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BLOCKCHAIN TECHNOLOGY AS A RELIABLE METHOD OF INFORMATION PROTECTION

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Анотація
У статті розглядається блокчейн як один із найнадійніших методів захисту інформації. Проаналізовано переваги використання блокчейну в різних сферах людської діяльності та перспективи цього криптографічного методу.

Ключові слова: блокчейн, криптографія, алгоритм, підробка, спотворення, хеш.

Abstract
The article considers blockchain as one of the most reliable methods of information protection. The advantages of blockchain use in different spheres of human activities and the prospects of this cryptographic method are analyzed.

Keywords: blockchain, cryptography, algorithm, forgery, distortion, hash.

Introduction

With the development of technologies digitization of all spheres of human activity and the need for more reliable algorithms for encryption and information security are increasing fast. This is due to the fact that new and more original ways of stealing personal or even government information are constantly emerging, leading to the use of illegally obtained data for the sake of self-profit or destabilizing the world economies. Special protection is needed by state institutions that retain important information about their citizens, about the country's defense capability and the budget, as well as financial institutions that control the money circulation and hold private information about their clients. This is necessary in the field of education too, in particular to protect students personal information, diplomas issued by the ministry, etc.

Basics

The most recent and by far the most reliable way of encryption is blockchain technology. Blockchain, that is, a block of transaction blocks is a distributed database that stores an orderly chain of records (so-called blocks) that is constantly lengthening. Data is protected from forgery and distortion. Each block contains a timestamp, the previous block's hash - function, and transaction data submitted as a hash tree.

This technology is reliable because each block is stored on each device that is connected to a particular network. Blockchain works in such a way that every member of the network records all activities and transactions that take place in it. Even if one device is hacked and the data in it is tampered with, it will automatically replace all its information with data taken from any other participant in the network that will match the information of all others. This guarantees fake protection since most devices cannot be hacked on large networks. Of course, for small private and relatively small corporate networks, blockchain technology is a bad decision because a certain group of programmers is able to steal information hash that needs to be protected. But for the Internet, blockchain is a real technological revolution, because no matter how large a group of hackers are, it is impossible to physically hack most of the planet's devices.

Figure 1 shows a block diagram containing the hash of four transactions.
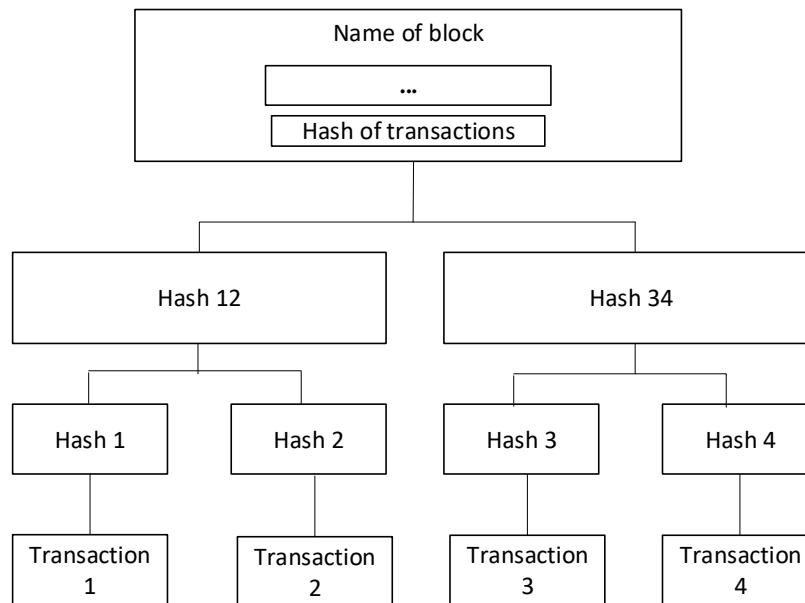

Figure 1

Blockchain technology is at the heart of many cryptocurrencies, including bitcoin.

Melanie Swan wrote in her book «Blockchain - Blueprint for a new economy»: "The blockchain is a revolutionary paradigm for the human world, the" Internet of Individuals, "and it could also be the enabling currency of the machine economy".

Despite the prospects of blockchain technology, implementing this idea is a very difficult process, as each device must have the appropriate software. Alternatively, international regulations could be adopted that would oblige device manufacturers to install an additional program so that users could not remove it. These rules must be upheld by the legislatures of all countries, which is disadvantageous to existing financial systems. The introduction of this technology will reduce the need for people to use the services of banks as a legal intermediary, as people will be sure that their money is safe. As a result, it will not be necessary to allocate funds from the state budget for the maintenance of all banks, and to direct these resources to the development of other spheres of activity such as medicine, education, infrastructure, etc.

Conclusion

In the long run blockchain technology gives humanity enormous benefits and solves many existing problems. The main obstacle to adopt relevant laws is non-perfect international legislation and little interests of developing countries governments. This technology is hoped to arise great interest among various strata of community.

REFERENCES

1. *Pedro Franco*. Understanding Bitcoin: Cryptography, Engineering and Economics. — John Wiley & Sons, 2014. — 288 p. — ISBN 978-1-119-01916-9.

2. Дон Тепскотт, Алекс Тепскотт. «Блокчейн-революція». Переклад з англійської Юлії Григоренко, Ганни Лелів. Львів: Видавництво «Літопис», 2019. 492 с. ISBN 966-8853-58-6

3. *Melanie Swan*. Blockchain: Blueprint for a New Economy. — 2015. — 152 p. — ISBN 978-1-4919-20473.

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