

## Chapter 64

# Blockchain and IoT Integration in Dairy Production to Survive the COVID-19 Situation in Sri Lanka

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### **ABSTRACT**

*The epidemic crises place massive burdens on our economies. The risk of food supplies is also pushing massive stress on food vendors around the world. There are big problems associated with supply chains framework. Farmers do not receive payment upon delivery of their supplies. The buyers do not have access to finance that will enable them to pay farmers on time. To solve this problem, the authors proposed a dairy production system integration with blockchain and IoT. Blockchain is a decentralized digital ledger technology that allows network participants to trust each other and interact. The dairy product system can check the temperature of the product in real-time by using the website application. Moreover, customers can get notifications when the policy found problems related to temperature values. The blockchain database confirms the information security of the system by using the proof of work algorithm to create the transactions and the blocks. Therefore, the proposed methods can use sensitive data with reasonable time consumption, and no block creation fees are needed.*

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## **INTRODUCTION**

Every day we consume food products on the basis of the confidence because that providers are produced, warehouse and transported in agreement with the internal and government regulations on food safety. Before reaching the end consumer, food product moving through different phases of supply chain from suppliers to retailers. These intermittent stages contribute to product design, manufacture, delivery, and sales. Although food safety measurements do periodic and provide certifications of the quality, it is often difficult to trust when searching a supply chain scaling across countries with the distribution of technology. For example, The United States stopped imports of meat from Brazil due to the acceptance of bribes by food examiners in Brazil, the horsemeat scandal in Europe, the milk powder of babies' scandal in China and the growing problem of food pollution in India. Over the past decade, these incidents have occurred periodically, pushing consumers and governments to request greater transparency throughout the food supply chain (Bosona & Gebresenbet, 2013) (Aung & Chang, 2014).

Based on Food and Drink research, organizations decide, increasing consideration of the food provenance as a business challenge. They are finding business opportunities through increasing health awareness. Nowadays consumers highly consider the quality of food product so they hesitate to purchase. It is because there is no way to ensure the quality of the food product and less transparency through the supply chain process of the product. So the organizations are identified that customers are always looking for trusted products with verified sources. For that, they are plan to get a competitive advantage by providing service with transparent food supply chain and sustainable manufacturing. For example, Walmart has joined with IBM to study. They were together from February 2018 to test whether the organization can guarantee the Health of food products that they sell in their retail stores. Nevertheless, contemporary repositories for each silo stage of the logistic transportation are ineffective in giving unparalleled trust to the client, because they are not dishonest. A lot of food supply chains today only check their product end of the logistic transportation processes and still there is no way to map their product in source and stages between customers.

Although the different phases of the food supply chain contain many possible adverse results such as Irreversible disruption to the environment, abuse of working conditions, unethical manufacturing practices, counterfeiting and large quantities of agricultural waste attributable to imbalanced sourcing and storage strategies. End users tend to use these programs without realizing the repercussions that they create by their footprint and food supply chains are easily kept hidden with little effort to provide end-to-end access to their stakeholders. Although these challenges, the idea of requiring a single agency to provide data and transaction control in food supply chain was the only realistic solution until recently when a modern system called blockchain provided a whole modern way of addressing food provenance.

## **BACKGROUND**

### **Supply Chain**

Throughout the years, global supply chains are getting increasingly complicated. Therefore, it is very difficult to manage continuously within the industry as sustainable, because the problems many foreign buyers (including large retailers and brand owners) and consumers are concerned about, where monitoring and analysis of their transportation supply networks relies on many suppliers, distributors

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