

**BLOCKCHAIN TECHNOLOGIES AND THEIR LEGAL  
REGULATION****Abdreymov Yusupbay Turdibaevich****Karakalpak State University,****Department of Civil and Business Law,****Associate Professor, Doctor of Law. (PhD)****ORCID: <https://orcid.org/0000-0003-2255-9094>****E-mail: [abdreymovyusupbay@gmail.com](mailto:abdreymovyusupbay@gmail.com)****Alauaddinova Albina Aybekovna****3rd year student of the****Faculty of Law of Karakalpak State University****Kojabaeva Gulnur Bakhit kızı****3rd year student of the****Faculty of Law of Karakalpak State University****<https://doi.org/10.5281/zenodo.17461961>****ARTICLE INFO**Received: 25<sup>th</sup> October 2025Accepted: 26<sup>th</sup> October 2025Online: 27<sup>th</sup> October 2025**KEYWORDS**

*blockchain technologies, cryptocurrency, capital, assets, strategy, security, digital technologies, finance.*

**ABSTRACT**

*This article addresses blockchain technologies, which hold a special place among modern digital technologies, and the issues of their legal regulation. Blockchain technology is widely used not only in the financial sphere, but also in public administration, healthcare, supply chains, and ensuring the security of personal data. The article analyzes the practical application of blockchain, as well as the laws and regulatory legal documents governing it, using the examples of the USA and Uzbekistan.*

*Furthermore, the main problems encountered in the legal regulation of blockchain technologies - lagging legislation, technological disparities, and the absence of international standards - will be addressed, along with ways to address them. The study, based on legal reforms, international experience, and regulatory models, provides recommendations for the safe and effective implementation of blockchain.*

**Introduction.**

With the development of digital technologies, blockchain technologies are becoming increasingly important for the reliable and secure preservation of intellectual property created by people. Blockchain technology has been recognized as a revolutionary solution for the digital economy and various spheres of society in the last decade. This technology is being widely implemented, ensuring decentralized, secure, and open data exchange, from financial to government services. At the same time, the rapid development of blockchain is making the issues of its legal regulation important. Blockchain technology is recognized as one of the most important digital innovations of the 21st century. This technology, proposed by Satoshi Nakamoto in 2008 as the basis for the Bitcoin cryptocurrency, is revolutionizing many areas today, from finance to public administration. The decentralized structure, security, and

transparency of the blockchain distinguish it as an alternative to traditional systems. It stores data in the form of blocks, protects them with cryptographic methods, and ensures reliable cooperation on a global scale. Today, blockchain is used not only in cryptocurrencies, but also in such areas as supply chains, healthcare, public services, intellectual property rights, and even voting systems. According to the World Economic Forum, by 2025, 10 percent of the world's gross domestic product will be stored in blockchain-related technology<sup>1</sup>, which demonstrates its economic significance. Along with the rapid development of technology, the issue of its legal regulation is becoming increasingly important. Anti-money laundering (AML) refers to a set of policies and practices for financial institutions and other regulated organizations to prevent, detect, and report on financial crimes and especially money laundering<sup>2</sup>. Issues such as combating the financing of terrorism (CFT), government laws, regulations, and other practices aimed at restricting the access of individuals designated as terrorists to financial and financial services<sup>3</sup>, taxation, and consumer protection are being discussed at both global and national levels. Uzbekistan, not staying away from this global trend, is striving to implement blockchain in public services, financial systems, and civil status acts within the framework of the "Digital Uzbekistan-2030" strategy. However, problems such as the complexity of technologies, the shortage of specialists, and the incomplete formation of the legal framework are hindering development. This article provides a broader overview of the main features of blockchain technology, its application area, and the state of legal regulation globally and in Uzbekistan. Furthermore, the future prospects of the technology and its opportunities for Uzbekistan will be analyzed.

A technology called blockchain (from the English "block" and "chain") will emerge. It is based on a revolutionary new approach to information exchange - decentralization, the use of an advanced encryption algorithm - cryptography, as well as the simultaneous delivery of reliable data. American cryptographer David Chaum first described a blockchain-like protocol in 1982 as "supported and reliable computer systems created by mutually suspicious groups" (Eng. Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups). Furthermore, S. Huber and W. Scott described a cryptographically protected blockchain chain in their 1991 work on Stornet. Mathematicians aimed to implement a system where document timestamps could not be artificially created.

The digitalization of the private and public sectors is actively continuing in Uzbekistan. Numerous new digital applications and tools developed both domestically and internationally have provided citizens with effective tools for participating in the process of determining political direction, applying for licenses and permits, receiving legal advice, and reporting cases of corruption and bribery. Considering the projected high level of corruption in Uzbekistan, utilizing the potential of digital innovations, particularly blockchain technology, is of vital importance in strengthening trust in government agencies. The implementation of blockchain into the Unified Electronic System of the Civil Registry Office of Uzbekistan, funded

<sup>1</sup> Kimani, Danson; Adams, Kweku; Attah-Boakye, Rexford; Ullah, Subhan; Frecknall-Hughes, Jane; Kim, Ja (1 December 2020). "Blockchain, business and the fourth industrial revolution: Whence, whither, wherefore and how?". *Technological Forecasting and Social Change*. 161 120254. doi:10.1016/j.techfore.2020.120254. ISSN 0040-1625.

<sup>2</sup> [https://en.wikipedia.org/wiki/Anti%E2%80%93money\\_laundering](https://en.wikipedia.org/wiki/Anti%E2%80%93money_laundering)

<sup>3</sup> <https://www.investopedia.com/terms/c/combating-financing-terrorism-cft.asp>

by the European Union and implemented jointly with the United Nations Development Programme (UNDP) in Uzbekistan and the Ministry of Justice of the Republic of Uzbekistan, is one of the measures being implemented within the framework of the project "Improving the Provision of Public Services and Enhancing the Level of Governance in Rural Areas of Uzbekistan" (IPSD), aimed at improving citizens' lives by enhancing security and accelerating access to public services. The implementation of blockchain in Uzbekistan's civil registry system has been a national priority for the past two years. Its implementation will facilitate the transformation of online public service delivery across the country for the benefit of the population, including 15 million citizens living in rural areas and socially vulnerable segments of the population (including the elderly, people with disabilities, women, and youth in remote areas). The European Union and the UN Development Programme, in addition to implementing blockchain, are assisting government services in improving citizens' lives, particularly by launching new Public Service Centers (PSCs) based on the "single window" principle. These initiatives reflect the goals of the large-scale reforms being implemented in Uzbekistan since 2017, aimed at directing state authorities and administration primarily towards meeting the needs of the population. With proper implementation and in conjunction with other changes being implemented in public administration, the blockchain could bring significant benefits to all citizens of Uzbekistan<sup>4</sup>. Today, there are several types of blockchain that serve various purposes.

1. Mass blockchain, as the name suggests, is a program open to everyone. Bitcoin and Ethereum are the most famous examples of this type of blockchain. They are decentralized, where anyone can create an account, conduct transactions, and engage in mining by confirming blocks. The main advantage of mass blockchain is its transparency and security. Because any information encrypted in the blockchain is open to anyone, and it is impossible to delete the information encrypted in the blocks.

2. Private blockchains are managed and used only by a specific organization or group. Such systems are often used in the corporate environment. Private blockchains provide a high level of control and security and can have more centralized control.

3. Blockchain consortia is jointly managed by several organizations. This type of blockchain is considered semi-centralized and is often used to improve cooperation between various sectors and organizations. For example, such systems are widely used in the banking and financial sector. Several banks can join forces and create a blockchain system to accelerate mutual money transfers. This not only simplifies the work of banks, but also creates convenience for customers.

4. Hybrid blockchain combines the best features of both public and private blockchain. While ensuring a certain degree of transparency, they allow for the confidentiality of certain information. This is an acceptable solution for many companies. An example of a hybrid blockchain is the XDC Network blockchain, which operates in the areas of trade finance and supply chain management. Blockchain technology plays an important role in the

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<sup>4</sup> <https://www.undp.org/uz/uzbekistan/blog/ozbekistonda-blokcheyn-texnologiyasi-yanada-shaffof-davlat-xizmatlari-uchun>

development of the sphere in which it is necessary to ensure openness. Blockchain has the potential to revolutionize finance, supply chains, healthcare, and many other sectors.

Each type of blockchain has its own strengths and weaknesses. It is important for organizations wishing to use blockchain technology to choose the most suitable type based on their needs and objectives. In the future, with the development of blockchain technology, the emergence of its new types is expected, which will further expand the areas of application of blockchain<sup>5</sup>.

In 2008, a developer under the pseudonym Satoshi Nakamoto (the true identity is unknown, it is possible that a team worked under this pseudonym) proposed a general algorithm for the bitcoin system, the main element of which was a system consisting of a continuous sequence of information blocks called a blockchain. A fundamental difference from all previous versions of such technologies (including Hashcash) was the integration of a chain hash with a formal mechanism for developing an agreement on the validity of the next block, which made it possible to eliminate the need to verify information by a trusted agent (administrator) throughout the system, and the system was not centralized at all<sup>6</sup>. In 2009, the first version of the bitcoin cryptocurrency was launched, and a decentralized blockchain was implemented, which ensured the storage of all operations in the system. Currently, blockchain technologies are developed in more than ten countries. Especially in the US states, it took all measures to adopt and implement Blockchain technology, from the establishment of research associations to ATMs for bitcoins. The government intends to make this part of their standard operating system. States like Montana and Texas are seen as the most suitable locations for new blockchain-based companies.

Approximately 48% of the blockchain's primary industry is located in the US. The country plays an important role in the cryptocurrency and blockchain ecosystem. According to the latest report, the US Federal government expects to increase investment in blockchain development tenfold. Almost 80% of global leaders consider blockchain critical, while more than 60% believe that regulatory issues create obstacles to the adoption of blockchain. 81% of the top 100 state-owned companies use blockchain technology. In 2022 alone, governments and companies in the United States spent 4.2 billion US dollars on blockchain solutions.

Financial institutions located in many countries are investing resources in Blockchain technology to facilitate more efficient economic exchange. Another financial institution, Goldman Sachs, recently announced the launch of its own stable currency<sup>7</sup>.

These blockchain technologies are being used in many areas, such as finance, healthcare, logistics, and public administration. Using the example of the USA and Uzbekistan, we will compare how blockchain technology is being implemented, its legal framework, advantages, and disadvantages. In the USA, blockchain technology is controlled by various regulators: SEC, CFTC, FinCEN. In 2025, the CLARITY Act was adopted, establishing specific rules for stablecoins. Cryptocurrencies are taxed as capital income, and tax processes are automated. Some states, such as Wyoming and Florida, have created tax breaks for blockchain startups. Uzbekistan has begun implementing blockchain technology within the framework of the

<sup>5</sup> <https://www.blockchaintexno.uz/news/blokcheynning-qanday-turlari-mavjud%3F>

<sup>6</sup> Satoshi Nakamoto. Bitcoin: A Peer-to-Peer Electronic Cash System. — 2008. — 9 c.

<sup>7</sup> <https://www.blockchain-council.org/blockchain/top-10-countries-leading-blockchain-technology-in-the-world/>

"Digital Uzbekistan - 2030" strategy. Currently, this technology is being tested in government services, civil registry offices, financial systems, and some other areas. As areas of application: Public services: In cooperation with UNDP (United Nations Development Programme) and Canadian companies, the Civil Registry Office system is being transitioned to blockchain. Through this, documents are being processed transparently and quickly. In the field of financial systems, the Central Bank and some commercial banks are testing blockchain-based payment systems. In the field of cadastre: projects are being implemented to store land documents in the blockchain<sup>8</sup>. Despite the introduction of blockchain technologies in Uzbekistan today, a number of problems are arising in this area. That is, the lack of sufficient infrastructure, as well as the shortage of qualified personnel in this field, is negatively impacting the fundamental development of blockchain technologies in the country. Nevertheless, a Presidential Decree "On Measures for the Development of Crypto-Asset Circulation" was adopted on July 3, 2018. This decision laid the foundation for regulating blockchain and crypto assets. The following important aspects were identified:

Crypto-assets (cryptocurrencies and tokens) are recognized as property.

Crypto exchanges and oil operations are subject to licensing.

The establishment of a regulatory zone (test zone) has been proposed<sup>9</sup>.

Uzbekistan views blockchain as an effective tool for increasing public services and economic transparency. For future development, we consider the following recommendations important:

Firstly, strengthening the legal framework: Draft laws should be adopted that define a clear classification of crypto-assets, tax regulations, and the legal force of smart contracts.

Secondly, it is necessary to study international experience and implement the experience of regulatory sandbox and blockchain projects from countries such as Estonia, Singapore, and the United Arab Emirates.

Thirdly, infrastructure development: It is necessary to expand digital platforms, internet infrastructure, and energy resources.

Fourthly, personnel training: It is necessary to introduce special educational programs on blockchain in universities and attract international specialists.

Projects can also be financed through expanding cooperation with international organizations such as the United Nations Development Programme (UNDP), the World Bank, and others.

Studies show that the specific features of blockchain technology - the lack of centralized control, the impossibility of changing transactions, and the possibility of concealing the identity of participants - pose certain problems for current legal systems. Specifically, concepts such as blockchain-based crypto assets, smart contracts, and DAOs (decentralized autonomous organizations) have become an important problem in regulating related legal relations in many jurisdictions due to their incompatibility with traditional legal norms.

<sup>8</sup> O'zbekiston Respublikasi Prezidentining 2020-yil 5-oktabrdagi "Raqamli O'zbekiston — 2030" strategiyasini tasdiqlash va uni samarali amalga oshirish chora-tadbirlari to'g'risida"gi PF-6079-sonli Farmoni, <https://lex.uz/ru/docs/-5030957>

<sup>9</sup> <http://lex.uz/docs/3806053> O'zbekiston Respublikasi Prezidentining Qarori, 03.07.2018 yildagi PQ-3832-son.

Today, countries around the world are demonstrating different approaches to this technology: some countries are actively supporting it, while others are approaching it cautiously or imposing restrictions. Within the framework of the policy being pursued in the Republic of Uzbekistan on the transition to a digital economy, the issues of introducing blockchain technologies and their legal regulation are being gradually developed. In particular, a regulatory framework is being created in such areas as the circulation of crypto assets, the activities of crypto exchanges, electronic digital signatures, and digital identity identification.

**In conclusion**, blockchain technologies, along with new opportunities for modern legal systems, also bring certain risks and uncertainties. Therefore, the legal regulation mechanisms in this area must be adapted to the development of modern digital technologies, innovative, and compliant with international standards. Only then will it be possible to fully utilize the advantages of blockchain and minimize the legal risks arising from it.

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