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Blockchain in Logistics

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Today different technologies significantly affect the basics of the economy, business and the state. Changes in approaches to running business have led to the need for a technology that can ensure transparency and security of all related processes – Blockchain. When mentioning blockchain, people mostly remember about cryptocurrency – digital money. However, technology is already used in many areas including logistics.

Blockchain is a way of storing information in which data is written to blocks in a distribution registry. The information is not stored by one person, it is duplicated by each participant of the system. Therefore, any user has the transaction history of other people – deception is impossible.

Just 100 years ago, supply chains were simple and rarely went beyond regions. Globalisation across the planet, combined with the automation of all processes, has brought about fundamental changes in managing the movement of goods.

Due to the increasing complexity of supply chains, large companies are constantly talking about the introduction of blockchain in logistics, but only a few have done it. About a third of firms master blockchain and accumulate information. Consequently, corporations mainly use usual methods of communication to contact each other: e-mail, telephone or messengers. Meanwhile, people's demands are growing, and it is necessary to master new ways of communication with the consumer. In addition, it is necessary to process a large amount of information and transfer it to other parties.

International transport occupies an important position in the global economy. The process of delivering goods over long distances is complex. Even with the development of IT technologies, finding transport remains the main problem. So intermediaries take an advantage of this. The more players in the supply chain, the more expensive it is. Owners cannot constantly track the cargo during its delivery, so the problem of smuggling still exists. The situation is complicated by the processing a large number of documents and customs clearance. Blockchain can help overcome all these factors that negatively affect business.

There are some key processes that would benefit most from the blockchain technology implementation into the supply chain and logistics. First of all, inventory and cargo tracking. The technology can be used to create a unified digital document management system in the cloud that enables supply chain players to track the real-time location of vehicles, cargo and their products. For example, Unilever uses Provenance blockchain to manage its tea supply chain. More than 10,000 farmers, many banks, retailers and transport companies are involved in the project.

Secondly, verification of authenticity and quality. The blockchain technology makes it possible to trace the origin of goods from the shop counter to a specific manufacturer: a factory, a farm, a business, a person. And this data has a high degree of reliability, because each batch of goods is equipped with an RFID tag that constantly tracks the location of the goods and the interactions between participants in the supply chain. For example, Everledger uses blockchain for the diamond industry. The register stores data on the origin of the gemstone, colour, clarity, cut, carat weight, certificate number and other information.

Thirdly, freight and delivery improvement. IBM estimates that blockchain adoption could save the logistics industry \$38 billion a year. This will be made possible by smart contracts that

automate much of the paperwork and business processes. In addition, the distribution registry will reduce errors, shorten delivery times and detect fraud.

Finally, improving transparency. Because all data is stored on a blockchain, everyone in the supply chain can check information on each vessel, container and/or cargo at any time, reducing the chance of discrepancies in the documentation of different parties [1].

To implement blockchain in transport logistics, companies have to overcome many challenges.

1. Different types of information storage. Not all blockchain companies apply uniform database models.

2. Implementing blockchain into an existing information system. Existing IT algorithms are not equipped with the software to implement the new method.

3. Development of the technology. Blockchain is constantly changing and improving. If the method is implemented immediately, new problems may arise.

4. Information flow. When it comes to international logistics, managing data from so many participants becomes difficult [2].

In conclusion, I'd like to add that in order to integrate Blockchain effectively, it is necessary for companies to be active and constantly work with innovative technologies. They need to cooperate with each other, identify weaknesses in the system and share information.

References:

1. Blockchain – прорыв для современной логистики [Electronic resource]. – Mode of access: <https://www.4logist.com/blockchain-breakthrough-for-modern-logistics/>. – Date of access: 14.04.2022.
2. Как блокчейн помогает в логистике [Electronic resource]. – Mode of access: <https://merehead.com/ru/blog/how-blockchain-helps-in-logistics/>. – Date of access: 15.04.2022.