

МАЗМҰНЫ / СОДЕРЖАНИЕ / CONTENT

Мақала туралы мәлімет

| | |
|-----------------------|--|
| Конференция атауы | «Жастар және ғылым: бүгiнi мен болашағы» жас ғалымдардың халықаралық ғылыми-тәжірибелiк конференция материалдар жинағы |
| Сборник | «Молодежь и наука: настоящее и будущее». Сборник материалов Международной научно-практической конференции молодых ученых |
| Conference | The collection of materials from the International Scientific and Practical Conference of Young Scientists «Youth and Science: Present and Future» |
| Өткізілген күні | 7 сәуір 2025, Атырау |
| ISBN | 978-601-262-587-5 |
| Жинақтағы жариялану № | 002 |
| Жинақтағы беттері | 7-9 |
| ӘОЖ/УДК/UDC | UDC 33.339.339.7 |
| Секция | Секция IV. I Жұмысшы кәсіптері-экономикалық өсу мен дамудың драйверлері // Рабочие профессии - драйверы экономического роста и развития |
| Автор(лар) | Yermekov Madi Nurbolatulyiy |
| Мәртебесі | Магистрант |
| Ғылыми жетекші | Scientific supervisor: Candidate of Economics, Associate Professor - AbdeshevD.D. |
| Мақала атауы | BLOCKCHAIN IN ECONOMICS AND BUSINESS |

Ескерту: бұл бет сайтқа орналастыру және мақала PDF-ін сәйкестендіру үшін қосылды. Төменде жинақтағы мақаланың түпнұсқа беттері берілген.

the main determinants of telework in Europe. *Sustainability (Switzerland)*, Vol. 12, Iss. 21, pp. 1–15.

7. Ivanova, V., Poltarykhin, A., Szromnik, A., & Anichkina, O. (2019). Economic policy for a country's digitalization: A case study. *Entrepreneurship and Sustainability*, Vol. 7, Iss. 1, pp. 649–661.

UDC 33.339.339.7

BLOCKCHAIN IN ECONOMICS AND BUSINESS

Yermekov Madi Nurbolatuly

madi2.yermekov@yu.edu.kz

1st year Master's student of the educational program "Financial Management"
Caspian State University named after Sh. Yessenov, Aktau, Republic of Kazakhstan
Scientific supervisor: Candidate of Economics, Associate Professor – AbdeshovD.D.

Blockchain technology has established itself as one of the most revolutionary solutions of the 21st century, capable of changing the principles of doing business and economic processes. It provides transparency, security, and decentralization of operations, which makes it attractive to various sectors of the economy [1, p. 4].

Blockchain is a distributed ledger technology in which data is stored as a sequential chain of blocks combined using cryptographic methods.

The blockchain is a database that stores information about each transaction performed in the system. The transaction is considered completed only after confirmation. In order for a transaction to be considered valid (that is, "confirmed"), its format and signatures must be verified. After that, several transactions are combined into a special structure — a block in which information can be quickly checked. The data in the blockchain is stored as a chain of blocks (hence the name — blockchain) containing transaction records. This is a network where each participant has access to all information and can confirm a transaction before it is written to the block chain [1, p. 7].

The world is actively developing software based on blockchain technology, which can be used in the practical activities of financiers. The first results of the introduction of blockchain technologies in the financial sector have shown that such innovative solutions can reduce the cost of trading operations and significantly speed up their execution compared to traditional methods.

Below is a diagram showing the distribution of blockchain adoption across various sectors of the economy.

Blockchain Adoption in Different Economic Sectors

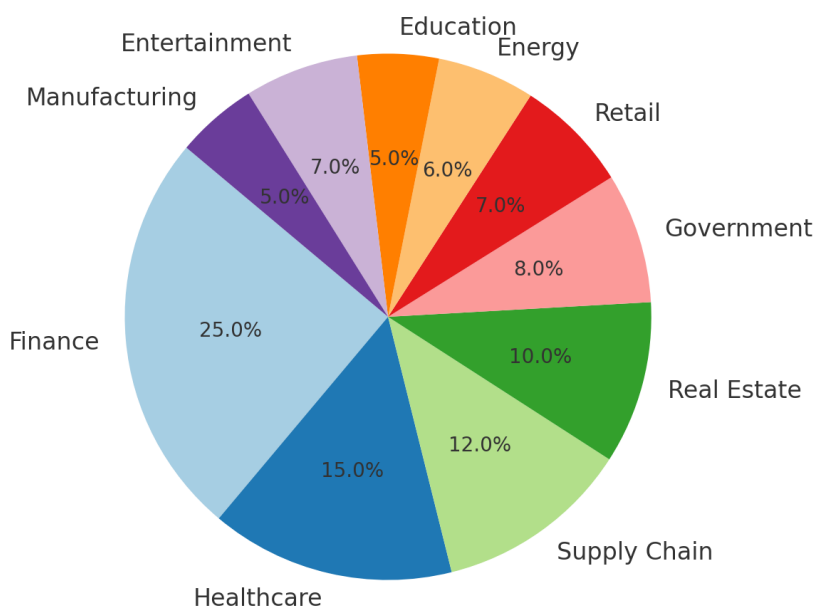


Figure 1 - The introduction of blockchain in various sectors of the economy.

All information is stored transparently in a single database, without intermediaries or management structures. The absence of a centralized management body eliminates the possibility of abuse from any side, which helps to increase trust between participants [3, p. 19].

The first trade finance deal using blockchain technology was announced by Barclays and the Israeli startup Wave in September 2022. As part of the deal, payment was guaranteed for the supply of cheese and butter worth almost \$100,000 from the Ornois Irish cooperative to a trading company in the Seychelles. The process, which usually takes seven to ten days, was completed in less than four hours.

Although banks and financial institutions were skeptical about blockchain in the early years, the situation has changed. With the increasing success of blockchain in various industries, the banking sector is actively looking for new ways to apply this technology.

Well-known players such as JP Morgan Chase are confident in the future of blockchain. An American investment bank based in New York has created a new division, Quorum, which is engaged in the research and implementation of blockchain technologies. Quorum is a distributed ledger and smart contract platform designed for enterprises. This system supports fast transactions and high throughput, solving problems for both the financial sector and banks in general. According to information from open sources, they have already issued an annual certificate of deposit based on a variable-rate distributed registry.

In addition, a major American bank, Bank of America, has filed a patent application, which has been published by the U.S. Patent and Trademark Office. The document describes the use of an authorized blockchain to protect records, as well as to verify the authenticity of business and personal data [7, p. 66].

Another important name is Goldman Sachs, which is actively engaged in research and support of distributed ledger technology. The bank has invested in the Circle cryptocurrency project, which is considered one of the most funded startups in the blockchain space. The aim of the project is to solve the key problem of instability in the field of digital currencies, making the financial sector more reliable with the help of cryptographic options.

By supporting such a promising project, Goldman Sachs aims to become a leader in the introduction of cryptocurrencies among competitors on Wall Street. The bank is also creating its own department for trading cryptocurrencies, which will deal exclusively with digital assets.

The use of smart contracts may be particularly important for the banking and financial sector. A smart contract is an executable piece of code that is activated when predefined conditions are met [7, p. 59].

When smart contracts are used for financial transactions, they increase the speed and simplify complex processes. This also guarantees the accuracy of the information, since the transaction will be confirmed only if all the conditions specified in the code are met. Moreover, since the conditions are visible to all parties involved in the transaction, the probability of execution errors is significantly reduced.

IBM

Various industries are gradually adopting blockchain technology. At the forefront of the integration of payment systems and logistics solutions is the technology giant IBM, which has established itself as a leading developer of blockchain products.

The company has been showing interest in this technology for the past five years, which indicates its balanced and consistent approach to implementing blockchain solutions at the corporate level. IBM's most current developments are focused primarily on the logistics sector, although their application is not limited to this area.

In 2021, IBM began exploring the possibilities of the Internet of Things (IoT), which led to a collaboration with Samsung to transform business processes using this technology. The companies joined forces to develop the ADEPT (Autonomous Decentralized Peer-to-Peer Telemetry) project. The main idea of ADEPT was to test the concept (Proof-of-Concept, PoC) of autonomous interaction of devices with the environment. The project explored the possibility of using home appliances, such

as Samsung washing machines, to exchange data with other nearby devices. This made it possible, for example, to automatically order washing powder from a store or optimize energy consumption. During the project, three key functions of decentralized IoT systems were identified: p2p data exchange, distributed information use, and autonomous device coordination. In 2022, IBM teamed up with Maersk, the largest container company in the world, to create a blockchain platform that digitizes the supply chain process and allows cargo tracking around the world.

Walmart

Walmart is a retail giant with 11,200 outlets under 55 brand names in 27 countries and e-commerce websites in 10 countries. The company employs about 2.2 million people worldwide. The company manages almost \$44 billion worth of inventory and has an annual turnover of about \$500 billion.

Despite its size, Walmart is also under pressure from changing technology and, in particular, the transition to e-commerce, where Amazon and other companies are challenging its dominant position in retail.

Food safety is an important issue for Walmart. The company doesn't want its customers to get sick. She also wants to keep her own income at a high level. The problem is that if there are any difficulties in the food supply chain, it is very difficult to track it. Each company along the way keeps only its own records, many of which are still stored on paper.

In 2022, Walmart, together with IBM and Tsinghua University in Beijing, used blockchain to track the movement of pork in China. This happened after several scandals involving food products from China, including milk and baby food contaminated with melamine.

Walmart is collaborating with IBM and 9 other companies on an ambitious joint project to track global food supplies, the IBM Food Trust. The collaboration began in 2020, testing began in August 2021, and the product was released in June 2022.

The main goal of the project is to identify the sources of infection. This is also done to prevent fraud, for example, when non-organic products are passed off as organic, and certain types of meat are mistaken for others. Ramesh Gopinath, IBM's vice president of blockchain solutions, says that food fraud costs the global food industry \$10-15 billion annually.

The project is a cloud-based solution based on the IBM blockchain. Information is exchanged through the IBM blockchain and the Linux Foundation Hyperledger Fabric. It would be more correct to call it a distributed ledger technology (DLT) project, since it is a private, permissioned blockchain that is not open to the public.

The participating companies usually compete with each other. However, in this case, they work together to ensure consumer trust. These include Walmart (the leading company), Nestlé SA, Dole Food Co., Driscoll's Inc., Golden State Foods, Kroger Co., McCormick and Co., McLane Co., Tyson Foods Inc. and Unilever NV. In June 2022, Forbes reported that the Finnish retail cooperative S-Group had joined the Food Trust ecosystem. Its main purpose is to track fish fillets sold in stores all the way to the lake where they were caught.

The same Forbes report notes that the system stores data on about a million items. During the testing phase, more than 350,000 food transactions representing vegetables, meat, spices, fruits and fish were registered on the blockchain. It collects real-time data on every food item anywhere in the world.

Frank Yannas, Walmart's vice president of food safety, called the project “the equivalent of tracking FedEx products.” IBM reported that blockchain technology can reduce the average product recall by up to 80%.

In August 2022, Walmart applied for a blockchain-based patent, this time for controlling smart devices, including desktops or laptops, wearables, media players, and others. The goal is to allow these devices to use the private key to authorize transactions.

For example, in a kiosk that accepts packages using drones, the owner can use the device to accept or reject a package or order an item. In the long term, it is planned to introduce a smart home system. This is a good example of how blockchain and IoT are combining to change the way the supply chain