

ICT for Development Essay

—Blockchain technology for Development

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Abstract

Recent years, the policy environment of the blockchain industry has been significantly optimized, the technical capabilities have been rapidly improved, and the application of the industry has gradually expanded. Despite this, it still needs to pay attention to the blockchain security risks, the core technology needs to be broken through, the blockchain technology needs to be deeply integrated with the real economy, and talent gap in blockchain industry is large.

1. Current situation

Currently, blockchain technology is still immature and still in the early stages of development. Technological innovations in blockchain performance, privacy security, and scalability are emerging.

With the continuous development of blockchain technology, the industry chain has been continuously improved, social cognition has been gradually improved, scenes have become increasingly rich, and blockchain application effects have gradually appeared. This is mainly reflected in two aspects.

First, the blockchain is first used in natural digital scenes such as cross-border payment, digital content copyright, and electronic deposit.

Second, the blockchain is used in traditional multi-party collaboration scenarios. The blockchain technology realizes data disclosure, transparency, non-tampering and traceability, reduces the trust cost of all parties, improves the efficiency of collaboration, and enables in-depth application in the business areas where supply chain finance, traceability, etc. require multiple participants to collaborate.

2. Blockchain promotes development

One aspect of a widely discussed blockchain-based SCM is that distributed ledgers can potentially improve traceability and establish a source record of goods from start to finish. Tracking information on the source of raw materials, production, inspection, transportation methods, duration and environmental factors can be instant updated to ensure a transparent and trustworthy blockchain.

The transparent real-time supply chain system enables manufacturers to quickly detect and resolve unexpected problems. Whether it is a product error or a security breach, the blockchain can be used to identify the cause of the problem, further reducing the cost of product manufacturing services.

Another exciting supply chain advantage of the blockchain is how companies manage more valuable data.

Currently, data is getting more and more valuable, and it will increasingly need to be exchanged in an efficient and collaborative way. Since blockchain technology can see documents and process chains, and supply chain partners can check the authenticity of products and processes at any stage. And every transaction can be audited and tracked. It is much harder for hackers to attack distributed networks than traditional centralized networks, because it is meaningless for a distributed network to attack a single node, unless all nodes are invaded to modify the data. Each time a data is stored or inserted, a new block is created. When a hacker invades a block, a new block is created and easily traced.

Last but not least, blockchain can help autonomous machine maintenance.

The industry 4.0 era will use a large number of advanced automation equipment, sensors and actuators, the maintenance of these machines will be a difficult task, plant managers may need to master more advanced technology to meet the requirements of maintenance equipment. Also, if it is a quantity of equipment, it is challenging to maintain.

Some plants are experimenting with new ways to maintain equipment, such as state-based maintenance, predictive maintenance, using artificial intelligence to automate diagnostics and alert employees to maintenance when problems are discovered, reducing costly downtime. In this process, the blockchain can make the machine more autonomous. When the machine is damaged, it can automatically place replacement parts, and the manufacturer and the parts supplier are tightly connected through the blockchain.

Overall, as technology continues to mature, the link between the blockchain and the real economy will become increasingly close. At the same time, the blockchain empowerment of the real economic consensus will help the manufacturing industry to work together to promote the transformation of the entire industry to the modernization model.

3. Challenges

There are many security risks in the core technology, mechanism and application deployment of blockchain. The illegal elements use related vulnerabilities to carry out attacks, and security risks are frequent. It is mainly divided into three categories: blockchain technology security, blockchain ecological security, and blockchain security.

Blockchain technology security is mainly caused by the imperfect core technology or mechanism of the blockchain itself, including consensus mechanism and intelligent contract logic vulnerabilities, cryptographic algorithm security, and P2P network mechanism security. . The ecological security of blockchain mainly refers to various security issues in the ecology of blockchain industry. For example, encrypted digital currency exchanges, mining pools, websites are subject to DDoS attacks, wallets are exposed to DNS hijacking risks, and various information leaks, phishing, account theft, etc. caused by imperfect or improper exchange management policies.

The use of blockchain security is primarily a potential security issue for users using blockchain applications. For example, private key management is not good, encountering Trojan horses, account theft, etc. In terms of blockchain information security, it is mainly the use of blockchain technology to make use of blockchain technology to tamper with the security regulatory issues caused by illegal information or file chaining.

In general, blockchain security incidents are highly prone and require special attention.

4. Solutions

First, improve the awareness of blockchain security risks, and organize forces to conduct continuous and normalization research on blockchain security risks.

According to the characteristics and development of blockchain technology, the blockchain technology, application potential risks, and changing means and methods of attack are continuously tracked and analyzed to develop security risk development trends and enhance security risk prevention awareness.

The second is to study and develop safety technology requirements and safety standards for blockchain technology, platform and application ecology.

Identify the main threats to the blockchain technology, platform, and application ecosystem, and the corresponding security system architecture, and propose security technology requirements for each key module to form a blockchain security standard system.

The third is to study the blockchain security risk detection and response technology in depth. For the different types of potential security issues such as blockchain core technology and mechanism, platform architecture, application deployment, etc., research solutions to cover the coding, operation, deployment and management of blockchain.

5. Reference

1. Maja Vujinovic: Manufacturing and Blockchain: Prime Time Is Yet to Come
2. Peter Fedchenkov: Value of blockchain in manufacturing