Chapter 6
Blockchain in Logistics and Supply Chain Monitoring

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ABSTRACT

Supply chain management (SCM) is a system to manage the flow of goods and services, and from transforming the raw into finished products, it has challenges that are needed to be achieved like good quality services to the consumer, reducing labor cost, etc. Industries need to digitize real assets and make distributed, immutable transactions possible to trace assets from manufacture to supply. To overcome the lack of transparency and traceability of the products in the enterprise resource planning system in supply chain (SC) and logistics issues, there is a solid need to employ a method that can efficiently track assets from production to supply decentralized, immutable records of all transactions. A blockchain (BC) is a decentralized software network that follows a digital ledger to exchange entities digitally and a way through which it makes secure transactions. Thus, this chapter proposes integrating BC in logistics and SC monitoring by giving a template on how Python and Flask can be used for BC with the SCM system to improve traceability without involving any intermediary.

INTRODUCTION

The use of digital technology has rapid growth in the whole world. The rapid growth and use of the internet have made business development and processes more efficient than ever. Digitalization has helped to solve many business Challenges (Tsiulin et al., 2020). Supply Chain Management (SCM) is a system that connects the primary roots of the company to its customers to manage the flow of goods and services, and it comprises whole operations from transforming the raw into finished products. It is the method through which supply chain (SC) operations are supervised to benefit rivals and enhance the value of their consumers.

Supply Chain Management (SCM) is a system to manage the flow of goods and services, and from transforming the raw into finished products but it has challenges that are needed to be achieved like good quality services to the consumer, reducing labor cost, etc. Industries need to digitize real assets and make distributed, immutable transactions, possible to trace assets from manufacture to supply. To overcome the lack of transparency and traceability of the products in the Enterprise Resource Planning system in Supply Chain (SC) and logistics issues, there is a solid need to employ a method that can efficiently track assets from production to supply decentralized, immutable records of all transactions.

The Supply Chain and logistic monitoring comprise of challenges that are needed to be achieved like lack of trust, good quality services to the consumer, visibility, fast-evolving in the markets due to this it becomes inevitable, increased amount of fraudulent activities, reducing labor cost, raw materials, and energy, unexpected delays in the deliveries, improving the relationship between traders by delivering product timely, lack of traceability, reduces the risk by making up the consumer demand with product delivery time due to the continuous variation in the market, trained staff for serving their consumer timely.

These challenges in the supply chain compromise in every stage of the supply chain. These challenges occur from phases like Plan, Source, Make, Deliver and Return. The Supply Chain Management (SCM) process has already been facing such situations, and meanwhile, a new challenge has been introduced in the name of Pandemic, i.e., COVID-19. To protect lives from this Pandemic, the whole countries have been locked down completely, and due to this, the supply chain processes have been affected badly, the consumers' basic needs could not have been delivered timely, and in many countries, people died of hunger. The COVID-19 remains in the countries and disturbing the economies around the world. Moreover, despite the burden to acquire the economy regain and running, ongoing unpredictability, lack of customer belief, and supply chain challenges pursue bear a pressure. Organizations need to digitize physical assets and make a distributed, immutable record of all transactions, making it feasible to trace assets from manufacture to supply or consumer usage.

However, there is a lack of transparency and traceability of the products in the Enterprise Resource Planning (ERP) system in supply chain and logistics. To overcome the issue, there is a solid need to employ some technique or a model that can efficiently trace assets from manufacture to supply or consumer usage decentralized, immutable record of all transactions. The integration of blockchain with logistics and supply chain monitoring can provide a solution that will help solve all these challenges faced by the supply chain.

A blockchain is a decentralized software network that follows a digital ledger and a way through which it makes secure transactions without an arbitrator. Blockchain differs from the central database by the way blockchain stores the data (Tijan et al., 2019). A blockchain is a fixed time-framed chain record of data dispersed and controlled by nodes of the computer network. It is a method to exchange entities digitally.

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