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Ivan Dykushar<sup>1</sup>, Olena Syvachuk<sup>2</sup>

<sup>1</sup> student of group E-418a NU “Zaporizhzhia Polytechnic”

<sup>2</sup> senior teacher NU “Zaporizhzhia Polytechnic”

## **BLOCKCHAIN TECHNOLOGY. BLOCKCHAIN IN THE POWER INDUSTRY**

Blockchain is one of the methods of distributed data storage. This technology can be used to record and track any kind of information, from medical records to elections.

The main difference between a blockchain and conventional databases is decentralization. What it means is that no regulator or organization monitors this process. Also, information is not concentrated on servers in one place, but distributed in a huge network of computers around the world. The importance of blockchain is that business depends on data. The speed of acquisition and the accuracy of the data play a decisive role. Blockchain is ideal for providing such information as it offers authorized network participants instant, shared and fully transparent access to information in an immutable ledger.

It is believed that distributed ledger technology was invented by Satoshi Nakamoto in 2008 as a ledger for the world's first cryptocurrency, bitcoin. However, it is not known for certain whether a person with that name actually exists or is it a pseudonym behind which a whole group of people is hiding.

Now blockchain is used not only in cryptocurrencies. In addition to the fact that it is impossible to make changes to the technology, it eliminates the need for a third party in transactions. That is, participants do not need banks or lawyers as intermediaries. Blockchain began to be used in banking systems, because, due to its transparency, it becomes "corruption resistant".

Experts in various fields point to the growth of the blockchain solutions market. At present, blockchain technology is actively used in the financial sector. But this technology has potential in the energy sector as well. Energy supply companies have to constantly interact with a big number of customers and process their requests. And sometimes the time to resolve issues is delayed for a long time. In addition, such a management system requires constant monitoring and maintenance of the database. Blockchain is able to solve these problems by processing data in automatic mode.

Alternative sources of electricity, such as wind and solar generators, can cover a significant amount of electricity, but due to unstable returns they require a more advanced accounting system. Therefore, blockchain is suitable for such management. Everything that is now taken into account by a person in spreadsheets will completely move under the new technology. It is the decentralized approach that will ensure the most effective interaction on the "seller-buyer" system. The new technology allows the seller and buyer of electricity, connected to the blockchain network via the Internet, to directly interact with each other by conducting cash payments. International energy companies are already developing projects based on blockchain. Currently, these projects are aimed at either to give consumers who own small generation the opportunity to trade electricity, or simply to connect sellers and buyers of electricity. At the same time, experts have no doubt that blockchain technology will contribute to further decentralization of energy systems

At the same time, the energy sector is different from the financial sector, where the blockchain concept was born and flourished. In the energy market, it is necessary, in addition to monetary transactions, ensure the physical supply of electricity. To do this, you need to flexibly use the network infrastructure, the availability and management of which pose serious challenges for the application of the new concept. At the next stage of technology development the network management problem is likely to be resolved.

The main advantages of blockchain are as follows: stability, trustless system, distribution. Confirmed blocks are almost never cancelled, so it is very difficult to delete or change the data registered in the blockchain. In most traditional payment

systems, transactions depend not only on the two participants in the transaction, but also on an intermediary: a bank, a card issuer, or a payment provider. When using blockchain technology, the need for them disappears, since a distributed network of nodes validates transactions using mining. For this reason, blockchain is often referred to as a “trustless” system.

The main disadvantages of blockchain technology are 51% attack, data changes, private keys. "51% attack" occurs when an attacker or organization manages to take control of more than 50% of the total hash power, which allows transactions to be excluded or reordered. Another disadvantage of the blockchain is that once the data is added, it is very difficult to change it. Although stability is considered an advantage of blockchain, it is not always a good thing. Changing the data or code of a blockchain usually requires a lot of effort and often a hard fork – creating a new chain and stopping work in the old one. Blockchain uses public key cryptography, giving users ownership of their blockchain data. Each blockchain address has a corresponding private key. Users can freely share the address, but the private key must be kept secret.

Despite its shortcomings, blockchain offers unique benefits and continues to evolve. In the next few years, companies and governments will experiment with new uses of blockchain and try to capitalize on it.