


Chapter 11

Blockchain Technology and Smart Contract in Supply Chain: Issues in Maritime Sector

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ABSTRACT

The maritime industry faces significant challenges, including inefficiencies, fraud, and a lack of transparency in the supply chain. Companies like Maersk are exploring blockchain technology and smart contracts to address these issues through secure

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and automated transactions. This chapter examines the transformative potential of blockchain technology and smart contracts within the maritime transport sector, aiming to provide a comprehensive overview of their current applications and future possibilities in the maritime supply chain. The chapter concludes that the adoption of these technologies is not without challenges, including regulatory hurdles, integration issues, and the need for standardization. By analyzing both the benefits and obstacles associated with blockchain and smart contracts, this study aims to elucidate their role in the transformation of the maritime sector.

INTRODUCTION

Frikha and Hlali (2023) examined the transformative impact of digitalization on logistics management, emphasizing how the digital transition serves as a pivotal factor in modernizing supply chains and enhancing operational efficiency. Their study highlighted the integration of advanced technologies, such as blockchain and automation, as crucial for addressing traditional challenges, including delays, inefficiencies, and limited transparency in stakeholder interactions. This aligns seamlessly with the application of blockchain and smart contracts in maritime logistics, where digital solutions play a critical role in streamlining operations, ensuring data accuracy, and fostering secure, real-time collaboration. Blockchain's decentralized ledger and the automated execution of smart contracts.

Blockchain technology has emerged as a transformative force across various industries, providing innovative solutions to longstanding challenges in supply chain management. In the maritime sector, which is characterized by complex logistics, multiple stakeholders, and a global scope, the adoption of blockchain and smart contracts offers an opportunity to enhance efficiency, transparency, and security. In recent years, the efficiency of major container ports has garnered significant attention within the maritime sector, especially as global trade continues to grow. Hlali (2017) conducted a detailed analysis of the operational efficiency of 26 major container ports in 2015, utilizing various models to assess their performance. This study highlighted how crucial port efficiency is for enhancing cargo handling, minimizing turnaround times, and optimizing logistical operations. The findings indicate that ports that adopt innovative strategies and leverage new technologies consistently outperform their peers. This underscores the importance of ongoing improvement in port management practices to meet the evolving demands of international trade.

As the maritime industry evolves, blockchain technology emerges as a game-changer for enhancing port efficiency. By facilitating real-time data sharing and promoting transparency across supply chains, blockchain can effectively address many of the inefficiencies identified in traditional port operations. The use of smart

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