Chapter 9
Blockchain for Logistics Transparency Securing the Supply Chain Through Decentralization

Asma Imran
https://orcid.org/0000-0002-0985-1755
COMSATS University Islamabad, Lahore, Pakistan

Munir Ahmad
https://orcid.org/0000-0003-4836-6151
Survey of Pakistan, Pakistan

ABSTRACT

This chapter examined the transformative role of blockchain technology in enhancing transparency and security within logistics and supply chain management. As global supply chains become increasingly complex and susceptible to issues such as fraud, data silos, and inefficiencies, blockchain offers a decentralized, tamper-proof ledger system that fosters trust, accountability, and real-time visibility across all stakeholders. The chapter explored how blockchain can mitigate long-standing logistical challenges by improving traceability, reducing counterfeiting, and optimizing coordination. Emphasizing both operational and ethical implications, it highlighted how blockchain adoption contributes to regulatory compliance, product authenticity, and sustainability.

DOI: 10.4018/979-8-3373-2434-0.ch009

INTRODUCTION

In recent times, blockchain technology has been making a big impact in many industries, improving both reliability and security. Because logistics involves many different suppliers, manufacturers, distributors, and retailers, blockchain provides a reliable and shared network that can help to improve how the supply chain functions. Blockchain's support for real-time tracking and proof of all activities encourages all stakeholders to work with trust and accountability, reducing risks from fraud, mistakes, and delays (Casino et al., 2019; Kshetri, 2018). The industry must deal with problems including a lack of clear information, separated data, fake products, and difficulty connecting different parties. Old-fashioned centralized systems regularly have issues with their information being manipulated, delays in sharing it, and a lack of traceability (Saberi et al., 2019). When global supply chains get more complicated, it is essential to have a solution that guarantees we can see our data and know it is safe along the full chain. Blockchain solves these issues by giving everyone who participates a single, verified record they can all use.

Being open and secure in the supply chain is necessary for smooth operations, winning customer trust, satisfying regulations, and supporting sustainability objectives. Adopting blockchain allows companies to fight fraud, keep products genuine, manage financial disclosures more easily, and perfect logistics systems, which lowers their expenses and puts them ahead of competitors. Being transparent about the origin of supplies also makes it easier to adhere to ethical standards and protect the environment, aligning a business with the latest global expectations.

This chapter examines how blockchain can help to improve both security and transparency in the logistics and supply chain sector. It aims to show the central principles of blockchain for logistics, review applications in practice, discuss problems faced, and explain possible patterns going forward. The chapter illustrates how decentralization can help ensure supply chain transparency and hand reliable information to stakeholders.

The chapter has been broken down into five main sections. The chapter starts with a simple explanation of blockchain and its important qualities for logistics. The next part of the discussion looks closely at current supply chain issues and how blockchain helps to solve them. The rest of the book looks at common difficulties that appear during development and implementation. Lastly, the chapter discusses future trends and areas where researchers might concentrate on blockchain in logistics transparency.

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Joseph M. Schulzand Jack S. Scilla (2024). *International Journal of Smart Technologies (pp. 1-27).*
www.irma-international.org/article/broad-perspective-of-smart-home-technology-in-2024/350186