Research Paper of Blockchain Technology Applying on Food Nutrition Delivery

Freshwhile: The Anatomy of a Blockchain-Enabled Traceability System for Fresh Produce Supply Chain

Abstract:

In this paper, we present Freshwhile, a prototype Blockchain supported system that enables us to trace the delivery of fresh produce from end to end. We use a combination of Blockchain and IoT technologies to track the freshness of produce from the farm to the consumer.

Freshwhile is designed to be a low-cost, low-power, and low-complexity system that can be easily deployed in the real world. We also present a novel method for calculating the freshness of produce based on the estimated best before use date, temperature and humidity of the produce.

Within the best before use date of the produce, the freshness of the produce is calculated based on the temperature and humidity of the environmental condition during delivery.

This research paper examines the benefits and challenges of using blockchain technology in food nutrition delivery. Blockchain technology has the potential to enhance the food industry by increasing transparency and traceability, reducing fraud and waste, and improving food safety.

However, in the past, implementing blockchain technology also presents challenges such as cost, scalability, and interoperability. This paper analyses the advantages and disadvantages of blockchain in food nutrition delivery, and proposes recommendations for future research and development.

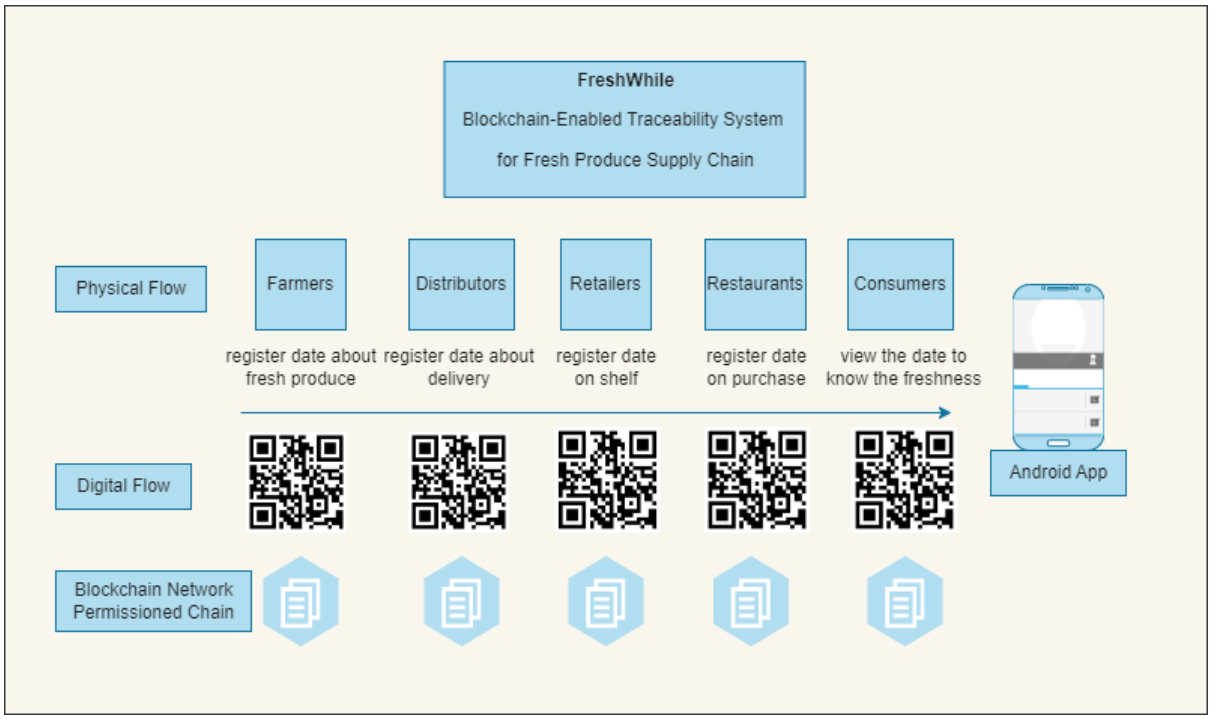

Fig 1. Diagram to illustrate the physical flow of fresh produce and digital flow of information

Introduction:

The food industry faces various challenges related to transparency, traceability, fraud, and food safety. These challenges can lead to serious consequences such as outbreaks of foodborne illnesses, economic losses, and loss of consumer trust. Blockchain technology has emerged as a potential solution to these challenges. Blockchain is a decentralized, secure, and transparent ledger that records transactions in a tamper-evident manner. Blockchain technology has already been applied in various industries, including finance, healthcare, and supply chain management. In the food industry, blockchain technology has the potential to improve transparency, traceability, fraud prevention, and food safety.

Benefits of Blockchain in Food Nutrition Delivery:

Blockchain technology can provide several benefits in food nutrition delivery. First, blockchain technology can increase transparency and traceability in the food supply chain. By recording transactions in a tamper-evident manner, blockchain technology can ensure that the information about the origin, quality, and safety of food products is accurate and reliable. This can help reduce food fraud, increase trust, and improve the efficiency of the food supply chain. Second, blockchain technology can reduce waste and improve sustainability. By providing real-time data on food inventory, supply, and demand, blockchain technology can help reduce food waste and improve the efficiency of food distribution. Third, blockchain technology can improve food safety by providing real-time monitoring and tracking of food products. By identifying and addressing potential food safety risks, blockchain technology can help prevent outbreaks of foodborne illnesses and improve public health.

Challenges of Blockchain in Food Nutrition Delivery:

Implementing blockchain technology in food nutrition delivery also presents several challenges. First, blockchain technology is expensive to implement, especially for small and medium-sized businesses. Second, blockchain technology requires significant computational power, which can make it challenging to scale up. Third, interoperability between different blockchain platforms can be a challenge, which can limit the effectiveness of blockchain technology in food nutrition delivery.

Conclusion:

Blockchain technology has the potential to enhance food nutrition delivery by improving transparency, traceability, fraud prevention, and food safety. However, implementing blockchain technology also presents challenges such as cost, scalability, and interoperability. Further research and development are needed to address these challenges and fully realize the potential of blockchain technology in food nutrition delivery. Governments, industry stakeholders, and academia can collaborate to overcome these challenges and create a more efficient, sustainable, and safe food supply chain.

References:

1. Wang, L., He, Y., & Wu, Z. (2022). Design of a blockchain-enabled traceability system framework for food supply chains. Foods (Basel, Switzerland), 11(5), 744. https://doi.org/10.3390/foods11050744

2. Wu, H., Cao, J., Yang, Y., Tung, C. L., Jiang, S., Tang, B., Liu, Y., Wang, X., & Deng, Y. (2019). Data management in supply chain using blockchain: Challenges and a case study. 2019 28th International Conference on Computer Communication and Networks (ICCCN).