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CHARACTERISTICS AND BENEFITS OF BLOCKCHAIN TECHNOLOGIES

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Abstract: It is known that blockchain technologies play an important role in the innovative development of commercial banks. This article provides an analysis of the specifics of the use of blockchain technology in the activities of commercial banks, as well as suggestions and recommendations for the development of their implementation, based on modern requirements.

Keywords: commercial banks, blockchain, digital technologies, digital economy.

Introduction

In the modern age of widespread use of IT technologies in the economy, each of us is faced with such concepts as "digital currency", "digital technologies". But, despite the fairly widespread use of digital technologies in the world and their constant development, their coverage of new markets and areas in various countries of the world, most of people do not fully understand or are not at all familiar with these concepts. However, it is reasonable to consider exactly the system on which such technologies are based - blockchain.

Trends in the development of banking, investing or crypto currency over the past ten years, often overlap with the concept of "blockchain", the accounting technology that underlies the Bitcoin network. Blockchain (English blockchain, initially block chain) is a continuous sequential chain of blocks (linked list), built according to certain rules, containing information. The connection between blocks is ensured not only by numbering, but also by the fact that each block contains its own hash-sum and the hash-sum of the previous block. To change the information in a block, you will have to edit all subsequent blocks. Most often, copies of blockchains are stored on many different computers independently of each other. This makes it extremely difficult to change the information already included in the blocks.

Blocks” in the blockchain are made up of digital data. Specifically, they have three parts:

1. Blocks store transaction information such as date, time and amount (Note: this example is for illustrative purchases).
2. Blocks store information about who participates in transactions. Instead of using real names, the purchase is recorded without any identifying information using a unique "digital signature" like a username.
3. Blocks store information that distinguishes them from other blocks. Just as people have names to distinguish them from one another, each block stores a unique code called a "hash" that distinguishes it from any other block. Hashes are cryptographic codes created using special algorithms.

According to Cotillard, famous names like Morgan Hase have a strong faith in the future of blockchain technology. An American multinational investment bank headquartered in New York has opened a new division called the Quorum division specifically to research and deploy blockchain technology. Quorum is a distributed ledger and smart contract platform for enterprises that supports fast transactions and bandwidth, solving problems for the financial industry, banks and beyond. According to Resources, they have already issued a variable rate distributed ledger based annual certificate of deposit.

Drescher's book *Blockchain Basics: A Non-Technical Introduction in 25 Steps* explains the basics of blockchain technology. The basic terminology is explained by images, analogies and metaphors. This book bridges the gap that exists between purely technical blockchain books and purely business-oriented books.

R. Ayupov believes that a blockchain is a database that simultaneously stores information on many computers connected to the Internet. In our opinion, this description does not cover blockchain in detail. He also notes that the benefits of blockchain are its transparency, efficiency, simplicity and value.

One block in a bitcoin blockchain can actually store about 1MB of data. Depending on the size of the transactions, this means that one block can accommodate several thousand transactions. When new data is stored in a block, it is added to the blockchain. The blockchain, as the name suggests, is made up of several blocks linked together. However, to add a block to the blockchain, four things must happen:

- The deal must take place. In many cases, a block can group potentially thousands of transactions together, so the transaction will be packed into a block along with information about other users' transactions;
- The transaction must be confirmed. With blockchain, this job is left to the network of computers. When you make a transaction, this network of computers is in a hurry to check if your transaction happened as you said. That is, they confirm the details of the purchase, including transaction time, amount, and participants.
- The transaction must be stored in a block. After the transaction is confirmed as correct, it will receive a green light. The amount of the transaction, the digital signature of the person who made the transaction, and the digital signature of the partner organization are stored in the block. There, hundreds or thousands of others are likely to join the deal;

After checking all transactions of the block, it must be assigned a unique identification code, called a hash. The block is also given the hash of the most recent block added to the blockchain. After hashing, the block can be added to the blockchain.

When this new block is added to the blockchain, it becomes publicly available for viewing all the information about when, where and by whom it was added to the blockchain.

Blockchain technology can be considered the ideal ledger. The data in the blocks of the blockchain cannot be replaced with others, they cannot be faked or obtained unauthorized access to them, since the reliability of the information stored in the blockchain is confirmed by all owners at a time. Blockchain, from a technical point of view, is so flexible that it can be tailored to almost any need, from the use of accounting data to the system for recording votes during voting.

Thus, the main advantages of blockchain technology are:

The main advantages of Blockchain technology

Data reliability	Decentralized system	Immutability of data	Lack of intermediaries between participants	System transparency
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Fig. 1. The main advantages of blockchain

In recent years, blockchain technology has been actively implemented in the financial sector in England, Japan, USA, China and other countries. According to Spanish bank Santander, blockchain implementation could reduce banking infrastructure costs in the international payments, securities and regulatory compliance sector by \$ 15-20 billion starting in 2022. According to PwC, about 300 technology startups are currently working on solutions for the implementation of blockchain technology in the financial services sector, most of which are concentrated in the United States and Great Britain.

Uzbekistan has also taken a course towards blockchain implementation. In Uzbekistan, it is possible to implement and implement blockchain in the banking, medical and land sectors, and use it in the sector of electronic identity cards. This will greatly reduce the time spent on individual transactions, ensure the reliability of data,

make it easier to obtain government and banking services from government agencies, and reduce the likelihood of errors by government officials, making life easier for the entire population.

Based on the preliminary estimates, this will happen by 2030.

According to the majority of experts familiar with this technology, blockchain technology is one of the most promising on the market in the near future, but for its rational implementation and full use it is necessary to thoroughly study the risks and be regulated by law.

The use of blockchain in banking can provide banks with a number of benefits. In particular, foreign banks attach great importance to such advantages as reducing the level of fraud, errors and costs of document circulation, maintaining the level of competitiveness, and accelerating the processing of transactions.

The technology is widely used in the banking sector. In particular, it can be used for clearing operations, for making payments, trade financing (with letters of credit), issuing syndicated loans, for personal identification.

As a rule, banking institutions carry out active operations within a five-day working week, and even the result of some operations performed at the end of a Friday's working day, as a rule, is only visible on Monday. The implementation of blockchain technology will help accomplish these within the short time it takes to add a block to the blockchain, regardless of the time or day of the week. By using blockchain, banks also have the ability to exchange funds between institutions faster and more securely. For example, in the securities market, the settlement and clearing process can take up to three days (or longer if the transaction is carried out internationally), which means that money and shares are frozen during this time. Sometimes, even being on the road for some time gives rise to the danger and risks of transaction amounts. European Bank Santander and its research partners estimate potential savings of \$ 15 billion to \$ 20 billion annually. Capgemini, a French consulting company, has calculated that consumers can save up to \$ 16 billion annually in banking and insurance fees using blockchain-based apps.

Therefore, those banks of our country that want to service a transaction in a fairly short time, efficiently and safely manage complex clearing operations, carried out, inter alia, within the framework of cooperation with foreign banks, will have to implement blockchain technology.

Certain foreign banks continue to implement and monitor the results of blockchain implementation in order to determine in which area this technology will be most effective. And this process can take a long time.

The dangers of using blockchain technology

Significant technology costs associated with mining	Low transactions per second	History of use in illegal activities	Susceptibility to hacking
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Fig. 2. Dangers of using blockchain technology

Moreover, the use of this technology is influenced by both external and internal factors and conditions.

As a rule, first of all, the banks of Uzbekistan need to create an appropriate information and communication infrastructure and business environment. To fully implement the blockchain, other participants in the financial market will have to use it.

In addition, it is necessary to amend the banking legislation, since the laws in force have restrictions.

The development of blockchain technologies in the banking system lays the foundation for the development of blockchain technologies in other systems. With the help of blockchain technology in the tax system, the management load is reduced, it is easier for the business entity to obtain information about the movement of cash flows in the bank account and the existing files, without excessive hassle, it is possible to easily pay off tax arrears.

The use of blockchain technology is also characterized by the ability to protect transactions from cyber attacks. Security problems are addressed in several ways: new

blocks are always stored linearly and chronologically. In other words, they are always added to the "end" of the blockchain. Since the block was added to the end of the blockchain, it is very difficult to go back and change the contents of the block. This is because each block contains its own hash, as well as the hash of the block in front of it. Hash codes are created using a mathematical function that turns digital information into a string of numbers and letters. If this information is edited in any way, the hash code also changes. That is, it will be necessary to change the hash of all subsequent blocks. And recalculating all these hashes will require enormous and incredible computing power. That is, once a block is added to the blockchain, it becomes very difficult to edit and impossible to delete. And in order to ensure trust, a system has been introduced into the blockchain technology that requires "proof" by users of "themselves" in order to gain access to participation in the blockchain network. For this purpose, it is necessary to solve a complex computational mathematical problem. If the computer solves one of these problems, it gets the right to add the block to the blockchain. The process of adding blocks to the blockchain is called "mining" and is not easy. To solve complex mathematical problems, computers must run programs that require significant amounts of energy.

For unauthorized changes in information in the blocks of the blockchain, it would be necessary to control more than 50% of all computing power in the blockchain in order to be able to suppress all other network participants. Given the massive size of the blockchain, a so-called 51% attack is almost certainly not worth the effort and most likely impossible. In the event that a hacker takes possession of a copy of the blockchain, only one copy of the information will be compromised, not the entire network.

Thus, it can be concluded that blockchain technology is actively included in our economic and financial policy, since for full cooperation with foreign financial institutions, full-fledged conclusion of transactions, transactions, it is necessary to introduce and use these technologies in our country. In addition, the advantages that the use of these technologies give speak in their favor, and this can become one of the

factors in the enormous savings of financial and time resources when performing thousands and millions of financial transactions.

Also, without knowledge of this technology, in the future it will not be possible to fully navigate in the modern economy, in particular in the financial sphere, since, as crypto currencies grow, which is a phenomenon that is not subject to regulation by legislative acts of different countries, it will be difficult to take them into account when assessing monetary mass, demand for monetary resources, as well as other significant macroeconomic parameters of the country's development. But this requires a modern innovative restructuring of the country's social, financial and economic system.

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