

Nexus between Blockchain Adoption and Supply Chain Performance in the Automotive Industry

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Abstract

The widespread recognition of blockchain technology's disruptive influence on transactions, contracts, networks, and supply chains is evident across various industries due to its advantageous attributes of security, privacy, and transparency. However, certain critical sectors such as healthcare and defense stand to gain even more from its implementation. Blockchain, among the forefront of emerging digital technologies, boasts distinct properties that set it apart. This research delves into the utilization of blockchain in enhancing the efficiency of the healthcare supply chain, with a specific focus on its implications for the automotive industry. Data was gathered through a questionnaire distributed among dealer managers in Iranian automobile companies based in Tehran, with a sample size of 201 respondents chosen through simple random sampling. Analysis of the collected data was conducted using IBM SPSS version 23.0 and Structural Equation Modelling via SmartPLS 4 software. The results revealed that security, supply chain adaptability, and supply chain agility significantly influenced blockchain adoption. Moreover, the study demonstrated the positive impact of blockchain adoption on supply chain transparency, blockchain transparency, and supply chain performance. Notably, both supply chain transparency and blockchain transparency were found to significantly enhance supply chain performance. These findings offer valuable insights for all stakeholders involved in the automotive industry's supply chain, facilitating the improvement of blockchain technology adoption by addressing crucial factors influencing its success.

Keywords: Blockchain Adoption, Supply Chain Performance, Automotive Industry

1. Introduction

In today's globalized economy, the manufacturing and distribution of numerous products occur daily through expansive supply chains (SC) spanning the globe. Despite this extensive network involving manufacturers, distributors, and retailers, comprehensive product information often remains elusive (Galvez et al., 2018; Xia and Yongjun, 2017). The automotive industry, known for its competitiveness and challenges, faces constant pressure to enhance its sustainable supply chain performance (SSCP) (Nassar et al., 2020). To achieve SSCP, firms must innovate to deliver

value to their customers. A pivotal factor in successful supply chain management (SCM) is the establishment of efficient and strategic partnerships between buyers and suppliers. Supply chain (SC) collaboration entails sharing crucial market and operational data, facilitating swift joint decision-making to align demand and supply. This collaborative effort enhances mutual benefits and mitigates risks for both trading partners (Kim and Shin, 2019). Since the inception of SCM, the automotive industry has emphasized the significance of SC collaboration. Information technology (IT), including web services, barcodes,