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ПЕРСПЕКТИВЫ ИСПОЛЬЗОВАНИЯ ТЕХНОЛОГИИ БЛОКЧЕЙН В ФИНАНСОВОМ СЕКТОРЕ КАК СРЕДСТВО ПЛАТЕЖЕЙ И РАСЧЕТОВ

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Аннотация. Научные исследования технологии блокчейна в области финансов является ключевым для стимулирования инновационных решений и улучшения эффективности существующих финансовых систем. Объект исследования – финансовая система. Предмет исследования – платежи и расчёты, как финансовые услуги. Цель исследования – исследовать возможность и перспективы использования технологии блокчейн в финансовом секторе как средство платежей и расчетов. Современное развитие технологий, таких как блокчейн и криптовалюты, стимулирует инновационные и технологические перемены в области финансовых операций, предлагая новые возможности для проведения платежей и расчётов с повышенной эффективностью и степенью безопасностью. Данная статья направлена на изучение способов, с помощью которых технология блокчейн трансформирует область платежей и расчётов, переходя от привычных методов проведения финансовых операций и транзакций к более современным и инновационным подходам.

Ключевые слова: технологическое развитие, платёж, расчёт, финансовая операция, транзакция, децентрализация.

Introduction

In the modern information society, as part of the acceleration of technological development, blockchain technology based on the principles of decentralization is a key element in building a new financial system of payments and settlements. This technology is a continuous "chain of blocks" [1], each of which stores digital data with a timestamp and unique hashes of previous blocks. For the first time, blockchain technology was widely used in the field of financial transactions, and its importance became apparent back in 2009 with the advent of the Bitcoin cryptocurrency. Market research shows

that by 2023, the global volume of financial services will reach 3 trillion US dollars [2], while the global financial system, serving billions of people and processing trillions of dollars a day, is facing a number of serious problems. These problems include high costs due to numerous intermediaries, transaction delays, excessive paperwork and data leaks, which leads to huge financial losses every year. According to PWC, up to 45%¹ of financial intermediaries, including stock exchanges, payment systems and money transfer services, face economic crimes every year, and it is in this case that blockchain technology in the financial sector acts as a potential solution to these systemic problems. The introduction of blockchain technology into the financial industry opens up a number of promising opportunities for it, as well as the development of blockchain solutions for the financial sector can create significant benefits for this industry, so the development of decentralized finance (DeFi) based on smart contracts and blockchain technology opens up new prospects for ensuring transparency and security in financial services, which is obvious. It arouses academic and scientific interest from both the state and academic communities.

The main part

The financial sector has been facing various problems for a long time, caused by both aspects of the existing infrastructure and the high level of centralization in its functioning. Modern technological advances have led to effective solutions to some of these problems, but new challenges inevitably arose in the innovation process: "Since the advent of blockchain in 2008, this technology has become one of the hottest topics in FinTech research and has gradually penetrated the global banking industry. Commercial banks in many countries have already started using blockchain in three main aspects of the payment and settlement business: the asset business and the intermediary business. The current use of blockchain in banks is mainly aimed at creating platforms and systems to increase the efficiency of transactions and information processing" [3]. Fintech solutions have become widely available, which has led to difficulties in choosing the best solutions for financial service providers and such uncertainty of choice forces financial companies to look for alternative solutions that can effectively cope with the full range of problems they face. In this context, blockchain technology in the financial industry seems to be a promising tool capable of solving serious problems facing the industry, because one of the key areas of blockchain use in finance is to ensure data security and increase transparency of financial transactions. Modern financial services are still centralized and multilevel, with capacious financial data, mainly stored in centralized

¹ URL: <https://www.pwc.com/us/en/services/consulting/cybersecurity-risk-regulatory/library/global-economic-fraud-survey.html>.

databases and passing through many intermediaries. Such a system suffers from a serious lack of transparency, while data security is completely dependent on intermediaries and the technical security of databases, and due to the lack of transparency, security threats arise, since it becomes difficult to control and track operations until something goes wrong or data is compromised.

The use of blockchain technology in the financial industry offers a number of solutions to ensure the security and transparency of financial transactions [4]:

- Data immutability, as the blockchain is an immutable structure, ensuring that data remains secure, authentic and genuine.

- Data confidentiality, which is due to the fact that the blockchain uses public and private keys to ensure confidentiality and financial transactions can be visible using the public key, but transaction details are only available to participants with the private key, ensuring a balance between transparency and privacy protection.

- Zero-disclosure proof technology, so some blockchain systems include zero-disclosure proof technology to ensure data confidentiality without the need for disclosure.

The use of blockchain in the financial industry is an effective way to solve key financial security problems and ensure transparency of the transaction pool, which prevents the possibility of financial abuse and fraud faced by the modern financial industry.

In the "traditional" financial sector, in which there is a high degree of centralization, there is a significant proportion of non-operating expenses for [5]:

- Acquisition of centralized databases;
- Accounting;
- Database management;
- Remuneration of service workers;
- Ensuring database security;
- Commissions of intermediaries;
- Value transfer systems.

These costs are systematic and require regular costs, which makes the "traditional" financial system more expensive while at the same time there are no guarantees of data protection. The use of blockchain technology in the financial sector can significantly reduce non-operational costs, since blockchain, as a means of payment and settlement, is able to increase transparency and reduce costs, while ensuring guaranteed data security. Banks and other financial service providers can use smart contracts to reduce the cost of: Intermediaries; Value transfer; Accounting, which allows you to significantly reduce costs by using blockchain in the financial industry.

Financial service providers face high risks when providing loans, such as:

- The counterparty's inability to fulfill obligations;
- Credit risk due to information asymmetry;
- Distrust of intermediaries;

And in the case of commercial banks, monitoring and management of credit funds are not always effective, since the maximum degree of certainty is required, which cannot be achieved with existing traditional technologies, but thanks to the use of blockchain in the financial sector, each participant is considered as a node, which allows:

- To enable peer-to-peer (P2P) transactions, eliminating the need for intermediaries;
- Reduce the management of financial funds and credit risks;
- Speed up transactions using smart contracts;
- Improve the reliability of transactions and financial data through data immutability.

Blockchain technology in the financial sector potentially makes it easier for financial service providers to manage risks, increasing the efficiency and security of financial transactions, through optimizing instant settlements and improving auditing in the financial sector. The existing financial system excludes the possibility of instant regulation of some payments, which can take up to several days, due to the multilevel structure of the system, which includes several intermediaries. The purpose of having multiple intermediaries is to ensure the security and authenticity of transactions in a centralized environment, however, this approach contributes to an increase in settlement time and overall costs. The use of blockchain technology in the financial sector allows for peer-to-peer (P2P) transactions, which eliminates intermediaries thanks to smart contracts, facilitating instant settlements by reducing the complexity of the system. The use of blockchain-based payment systems also facilitates instant cross-border payments, that is, blockchain technology in the financial industry can significantly improve and optimize the technology of instant payments.

Auditing payments and settlements is also a lengthy and expensive process in a modern centralized system, where artificial complexity has been created due to the inability of the system to cope with the growth of data, when financial service providers face a problem when accountants and managers responsible for compliance with the rules provide a limited amount of information during inspections, which contributes to unfair behavior, violations and ineffective auditing activities. The use of blockchain in the financial sector simplifies the audit process: records in the blockchain are immutable, which allows auditors to more effectively verify compliance with requirements and processes in terms of payments and settlements, thanks to blockchain technology, transparency, integrity and the ability to track any suspicious activity are ensured, and access to information speeds up audit procedures and provides more effective control. Thus, blockchain in financial services

provides solutions to improve instant settlement and audit processes, increasing efficiency and transparency in the financial industry.

The main advantages of using blockchain technology in the financial sector as a means of payments and settlements are the following:

1. Decentralization of payments

One of the main advantages of cryptocurrency payments on the blockchain is decentralization - the absence of central authorities, such as banks or payment systems, allows users to conduct transactions directly, bypassing the need for additional fees and restrictions.

2. Transparency and security

Blockchain provides a high level of transparency and security in payment transactions, as each transaction is recorded in an immutable blockchain registry that is available for verification to all participants of the system, which reduces the risks of fraud and strengthens trust in the payment system.

3. Instant transactions

The use of cryptocurrency payments on the blockchain allows transactions to be carried out almost instantly, regardless of geographical or time constraints, which makes cryptocurrencies an attractive option for international transactions and money transfers.

4. Low fees

Since there are no intermediaries and centralized structures, cryptocurrency payments on the blockchain are cheaper and the cost of transaction fees can be significantly reduced compared to traditional financial services.

5. Innovations in financial services

Blockchain and cryptocurrency technologies stimulate the development of innovative financial products, including decentralized financial applications, smart contracts, payment gateways for businesses and other tools - innovations open up prospects for more flexible and efficient ways to make payments.

Blockchain technology has become an empirical confirmation of technological progress in the financial sector, having been widely used in various fields of the economy, opening up new opportunities for creating decentralized systems that eliminate the need for intermediaries to perform financial transactions, which guarantees a high level of data protection. In the field of financial services, blockchain technology finds application, for example, in the registration and transfer of real estate rights, which leads to a reduction in the time and costs of the process, as well as to its increased transparency and security. Blockchain networks are also used to establish electronic registers of stocks and bonds, which improves the management of rights directly from traditional paper registers.

Blockchain technology opens up new horizons in providing access to finance, simplifying delivery processes, increasing transparency and security of interactions between borrowers and lenders, greatly facilitating payment and settlement transactions between economic agents geographically remote from each other. Blockchain allows for currency exchange between users without the participation of intermediaries, which significantly speeds up operations, using blockchain, you can effectively manage the database of insurance policies, easily modify and update data, increasing accuracy and trust in the entire financial system of the state.

Conclusion

The future of cryptocurrency payments in the blockchain environment is a trigger for innovative changes in the financial sector, such advantages of the technology as decentralization, transparency, security, efficiency and low costs of payments and settlements in cryptocurrency make them attractive to both ordinary users and businesses. Innovations in the financial services sector are currently possible thanks to blockchain and continue to change the standards of financial transactions and provide new opportunities for the development of the economy and the financial sector.

List of literature

1. Khatwani R. et al. Impact of blockchain on financial technology innovation in the banking, financial services and insurance (BFSI) sector //Journal of Statistics Applications and Probability. 2023. T. 12. № 1. C. 181-189.
2. Mohsin H.J. et al. The impact of digital financial technologies on the development of entrepreneurship: evidence from commercial banks in the emerging markets //Corporate & Business Strategy Review. 2023. T. 4. № 2. C. 304-312.
3. Yang J. Features of the application of blockchain technology in the functioning of the banking sector. 2023.
4. Yap K.Y., Chin H.H., Klemeš J.J. Blockchain technology for distributed generation: A review of current development, challenges and future prospect // Renewable and Sustainable Energy Reviews. 2023. T. 175. C. 113170.
5. Mhlanga D. Block chain technology for digital financial inclusion in the industry 4.0, towards sustainable development? // Frontiers in Blockchain. 2023. T. 6. C. 1035405.

PROSPECTS FOR USING BLOCKCHAIN TECHNOLOGY IN THE FINANCIAL SECTOR AS A MEANS OF PAYMENTS AND SETTLEMENTS

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Annotation. Research into blockchain technology in finance is key to stimulating innovative solutions and improving the efficiency of existing financial systems. The object of research is the financial system. The subject of the study is payments and settlements as financial services. The purpose of the study is to explore the possibility and prospects of using blockchain technology in the financial sector as a means of payments and settlements. Modern developments in technologies such as blockchain and cryptocurrencies are driving innovative and technological changes in the field of financial transactions, offering new opportunities for making payments and settlements with increased efficiency and security. This article aims to explore the ways in which blockchain technology is transforming the field of payments and settlements, moving from conventional methods of conducting financial transactions and transactions to more modern and innovative approaches.

Key words: technological development, payment, settlement, financial operation, transaction, decentralization.

References

1. Khatwani R. et al. Impact of blockchain on financial technology innovation in the banking, financial services and insurance (BFSI) sector // *Journal of Statistics Applications and Probability*. 2023. T. 12. № 1. P. 181-189.
2. Mohsin H.J. et al. The impact of digital financial technologies on the development of entrepreneurship: evidence from commercial banks in the emerging markets // *Corporate & Business Strategy Review*. 2023. T. 4. № 2. P. 304-312.
3. Yang J. Features of the application of blockchain technology in the functioning of the banking sector. 2023.
4. Yap K.Y., Chin H.H., Klemeš J.J. Blockchain technology for distributed generation: A review of current development, challenges and future prospect // *Renewable and Sustainable Energy Reviews*. 2023. T. 175. P. 113170.
5. Mhlanga D. Block chain technology for digital financial inclusion in the industry 4.0, towards sustainable development? // *Frontiers in Blockchain*. 2023. T. 6. P. 1035405.