the need for a coherent consensus among a large number of participants in the higher education services market, perception of blockchain technology as a threat to their business [45].

CONCLUSIONS

The made analysis allows us to draw the following conclusions.

Firstly, the process of digital transformation of all aspects of public life has become inevitable. The depth of digital technologies penetration nowadays does not allow to deny, level, and ignore their decisive influence.

Secondly, it is clear that further development and innovations will be linked mainly with the use of digital technologies and their combinations. Amon them in the context of mechanisms of financial autonomy development through the digitalization of the university education system of Ukraine, which will lead to its significant structural transformation.

Thirdly, digital infrastructures, as components of the mechanism of standardization of university activity, will require intensive improvement of, first of all, higher education institutions' management system; this will significantly accelerate all processes and encourage a quality transition, so-called mature data.

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Fourthly, the transition to digital tools, as components of the mechanism of funding and financing of university activity, will allow higher education institutions to reduce operating costs through the introduction of new educational business models based on the so-called network effect.

Fifthly, the infrastructure of a modern university should be developed on the basis of cloud-oriented digital technologies. As a component of the mechanism of measuring university performance, cloud-based technologies are becoming a necessary basis for the implementation of Fintech in education, in particular in the mechanisms for enhancing the financial autonomy of higher education institutions in Ukraine.

Sixthly, a pool of digital technologies, that collect data and automatically analyze it using artificial intelligence technology and machine learning algorithms, will provide opportunities to obtain in real-time the necessary information base to maximize the implementation of the educational needs of all participants in terms of regulating social and labour relations.

Seventhly, digitalization in the context of enhancing mechanisms of universities' financial autonomy become an important aspect of the users' personal data security in the institution's digital environment.

Eighthly, among digital financial technologies blockchain technology is the most perspective at this stage of technological development; it can be used in the sphere of education, in particular at accreditation, certification and digital transfer of educational documents. This technology is able to create a common global, secure and transparent cloud-based platform of the Ukrainian higher education system integrating the learning management systems of different universities.

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МЕХАНІЗМИ ПОСИЛЕННЯ ФІНАНСОВОЇ АВТОНОМІЇ УНІВЕРСИТЕТІВ: ЦИФРОВИЙ ВИМІР

У статті розглянуто проблеми цифровізації в системі вищої освіти, розкрито сучасні цифрові інструменти як механізми підвищення фінансової автономії університетів України.

Автори припускають, що основним напрямом цифровізації та розвитку цифрових технологій є створення цифрових інфраструктур (е-інфраструктур), які забезпечують первинну обробку, зберігання та обмін даними, розподілені обчислення й автоматизовану аналітику вищої освіти. Однак зауважується, що в цифровому світі зрілість даних – відповідність даних вимогам згаданих цифрових інфраструктур – є важливою.

Цифрові інструменти для фінансового сектора економіки заведено називати FinTech. Цей термін використовують для опису технологічних інновацій у фінансових послугах, які можуть призвести до появи нових бізнес-моделей, програм, процесів і продуктів; вони також можуть мати суттєвий уплив на фінансові ринки, установи та способи надання фінансових послуг.

Автори спираються на основні положення інституціоналізму та неоінституціоналізму, фінансового капіталізму як теоретичних основ сучасних економічних відносин університетів. Запропоновано авторське визначення інституційної автономії університету як інституційної одиниці сучасної економіки, а також основні механізми та інструменти регулювання меж їхньої інституційної автономії. У цьому контексті автори описують основні FinTech-технології, які мають значні перспективи як складові механізмів фінансової автономії українських університетів, а саме: хмарні технології, технології штучного інтелекту, Інтернет речей, peer-to-peer, транзакційні технології, цифровий банкінг, блокчейн. Аналізуючи особливості цифрових фінансових технологій, автори значну увагу приділяють блокчейну, зокрема смарт-контрактам як найбільш доступним для українських університетів у найближчому майбутньому. Окреслено перспективні напрями впровадження технології блокчейн у цифрові системи ЗВО України.

Зазначається, що цифровізація в університетській сфері передбачає встановлення обов'язкових правил (стандартів), створення та функціонування цифрових технологій, які виступають інституційними обмеженнями майже для всіх запропонованих механізмів та інструментів інституційної автономії, включно з механізмом фінансування університету.

Ключові слова: цифровий вимір, університети, фінансова автономія, фінтех, Інтернет речей, блокчейн

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