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BLOCKCHAIN TO IMPROVE THE INTERNET OF THINGS
БЛОКЧЕЙН ДЛЯ УЛУЧШЕНИЯ ИНТЕРНЕТА ВЕЩЕЙ
ИНТЕРНЕТ АШЁЛАРНИ ЯХШИЛАШ УЧУН БЛОКЧЕЙН

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Annotation

The article presents the integration of blockchain and the Internet of things, their advantages and existing problems. It also examines the relationship between blockchain and the Internet of Things and discusses how blockchain can solve potential problems of the Internet of Things. Examples of using blockchain and the Internet of things are shown.

Keywords: Blockchain technology, network security, Internet of Things security and privacy, logistics, smart Homes.

Аннотация. В статье представлена интеграция блокчейна и интернета вещей, их преимущества и существующие проблемы. Также рассматриваются отношения между блокчейном и интернетом вещей и говорится о том, как блокчейн способен решить возможные проблемы интернета вещей. Показаны примеры использования блокчейна и интернета вещей.

Annotatsiya. Maqolada blokcheyn va Internet ashyolarning integratsiyasi, ularning afzalliklari va mavjud muammolari keltirilgan. Shuningdek, u blokcheyn va Internet ashyolari o'rtasidagi munosabatlarni o'rganadi va blokcheyn Internet ashyolarining potentsial muammolarini qanday hal qilishi mumkinligini muhokama qiladi. Blokcheyn va Internet ashyolardan foydalanish misollari ko'rsatilgan.

Introduction. The Internet of things (IoT) connects people, places and goods, allowing the creation of high-quality products and business processes. Sensors and chips are transforming our work processes. However, when such technologies are applied on a large scale, safety becomes an important issue.

Blockchain technology is critical to the development and security of the Internet of Things: it can improve data encryption and increase trust. The article discusses the relationship between blockchain and the Internet of things and talks about how blockchain can solve possible problems of the Internet of things.

Research object and methods. Integration of blockchain and Internet of things: advantages and problems. Large-scale implementation of the Internet of Things is just around the corner thanks to technologies such as smart cities. They promise to make our lives more convenient: cities will be free of traffic jams, become more environmentally friendly and energy efficient [1,2].

But such a large-scale implementation creates certain difficulties:

• Network security. Thanks to the development of 5G networks and their interoperability, such networks can become a target for hackers.

• Data from different sources must interact and be integrated at the same level. Privacy, data ownership and security must be ensured.

• Potential danger for IoT devices because one defective device can attack other devices on the network.

In general, the main problem is to ensure the privacy and security of data transferred from one network to another. These are the problems that blockchain technology can solve [3].

Research results and their discussion. Here are the benefits of integrating blockchain and the Internet of Things: Data authenticity to ensure quality. Due to its immutability, blockchain technology gives processes a reliable structure, allowing data manipulation to be accurately and quickly detected. Monitor devices to detect errors. IoT networks can be gigantic, and failure patterns can be difficult to track. Blockchain technology assigns each endpoint a unique key, which helps track inconsistencies. Smart contracts for fast automation. IoT technology itself facilitates automation, but with smart contracts, automated responses can be authorized through the network. Decentralization for security. The blockchain is decentralized, so regardless of the connection method, cybercriminals will not be able to attack any server and corrupt their data. Use logs to evaluate employee performance. Blockchain can track user activity: who uses the device, when and how [4,5].

Blockchain for Internet of Things security and privacy. Let's consider the integration of blockchain with Internet of Things devices in business.

Internet of Things devices are capable of processing large amounts of data from different organizations, so in the event of a cyber attack, it will be difficult to find the source of the data leak, as well as determine its owner.

Blockchain can reduce the associated stability and security risks. Here's what blockchain does:

1. Increases the level of security when storing data collected by Internet of Things devices: it is more difficult for hackers to gain access there.

2. Provides a more secure level of encryption: it becomes impossible to overwrite existing records.

3. Brings transparency: It allows any authorized user to access the network and track past transactions [6].

4. Speeds up transaction processing and coordination among billions of connected devices.

5. Increases trust among participants and helps companies reduce costs by eliminating overhead processing associated with IoT devices [7].

6. The system, protected from distortion and counterfeiting, eliminates the control of one organization over all the data collected by Internet of Things devices.

Scientific research results and conclusion. Examples of using blockchain and the Internet of things. The integration of blockchain and the Internet of Things creates a marketplace of connected devices where companies can collect data and use it to create value. Here are just a few possible ways blockchain and the Internet of Things can be used for security and privacy [8].

Financial sector. Some banks, such as ING, Deutsche Bank and HSB, are already using blockchain technology to create a scalable, decentralized environment for IoT devices, platforms and applications.

Logistics and supply chain. The supply chain involves many participants, payments and accounts, all of which hinder transparency at all stages. Therefore, many companies want to develop IoT devices that can track vehicles and deliveries.

Automotive sector. Automotive industry giants are investing in the development of automated vehicles equipped with Internet of Things sensors. And with the help of blockchain, automatic payments at gas stations, autonomous cars, smart parking and automated traffic management become available.

Smart Homes. It is obvious that the Internet of Things plays a leading role in these systems. Its integration with blockchain allows you to remotely manage a security system, eliminate centralized infrastructure, or store personal data (biometrics or facial and voice recognition data) in a secure manner.

Pharmaceuticals. Counterfeiting of medicines is a problem that is becoming more serious every day. The transparency of the blockchain and the ability to track all changes allows you to control the entire supply chain.

Agriculture. Technologies have the potential to transform this vitally important human activity at all stages, from production to retail sales. IoT sensors can be installed on farms and send data directly to the blockchain network to improve the supply chain. However, there are many more ways to use it, and some companies are already using new technologies in practice.

Final conclusion. Some inspiring examples have been offered, but the potential of the Internet of Things and blockchain is much broader. Billions of IoT devices are becoming the foundation for a new ecosystem of smart machines, and integration with blockchain makes them more secure.

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