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### **Education of engineers for the 21<sup>st</sup> century**

The article examines the influence of modern innovative trends on all areas of life including education. The author believes that the technological progress leads to necessity to educate new professionals needed by society. Due to the rapid development of the digital world, the blockchain technology is getting more and more popular. In this regard, information security engineers are in great demand.

Key words: blockchain engineers; cryptography; cryptocurrency; blockchain technology; innovative trends.

In the nearest future, the majority of the professions will be related to computer technologies. Also, their rapid development leads to the emergence of new professions. In particular, not so long ago, a completely new software development appeared, it is called the blockchain technology, that is still little known to a wide range of users. Because of its fundamental difference, this technology has practical benefits in the security system. Despite the fact that blockchain technology penetrates into various areas of our life very slowly, it has great potential for business. Its use can reduce operating costs, increase the speed of transaction processing, and increase the level of protection of stored information what is important in the modern world because most of the information is saved in digital form. Experts are already confident that by using blockchain technology, you can achieve a higher level of protection of personal information from hacker attacks [1, p. 350].

In this article, there was an attempt to highlight advantages of new technological tendencies in the field of IT. These technologies will definitely affect all of us in future and some of them have already affected. Thus, you need to keep up with the times and be comprehensively developed specialist.

Today, the study and implementation of this technology leads to the necessity to create of an absolute new profession – a blockchain engineer. Blockchain engineers and developers are specialists in a wide range of IT technologies who are engaged in blockchain development; work with decentralized services and cryptographic tools.

Cryptography is a method of using advanced mathematical principles for saving and transmitting data in special forms, when information can be read only by people for who it is intended.

Blockchain is a chain of blocks, which form database. The devices that store this distributed data do not have a shared server. Each block is an ordered record that contains a reference to the previous block and a timestamp. The list of blocks inside the database is constantly growing.

The principle of the blockchain is to combine digital records into blocks.

Difficult mathematical algorithms link these blocks together in a chronological cryptographic chain – new blocks are located at the end of this chain [2, p. 217]. You cannot move block to another location; the system rejects this acting because of mismatch in timestamp and structure. All data about the cryptosystem is saved on a set of separate computers that are nodes of the network. All changes to the current state of the system are registered and confirmed by each node. Virtual coins are generated by performing cryptographic calculations, which at the current level of computer technology completely eliminates the possibility of forgery.

Blockchain technology is applicable not only in the economy of the future, but also in those areas where it is necessary to improve the security of confidential information. Features of the blockchain system are a continuous and sequential chain in which copies (blocks) are stored independently of each other on electronic media, without the possibility of penetration by third-party users, which, in comparison with modern multi-level banking security systems, is an absolute advantage.

In addition, all data with cryptocurrency wallets and transactions is stored in Blockchain.

Cryptocurrency are one of digital money type which don't have a physical form. Creation and control of these currencies are based on cryptographic methods. Cryptocurrencies in some countries (Germany, Venezuela) are equated to national financial instruments, each of the virtual coins has its own exchange rate relative to the US dollar and other traditional currencies.

Cryptocurrency mining is main technology of creation new virtual coins.

Each block consists the current time, a record of some or all recent transactions, a link to the block that went directly before it and other things. The answer for every block is unique. In this regard, it is like a mathematical puzzle to solve, it is impossible to crack a code. New blocks cannot be sent to the

network without a correct response. The math problem in each block is extremely complex, but confirms that the solution is correct. There are several valid solutions for any given block. To solve a block, you need to find only one of the solutions [3, p. 270].

Along with all benefits that this area of engineering offers, there are some drawbacks, which should be taken into account. They are the following:

- Rate of Cryptocurrency is very flexible.
- The loss of the secret key is equivalent to the withdrawing money from your electronic wallet.
- The security and complex mathematical devices of the entire system slows down the speed of the operation.
- The profitability of mining process becomes more complicated due to the increase in the number of coins mined.

In conclusion, it should be noted that due to the popularity of cryptocurrencies, blockchain technology would become more and more widespread all over the world. Now it is implementing very fast in different areas of our life because of rapidly developing information society.

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### **The teacher's roles in the contemporary educational process**

The article attempts to examine the transformation of the teacher's role in the education process. The description of modern trends in Higher Education has been provided. The roles of teachers have been listed. The model illustrating the roles of a contemporary teacher in correlation with the lesson format and the skills to be trained has been presented.