

Legal Aspects of Blockchain Technology Regulation in the Financial Sphere

Kateryna Tokarieva¹, Nataliya Vnukova², Volodymyr Aleksiyyev³

¹ *Scientific and Research Institute of Providing Legal Framework for the Innovative Development of the National Academy of Legal Sciences of Ukraine, Chernyshevskaya st., 80, Kharkiv, 61002, Ukraine,*

^{2,3} *Simon Kuznets Kharkiv National University of Economics, Nauky Avenue, 9A, Kharkiv, 61166, Ukraine*

Abstract

The article is devoted to the investigation of legal aspects of distributed registry technology (blockchain). It is proposed to create a legal environment that facilitates the introduction of distributed registry systems in the financial sector by defining systems as a set of devices that are independent of each other and carry out the formation of digital records of registration, storage and accounting of digital data.

Keywords

legal regulation, blockchain, technologies, cryptocurrency.

1. Introduction

The rapid development of technology has led to the emergence and development of new legal relations in all spheres of public life. In particular, the emergence of blockchain technology (or distributed registry system) and its use in many areas of activity have formed a new type of socio-economic relations, which currently require appropriate legal regulation.

Indicate that the governments of many countries in the world pay attention to the priority of implementing the above technology in existing information exchange systems, tax integration, payment systems and more. This conclusion is based on studies conducted by Deloitte [1]. Depending on this, we can state the need to form a new regulatory environment through which a favorable legal regime for the functioning of modern technologies, including in the financial sector.

Areas of formation of a new regulatory environment are:

(1) removal of legal restrictions that hinder the development of the digital economy;

(2) definition of basic legal concepts,

(3) ensuring equal opportunities in the identification and authentication of individuals and legal entities, which will increase the efficiency of management of economic processes by legal measures.

In order to form such a regulatory environment, it is necessary to adopt a number of new regulations aimed at regulating relations in the financial sector, as well as to amend existing legislation.

2. Problem setting

In view of the above, there is now a need not only to cover the legal aspects of the use of blockchain technology in the financial sector, but also to provide proposals for regulatory regulation of such relations. In addition, it should be noted that in 2020, attacks on blockchain platforms took first place, which indicates the active interest not

III International Scientific And Practical Conference "Information Security And Information Technologies", September 13–19, 2021, Odesa, Ukraine

EMAIL: katerina.tokarieva@gmail.com; ufp2007@meta.ua; aleksiyev@gmail.com.

ORCID: 0000-0001-7891-226X; 0000-0002-1354-4838; 0000-0001-6767-7524.



© 2021 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

CEUR Workshop Proceedings (CEUR-WS.org)

only of society but also of cybercrime. This approach makes additional demands on the settlement of legal aspects in the use of distributed networks, smart contracts based on blockchain technologies. Therefore, the urgent task of research is the synergy of issues related to the legal aspects of regulation of blockchain technology in the financial sector with technical solutions to ensure the security of blockchain technology.

3. Methodology

To solve the research problem, it is proposed to use the method of system analysis, which provides identification of approaches to financial and legal regulation of the implementation of distributed registry systems, taking into account the scientific concepts of domestic and foreign scientists. With the help of the formal-legal method, the problem related to the formulation of the concept of "distributed registry system", "digital currency" and the identification of the subjective composition of the participants in these systems. The theory of protection and the laws of synergy propose the definition of transaction security requirements in financial systems based on blockchain technology.

The comparative legal method allows us to trace the changing roles of states in the regulation of relations using blockchain technology and analyze such transformations.

4. Results

Obviously, the advantages of integrating blockchain technology into various areas of public administration include:

- reduction in economic costs, time and complexity in intergovernmental and public-private information exchange, which enhances the administrative function of governments;

- reduction of bureaucracy, discretion and corruption due to the use of distributed registers and programmed smart contracts;

- increasing the level of automation, transparency, auditability and accountability of information in state registers in the interests of citizens;

- increasing the confidence of citizens and companies in government programs and the introduction of documentation, due to the use of algorithms that are no longer under the sole control of the government [2, 4]. With this in

mind, it can be stated that with the help of blockchain technology, trusting, direct and to some extent decentralized relations between citizens and government entities are formed.

But it is necessary to take into account the technical "mistakes" of modern exchanges / platforms based on the use of blockchain and cryptocurrencies, which are formed by a hierarchical structure (as well as banking systems), and only then use distributed networks and blockchain technology to form smart contracts and mining. This approach allows in 2020 to break the hierarchical superstructure and use threats to automated banking systems (ABS) of banking sector organizations (BSO) with signs of synergy and hybridity. Figure 1 shows a block diagram of a synergistic threat model that takes into account threats to the components of security (cybersecurity (CB), information security (IS) and IT-security) [10,11].

In the current national legislation of Ukraine there is no definition of the category "distributed registry system", however, it is basic in this context, as the use of this technology is the introduction of new tools and institutions. In addition, we believe that the very definition of distributed registry technology will allow to correctly determine the legal regime of cryptocurrency / digital and virtual assets and relations in the field of their application.

Based on the analysis of the essence of distributed registry technology, we consider the most successful approach, in which the latter is considered not as a payment system, but directly as a set of devices that are independent of each other and generate digital records of registration, storage and accounting of digital data.

Indicias of the distributed register system are: decentralization, non-mandatory existence of a central body, the absence of intermediaries in the process of such a system, equality of participants and their agreement.

It is widely believed that the use of a distributed registry system in the financial sector is primarily associated with cryptocurrencies (digital or virtual assets). However, these categories are not identical in content.

We are of the opinion that their research and ratio should be conducted taking into account the technological and economic nature. The study of the technological nature of virtual assets and cryptocurrency is appropriate given that their creation is possible only on the basis of appropriate technologies. Clarification of the economic and legal nature will determine the

economic essence of cryptocurrencies as one of the modern financial instruments and regulate its functioning within the modern legal field.

Thus, within the analysis of the economic component of the economic and legal nature of the virtual asset of the distributed register, it is

necessary to consider the virtual asset of the distributed register from the standpoint of its compliance with the tool by which systems and accounting tokens [8, p. 8].

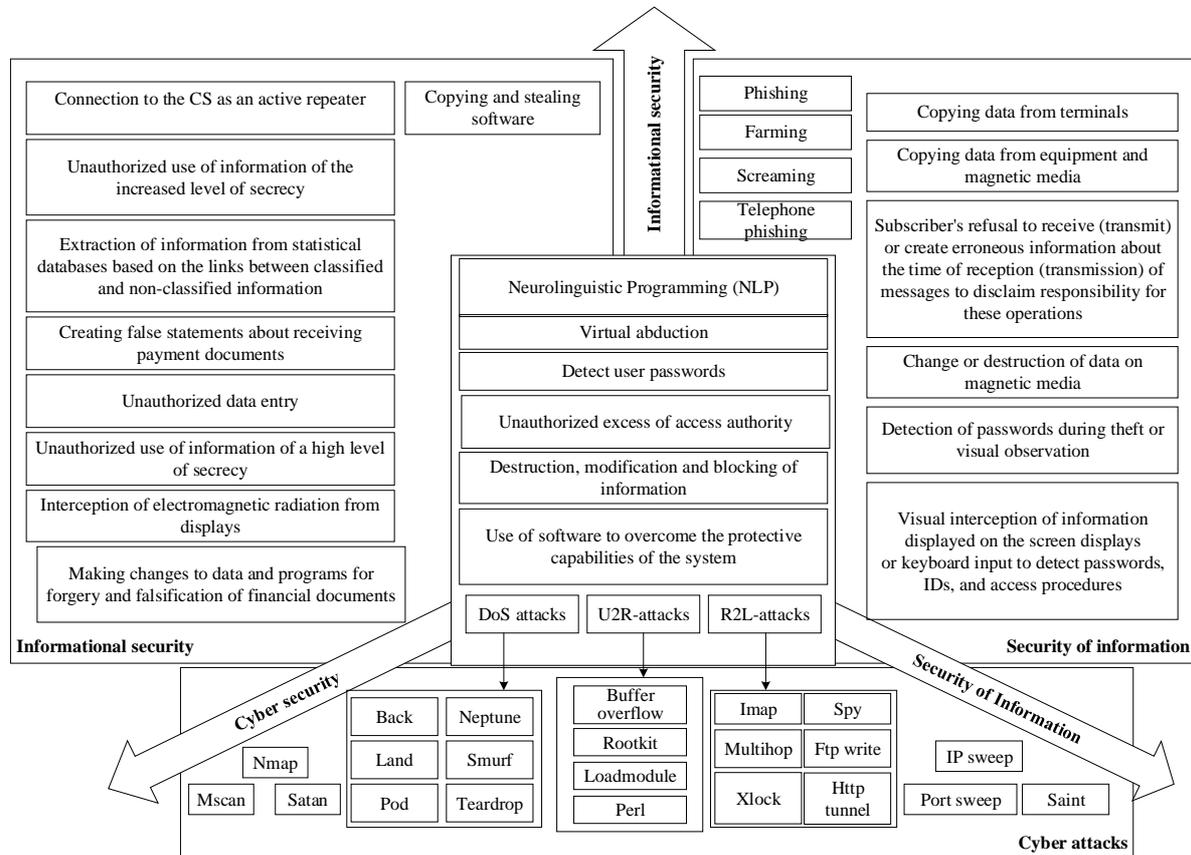


Figure 1 - Synergetic model of security threats

At the same time, regarding the legal nature of the studied phenomena in the world, several basic concepts are identified to determine the legal nature of a virtual asset, in particular, it is about considering the latter (and regulation at the legislative level, respectively) as: 1) means of payment; 2) currency; 3) goods; 4) tangible assets; 5) securities. We also emphasize that some countries around the world are open to the introduction of such a phenomenon, and some – per contra. As can be seen, this is due to many factors, including the form of the state, the form of government, the state regime.

In Japan, at the legislative level, cryptocurrency is considered as a means of payment and is fixed as a value used to fulfill obligations to purchase or borrow goods or services for the benefit of others transmitted by an electronic data processing system, provided that its value is limited to a value recorded on an electronic device or in any electronic form, and

does not include Japanese or foreign currencies or assets denominated in such currencies. [3].

Another approach is chosen in China. In particular, the government has taken a number of steps to curb the use of cryptocurrency. First, statements have been published on local exchanges to stop trading cryptocurrencies and to prevent their extraction. Second, access to online platforms and mobile applications that offer cryptocurrency exchange services is blocked. Third, financial institutions and third-party payment transfer operators are prohibited from accepting, using or selling such currency. At the same time, the People's Bank of China tested its own cryptocurrency, striving to become the first major Central Bank, issued digital money under full control over digital transactions [4].

Thus, at a certain stage, China joined the states that are interested in the introduction of cryptocurrency, but with certain features - maintaining a centralized approach to their

regulation, which, in our opinion, contradicts the essence of the use of blockchain technology.

Ukraine has not yet formed a unanimous approach to determining the legal regime of cryptocurrency (virtual / digital assets). It is noteworthy that several bills on the legal regulation of cryptocurrency (virtual / digital assets) have been registered, in particular, the following draft Laws of Ukraine: a) "On tokenized assets and cryptocurrencies" № 4328 of 05.11.2020 [5];) "On virtual assets" № 3637 dated 11.06.2020 (adopted in the first reading, finalized within the second reading). [6]

The latest bill is no longer about cryptocurrency, but about a virtual asset, which is defined as a special type of property that is valuable in electronic form, exists in the circulation of virtual assets, and may be in civil circulation. Virtual assets can be secured and unsecured [6, Art. 1]. Thus in h. 1 Art. 4 of the said bill states that virtual assets are property, the peculiarities of the circulation of which are determined by the Civil Code of Ukraine and this Law.

In our opinion, such a position is considered quite constructive given not only the essence of this category, but also the fact that in the national legal field in modern conditions it is the most relevant option of legal regulation. When defining virtual assets as property in the context of taxation, it is advisable to talk about the establishment of a legal mechanism of income tax / income tax on transactions with such property [7, p. 175; 9]. In this context, issues related to the taxation of virtual assets need to be comprehensively studied.

The legal status of participants in distributed registry systems requires a separate legal study. We emphasize that the range of such participants and, accordingly, their legal status will vary depending on what kind of relationship in the financial sphere. We emphasize that the studied technology is peer-to-peer, which provides an opportunity to include in the circle of participants (users) of the distributed registry systems not only legal entities but also individuals. Such a system is based on equal rights of participants (unlike "classic" banking, currency relations, etc., in which there is always an authorized entity), which significantly changes the content of such relations.

It should be emphasized that along with a positive assessment of the use of new technologies in almost all spheres of public life, and financial, in particular, it should be noted the

presence of certain risks that occur. In our opinion, first of all, the risks of untested business models, the high potential for abuse of rights by the relevant participants in such relations, fraud, the lack of an effective mechanism for protecting information (data) provided by entities to the relevant registers. To ensure the safety of participants in relations that are formed and developed with the help of blockchain technology, high-quality technical support and an effective legal mechanism for regulating such relations are needed. The primary task of creating a system of legislation in the field of innovative technologies in the financial sector is the formation of an effective legal mechanism for leveling possible financial risks and consumer protection.

In addition, it is necessary to take into account the risks associated with existing and threats of the post-quantum period (which will occur with the advent of a full-scale quantum computer, with its ability to break modern symmetric and asymmetric security algorithms used not only in ABS, but and in distributed networks and systems based on blockchain technology, this approach will ensure that critical target threats on cryptocurrency exchanges / platforms are taken into account in legislation and regulations.

5. Conclusions

It is proposed to create a legal environment that facilitates the introduction of distributed registry systems in the financial sector by defining systems as a set of devices that are independent of each other and carry out the formation of digital records of registration, storage and accounting of digital data. In addition, it is proposed to take into account the impact of current targeted threats with signs of synergy and hybridity on the infrastructure elements of networks / systems based on blockchain technology.

6. References

- [1] Blockchain in Public Sector Transforming government services through exponential technologies. Deloitte, FICCI. January 2018. URL: <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/public-sector/in-ps-blockchain-noexp.pdf>
- [2] A. Kud, M. Kucheriavenko, Y. Smychok, Digital assets and their legal regulation in the

- light of the development of blockchain technology, Right, Kharkiv, 2019. 216 p.
- [3] Clifford Chance. The fintech market in Asia pacific – an overview. URL: https://financialmarketstoolkit.cliffordchance.com/content/micro-facm/en/financial-markets-resources/resources-by-type/guides/the-fintechmarket-in-asia-pacific--june2017/_jcr_content/parsys/download/file.res/The%20fintech%20market%20in%20Asia%20pacific_LR.pdf
- [4] Glazer, Phil. State of Global Cryptocurrency Regulation. January 2018. URL: <https://hackernoon.com/state-of-globalcryptocurrency-regulation-january-2018-6e03dea0f036>
- [5] Draft Law of Ukraine “On tokenized assets and cryptocurrencies” No. 4328, 2020. URL: http://search.ligazakon.ua/l_doc2.nsf/link1/JI03596A.html.
- [6] Draft Law of Ukraine “On Virtual Assets” No. 3637, 2020. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=69110.
- [7] K. O. Tokarieva, Some issues of legal regulation of cryptocurrency, in: Actual problems of business activity in the conditions of development of economy, 2021, 171–177.
- [8] A. Kud. Comprehensive classification of virtual assets, 2021. URL: https://virtualasset.science/kompleksna-klasifikacziya-virtualnikh-aktiviv.pdf?fbclid=IwAR3wm4R3PKIFWTbDKLdBTN6Qg5MolzuS_JXwvjfO1PW4NcwXxqUI76S76bo.
- [9] O. O. Dmytryk, M. P. Kucheriavenko, O. O. Holovashevych, Cryptocurrency: development, features, classification, Financial and credit activities: problems of theory and practice, volume 3, number 30, 2019, 361–370. URL: <http://fkd.org.ua/article/view/179737>.
- [10] Hryshchuk R., Construction methodology of information security system of banking information in automated banking systems : monograph / R. Hryshchuk, S. Yevseiev, A. Shmatko // Vienna.: Premier Publishing s. r. o., 2018. 284 p.
- [11] Edited by Serhii Yevseiev, Volodymir Ponomarenko, Oleksandr Laptiev, Oleksandr Milov. Synergy of building cybersecurity systems: monograph / S. Yevseiev, V. Ponomarenko, O. Laptiev, O. Milov and others. – Kharkiv: PC TECHNOLOGY CENTER, 2021. – 188 p.
- [12] Pukala R., Hlibko S., Vnukova N., Davidenko D., Usage of E-Technologies to Enhance Infocommunication in Financing Innovation // *International Scientific-Practical Conference Problems of Infocommunications. Science and Technology, PIC S&T'2019*, October 8-11, 2019 Kyiv, Ukraine.