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Operating Principles and Applications of Blockchain Technology

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Abstract
This study is intended for independent users and students, all users of the blockchain form a network of computers, each of which has copies of data blocks. Usually full copies of all these blocks are stored in the required blocks. Therefore, the data in the blockchain blocks cannot be hacked, destroyed, processed, because the data on all computers must be deleted or changed. Blockchain has the following advantages: each new user expands this system and increases its tolerance; since the blockchain system is decentralized, there is no central administrator in the system; all users manage their blocks and have the ability to delete entries in blocks.

Keywords: Blockchain, program, computer, network, information, block, user, administrator.

Introduction

I. Blockchain is the only reliable technology that transmits data about arbitrary data over an open communication network. For example, financial information can be securely stored using Blockchain technology. In crypto currency systems, blockchain technology makes it possible for users to securely store and spend their virtual funds, protecting them from fraud. In addition, using blockchain technology, property rights of subscribers or organizations, electronic contracts, confidential information in the healthcare system (patients' medical records and similar confidential information), information in the field of pharmaceuticals (medicine in order to ensure the authenticity of medicinal products) and is widely used to ensure the confidentiality of information about marriage. In general, storing all textual and other types of information in blocks of blockchain chains provides a great opportunity to ensure the confidentiality of the authorities. The difference between blockchain technology and other crypto-algorithms is that changing, stealing, and similar crypto-attacks of public or private information included in blockchain blocks do not give good results to cryptanalysts. This means that cryptanalysts cannot harm the data in the blockchain chains [1-4].

II. Blockchain technology includes the following principles.

- Distribution
- Openness
- Safety

Based on these principles, all users of the blockchain form a network of computers, and each of them has copies of data blocks. Usually these are full copies of all blocks, and we keep the blocks we need. Therefore, it is impossible to damage, destroy, process, delete the data in the blocks of the blockchain, because the data on all computers must be deleted or changed. Blockchain is used from a system with at least one user to any number of user systems. Each new user expands this system and increases its tolerance.

III. Blockchain system. All information in blockchain chains is stored on users' computers. System users have equal rights and can perform various actions. In particular, there may be threats and attempts to commit fraud. But since the blockchain system is decentralized, there is no central administrator in the system. After that, as we said above, all users manage their own blocks and have the ability to delete entries in the blocks. The creation of a management system by applying blockchain technology to industries will make it possible to abandon intermediaries in systems, banks, intermediary software, state authentication departments, auditors, monitors, insurance companies.

The process above is SimBlock, produced by the Distributed Systems Group of the Tokyo Institute of Technology implemented through an open source simulator of the **blockchain network.** In this regard, blockchain borderless technology, one of the main tasks of the implementation of this technology is to protect the systems from cross-border attacks by malicious subscribers. Users of blockchain technology systems are divided into two groups.

1. System users who create new blocks in the system
2. Miners form the common blocks in the network

of users in the system, such as miners and ordinary users, is mainly used in the formation of blocks. The reason is that the process of forming blocks is a very complex process that requires a lot of resources. Therefore, not all users in the system have the opportunity to create blocks. As an example, we can cite Bitcoin, a cryptocurrency company that creates blocks and offers them to users at the rate of BTC. But this cryptocurrency is not controlled by the miner that creates it. This process can only be controlled by the user. He can sell his block, i.e. Bitcoin, to another user at any moment of time and perform financial operations of this type. We will explain this process as follows.

An arbitrary user in blockchain chains creates records in his blocks and can distribute these records to blocks, for example, to blocks "3,000,000,000 soums were allocated to the user with key X in the system" or "5,000,000,000 soums were allocated to the user with key Y in the system It is necessary and sufficient to include important entries such as "my credit debt has been extinguished in the amount of 100%". As we can see in this example, these entries in blocks are public but encrypted. In this case, records are written in the block allocated by the bank for this customer , and it can be managed only by the customer who has the key. As a result of knowing this block key, it is possible to know the amount of an open-type loan, but it is not possible to know the name of the bank to which the loan was granted, personal and financial information about the buyer. This example may seem simple, but it is a very complex process. The main calculator in the process is blocks and miners. The system has several miners, and each block in the blockchain system has its own security system. From this, most users usually send new records to the miner, and the miner writes to the block after receiving the records. Only after data is written to a block are we sure that the data is verified and valid, and no user can tamper with the data in that block. This is how blockchain technology works [5-8].

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Block structure. Blockchain blocks are composed of a header and a block body. The system of records in blocks is called a block body. Figure 1.

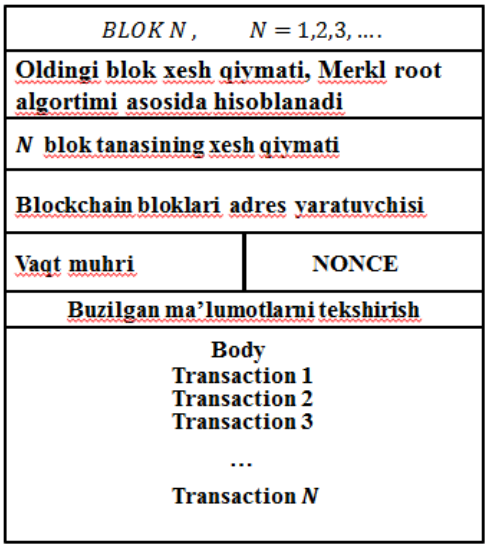

Figure 1. Block structure diagram

It is mostly blocks ***BLOK N*** pay close attention to the title. The reason is that the main secret messages in the records are stored in the header of this block. Blockchain connects all the blocks in the chain using keys, where the key of each block is added to the header of each subsequent block. This is one of the most important actions and is considered a technical solution that guarantees the safety and integrity of the block at the same time .

Above, as we said, the key of each block is calculated using the key data of the previous block with common blocks. Here are the comments on these processes.

First, on block disks, not only this block, but the records of previous blocks are encoded. In blocks, the change of one meaningless symbol in an arbitrary block leads to a complete change of keys (see Table 1), which, in turn, requires the change of keys of all subsequent blocks. Thus, it is possible to verify the authenticity of arbitrary data by seeing the keys of all the blocks of the blockchain chain. During the verification process, in new blocks that do not match the sequence number or are added to an arbitrary part of the chain, the key is mainly the entries included in the blocks themselves. In general, the authenticity and confidentiality of data can be easily ensured.

Second, the key of the block must satisfy important security rules that determine the level of security of the system, the level of security of the system changes as the number of blocks in blockchain chains increases. In this case, the keys of the blocks must start with zeros. This type of key generation enables the creation of new real and artificial blocks. However, it should be noted that one immutable key is used for each data set at an arbitrary point in time. Now let's look at the process of making keys that are applied to blocks of blockchain chains.

Potential threats to blockchain chains. Each system will have its own malicious subscribers, i.e. cryptanalysts. There are also malicious *E*users who attempt to perform actions such as creating threats to the data on the blockchains or forging records on the blocks. A malicious *E*subscriber cannot carry out cryptoattacks on block records or their keys, which is theoretically

impossible. However, *E*a malicious subscriber may attempt to deceive other users on the blockchain by adding artificial blocks. Let's see the crypto attacks on the blockchain system as follows.

IV. CONCLUSION

In conclusion, In crypto currency systems, blockchain technology makes it possible for users to securely store and spend their virtual funds, protecting them from fraud. Using blockchain technology, property rights of subscribers or organizations, electronic contracts, confidential information in the healthcare system, information in the field of pharmaceuticals and is widely used to ensure the confidentiality of information about marriage. In general, storing all textual and other types of information in blocks of blockchain chains provides a great opportunity to ensure the confidentiality of the authorities. This means that cryptanalysts cannot harm the data in the blockchain chains.

REFERENCES

1. Usmonova Mavludahon Soyibjon qizi. European Journal of Pedagogical Initiatives and Educational Practices. "Library of Programming Languages Python" Easy Delivery Methods Using Modern Information Communication Tools. Volume 1, Issue 1, April, 2023 101 Page.
2. Melanie Swan. All rights reserved. Perevod. Blockchain. Skhema novoj ehkonomiki [Translation. Blockchain. Scheme of new economy]. Moscow, Swan- «Olimp Business» Publ., 2015.
3. Usmonov Johongir Nishonboevich at all. European Journal of Pedagogical Initiatives and Educational Practices. “Interactive Approach to Nanotechnology Science Teaching”. Volume 1, Issue 1, April, 2023.
4. Mahkamov M.K., Usmonov J.N., Usmonova M.S. Digitization of Educational Processes in Higher Education. Periodica Journal of Modern Philosophy, Social Sciences and Humanities Volume 5, April, 2022. pp.90-95.
5. M.K. Makhkamov, M.S. Usmonova. Management and digitization of educational programs in higher education institutions. Scientific Bulletin of NamSU-Nauchnyy vestnik NamGU-NamDU scientific bulletin-2022. No. 4, pp. 636-641.
6. Zainobiddinov S.Z., Mamatohunov Yu.A., Rakhmatulina R. Methodology for organizing educational and methodological activities of students in the process of forming students' independence in physics lessons // European Journal of Research and Reflection in Education Sciences Vol.7 No., 2019
7. Mamatohunov Yorqinbek Abduraimjanovich. Problems in formation of cognitive independence of primary school students in the process of teaching physics // International Journal of Early Childhood Special Vol 14, Issue 05 2022. pp. 8636-8641.
8. URL: https://russian.rt.com/tag/blockchain