Chapter 10
Blockchain Adoption in Nigerian Port and Maritime Operations:
Impact on Shipment Tracking and Smart Bills of Lading

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ABSTRACT

The Ports and Maritime industry has long utilized technology interventions. This study examines the relationship between Blockchain technology and shipping operations in Nigerian ports. It evaluates Blockchain's role in the supply chain and its potential to improve information dissemination and efficiency. Two key roles of Blockchain technology are focused: Shipment Tracking and Smart Bills of Lading. The study used the survey method to collect data through questionnaires from a sample size of 120 respondents, including shipping company representatives and port workers in the commercial unit. The study finds a positive correlation between Blockchain technology and shipment tracking and between Blockchain technology and Smart Bills of Lading. It concludes that Blockchain technology is relevant in the Nigerian shipping industry for Shipment Tracking and Smart Bills of Lading. The study integrates various theories to explain adoption trends and supports findings. Government policy support and public-private collaboration can accelerate

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INTRODUCTION

Traditional maritime ports are used chiefly as hubs for logistic operations. Modern ports are more than piers or harbors for the berthing of vessels. They are a comprehensive infrastructure and industry for shipping operations in the coastal and global maritime trades with complex network connections. Container ports now handle increased throughput and performance by investing in infrastructure development (Hlali, 2017). Technology can bring positive changes to port and maritime operations. It integrates scientific methods into practice, making these innovations beneficial to the industry (Jović et al., 2019). Scholars began interrogating how technological innovation eliminates obsolete operational methods in the shipping industry. They introduced new, more efficient, cost-effective, and time-saving approaches in the maritime industry (Kyaw, 2024). The sector involves information networks connecting various stakeholders (Jabbar & Bjørn, 2018). Figure 1 shows various stakeholders directly connected with the shipping and port operations. More specifically, seaport operations involve complex processes requiring numerous stakeholders' intervention (Hlali & Wanis, 2020) who exchange large volumes of data surrounded by the global supply chain network (Jović et al., 2019).

Most importantly, many rules and regulations govern the industry. They make transactions rigid, complex, and expensive financially and time-consuming. According to the World Bank, developing countries can boost maritime supply chain performance and resilience with digital tech (World Bank, 2021). The report highlighted that maritime transport is vital to the global economy yet remains vulnerable. Ships carry over 90% of all merchandise trade.