Crossref   doi   Google Scholar   WorldCat   MENDELEY

OSCAR PUBLISHING SERVICES

🔓 **Research Article**

BLOCKCHAIN TECHNOLOGY AS A DOCUMENT MANAGEMENT AND ELECTRONIC DOCUMENT MANAGEMENT SYSTEM TOOL

S.Sh. Muminova
Nurafshan Branch Of Tuit Named After Muhammad Al-Khwarizmi, Uzbekistan

ABSTRACT

This article discusses the basic concepts in the field of blockchain technology, analyzes various types of blockchain and consensus algorithms. The advantages and disadvantages of various technologies are considered, their preferred areas of application are determined. It is shown how, based on the analysis, the types of blockchain and the consensus algorithm were selected, which are the most suitable for the implementation of an electronic document management system.

KEYWORDS

Blockchain, blockchain network roles, secure document flow, blockchain classification.

INTRODUCTION

Blockchain technology, despite almost a decade of its existence, remains relatively underused. Its idea is a distributed database, which is a chain of interconnected blocks, each of which, in addition to the main data array, contains information about previous blocks, including their storage location. The main use of the technology at the present time is monetary transactions through computer networks, especially cryptocurrencies. In addition to monetary transactions, there are also applications that are due to the following platform features: registration of transactions; conclusion of contracts; confirmation of the user's identity at the stage of his identification.

Outside banking, blockchain, in addition to standard transaction records and block data, can be used to store any other computer code, such as triggers to initiate certain actions under certain conditions. For example, the generation of related documentation, when two participants in a transaction use their keys when signing a contract. In addition, special indicators or parameters are set. When they occur, the

transaction will be signed automatically. In the field of intellectual property, a blockchain-based network allows you to determine how many times a member of the network is entitled to access the necessary content.

A distributed data warehouse, due to its security from changes, anonymity and verifiable mechanisms of work, may be of particular interest to companies. The technology, although limited, can be applied in a variety of ways:

- Factom succeeded in the field of data management. Its clients, thanks to the provided blockchain-based database, have the opportunity to conduct their activities safely;
- the Ascribe platform gives creative people more opportunities to retain ownership of their works;
- Uphold's solution ensures the security of transferring funds to other wallets and transactions with raw materials for individuals and legal entities;
- Civic's platform, thanks to blockchain technology, allows you to register, confirm personal data and protect your own credit history;
- LO3 Energy came up with the Trans Active Grid project - a decentralized platform for creating applications. In particular, it helps to measure electricity consumption;
- Follow My Vote has developed a secure system for online voting. When using the blockchain, the results are reliable and accurate;
- There is a Free My Vunk movement, which has set itself the task of exchanging virtual property in video games.

The currency is Ethereum-based tokens;

- The Advocate platform helps ordinary citizens to interact conveniently with government agencies;

- Chronicled helps people improve their consumer experience;
- Ubitquity, based on its own blockchain platform, offers other companies to securely keep records of property and related ownership.
- The technology has a number of features that ensure its reliability and trust. The advantages of blockchain are as follows:
- information about chain blocks is stored decentralized on various servers around the world. This ensures that when such data gets to strangers, they cannot do anything with it;
- in the blockchain, trust is formed not to any particular node, but to the network as a whole. This unique property is built, among other things, on cryptographic algorithms. To change the information in any block, it is necessary to change all subsequent blocks. In order for the network to recognize these changes, other nodes must confirm them. Only in the case when most of the network belongs to the attacker, such operations are possible, but in practice this scenario is unlikely and often financially unprofitable;
- resistance to attacks and data substitutions, which is due to decentralization and features of the formation of trusted calculations;
- acceleration of settlements on transactions, since the blockchain allows transactions to be carried out around the clock, 365 days a year. Banks need several days to complete the main transactions, in addition, they have working hours and days off;
- Blockchains almost always have an open source code that can be modified at the discretion of anyone with the appropriate skills. However, this makes it very difficult to discreetly change previously registered information. The latter circumstance makes blockchain a reliable technology;

- Governments of all countries of the world are trying to control the blockchain, but so far it is not working out well. Therefore, the technology immediately fell in love with most users.

In addition to such advantages as openness, security and security, blockchain also reduces transaction costs and allows organizations to get rid of unnecessary expenses.

It is also possible to use network platforms based on blockchain technology. There are even business app builders for both start-ups and established companies.

As part of the use of blockchain technology in electronic document management systems, several areas seem promising. Firstly, authentication systems for providing access to materials and cloud data storages such as Sia, which provide much more reliable storage of information than centralized databases. This is due to the peculiarities of the blockchain network structure, which are most clearly described in the functioning of the Bitcoin network. For ten years, there has not been a single software failure of the actual system blocks, only problems associated with software add-ons and associated platforms.

Systems for signing documents of various types. Unlike an electronic signature that already has regulatory support, similar cryptographic data protection technologies in blockchain services are not yet able to give legal force to protected information. This argument may lead to the conclusion that in the current situation, electronic document management is incompatible with blockchain technology.

Another point of view is also possible, based on the assumptions of the current civil law regarding cryptographic algorithms of the electronic signature. Judicial practice confirms that the types of electronic

signature - simple and unqualified - are recognized if the parties to the interaction have agreed on this.

To sign transactions in blockchain systems, public key-private key pairs are used. All generated transactions must be signed using a private key. This mechanic is no different from a simple or enhanced unqualified electronic signature in the presence of a duly certified electronic interaction agreement of this type. It has the following stages:

- each party generates a pair of "public key - private key";
- the agreement on electronic interaction or the main agreement establishes the possibility of exchanging messages signed with a simple electronic signature;
- details of the parties are registered in the blockchain network;
- the procedure for the formation of an electronic document and its signing is established.

The BlockSign registry platform is already functioning, containing electronically signed documents. Each such signature is stored on the blockchain of the Bitcoin network and is therefore unique and unmodifiable.

In building an EDMS, in addition to giving legal force to electronic documents, it is also important to implement the exchange of unstructured documents. In this aspect, the blockchain is not very suitable for storing a large number of heavy files in their original form, therefore its use is limited to storing the hash sums of documents and their verification using both electronic signature tools and hash sums. It is also useful to speed up transactions, i.e. the blockchain is suitable for records management to a much greater extent than for document management.

In the workflow between companies, blockchain can be used to speed up transactions and, ultimately, build trust between the parties. A good example of projects that use this property of the blockchain are Legium and BlockSign. Blockchain technology, in the presence of an appropriate regulatory framework, will reduce the need for intermediaries and a third trusted party when conducting transactions in electronic form to zero. It is not known whether this will happen in the near future, since the obligatory presence of operators in the exchange chain and the use of a qualified electronic signature is prescribed by law.

The use of technology directly in the exchange of electronic documents is limited and requires further study. Here are a few situations in which the use of blockchain technologies may be considered justified:

- tokenization of settlements - the issuance of electronic means of payment in the form of tokens - the absence of control over the registry by the issuer is guaranteed. Therefore, the issuer will not be able to delete records of notes issued, which creates a credibility in electronic bills comparable to that in a paper bill;

- certification of documents - the blockchain acts as a guarantor of the accuracy of information in the electronic certification system. Such a system would solve the problem of verifying the authenticity of a document by removing the need for an intermediary person;

- tracking of goods along the supply chain - the blockchain would solve the problem of authentication, combating counterfeiting and exchanging information about the location and quality of goods, since, due to immutability, the chronological order of blocks and decentralization, all participants can enter their own information and trust someone else's.

In the future, smart contracts can become very useful in carrying out economic activities, which can replace both classical contracts and procedures and regulations governing business processes. In fact, this is an environment for developing rules according to which certain events, such as transactions, occur or do not occur. Thus, inside the blockchain, it is possible to develop rules, conditions, work protocols, according to which network participants will interact.

Nevertheless, the prospects for using blockchain in providing electronic document management are already being seen in several aspects at the present time. These are records management, systems for signing and verifying documents, tokenization of settlements, tracking supply chains, as well as the use of smart contracts when making various transactions. The expansion of the use of blockchain is possible with the improvement of the regulatory framework and overcoming technical problems and limitations, which will allow for fast, reliable and secure electronic transactions. At the same time, further possibilities of its use within the framework of electronic document management remain at the level of assumptions and prospects.

REFERENCES

1. Блокчейн – что это такое простыми словами // Finfex: финансы, инвести- ции, бизнес : [сайт]. URL: https://finfex.ru/blokcheyn-chto-eto-takoe-prostymi- slovami/ (дата обращения: 06.02.2019).

2. Болдачев А. Лишнее звено: почему электронный документооборот на блокчей- не не имеет смысла // Forbes : [официальный сайт журнала]. URL: http://www.forbes.ru/ tehnologii/343787 -lishnee-zveno-pochemu-elektronnyy-dokumentooborot-na-

blokcheyne-ne-imeet-smysla   (дата обращения: 06.02.2019).

3.   Евтушенко А. ЭДО без операторов, или немного о блокчейн // ECM-journal : журн. об электронном контенте, документах и бизнес-процессах : [сайт]. URL: https://ecm-journal.ru/docs/EhDO-bez-operatorov-ili-Nemnogo-o-blokchejjn.aspx   (дата обращения: 06.02.2019).

4.   Теряева А. С., Баева А. С. Внедрение в банке электронного документооборота на основе blockchain: проблемы и перспективы // Научная электронная биб- лиотека «Киберленинка» [Электронный ресурс]. URL: https://cyberleninka.ru/ article/n/vnedrenie-v-banke-elektronnogo-dokumentooborota-na-osnove-blockchain-problemy-i-perspektivy (дата обращения: 06.02.2019).

5.   Технология блокчейн (Blockchain) – что это такое простыми словами // Mining-bitcoin: все о криптовалюте : [сайт]. URL: https://mining-bitcoin.ru/interesting/ tehnologiya-blokchejn-chto-eto   (дата обращения: 06.02.2019).