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“Impact of Artificial Intelligence Adoption on Supply Chain Performance in Pakistan’s Textile Sector with the Mediating Roles of Supply Chain Resilience and Supply Chain Innovation”



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ABSTRACT

This study examined the impact of the adoption of AI on the performance in the supply chain in the Pakistani textile industry, considering the mediating variables as supply chain resilience and supply chain innovation. The research itself was mainly based on the theory Organizational Information Processing Theory, which describes how companies can improve their performance by improving their ability to process information when they are in dysfunctionality. In addition, the Dynamic Capabilities View highlighted the importance of perception of change in order to realign resources to redesign the processes to achieve better performance in the operations. The quantitative research approach was used and the data set was obtained from 384 respondents related to textile organization of Pakistan. The relationships were tested using SmartPLS 4 software with the application of Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. Results indicate that there's a robust constructive relation between AI and supply chain resilience and supply chain innovation. AI is also directly impacting the supply chain's performance. The mediation analysis, however, indicates that Supply chain innovation plays a significant mediating role between AI adoption and supply chain performance; by contrast, Supply chain resilience doesn't play a significant mediating role between AI adoption and supply chain performance. Based on the findings, it can be concluded that adopting AI can positively impact supply chain performance, primarily by facilitating the adoption of new supply chain practices—particularly digital process improvement, supply chain coordination, and data-driven decision-making. Whilst AI increases resilience this alone may not be enough to enhance performance and require innovation and operational integration. The study makes a novel contribution to the literature by the designing and testing of an integrated model on AI adoption, resilience, innovation and performance in an emerging-economy context of textiles. In practical terms, the study's outcomes indicate that textile companies need to integrate AI investments with strategies that prioritize innovation to drive tangible improvements in supply chain performance.

Keywords: *Artificial intelligence adoption, supply chain performance, supply chain resilience, supply chain innovation, textile sector, Pakistan.*

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