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PROBLEMS OF NORMATIVE AND LEGAL REGULATION OF THE PROCESS OF APPLYING BLOCKCHAIN TECHNOLOGY IN THE FINANCIAL SYSTEM OF UKRAINE

ABSTRACT

The purpose of the article is to study the theoretical and applied aspects of identifying the problems of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine. The results of the conducted research allow us to assert that blockchain technology is a qualitatively new tool for carrying out financial transactions and strengthening the financial system of Ukraine, the essence of which is the creation of a decentralized database consisting of blockchains capable of preventing deliberate actions, the subject of which is data falsification and their chronological records for the purpose of tracking and controlling transactions. The important role of blockchain technology in the financial system of Ukraine has been established, which is manifested in the modernization of the processes of moving funds, making cross-border payments, and the functioning of cryptocurrency. The excessive weakness of the legislative and normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine was revealed, which is situational and fragmentary in nature and cannot fully regulate the organizational and legal mechanisms of its effective application in the implementation of financial transactions. Detailed studies made it possible to substantiate the need for the formation of a national system of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine, as a number of its problems were identified, in particular, the low level of the country's provision of digital technologies and the absence of high-speed Internet, as well as the high cost of using technologies and energy for maintenance of financial transactions in the blockchain system. On the basis of comparative studies of the USA, Great Britain and Ukraine, it has been proved that the development of blockchain technology is significantly dependent on the level of socio-economic development of the country and its ability to regulate problematic aspects arising under the influence of modern challenges and dangers at the legislative level. The need to adopt the Law of Ukraine "On Virtual Assets" is proposed, which will partially solve the most acute problems by unifying norms and creating an organizational and legal mechanism for regulating the process of applying blockchain technology in the financial system.

Keywords: financial system, blockchain, digital assets, innovative technologies, financial instruments, cryptocurrency

JEL Classification: E44, G01, G18, L86

INTRODUCTION

Ukraine's efforts to integrate into the global financial and economic community necessitate the structural restructuring of its economy, legal system and society. Reformatting processes must take into account the modern pace of innovative development, and the introduction of innovative socio-economic and financial tools is actualized in the context of achieving the desired results on the way to joining the European Union and obtaining the status of a full member of the European community. It is obvious that the development of the digital economy conditions the intensification of the processes of its legal support and the formation of effective economic and legal mechanisms for the regula-

tion of legal relations arising in the dynamic conditions of modernity. It should be recognized that one of the tools of a successful scientific and technical breakthrough, which is actively used in the economy of Ukraine and successfully tested in its financial system, is blockchain technology, which significantly affects the business processes taking place in it and allows to increase the efficiency of access to financial services. However, assessing the possibilities of applying blockchain technology in the modern realities of the functioning of Ukraine, excessive weakness of its normative and legal regulation is noted not only at the national but also at the regional and global levels. That is why we believe that the outlined issues of research are extremely relevant and require detailed study taking into account the existing crisis trends of the country's socio-economic and financial development.

LITERATURE REVIEW

The problematic aspects of the research of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine and the identification of its main problems were actualized under the influence of the intensification of the development of digital tools and the latest technologies, which are actively used in the implementation of financial calculations and various transactions using the country's financial system. At the same time, some scientists, in particular, H. Karcheva, R. Lernatovych and V. Kavetskyi [1], as well as O. Solodovnik and K. Dokunina [2, p. 127] claim that the formation of the blockchain concept went through three stages: (1) blockchain 1.0 – as a cryptocurrency used in various applications; (2) blockchain 2.0 – as contracts reflecting classes of the market, economic and financial applications aimed at working with different types of financial instruments; (3) blockchain 3.0 – as special applications, the scope of which is not limited to monetary calculations and the financial sphere, but extends to public administration, education, medicine, culture, politics, etc. In this context, scientists pay attention to the retrospect of the development of this economic category and insist on its innovative nature, therefore they consider it necessary to define the essence of the blockchain as a distributed database able to store ordered economic transactions and capable, if necessary, of executing a specific transaction, the set of which, in the future, forms a chain of blocks, the feature of which is a unique hash number.

S. Lehominova and T. Kochura adhere to a similar position when interpreting the essence of blockchain technology [3, p. 260], who, in fact, complement and expand the opinion of previous scientists, stating that this category must be considered as a special database where block storage devices do not have a connection with the central server, however, there is an opportunity to track and control transactions that take place in the financial system, without special supervision of the relevant financial regulators.

Taking into account the lack of research on the concept of blockchain technology and its innovative nature, there are certain problems with defining its essence. However, the need for the normative and legal regulation of blockchain-related relations remains no less important. It is obvious that there are significant conflicts in the legislative field because there is no such legislative act in the country that would regulate the basic principles of blockchain technology implementation. In general, as noted by A. Nikolashyn [4, p. 143], the financial and legal systems were not ready for such a rapid development of blockchain technology in Ukraine, especially since the legal system does not provide for a full range of formed relevant legislative and normative and legal acts regulating legal relations in this area, and the first attempts to implement it were made in 2017 by developing such draft laws as the Draft Law of Ukraine "On Circulation of Cryptocurrencies in Ukraine" [5] and the Draft Law of Ukraine "On Stimulating the Market of Cryptocurrencies and Their Derivatives in Ukraine" [6]. In these legislative acts, the blockchain is considered a decentralized public register of transactions related to cryptocurrency within the framework of cryptocurrency operations carried out by entities. However, these draft laws were not adopted, and in 2019 a decision was made to withdraw them altogether. Instead, a new legislative initiative was created in 2020, as a result of which the Draft Law of Ukraine "On Virtual Assets" [7] was prepared, which was adopted on February 17, 2022, but has not yet entered into force. In this legislative act, the organizational and legal principles of cryptocurrency functioning in the country's financial system are systematized in detail, but there is no definition of blockchain technology and, in fact, no principles of its regulation are provided. Under such circumstances, it becomes clear that the existing state of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine is extremely unsatisfactory and has a significant number of gaps, which requires sufficiently thorough research in this direction.

It is worth noting that in the developed countries of the world, in particular in the USA and in the countries of the European Union, the regulatory mechanisms of blockchain technology are sufficiently rigid and strict, as evidenced, in particular, by the successful functioning of such a regulatory body as ESMA, which is called to exercise control over the Securities Commission in Europe [8; 9]. However, G. Sigley and W. Powell [10] prove that the insufficient level of normative and legal regulation of the principles of applying blockchain technology at the global level creates significant problems regarding its provision at the level of each of the countries of the world, despite the fact that its feasibility has been established and

the prospects for further development have been justified. Moreover, in this context, the statements that we proved in previous studies [11, p. 347] regarding the strong relationship between the development and regulation of blockchain technology and the development of socio-economic and financial processes in the country, which is proved by the example of the intensification of the use of blockchain technology in the USA and Great Britain, as well as the powerful regulatory mechanism of its application in these countries, are correct.

At the international level, the study of problematic aspects of normative and legal regulation of blockchain technology is gaining more and more relevance and popularity, since the use of this innovative financial instrument is due to the intensification of operations related to cryptocurrencies. In this context, C. Zhou, Y. Li, H. Yu and H. Dong [12] hypothesize the inseparability and close relationship of these scientific categories. Moreover, as proved by A. Collomb, P. de Filippi, and K. Sok [13] the high level of risk of using blockchain technology when making transactions using the country's financial system determines the need for the normative and legal regulation of processes and principles of their minimization and levelling of the negative impact on the financial system, as well as strengthening the role and powers of financial regulators. P. Yeoh [14] proves the fact that effective regulation of blockchain technology based on a balanced regulatory approach in the USA and in the countries of the European Union makes it possible to quickly achieve the desired results and obtain a significant innovative contribution of blockchains to financial services and increase financial inclusion in a strategic perspective.

It becomes obvious that the combination of innovative blockchain technologies with modern financial instruments contributes to the strengthening of the country's financial system and the sustainable development of the economy, because, as noted by G. Tang, Z. Wu, Y. Zhang and H. Guo [15], the application of blockchain in financial services enables financing of supply chains, making cross-border payments and functioning of cryptocurrency. However, as already noted, a significant drawback of its normative and legal regulation is the immaturity of domestic legal systems in this area, which is proved by the research of Y. Yang, Y. Shi and T. Wang [16], who claim that institutional weakness is due to challenges and dangers modern time. On the other hand, in Ukraine, the normative and legal support of blockchain technology has a situational and fragmentary nature, which, according to O. Kostenko and O. Radutnyi [17, p. 499], requires the normalization of basic rules of conduct regarding its existence and use.

Taking into account the outlined trends, it is worth stating a significant level of weakness in the normative and legal regulation of the process of applying blockchain technology in the financial system of the country, not only at the national level but also at the global level. It is obvious that highly developed countries have greater capabilities to ensure the legislative consolidation of organizational and legal principles and norms of the operation of blockchain technology than countries of the transitive type, which includes Ukraine. Therefore, we consider it expedient to deepen scientific research in the indicated direction in order to identify the most significant problems of normative and legal regulation of blockchain technology in Ukraine.

AIMS AND OBJECTIVES

The purpose of the article is to study the theoretical and applied aspects of identifying the problems of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine. To achieve the set goal, it is necessary to solve certain tasks related to the analysis of existing scientific approaches to the interpretation of the essence of blockchain technology; clarification of its place and role in the financial system of the country; assessment of the current state and identification of the main problems of normative and legal regulation of the process of applying blockchain technology in the financial system; determination of strategic priorities for the development of blockchain technology in the context of strengthening the financial system of Ukraine.

METHODS

The methodological basis of the research consists of general scientific and special methods of economic analysis and scientific knowledge, namely: the definition of the essence of blockchain technology was carried out using the method of scientific abstraction, system analysis, synthesis and comparative analysis; a review of the legislative and normative and legal framework in the sphere of regulating relations connected with the application of blockchain technology in the financial system of the country was carried out on the basis of economic and legal analysis and observation; empirical studies of blockchain technology parameters, its advantages and disadvantages were conducted using the method of comparison

and statistical analysis; identification of the problems of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine was carried out on the basis of a functional and systemic approach; the method of generalization and systematization was applied to form conclusions and results of the conducted research.

RESULTS

The intensification of the development of the world financial system and the activation of the processes of the emergence of the latest challenges and dangers make it necessary to find effective means of counteracting the destructive changes caused by them, both at the global level and at the national level. One of the effective methods of ensuring the successful achievement of the desired results is the introduction of innovative technologies into the economy and the financial system, in particular. It is obvious that in the conditions of instability, uncertainty and the strengthening of crisis phenomena, the processing of significant volumes of information of a financial nature, which accompanies the financial and economic development of any country, requires the search for the main ways of its optimization, which should be carried out using blockchain technology as one of the tools for ensuring control over the economy, reducing costs and simultaneously speeding up international transactions, increasing the transparency of the functioning of the financial system, as well as achieving a high level of public trust in public finances. In addition, the indisputable advantage of blockchain technologies is the possibility of increasing the level of security of financial operations and various transactions, as well as significantly reducing the risks of committing fraudulent actions, hacker attacks, and spreading misinformation.

However, as it has been established, the rapid development of innovative technologies and their introduction into the financial and economic processes of Ukraine are rather weakly regulated at the legislative level, and the current normative and legal framework is not able to fully protect the interests of all participants, which is due to the too short period of existence of this technology and insufficient level of its regulation on a global scale, because for the first time blockchain technology appeared in 2008, and in Ukraine it began to be considered at the legislative level only in 2017. However, a certain concept of it has already been formed, and the main characteristics are manifested in the formation of chains of information, which can be stored, processed and transmitted, in the creation of a set of data that is subject to checks and in the absence of the need to establish ownership rights to them on the part of the participants. The most important characteristics of blockchain technology are shown in Figure 1.

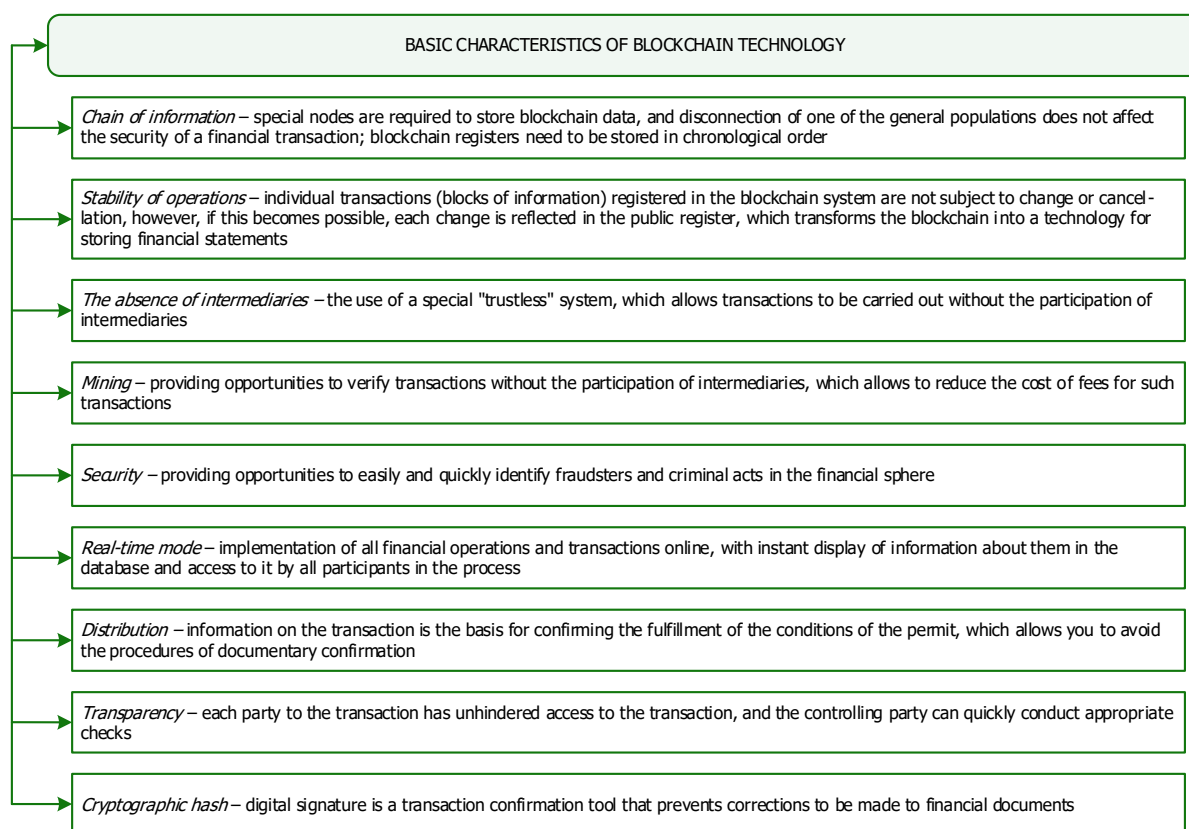


Figure 1. Basic characteristics of blockchain technology. (Source: compiled on the basis of [18, p. 5])

At the same time, we should note that significant efforts are aimed at testing blockchain technology in various sectors of the economy, as a result of which its significant feasibility in the functioning of the country's financial system has been revealed because blockchain allows not only to organize information chains but also to ensure the stability of financial transactions, their security, mining and transparency. Moreover, blockchain technologies allow financial transactions to be carried out and monitored in real time, without the involvement of intermediaries and with the use of a cryptographic hash.

Thus, scientists Suslenko, V., Zatonatska, T., Dluhopolskyi, O., & Kuznyetsova, A. are investigating the use of blockchain technology in e-commerce enterprises [19]. The study proved that the use of blockchain technologies creates significant advantages for the e-commerce sectors of Ukraine. Based on the results of the analysis of the use of blockchain technology at an e-commerce enterprise, it has been proven that its use allows for significant savings on electronic payments.

It is obvious that the too short period of existence of blockchain technology in Ukraine indicates the presence of significant disadvantages of its practical application in the field of finance, however, it is also worth stating a significant range of its advantages, the main ones of which are systematized in Figure 2.

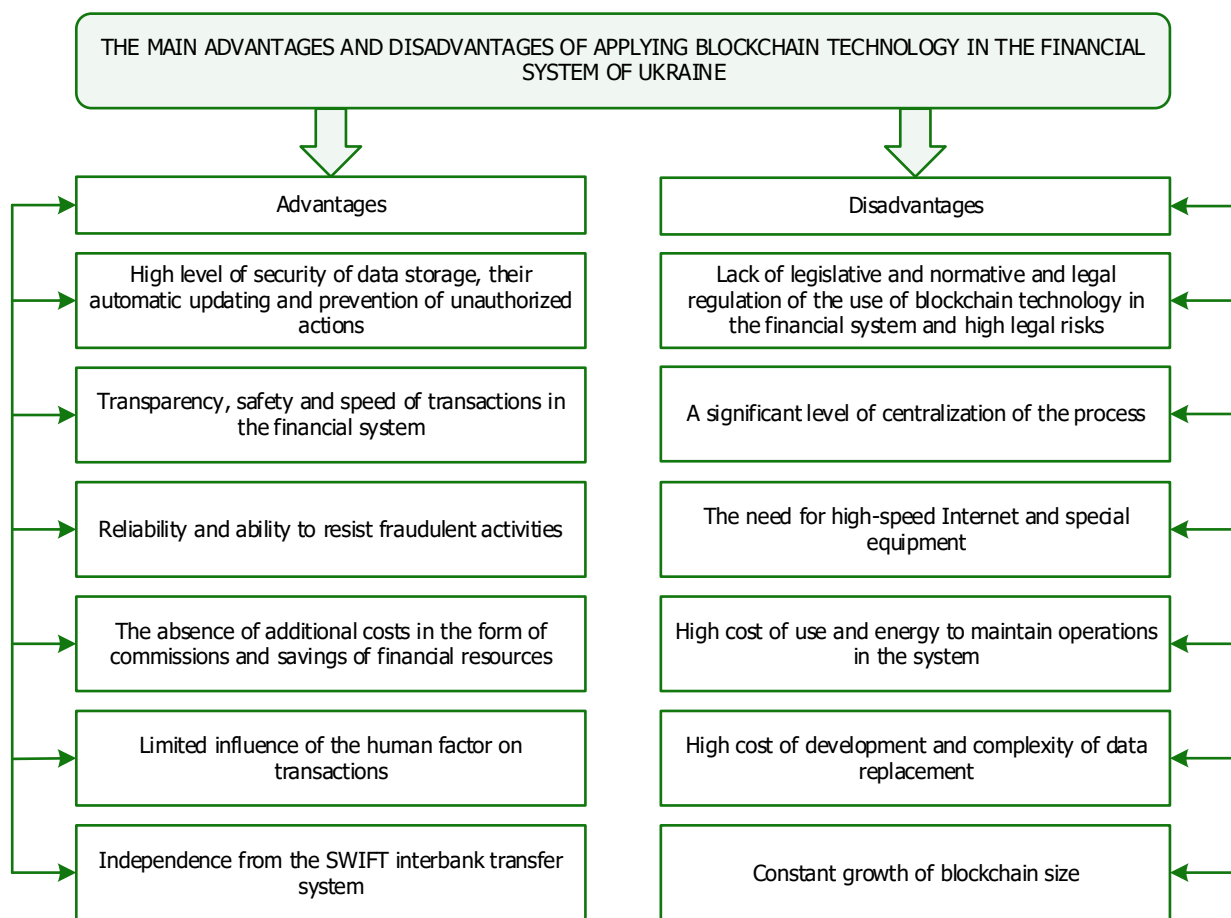


Figure 2. The main advantages and disadvantages of applying blockchain technology in the financial system of Ukraine.

Among the most significant advantages of the use of blockchain technology in the financial system of Ukraine is the provision of a significant level of data storage security, their automatic updating and the prevention of unauthorized actions in relation to the formed databases, as well as the ability to resist fraudulent actions, significant opportunities for transparency, safety and speed of transactions in the financial system, the limited influence of the human factor on the implementation of transactions and, no less important, the absence of additional costs in the form of commissions and the saving of financial resources, as well as independence from the SWIFT interbank transfer system.

As for the main disadvantages of using blockchain technology in the financial system of Ukraine, their list is much larger, and the main problem is the lack of legislative and normative and legal regulation of the use of blockchain technology in the financial system and the presence of high legal risks. Other no less significant disadvantages include the need for the constant availability of high-speed Internet and special equipment, the high cost of using technology and energy to service

financial transactions in this system, the high cost of development and the difficulty of replacing data due to the constant growth of the blockchain size.

In addition, in modern conditions, the problems of the growth of cybercrime spread risks, which directly affect the blockchain market, have become particularly acute, because the incompleteness of the process of its formation and the institutional weakness in relation to normative and legal regulation do not allow to fully ensure the implementation of security tools, as a result of which cases of hacking of crypto exchanges and trading platforms become possible.

Separately, it should also be noted that along with the positive effects of using blockchain technology, there are a number of risks of using its certain advantages for criminal purposes, which at the current stage, the current legislation of Ukraine regarding counteracting such actions cannot affect. In this context, it should be noted that the autonomy of transactions creates a reliable basis for the formation of criminal trading platforms, and the absence of tools for cancelling transactions after their confirmation contributes to the achievement of illegal goals.

Another problem that is gaining significant importance in the context of the application of blockchain technology in Ukraine is the low level of digitalization of financial processes, according to the parameters of which Ukraine is significantly behind the USA and Great Britain in international rankings, which, in contrast to Ukraine, are able to ensure sufficiently high indicators of the application of blockchain technology at carrying out operations using the financial system and regulate such processes in current legislation. Analyzing the value of the multidimensional digitization index in the USA, Great Britain and Ukraine in 2017–2022 (Figure 3), we can see that its parameters are highest in the USA (0.92–0.98), slightly lower in Great Britain (0.80–0.97), and the lowest – in Ukraine (0.22–0.48), which indicates the inability of Ukraine to ensure proper access to Internet resources and effectively implement blockchain technology due to low Internet speed.

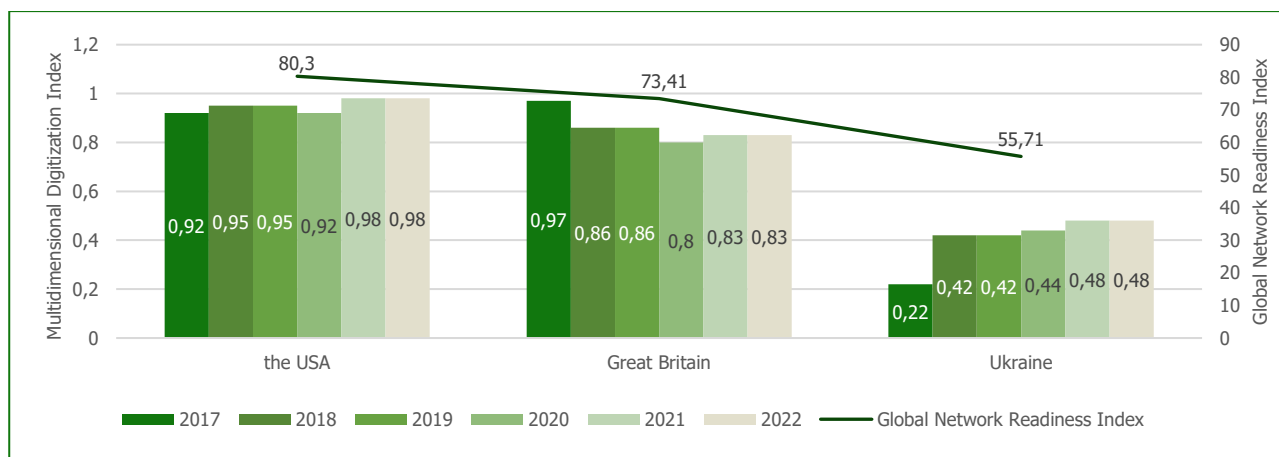


Figure 3. Dynamics of changes in the multidimensional digitization index and the Global Network Readiness Index in the USA, Great Britain and Ukraine in 2017–2022. (Source: calculated on the basis of [20–25; 26, p. 32])

At the same time, significant problems are observed in Ukraine regarding the provision of population access to modern information technologies, communication infrastructure and the creation of conditions for their effective use. At the same time, the pace of development of the network economy is quite low, which is evidenced by the low value of the Global Network Readiness Index in Ukraine, recorded at the level of 55.71, which determines the degree of harmonization of the needs of the economy and society with the possibilities of scientific and technological progress. It becomes obvious that the USA and Great Britain introduce modern digital technologies and innovative tools into the financial system more actively and effectively than Ukraine, and the regulation of the process of applying blockchain technology is more perfect, as evidenced by the adoption of the Law "On Blockchain Technology" in the USA, which should be investigated by the domestic legislator and it is worth assessing the possibilities of its adaptation to the modern conditions of the development of Ukraine. This thesis is confirmed by empirical studies on the identification of the structure of the use of blockchain technology by the countries of the world, in which 40% of the total blockchain market is occupied by the USA, and 17% by Great Britain [27, 28].

An absolute fact is the weakness of the national legislation of Ukraine regarding the regulation of legal relations in the field of applying blockchain technology against the background of certain positive developments, in particular, the successful testing of electronic signatures and the recognition of qualified electronic trust services during financial transactions involving the transfer of funds. In this context, the need to adopt the Law of Ukraine "On Virtual Assets", which will unify

all norms and create a reliable organizational and legal mechanism for regulating the process of applying blockchain technology in the financial system, is extremely urgent.

DISCUSSION

The conducted studies of the problems of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine allow us to identify the most important ones, among which it is worth highlighting:

- the absence of legislative and normative and legal regulation of applying blockchain technology in the financial system and the lack of clear legislative acts in the field of the introduction of innovative technologies and the use of blockchain technology in the financial system of the country;
- insufficient level of digitization of the economy, low values of the technological parameters of the Internet connection, which creates significant obstacles for the quick and high-quality implementation of financial operations and transactions.

At the same time, normalization of the normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine will open up additional opportunities to ensure the stability, transparency and security of financial transactions, increase the speed of transactions and make it impossible for third-party and unauthorized interference in the processes and phenomena occurring in the financial system of the country.

Taking into account the multifaceted and understudied nature of the outlined issues, it is necessary to ensure an effective search for ways and methods of improving the normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine, of which the adoption of effective and efficient legislative acts, in particular, the Law of Ukraine "On Virtual Assets" is of primary importance.

CONCLUSIONS

Thus, on the basis of the research conducted to identify the problems of normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine, it can be stated that the need to apply blockchain technology as an innovative tool for financial transactions and strengthening the financial system of the country is being actualized both at the national and international levels. It has been established that blockchain technology is a specially created decentralized database consisting of chains of blocks, which is capable of preventing deliberate actions, the subject of which is the falsification of data and their chronological records for the purpose of tracking and controlling transactions. The significant importance of blockchain technology in the financial system of Ukraine was revealed, which is evidenced by additional opportunities for organizing the processes of moving funds, making cross-border payments, and functioning of cryptocurrency on the basis of innovation. At the same time, excessive weakness of the legislative and normative and legal regulation of the process of applying blockchain technology in the financial system of Ukraine was proved, as its situational and fragmented nature was revealed, as well as the inability to ensure the regulation of organizational and legal mechanisms for the effective application of blockchain technology in financial transactions. Certain significant problems of the functioning of blockchain technology in Ukraine and its application in the financial system have been identified, namely: (1) the country's low level of provision of digital technologies; (2) lack of high-speed Internet; (3) the high cost of using technology and energy to service financial transactions in the blockchain system. The close interdependence of the development of blockchain technology on the level of socio-economic development of the country and its ability to regulate problematic aspects arising under the influence of modern challenges and dangers at the legislative level was revealed. The need to adopt the Law of Ukraine "On Virtual Assets" as a comprehensive legislative act designed to regulate the basic principles of applying blockchain technology in the country's financial system is substantiated.

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ПРОБЛЕМИ НОРМАТИВНО-ПРАВОВОГО РЕГУЛЮВАННЯ ПРОЦЕСУ ЗАСТОСУВАННЯ ТЕХНОЛОГІЇ БЛОКЧЕЙН У ФІНАНСОВІЙ СИСТЕМІ УКРАЇНИ

Метою роботи є дослідження теоретико-прикладних аспектів щодо виявлення проблем нормативно-правового регулювання процесу застосування технології блокчейн у фінансовій системі України. Результати проведеного дослідження дозволяють стверджувати, що технологія блокчейн є якісно новим інструментом здійснення фінансових операцій та зміцнення фінансової системи України, сутність якого полягає у формуванні децентралізованої бази даних, що складається з ланцюжків блоків, спроможної забезпечити попередження та унеможливлення зумисних дій, предметом яких є фальсифікація даних та їх хронологічних записів із метою здійснення відстеження транзакцій і контролю за ними. Установлено вагомую роль технології блокчейн у фінансовій системі України, що проявляється в модернізації процесів переміщення грошових коштів, здійснення транскордонних платежів та у функціонуванні криптовалют. Виявлено надмірну слабкість законодавчого та нормативно-правового регулювання процесу застосування технології блокчейн у фінансовій системі України, яке має ситуативний і фрагментарний характер та не спроможне комплексно регламентувати організаційно-правові механізми ефективного застосування блокчейну при здійсненні фінансових операцій. Детальні дослідження дозволили обґрунтувати необхідність формування національної системи нормативно-правового регулювання процесу застосування технології блокчейн у фінансовій системі України завдяки виявленню низки проблем, зокрема низького рівня забезпечення країни цифровими технологіями та відсутності високошвидкісного інтернету, а також високої вартості використання технологій та енергії для обслуговування фінансових операцій у системі блокчейн. На підставі порівняльних досліджень США, Великобританії та України доведено значну залежність розвитку технології блокчейн від рівня соціально-економічного розвитку країни та її спроможності на законодавчому рівні врегульовувати проблемні аспекти, які виникають під впливом викликів і небезпек сучасності. Запропоновано та обґрунтовано необхідність прийняття Закону України «Про віртуальні активи», який частково вирішить найбільш гострі проблеми шляхом уніфікації норм та створення організаційно-правового механізму регулювання процесу застосування технології блокчейн у фінансовій системі.

Ключові слова: фінансова система, блокчейн, цифрові активи, інноваційні технології, фінансові інструменти, криптовалюта

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