# BLOCKCHAIN TECHNOLOGIES: FEATURES OF REGULATION AND APPLICATION IN LEGAL PRACTICE

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**Abstract:** This article discusses the features and practical problems of the legal regulation of blockchain technology. The rapid spread of digital technologies in many areas of public life has raised serious questions about the formation of legal regulation of the use of these technologies for the leadership of the world's leading economies. The purpose of this research is to analyze practical problems faced by developers of digital legislation and develop recommendations for the formation of effective organizational and legal mechanisms for their solution. The authors analyze the spheres of the possible application of blockchain technology, international approaches to the regulation of digital technologies, as well as the projected legal norms of the Russian bill on the use of digital technologies in civil circulation. The article shows the huge possibilities of using blockchain technology, as well as the possible risks of its use in certain areas. The noteworthy opinions of various scholars on the prospects for the development of legal regulation of blockchain technology in various sectors of the economy, as well as in individual institutions of the political system of the Russian Federation have been investigated. At present, regulatory regulation and judicial practice on blockchain technology in the Russian Federation has not yet been developed,

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but positive examples of successful application of this technology in various areas of economy and politics are already available. Conclusions are drawn, prospects for the development of legal regulation of blockchain technology in general and in certain areas of its application, in particular, the banking sector, are shown. The authors name the main goals of legal regulation that should be considered by the legislator when making additions to the current civil legislation and forming digital legislation.

**Keywords:** blockchain technology, areas of application, legal regulation, cryptocurrencies, implementation of digital technologies

**Introduction**

The emergence of blockchain technology has become one of the key events in the modern technological sphere (Yasnitsky, 2020). A significant number of cryptocurrencies operate based on the blockchain, and its use is becoming popular to optimize business processes (Federova et al., 2020; Winter et al., 2020). This is due to the fact that the blockchain can be regulated at different levels taking into account its technical capabilities. The blockchain regardless of the scope of application is always only a supporting technology: a method for storing and processing information. Therefore, it makes sense to consider possible options for implementing blockchain technology.

Since the emergence of the first digital currency as a fundamental component, the functions of the blockchain have been revealed in the following areas (Luntovskaya, 2020):

- cryptocurrencies – the well-known successful examples of the real use of the blockchain are the Bitcoin cryptocurrency, which became the forerunner of all blockchain technologies; the Ethereum project is a platform that allows creating blockchains using much more complex digital assets (tokens). Cryptocurrencies are used for three purposes: "by itself, that is, as an analog of fiat currencies" (Bitcoin, Zcash, Darkcoin); as payment for services provided using the blockchain as a service (Namecoin, Ethereum); as an ICO (ICO — Initial Coin Offering) as an innovative way of crowdfunding. Moreover, the use for some purposes does not exclude the use for others (Churilov, 2018);

- smart contracts – agreements that are fully or partially executed without human participation are placed in an open registry. For example, Gazpromneft-Aero, the operator of Gazprom Neft's jet fuel business, S7 Airlines, and Alfa-Bank have tested digital smart contracts based on blockchain technology. Due to the smart contract, the airline has the opportunity to instantly pay for fuel when refueling aircraft: without prepayment, bank guarantees, and financial risks for participants in the transaction (Samoylova, Kozlova, 2019).

- banking business – notable players in the financial industry are introducing technology into their schemes to increase the speed of transfers – the UCS project − Utility Settlement Coin, created in 2016 by the Swiss bank UBS in partnership with 10 more banking institutions, including State Street, MUFG, Barclays, Credit Suisse, HSBC and Canadian Imperial Bank of Commerce (Detrixhe, Wong, 2017; Altynbekkyzy, Zhumabaeva, 2019; Dzhanadilov, Azhibayev, 2019);

- electoral system – in the electronic elections to the Moscow City Duma of the seventh session on September 8, 2019, an experiment on using blockchain technology was held in three constituencies. According to the authorities, the results of using the blockchain are positive, but, as noted by many media outlets, the system was poorly designed from the point of view of security, because a fairly simple encryption code was used, as well as a temporary failure lasting one hour (Electronic elections to the Moscow City Duma, n.d.).

- sale of intellectual property – in 2017, IBM began partnering with distribution companies to implement distributed technologies in the music business (21 Areas of Blockchain Application Beyond Financial Services, 2016);

- social networks – Facebook announced the opening of a blockchain division on May 8, 2018, planning to issue a cryptocurrency for use within the platform (21 Areas of Blockchain Application Beyond Financial Services, 2016);

- pharmacology – IBM and Humanity.co startup in September 2018 launched a joint blockchain application for anonymous feedback from patients to drug manufacturers (21 Areas of Blockchain Application Beyond Financial Services, 2016).

As blockchain technology has spread around the world, regulators and influential political structures have become increasingly interested in bringing this technology into the regulatory sphere as it can affect almost all sectors of the economy and social relationships in society (Frolova et al., 2018; Dudin et al., 2018). Among the initiatives currently being taken in this direction in jurisdictions around the world, the most common approach is to disseminate warnings about the risks inherent in cryptocurrencies and initial coin offerings (ICOs). While warnings and public statements are effective forms of pre-regulation of new technologies in the short term, the increasing popularity of blockchain technology warrants detailed regulatory guidance to provide legal certainty for blockchain participants and users.

The problem of legal regulation of blockchain technology is also very relevant for Russia. Since the practice of using technical innovations in business does not lag behind the global level, disputes often arise between interested parties on issues related to this topic. In the absence of special legal regulation, the courts are already forming a certain base of decisions that must be considered when regulating these issues.

There have been many publications on blockchain technology in recent years. However, they are either of an overview nature (K. Fanning (2016), A.I. Savelyev (2017), A.Yu. Churilov (2018), while the issues of the relationship of economic institutions, legal norms, and technologies that together determine the successful promotion of the blockchain, or the attention of researchers is focused on certain areas of blockchain use (Guo, Liang, 2016). It seems that studies containing a comprehensive analysis of the economic, legal, and technical aspects of blockchain technology in their relationship can be distinguished by their relevance and scientific novelty. Research hypothesis. Blockchain technology regulation should be based on the principle of technological freedom and benefit to society. Excessive regulatory intervention can damage the spread of useful technology.

**Methods**

Both general and special research methods, characteristic of many sciences, were used in the presented study. The dialectical method of

cognition of reality allowed studying the blockchain technology concerning the technical, economic, and legal development of society. The statistical method showed that blockchain technology is increasingly being used in various sectors of the economy, and the relationships associated with their use are increasingly in need of legal regulation. Using the comparative legal method, the international experience of regulating the use of blockchain technology was summarized and the possibility of its use in the Russian legal field was analyzed. The formal legal method allowed identifying terminology that can be used in the regulatory design of emerging digital legislation. The most relevant sources of information were selected to prove the hypothesis of the research – Internet sites containing statistical data and analytics, collections of legal practice, draft laws with comments, recently published (1-3 years) scientific research.

**Results**

Attempts to regulate relations using blockchain technology had been made several times. Government regulation of blockchain technologies in the United States is carried out by Federal agencies (macro-level), state government agencies (regional level). The Federal government at the time of the study has not yet adopted uniform regulations and documents regulating the development of blockchain technologies in the United States. Government regulation is implemented at the level of US federal agencies within their competence. At the same time, US state authorities are adopting local regulations and rules for the use of blockchain technologies. For example, the law on BitLicense was passed in New York, which actually equated operations with bitcoin to financial transfers, established rules for companies that use bitcoin for settlement operations (NYDFS Announces Approval of First Bitlicense Application From a Virtual Currency Firm, 2015).

In some countries, mainly in the European Union, the authorities do not consider it necessary to adopt special legislation — the leading role is played by local regulators, who, in the absence of special regulations, issue guidelines on ICO and cryptocurrencies based on the applicable norms of current legislation, respond to requests for specific projects and give opinions on them. The State of Malta should be

specially noted, which for quite a long time has been at the forefront of countries recognizing new industries and using new technologies and innovations. Improving the experience of promoting new technologies, Malta is now the most ambitious country in the field of regulating blockchain technologies. The idea is for lawmakers to find a balance between the need for governance and avoiding harsh interference that could negatively affect the use and development of new technologies (Tokolov, 2020).

At the same time, unregulated ICOs were banned in the European Union (Asmakov, 2017). The initiative is associated with a high risk of abuse in conducting, as well as the fight against money laundering or the financing of terrorism. This is an incomplete list of already implemented attempts by the legislator to regulate relations on the use of blockchain, but most often they are associated with preventive measures to prevent violations of the law (mainly criminal) or the application of liability.

To implement the strategy for the development of the information society and the program "Digital Economy of the Russian Federation", draft federal laws have been developed and are undergoing the stage of approval and adoption: "On digital financial assets", "On the distributed national mining system", "On alternative ways of attracting investments (crowdfunding )", "On Amendments to Parts One, Two and Four of the Civil Code of the Russian Federation".

The draft law "On Amendments to Parts One, Two, and Four of the Civil Code of the Russian Federation" defines the terms "digital money" and "digital rights", provides for their judicial protection, uses the concept of a decentralized information system, which includes blockchain technologies. At the moment, such important bills have not yet been adopted. The Civil Code of the Russian Federation currently enshrines the concept of "digital rights".

In the Russian Federation, judicial practice is gradually being formed in relation to several assets produced based on blockchain technology. The main number of disputes in the field of application of blockchain technology in the financial market is devoted to the use of cryptocurrency. When analyzing publicly available court decisions, attention is drawn to the fact that disputes in which there are references to

cryptocurrency in the case materials, as well as for which there is relevant evidence, are resolved primarily in courts of general jurisdiction and belong to the categories of disputes on consumer rights violations (civil, administrative), as well as in criminal cases (Chitchyan, 2019). Currently, there are more than 134 disputes in this area (Smart contracts in the financial market: research results, 2019), of which almost 40% are civil disputes related to the recognition of an obligation to pay for a particular property by transferring cryptocurrency to a counterparty. When submitting applications, interested parties point out violations of their rights, expressed in the fact that goods of inadequate quality were sold to them (or not sold), the service for exchanging cryptocurrencies for fiat money was improperly provided (not provided). In this matter, the court practice is not in favor of persons who prove the fact of payment under purchase and sale agreements or exchange. Thus, the decision of the Ryazhsky Court of the Ryazan region in case No. 2-160 / 2017 stated that "the presence of cryptocurrencies outside the legal field does not allow the plaintiff to implement legal mechanisms for imposing liability on the defendant in the form of paying the latter a penalty, compensation for moral damage and a fine, provided for by the Law of the Russian Federation dated February 07, 1992 No. 2300-1 "On the Protection of Consumers' Rights" (Analysis of judicial practice on cryptocurrencies in Russia, n.d.). As follows from the above example and several similar ones, the position of the courts boils down to the fact that all operations using cryptocurrencies are carried out by their owners at their own risk and risk, and also that they should be considered in accordance with the provisions established by Chapter 58 of the Civil Code of the Russian Federation, like games. This situation is due to the lack of legislative regulation of the use of cryptocurrency, as well as blockchain technology in general, and it can be assumed that in the event of disputes concerning other areas of application of blockchain technologies, the position of the courts will be similar. This indicates the need for regulatory regulation of digital assets and rights and the recognition of blockchain technology.

**Discussion**

The concept of regulating breakthrough innovation is impossible and unattainable without applying the

principle of "technological neutrality". The volume of new technical developments increases exponentially rapidly, and, naturally, social, economic, and legal systems do not keep up with this process. Thus, the introduced legal regulation of the latest technology almost immediately becomes irrelevant. Also, the very need for technology development is crucial to justify the need for changes to existing legislation and regulations; that is, the purpose of regulatory regulation should never be to slow down or restrict the development of any information technology, since this inevitably leads to the suppression of innovation (Tokolov, 2020).

According to A.V. Tokolov, "when preparing any regulatory acts — laws, government decisions or conditions for the implementation of government-sponsored technological projects — it is necessary to focus only on the ultimate goal of these initiatives, and not on specific technologies that can be used to achieve it <...> The focus of the innovation regulatory process should always be on creating technical standards for its implementation, as well as ethical and good governance principles, since these are, in fact, the tools that are necessary for the maturation, growth, and prosperity of a new branch of knowledge. Without the principles of good governance, commercial entities will not be able to turn into structured, stable, and trustworthy enterprises" (Tokolov, 2020; Malikova et al., 2018).

When considering any new technology, the legislator must clearly answer the question of whether there is a need for its legislative regulation at all. In a specific case, in relation to the blockchain, to ensure its safe use, we believe that the answer "Yes" is necessary, but it is extremely important to avoid excess in this question. The risk of "readjustment" is quite high, especially if we consider specific cases. Many recent directives and regulations of the European Union, such as, for example, the Resolution of the European Parliament on the adoption of amendments to the EU directive on combating money laundering (2015/849) (2015), even though they were supported by good intentions, are harmful to business: they cause damaging startups and limiting innovation. As prospects for the development of legal regulation of blockchain technology, researchers identify two regulatory schemes.

First of all, the regulation of the blockchain can be carried out horizontally by concentrating on the hierarchy of identifiable layers-levels participating in the technical structure of such assets (Tokolov, 2020). In this case, the relevant regulatory documents are prepared, for example, standards that define the functioning of each level of the regulated asset. As such, this form of regulation is usually met with skepticism and criticism (Strong, Seira, 2019), because its use distorts the idea of freedom, which is the basis of the blockchain, and increases the risk of "readjustment", which we discussed earlier. At the same time, horizontal regulation provides a more detailed definition of the legal status of entities based on blockchain technology. In addition, there is a widespread opinion that cryptocurrencies can be introduced into the regulatory sphere without regulating cryptocurrencies as such through the vertical regulation of the blockchain market itself (Behlendorf, 2016). According to A.V. Tokolov, vertical regulation follows an industry approach, delimiting the blockchain technology ecosystem with the accompanying services of cryptocurrencies, smart contracts, etc. from the traditional financial and economic sector, while establishing the rules for the functioning of the interfaces of their interaction (Tokolov, 2020). This form of regulation is even more justified given the fact that an increasing number of cryptocurrency transactions are carried out not "inside the blockchain", i.e. directly in the blockchain network, but "outside the chain" through internal registration systems controlled by centralized cryptocurrency exchanges and payment companies (Tokolov, 2020). As with any other innovation, the legislator needs to carefully analyze the functional characteristics of the various concepts under consideration, as well as their consequences and real risks, so that the implemented regulatory regime provides an appropriate and adequate response to regulatory problems without "overregulation". When regulating the use of blockchain technology for a particular industry, it is necessary to take into account the specifics of this industry. Norton Rose Fulbright (Behlendorf, 2016) says in his research that most countries with large economies are at the beginning of the path of legislative regulation of the use of blockchain in the financial sphere (Financial institutions and blockchain

technology, 2016). Problems that remain unresolved for legislators include the following questions: which of the alternative directions of blockchain technology (for example, public or open networks) can be recommended for the banking sector, how strict such recommendations should be; whether broad regulation of blockchain use is necessary or is it required only in cases of providing certain financial services; how it is necessary to change the indicators and standards so that the banks that keep records of transactions in the blockchain meet the requirements of regulators; how to change information security standards and procedures for its audit; how the use of blockchain can affect banking secrecy and the implementation of legislation on "oblivion" (relevant for several countries); what responsibility should be envisaged in this area; how to form and staff regulators to avoid suppressing innovation? (Lipnitskii, 2019). Summing up the above, it can be argued that regulatory intervention in relation to blockchain technology should not only be functional, technology-neutral, and based on regulatory goals and principles but also take into account the characteristics inherent in every branch of the economy.

**Conclusion**

Thus, based on the above analysis, it can be concluded that the goals of any form of regulation of blockchain technology should be: 1) creating technical standards that ensure interoperability and protect end-users (the goal of compatibility); 2) ensuring the protection of vulnerable users and protecting them from criminals (the goal of protection); 3) ensuring proper management to protect investors as well as end-users from fraud, mismanagement and gross negligence (the goal of management). Meanwhile, for regulators, the fine line between protecting citizens and applying an excessive control approach is often blurred; at the same time, it becomes difficult for thinking capable citizens to obtain the necessary information to enable them to make their own informed decisions. It seems that the best solution for implementing the goal of protection concerning a blockchain is to ensure transparency and provide all necessary information about the technology to the widest range of stakeholders. Blockchain is based on the idea of providing

humanity with freedom and self-sufficiency. This technology was created to mathematically solve the problem of finding the right solution in a collision of goals of several distrustful subjects. Therefore, distorting the idea of freedom inherent in technology by attempting to regulate it can be harmful and negate its entire value. Thus, the hypothesis of this study appears to be proven. As a prospect for continuing the research started in this article, the attention of researchers can be focused on regulating the use of blockchain technology in the financial system.

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