Chapter 65
Applying Blockchain Security for Agricultural Supply Chain Management

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ABSTRACT

Blockchain technology permits a highly secured record keeping and digital transaction. Blockchain technology is changing the digital world and industry by bringing a new view to security, transparency, and efficiency of systems. It provides a safe way for the exchange of products, services, or transaction. Blockchain will enable more agile value chains, faster product innovations, closer customer relationship sector. This paper provides an overview of blockchain technology and its potential in developing a secure and reliable agriculture supply chain management. Agriculture supply chain management systems are vital for getting food products delivered from farmers to the consumers. Blockchain technology can also be used to achieve better prices and payment options, land title registration and for transparent disbursement of subsidies to farmers.

INTRODUCTION

In recent years, the security concern is increasing exponentially and the technologies being developed for the same are also advanced. Blockchain can a futuristic technology and it will be particularly used for secure end-to-end transactions in terms of payments, values, trades in the supply chain, etc.. The blockchain technology can be implemented in various sectors like retail, healthcare, logistics, manufacturing, and communication. Technology can be simply characterized as a decentralized, distributed ledger system. Blockchain sometimes is also termed as Distributed Ledger Technology (DLT). Nowadays, blockchain technology is also implemented and been used in various government sectors for administrative purposes like land deals and land authentication. The government of Kerala has implemented various methods to use blockchain technology to the technologies purchase process and provide a network of vegetables, fish, and various other small scale retail networks. Blockchain technology originated from the bitcoin technology in 2008, having various characteristics such as decentralized, distributed, providing asymmetric cryptography, smart contract, and time stamp. The blockchain technology has a key contribution to allow building confidence and trust among people without any centralized body, by providing mathematical solutions to the problem of trust. The main aim of blockchain technology is to confirm that the information is authentic and not tampered by a group of hackers on the net by "sharing" and "checking" all accounts within the network. Blockchain technology can be summed up as decentralization, consensus trust, collective maintenance, and a reliable database.

With inspiration for blockchain technology and a bitcoin system, the agricultural supply chain system can be developed with a distributed network of the participants including the farmers, end-users, distributors, retailers, small scale business owners. The key component of such supply chain systems is replicable and shared data encrypted and decrypted using SHA-256 algorithms. In an agricultural supply chain using blockchain technology, we can put all the knowledge and information about the crop produced by a farmer and transactional details and event onto blockchain nodes within a network to enable transparent, reliable authenticated and trusted source of data for the farmers. Farmers can put data associated with the food such as quality, payments, the demand of the crop and selling price of the crop, etc. all at one platform(single network)Blockchain will help in setting up a direct link between farmers and consumers, retailers and small scale business owners. It will empower and encourage small farmers to prepare themselves and acquire together to achieve the market without any help from third-party elements like distributors and retailers. The peer-to-peer network is used in blockchain technology and everybody is allowed to affix.

LITERATURE SURVEY

Fran Casino et al. (Casinoa, 2019) has proposed a survey-based application of blockchain and its tremendous usage in various categories. The team has classified in terms of privacy & Security, Education, Health, IoT, Governance, integrity verification, financial, data management & business. This field is wide open with full of research issues enlisted in this paper. There is another survey given by Marco Conoscenti et al. (Conoscenti, 2016) where they have discussed the Use Cases of the Blockchain beyond Cryptocurrencies, along with various categories based on implementation differences.

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