LEGAL ASPECTS OF USING BLOCKCHAIN TECHNOLOGIES IN THE FIELD OF E-COMMERCE

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ABSTRACT

Objective: This research aims to explore the implications of blockchain technology, focusing on its various forms of social implementation and its impact on security and trust in public blockchains.

Theoretical Framework: The study examines the legal regulation of digital technologies in the context of the digital age, considering the balance between public and private interests, and the benefits and risks associated with blockchain technology.

Method: The research employs qualitative analysis, reviewing literature on blockchain technology, digital regulations, and trends in the global blockchain market.

Results and Discussion: The findings emphasize the security and trust provided by public blockchains due to their openness and consensus mechanisms, highlighting their significance in e-commerce and the broader digital landscape.

Research Implications: This study underscores the importance of legal frameworks for managing the impact of blockchain technology on society, emphasizing the need for regulatory measures to address emerging challenges and opportunities.

Originality/Value: The research contributes to understanding the evolving role of blockchain technology in the digital age, forecasting its significant growth and impact on various sectors, including finance, security, and digitalization.

Keywords: Legal Aspects, Blockchain, E-Commerce, Electronic Technologies.

ASPECTOS LEGALES DEL USO DE TECNOLOGÍAS BLOCKCHAIN EN EL CAMPO DEL COMERCIO ELECTRÓNICO

RESUMO

Objetivo: Esta pesquisa tem como objetivo explorar as implicações da tecnologia blockchain, focando em suas diversas formas de implementação social e seu impacto na segurança e confiança nas blockchains públicas.

Referencial Teórico: O estudo examina a regulação legal das tecnologias digitais no contexto da era digital, considerando o equilíbrio entre interesses públicos e privados, e os benefícios e riscos associados à tecnologia blockchain.

Método: A pesquisa utiliza análise qualitativa, revisando literatura sobre tecnologia blockchain, regulamentação digital e tendências no mercado global de blockchain.

Resultados e Discussão: Os resultados enfatizam a segurança e confiança proporcionadas pelas blockchains públicas devido à sua abertura e mecanismos de consenso, destacando sua importância no comércio eletrônico e no cenário digital mais amplo.

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Legal Aspects of Using Blockchain Technologies in the Field of E-Commerce

Implicações da Pesquisa: Este estudo destaca a importância de estruturas legais para gerenciar o impacto da tecnologia blockchain na sociedade, enfatizando a necessidade de medidas regulatórias para lidar com desafios e oportunidades emergentes.

Originalidade/Valor: A pesquisa contribui para entender o papel em evolução da tecnologia blockchain na era digital, prevendo seu crescimento significativo e impacto em diversos setores, incluindo finanças, segurança e digitalização.

Palavras-chave: Aspectos Legais, Blockchain, Comércio Eletrônico, Tecnologias Eletrônicas.

ASPECTOS LEGALES DEL USO DE TECNOLOGÍAS BLOCKCHAIN EN EL CAMPO DEL COMERCIO ELECTRÓNICO

RESUMEN

Objetivo: Esta investigación tiene como objetivo explorar las implicaciones de la tecnología blockchain, centrándose en sus diversas formas de implementación social y su impacto en la seguridad y confianza en las blockchains públicas.

Marco Teórico: El estudio examina la regulación legal de las tecnologías digitales en el contexto de la era digital, considerando el equilibrio entre intereses públicos y privados, y los beneficios y riesgos asociados a la tecnología blockchain.

Método: La investigación utiliza análisis cualitativo, revisando literatura sobre tecnología blockchain, regulación digital y tendencias en el mercado global de blockchain.

Resultados y Discusión: Los resultados enfatizan la seguridad y confianza proporcionadas por las blockchains públicas debido a su apertura y mecanismos de consenso, destacando su importancia en el comercio electrónico y en el panorama digital más amplio.

Implicaciones de la investigación: Este estudio destaca la importancia de estructuras legales para gestionar el impacto de la tecnología blockchain en la sociedad, enfatizando la necesidad de medidas regulatorias para abordar desafíos y oportunidades emergentes.

Originalidad/Valor: La investigación contribuye a comprender el papel en evolución de la tecnología blockchain en la era digital, previendo su crecimiento significativo y su impacto en diversos sectores, incluyendo finanzas, seguridad y digitalización.

Palabras clave: Aspectos Legales, Blockchain, Comercio Electrónico, Tecnologías Electrónicas.

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1 INTRODUCTION

The idea of blockchain technology was developed in 1991 when research scientists Stuart Haber and Scott Stornett implemented a computational and practical solution for digital documents with a time stamp so that they could not be forged or issued retroactively (Schrijver, 2018). This became the first prototype of the future technology. A blockchain is an ongoing sequence of interdependent information elements (blocks) confirmed by network participants using consensus mechanisms. Simplifying, one can think of a blockchain as a spreadsheet that...
is simultaneously stored on many computers. It can be accessed simultaneously from different geographical areas and from any technological platform. Information about transactions between its co-authors (users) is recorded in the table cells. These records cannot be deleted. New records are added to the table if all co-authors agree on this issue.

Blockchain, like any technology, can have different forms of social implementation. The features listed above are most typical of public open blockchains. Their openness manifests in the fact that anyone can become a network node participating in the consensus procedure and perform and verify transactions in it. Information in public blockchains is actually and legally publicly available. The listed qualities ensure a high level of security for public blockchains and a high level of users’ confidence in them. The symbol of an open public blockchain is the Bitcoin network, which has been operating non-stop since 2009 and has earned the trust of millions of users around the world (Solaiman, 2017).

2 THEORETICAL FRAMEWORK

The idea of an endless decentralized database that can store digital casts of real-world objects forever is the basis of the modern version of the World Wide Web, called Web3. The term was coined by Ethereum co-founder Gavin Wood, who invented this decentralized online ecosystem based on the blockchain (Blemus, 2023).

Blockchain is one of the most prominent technologies and it has become a driving factor in business transformation. Following the rapid growth of the global cryptocurrency market, blockchain solutions have gained a strong interest among many companies from various market sectors. Currently, the blockchain mechanism covers almost all sectors of the economy, from healthcare to retail, with the prospect of digital transformation.

Michael Guihot et al. (2017) note that legal regulation is exceedingly difficult even in the areas of application of the “simplest” technological innovations. Accordingly, the regulation of artificial intelligence technologies may turn out to be the most difficult task that has ever fallen on the shoulders of legislative bodies. Legislation can either facilitate or hinder the development of technological innovations.

The authors (Turban et al., 2019) argue that Malta can become a blockchain island. Malta is creating a favorable environment for blockchain-related businesses. The Maltese government welcomes major cryptocurrencies. The Maltese government has developed a legal framework for distributed ledger technology (DLT). Several laws have also been adopted there: The Malta Digital Innovation Act (MDIA), the Innovative Technology Organization and
Services Act (ITAS), and the Virtual Currencies Act (VC). As a result of these legislative acts, the flow of interest in Malta has increased from blockchain developers.

Abazorius (2022) argues in his scientific work that Estonia has made the greatest progress among the post-Soviet countries in applying and regulating blockchain, having started using it in 2008. Blockchain has been used in Estonia’s production data registries since 2012, such as judicial, legislative, national health and safety systems, and the commercial code. The government plans to extend it to other areas such as cyber security, personal healthcare, etc.

Japan has played a crucial role in cryptocurrency regulation due to its rapid response to the growth of Bitcoin and other cryptocurrencies (Krausova, 2017). Japan is known as one of the most advanced countries in technology worldwide and one of the few with a properly defined legal system regulating cryptocurrency trading (Broeckaert, 2022). After the Coincheck hack, when more than 500 million USD of customers’ funds were stolen from exchanges, the Japanese government began applying stricter security and anti-money laundering measures.

3 METHODOLOGY

The research’s purpose is to analyze the use and justification of blockchain technologies in e-commerce. This will allow data optimization and describe the international experience and legal aspects of blockchain use.

The subject of the research was the Ukrainian and foreign experience of using blockchain. We conducted a retrospective analysis of various technologies used in the field of e-commerce. The study of technical features, efficiency of use, and prospects for developing logical and system analysis and forecasting methods was conducted.

Historical and logical analysis and comparison methods, expert opinions, system analysis, and forecasting were used. The research materials included legal aspects, particularly in the development of blockchain technology.

4 RESULTS AND DISCUSSIONS

Blockchain is commonly associated with cryptocurrencies; however, its immutable records, decentralized structures, and other advantages have found applications in various sectors of the economy. Here are some examples of how blockchain optimizes business processes.
Banking. Blockchain implementation has become an ideal alternative to online banking systems due to the large number of security breaches faced by online banking systems and the fact that one of the most significant aspects of blockchain technology is data protection. This is precisely why some banks were forced to implement the blockchain mechanism to maintain customers’ confidence. This, in turn, has increased the accuracy, speed, and security of transactions and online banking in general.

Insurance. For any insurance company, data transparency is a necessary and mandatory condition. The introduction of blockchain technology optimizes the exchange of information and guarantees its transparency. This process is carried out with the help of smart contracts for greater efficiency. They help verify the authenticity of the contract’s terms and establish whether a certain situation falls under the specified requirements. As a result, the client gets the needed sum of money promptly. The entire process is safe and resistant to illegal hacker attacks and external influences. That is why there is a large increase in applications for blockchain insurance.

Tourism. Large hotel chains often lose 10% to 15% of their total revenue in commissions to third-party booking services. Nevertheless, blockchain business ideas in the tourism sector can help eliminate intermediaries and ensure that revenue reaches organizations directly. Small and medium-sized businesses in the hospitality sector can get a small return on direct supplier-consumer interaction while reducing costs. The Winding Tree platform is one of the most prominent examples of blockchain-based business ideas in the hotel sector. It has created a decentralized travel marketplace using the trusted Ethereum blockchain to connect buyers and suppliers directly in a peer-to-peer environment. With the industry moving toward decentralized markets for direct distribution, Winding Tree lowers expenses while increasing customer awareness and closeness.

Logistics. Managing the flow of goods from the point of origin to the point of consumption is a complex but essential process. Blockchain can be a solution to the problem of unsecured payments and difficult tracking within the logistics system. Due to the absence of third parties, blockchain can provide faster, safer, and more transparent transactions, which leads to increased trust between stakeholders. Moreover, smart contracts can make payments automatically as soon as the agreement terms between the parties are fulfilled.

The industry loses about 50 billion USD in revenue annually due to lost or stolen goods. The data in a blockchain-based system cannot be tampered with, reducing the risk of stolen documentation or goods, and ensuring supply chain security. In addition, blockchain makes
information about a product’s origin, storage, and transportation more accessible, improving traceability. Permanent and irrevocable records confirm that goods comply with standards and build trust between the parties.

Retail trade. The Covid-19 pandemic has accelerated the global shift toward online shopping. In June 2020, nearly 22 billion people visited retail sites, exceedingly even the peak traffic during the holiday season. Between 12 and 24 million e-commerce sites exist in the world, and their number continues to grow. Thus, major retail players have begun to implement new blockchain-based business ideas to outperform their competitors and improve the quality of customer service.

According to a PwC study, 47% of companies have suffered from fraud in the past 24 months. Cybercriminals take over legitimate accounts and use them to make purchases. Blockchain can be used to establish a proxy that is exceedingly difficult for third parties to access.

Healthcare. The pandemic has exposed issues such as data leaks and disruptions in the healthcare supply chain, which are driving the need for efficiency and innovation in this area. With most records still on paper, they are distributed across facilities rather than being part of a common database. As a result, documents can be lost, leading to many errors and slower data processing. Blockchain allows the creation of one data set with all the patient’s medical records. Medical records stored in the blockchain are encrypted and processed securely; only authorized persons can add information.

Several questions need to be answered to understand the legal nature of blockchain relations. Firstly, what is the legal regime of the information recorded in the blockchain? From a technological point of view, the answer is simple – any blockchain consists of blocks in which records of transactions between users of a given network are grouped. Nothing else can be written to the blockchain. A transaction is a sequence of logically connected actions that transfer an information system from one state to another, that is, information in digital form. As we know from the general part of digital law, a special legal structure is required to give digital information a legally significant form – an electronic message or an electronic document. Consequently, it makes sense to want to classify a blockchain transaction as an electronic document since it can potentially address many law enforcement issues.

In accordance with the Law on Information, an electronic document is documented information presented in electronic form, that is, in a form suitable for human perception using electronic computers, as well as for transmission via information and telecommunication
networks or processing in information systems. The documented information required to obtain legal status must be requisite. At the very least, it must be signed with an electronic signature. Obviously, a blockchain transaction has neither a human-readable form nor an electronic signature in the sense given to this term by Ukrainian law. A proposal has been made to grant a record in the blockchain of the status of information signed with an enhanced unqualified electronic signature. However, implementing this initiative is unlikely to be possible under current legislative regulations.

A qualified electronic signature should make it possible to identify the person who signed the electronic document, while the identification of the person participating in the transaction in the blockchain is usually not carried out. The academic paper also substantiates the standpoint that granting records in the blockchain the status of electronic documents is unnecessary since existing document management systems already provide a sufficiently reliable and legally recognized exchange of information. In the conditions of transferring legally significant document flow to the blockchain, the technical features of this technology may lead to the rejection of the very concept of electronic document flow.

When a blockchain transaction is performed, new information is created, which may change the legal status of the persons involved in the transaction. Using the terminology of the Ukrainian legislation on information, the transaction results in the entry of information into the blockchain, and a certain person becomes the owner of the information (it may be a cryptocurrency, token, or other digital asset).

The second issue that requires attention to determine the legal nature of blockchain relations is related to the status of persons involved in them. A necessary element of public blocks is a system for verifying transactions by reaching a consensus of network participants. There are several types of consensus, the most common of which are proof of work and proof of ownership. Without delving into the technical aspects, it should be noted that any consensus system requires the participation of not only the persons transmitting and receiving information but also a certain number of network nodes confirming the transaction – miners in the case of proof-of-work consensus or validators in systems based on proof of ownership. Consequently, the assertion that the system of transaction participants is heterogeneous is justified.

The initiator of the transaction determines its terms within the limits allowed by the system and expresses his or her will by proposing to enter the register. For example, a crypto wallet program transfers a unit of cryptocurrency or a token to a specific address. The initiator of the transaction can only be someone who knows the secret key to the address where the crypto asset, such as a token, is recognized. At the same time, the initiator is not bound by
obligations with other network participants, except for the need to pay a transaction fee. If the transaction is confirmed, it is recorded in the blockchain, which may lead to the status of the owner of the information being granted to another person – the recipient of the crypto asset. It is reasonable to accept that the initiator who started the transaction acted unilaterally as an expression of will and committed a purposeful legal act.

The other necessary participants in a blockchain transaction are those who validate the transactions. They can be miners in networks using proof-of-work consensus, validators in networks based on proof of ownership, or administrators of private blockchains. Their goal is not to participate in a particular transaction but to ensure the operation of the network and receive remuneration for it; therefore, they cannot be considered interested in making a separate transaction. There is an assumption that when confirming transactions, they perform legal acts – actions that are not aimed at a certain legal result but lead to its occurrence directly by the norms of the objective world. The norms of the objective world for them are the technical algorithms of the blockchain network. While not denying the value of this conclusion, it is still worth noting its somewhat scholastic nature. The circle of persons confirming transactions in the most popular networks is unlimited.

For instance, anyone with the necessary equipment can be engaged in mining on the “Bitcoin” network. In addition, users interested in it are united in communities – “mining pools” – due to the increasing complexity of mining; consequently, it is impossible to actually identify the person who made the decisive contribution to the confirmation of the transaction. Therefore, it is unlikely to make practical sense to conclude that persons involved in transaction confirmation enter legal relations with each other, transaction initiators, or network administrators. Their position is not governed by law but by network algorithms and economic interests. Currently, there are no legal mechanisms to force miners or validators to confirm a transaction. The legal risks of not confirming a transaction are borne by its initiator.

Another potential party to a transaction is its recipient. Users of open public blockchains are not identified; one person can be behind an unlimited number of addresses in the blockchain network. It cannot be stated that any transaction results in a change of ownership of information in the blockchain. A situation is possible when a token is transferred between addresses that are owned by the same person. Transactions that are purely technical in nature and do not lead to the emergence, change, or termination of legal relations are also not excluded. Therefore, the recipient of information as an independent party to the relationship is not present in all transactions.
It should also be considered that a successful transaction does not require the consent or other expression of the recipient's will. A unilateral expression of will by the initiator of the transaction and its confirmation by the miners, validators, or administrators of the private blockchain is sufficient. Given the pseudo-denominational nature of public blockchains, this situation contains potential risks of receiving undesirable information. It is also not possible to get rid of the received unsolicited information without costs since returning the token to the sender will at least require a transaction confirmation fee. Thus, the absence of a volitional element in the recipient's information status makes him a potentially vulnerable participant in a blockchain transaction.

It is also necessary to consider that blockchain users can constantly change roles. These circumstances should be interpreted in favor of the conclusion that blockchain relations are multilateral obligations. The foregoing makes it possible to conclude that a transaction in the blockchain has a mixed technical and legal composition—a volitional legal act of the transaction initiator confirmed by other network users in accordance with the technical parameters of the system.

5 CONCLUSION

A blockchain is an ongoing sequential chain of blocks structured according to certain rules (a linked list) containing information. Blockchain technology is the basis for many different areas of activity worldwide. However, the absence of a legal framework significantly complicates the use of this technology. Many countries are currently adopting various regulations. Nevertheless, no general standard that includes definitions, regulations, and relevant features has been developed yet. There is a project called ISO/TC 307, “Blockchain and distributed ledger technologies”. This project involves 39 countries, including Australia, Ukraine, Finland, Canada, the United States, and the United Kingdom. There are also 13 observers in the project. More and more countries are realizing that the development of model provisions regulating and explaining the concept of blockchain is an important factor in the development of the global economy.

Since the beginning of 2018, digital currencies have gained a foothold in many countries that have shown great interest in the introduction and development of blockchains within the framework of their jurisdictions. The high interest in the cryptocurrency market is the main reason for taking regulatory measures in the field of cryptocurrencies, mining, and controlling their turnover in the first place. Switzerland is considered one of the main countries that have
implemented blockchain-based projects related to cryptocurrencies. Many large blockchain firms are in Switzerland, especially in the canton of Zug, also called the Crypto Valley. Hypothekarbank Lenzburg, a Swiss bank, recently announced that it will allow individual crypto and blockchain businesses to open accounts with them. This will make the country even friendlier to this sector. Cryptocurrencies are a legal means of payment in Switzerland. Therefore, cryptocurrencies are not “money” in the narrow sense. However, some legal scholars believe that cryptocurrencies, assuming their widespread use, public acceptance, and adoption of the typical functions of money, are classified as “money” in the broader sense. Furthermore, in Switzerland, most traders are not subject to tax on capital gains in cryptocurrencies.

It is no coincidence that blockchain is the cornerstone of the new world order. Its qualities allow it to become the most popular embodiment of distributed ledger technology. Blockchain has all the above properties of a distributed ledger: digital form, decentralization, immutability, and transparency of records. The peculiarity of the blockchain is that records are stored in the registry in the form of information blocks connected in a chain. Each block contains information about its predecessor.

REFERENCES


