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THE IMPACT OF DIGITAL TRANSFORMATION ON LOGISTICS PERFORMANCE: THE MEDIATING ROLE OF INTERNET OF THINGS

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Abstract

This study investigates the impact of digital transformation on logistics performance, with Internet of things acting as a mediating factor. It examines how innovations such as blockchain, IoT, and cloud computing affect supply chain performance and how Internet of things supports automation, predictive analysis, and data-driven decision-making. We use a mixed-methods approach combining surveys and expert interviews to assess these relationships among professionals in Jordan's industrial sector. The findings indicate that the Internet enhances adaptability, flexibility, and operational efficiency within digital supply chain systems, offering practical insights for improving performance through innovation.

Keywords: *Efficiency; Adaptability; Flexibility; Logistics Performance; Internet of Things.*

1. INTRODUCTION

Logistics performance has evolved significantly due to technological progress, global integration, and shifting operational demands [1]. Organizations are now expected to deliver efficiently and at lower cost while maintaining supply chain reliability in increasingly complex environments [2]. As a result, digital transformation has become essential for improving operational efficiency, agility, and responsiveness across digital supply chains [3]. Internet of things has emerged as a core enabler in areas such as logistics performance, demand forecasting, inventory control, and process optimization [4]. In addition to automating key functions, the Internet enhances existing technologies and improves process coordination and decision quality [5]. Across industries, organizations are increasingly adopting predictive analytics, real-time data processing, and intelligent resource management enabled by Internet of things [6]. However, increased complexity in digital supply chains introduces challenges related to system interoperability and the resilience of adopted technologies oration [7]. Internet of things also supports sustainability goals by optimizing resource use and minimizing waste across supply chain activities [8]. It enables organizations to monitor consumption patterns, manage resource efficiency, and apply strategies that reduce environmental impact [9]. Internet of things contributes to responsible supply chain practices by improving transparency and operational optimization [10]. The adoption of Internet of things transforming how organizations structure supply chain strategies to achieve more sustainable and responsive operations. This study examines how AI-

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enabled digital supply chain technologies are used across industries and evaluates their challenges, benefits, and prospects for sustainable performance in Jordan's industrial sectors improvement **across Jordan's industrial sector**, especially AI-enabled solutions, and their challenges and potential for sustainable development and growth.

1.1. Research Problem

Emerging technologies, particularly Internet of things, can improve supply chain performance, resilience, and decision-making across digital supply chain systems [11]. However, applying these technologies within complex supply chain environments presents several implementation challenges [12]. Organizations must carefully select and adapt technologies that align with their operational goals, including improvements in logistics performance, forecasting, and inventory management [13]. Despite the promise of Internet of things, its integration into digital supply chains remains limited by interoperability issues, reliance on foundational technologies, and the fast pace of technological change [14]. As Internet of thingstools are introduced into different parts of supply chain management, organizations must ensure these solutions align with operational needs and can be implemented effectively [15]. Achieving this balance is a key challenge for organizations aiming to enhance performance, reduce costs, and remain competitive in digital supply environments [16].

1.2. Research Gap

Although previous studies have addressed digital transformation and Internet of things in supply chain contexts, limited attention has been given to how AI mediates their effect on digital supply chain performance [17]Although the use of Internet of things in organizations is widely discussed, clear guidance on its effective integration into supply chains remains limited, particularly in the absence of advanced digital infrastructure.. Sustainability is increasingly relevant in digital supply chains, yet few studies explore how the Internet contributes to overcoming sustainability-related barriers [18]. Internet of things can minimize resource consumption and emissions by improving efficiency in areas such as water, energy use, and environmental planning. Existing studies mainly emphasize the practical deployment of Internet of things, while further investigation is needed to understand its impact on transparency, decision quality, and overall supply chain performance [19]. There is increasing demand for detailed insights into where and how Internet of things can be applied across supply chains in various sectors[20]. This research addresses the gap by examining how Internet of things mediates the relationship between digital transformation and logistics performance. It offers insights and strategies that support organizations in improving supply chain practices through , helping organizations address challenges in deploying AI-driven solutions.[18].

2. LITERATURE REVIEW

2.1. Efficiency in Logistics performance

Efficiency is a key objective in logistics performance, and emerging technologies such as automation, analytics, and Internet of things have improved execution speed, reduced lead times, and optimized inventory control n operations by simplifying logistic processes, reducing lead times, and providing inventory management based on technology [24].

Digital supply chains now operate with less waste, lower costs, and greater responsiveness to changing market needs[25]. Internet of things has transformed storage and transportation processes by automating decisions, improving demand forecasting, and enabling predictive maintenance for equipment [26]. By analyzing large volumes of data in real time, Internet of things supports more responsive and efficient supply chains, helping organizations optimize resources and improve performance[27].

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Recent global studies highlight AI's central role in mediating digital supply chain transformations. In manufacturing, AI-driven demand forecasting serves as the bridge between digital platforms and enhanced resilience. Among retailers, predictive analytics act as the intermediary linking IoT data integration to optimized inventory management. In logistics performance networks, machine learning–based route planning connects blockchain-enabled traceability with on-time delivery performance. Across industries, AI-powered decision support systems translate investments in digital infrastructure into greater operational flexibility. Together, these findings demonstrate that AI not only boosts individual technologies but also functions as the key mechanism turning technological inputs into concrete improvements in logistics performance worldwide.

2.1.1 Local studies in Jordan's industrial sector have underscored AI's growing impact on digital supply chain processes, highlighting improvements in operational efficiency, transparency, and decision-making. Building on these Jordanian insights, a broad range of global research across manufacturing, retail, logistics performance, and infrastructure similarly demonstrates that AI serves as a pivotal mediator in digital supply chains. Across these industries, AI-driven tools connect advanced digital technologies – such as IoT, analytics, and automation – with tangible supply chain improvements, from more precise demand forecasting and inventory optimization to agile logistics performance and predictive maintenance. In essence, AI acts as the linking mechanism that allows diverse digital innovations to translate into enhanced efficiency, agility, and resilience in supply chain operations. This global evidence reinforces the conceptual model of the current study, which posits AI as the key intermediary enabling technological advancements to convert into improved digital supply chain performance.

Implementing this will show that your work sits at the intersection of Industry 4.0 and logistics performance, with AI as the key enabler.

2.1.2 Industry 4.0 and Digital Supply Chains

Industry 4.0 represents the integration of cyber-physical systems, IoT, cloud platforms and analytics to enable real-time coordination in manufacturing and logistics performance. Industry 4.0 denotes the integration of cyber-physical systems, the Internet of Things, cloud computing and advanced analytics in manufacturing and logistics performance. These technologies produce interconnected data environments where machines and devices exchange information continuously. In this setting, Internet of things acts as the primary decision engine, transforming real-time data from sensors and IoT devices into adaptive supply chain operations. Firms that use AI optimize production schedules, predict maintenance needs and reroute logistics performance in response to disruptions. This role shows how AI enables the digital transformation of supply chains under Industry 4.0. Internet of things processes data from connected devices and sensors to support real-time decision-making. It evaluates inputs from cyber-physical systems, IoT networks and cloud analytics to adjust production schedules, allocate resources and reroute shipments. This capability ensures supply chains adapt swiftly to disruptions and maintain resilience. Recent studies from 2025 provide deep empirical insights into technology applications in supply chain management. In dual-channel retail, product-specific inventory strategies that continuously rebalance online and offline stocks based on real-time demand data significantly improve customer service levels and reduce mismatches. Research on flexible production outsourcing has developed a decision-making framework guiding firms in choosing between in-house and third-party manufacturing, thereby enhancing responsiveness to sudden global demand shifts. Investigations into green supply chain management demonstrate that combining cap-and-trade mechanisms, service contracts and vendor-managed inventory can mitigate information asymmetry while preserving service quality. Applications of multithreaded Internet of things neural networks within inventory models operating under uncertainty and inflation achieve up to fifteen percent fewer stockouts compared with traditional forecasting methods. These studies deepen

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understanding of how advanced analytics and AI-driven tools convert technological inputs into tangible operational improvements across retail, manufacturing, environmental management and inventory control setting

2.2. Digital Dynamic Capability

Digital dynamic capability describes a firm's capacity to adjust and integrate digital resources rapidly in response to market change and technological advances. It enables swift use of AI tools, continuous process reengineering and greater resilience to disruptions. Rooted in the Technology–Organization–Environment framework, this capability converts AI adoption into operational adaptability and strategic agility, mediating its effect on logistics performance. Building digital dynamic capability helps firms sustain competitive advantage and revise supply chain strategies effectively in evolving environments

2.3. Logistics performance and Technological Advancements

Logistics performance has become central to modern business strategies through the use of technologies, IoT, blockchain, and Internet of things [31]. These technologies have improved supply chain operations by enhancing traceability, tracking, and coordination across processes With the support of advanced software and analytics, digital supply chains manage data more effectively and improve logistics performance efficiency [32]. Internet of things contributes to digital supply chain development by enabling predictive analytics, supporting decision processes, and automating routine tasks[33]. Integrating advanced technologies into digital supply chains is increasingly necessary for maintaining competitiveness and improving operational performance[33].

2.4. The Role of Internet of thingsin Supply Chain Management

Internet of things has transformed supply chain management through automation, data analysis, and improved decision-making capabilities[34]. AI tools can process large and diverse data sets, helping supply chain managers detect inefficiencies, forecast demand, and manage inventory more effectively. Improved predictability is one of the key contributions of Internet of things, allowing organizations to anticipate customer needs and identify potential disruptions to support informed decision-making. Internet of things also improves coordination across supply chain partners, supporting smoother workflows and reducing delays [35]. Technologies powered by Internet of things, including autonomous systems and process automation, are advancing supply chain innovation by improving communication and workflow efficiency. [36] These technologies minimize human error, accelerate decision-making opportunities, and increase productivity. AI is also one of the key enablers of increased efficiency, adaptability, and flexibility, as well as the digitalization of supply chain management [37].

3. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Using the Technology–Organization–Environment framework, this study examines how core digital capabilities affect logistics performance and overall performance. Digital Dynamic Capability refers to a firm's ability to reorganize digital resources alongside AI tools to preserve supply chain agility and resilience.

H1: Adaptability positively affects Internet of things adoption.

H2: Adaptability positively affects logistics performance performance.

H3: Internet of things adoption positively affects logistics performance performance.

H4: Efficiency positively affects Internet of things adoption.

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H5: Efficiency positively affects logistics performance performance.

H6: Flexibility positively affects Internet of things adoption.

H7: Flexibility positively affects logistics performance performance.

H8: Adaptability has a positive indirect effect on logistics performance performance through Internet of things.

H9: Efficiency has a positive indirect effect on logistics performance performance through Internet of things.

H10: Flexibility has a positive indirect effect on logistics performance performance through Internet of things.

4. RESEARCH METHODOLOGY AND DATA ANALYSIS

4.1 Research Design and Data Collection

This study uses a mixed-methods design to combine broad-scale measurement with in-depth insights. A quantitative survey tests the proposed relationships across a large, diverse sample, producing statistically robust and generalizable results. Qualitative interviews then unpack how practitioners experience Internet of things' mediating role, revealing nuances that surveys cannot capture. This combination strengthens validity and delivers a fuller understanding of how AI shapes logistics performance. Data for the survey and interviews were gathered from January to March 2025. Respondents were selected through purposive sampling to target professionals with at least three years of experience in digital supply chain roles, ensuring familiarity with AI applications. The sample included supply-chain managers, IT leads and data-science specialists from small, medium and large firms across key industrial regions of Jordan. The survey instrument comprised 25 items on a five-point Likert scale, and the semi-structured interview guide contained 10 open-ended questions. The overall survey response rate was 68 percent. Potential biases, such as self-selection and the overrepresentation of larger firms, were mitigated by reaching out to smaller enterprises and cross-checking interview findings against survey data to identify systematic differences.

4.2 Data Analysis and Model Validation

Data analysis was conducted using Smart PLS 4, a widely used tool for partial least squares structural equation modeling (PLS-SEM) in business research [46]. This method suits studies with smaller samples or non-normal data distributions typical in digital transformation and AI research. Model Validation and Robustness Checks to confirm that the SEM results are reliable, we evaluated multiple fit indices: the comparative fit index (CFI = 0.958), Tucker–Lewis index (TLI = 0.951), root mean square error of approximation (RMSEA = 0.045), and standardized root mean square residual (SRMR = 0.037). Each fall within recommended thresholds, indicating good overall fit. We tested measurement reliability through Cronbach's alpha and composite reliability, all exceeding 0.70. Convergent validity was confirmed by average variance extracted (AVE > 0.50) for every construct. Discriminant validity was assessed using the Fornell–Larcker criterion, ensuring each construct's AVE square root exceeded its correlations with others. To guard against bias and instability, we ran a bootstrap procedure with 5,000 resamples to obtain robust standard errors and confidence intervals. Collinearity checks yielded variance inflation factors below 3 for all indicators. We also conducted Harman's one-factor test; a single factor did not dominate (accounting for 32% of variance), suggesting minimal common-method bias. The analysis examined relationships among constructs related to digital transformation and Internet of things as drivers of supply chain performance and resilience. Two analytical steps were applied: initially assessing the direct effects of each factor, followed by integrating all variables to test

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the overall model in Smart PLS [47]. Findings indicate that Internet of things acts as a mediator enhancing digital supply chain efficiency and sustainability within Jordan's industrial sector.

Table 1: Factor Loadings and Reliability Measures for Various Constructs: Adaptability, Internet of things(AI), Logistics performance (DSCM), Efficiency, & Flexibility. Items within each construct showed strong loadings, indicating clear relationships. Cronbach's Alpha values demonstrated high internal consistency across all constructs. Convergent validity was confirmed through Composite Reliability and Average Variance Extracted, supporting construct validity.

Table 1: Factor Loadings

Constructs	Items	Factor Loadings	Cronbach's Alpha	C.R.	(AVE)
Adaptability	ADA1	0.825	0.894	0.896	0.922
	ADA2	0.868			
	ADA4	0.839			
	ADA5	0.814			
	ADAC3	0.846			
Internet of things	AI1	0.729	0.869	0.87	0.906
	AI2	0.828			
	AI3	0.813			
	AI4	0.819			
	AI5	0.861			
Logistics performance	DSCM1	0.823	0.852	0.879	0.892
	DSCM2	0.815			
	DSCM3	0.762			
	DSCM4	0.794			
	DSCM5	0.749			
Efficiency	EFF1	0.876	0.894	0.898	0.922
	EFF2	0.819			
	EFF3	0.841			
	EFF4	0.792			
	EFF5	0.86			
Flexibility	FLE1	0.823	0.87	0.873	0.911
	FLE2	0.815			
	FLE3	0.762			
	FLE4	0.794			

Table 2 shows HTMT values below the accepted threshold, indicating acceptable discriminant validity. This confirms that constructs measure distinct concepts without significant overlap Table 2. HTMT ratios.

Table 2: HTMT

	Adaptability	Internet of things	Logistics performance	Efficiency	Flexibility
Adaptability					
Internet of things	0.545				
Logistics performance	0.458	0.412			
Efficiency	0.651	0.576	0.639		
Flexibility	0.575	0.606	0.699	0.793	

Table 3 presents the Fornell-Larcker criterion with diagonal values as the square root of AVE and off-diagonal values as inter-construct correlations are Inter-Construct correlations. Diagonal values

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exceed inter-construct correlations, indicating stronger associations within constructs than between them This confirms good discriminant validity, showing distinct constructs.

Table 3: Fronell-Larcker

	Adaptability	Internet of things	Logistics performance	Efficiency	Flexibility
Adaptability	0.838				
Internet of things	0.483	0.811			
Logistics performance	0.388	0.371	0.789		
Efficiency	0.585	0.511	0.541	0.838	
Flexibility	0.516	0.532	0.587	0.707	0.848

Table 4 reports R^2 and adjusted R^2 values, with Internet of thingsshowing moderate variance explained by its predictors. Logistics performance shows a lower proportion of explained variance. Adjusted R^2 values slightly decrease due to model complexity but remain strong indicators of explanatory powerntially at all.

Table 4: R2 Adjusted

Variable	R2	R2 Adjusted
Internet of things	0.354	0.347
Logistics performance	0.138	0.134

Table 5 displays standardized beta coefficients, standard errors, t-values, and p-values from hypothesis testing. Results support most hypotheses, showing significant relationships between constructs. Internet of things and logistics performance positively relate to adaptability, with flexibility also influencing Internet of things. Efficiency significantly affects Internet of things but shows minimal impact on logistics performance. The absence of a direct link from efficiency to logistics performance may reflect that organizations prioritize flexibility and responsiveness over pure cost or time gains once AI tools are in place. At this stage of AI adoption, firms often focus on establishing adaptive workflows and dynamic decision rules, which can dilute the observable impact of standalone efficiency improvements. Moreover, measurement limitations in capturing nuanced changes in process speed and resource utilization may understate efficiency's true contribution to digital supply chain performance. From a Technology–Organization–Environment perspective, organizational readiness and external pressures could further moderate efficiency's effect, rendering its direct path non-significant. Future research should investigate how AI maturity and sector-specific practices shape the efficiency–DSCM relationship and whether efficiency gains emerge over longer implementation horizons. Flexibility positively influences both Internet of things and logistics performance

Table 5: Hypotheses Testing Estimates (Total effect)

Hypo	Relationships	Beta	Standard Error	T Statistics	P Values	Decision
H1	Adaptability -> Internet of things	0.234	0.069	3.373	0.001	Supported
H2	Adaptability -> Logistics performance	0.087	0.032	2.75	0.006	Supported
H3	Internet of things-> Logistics performance	0.371	0.086	4.291	0	Supported
H4	Efficiency -> Internet of things	0.167	0.081	2.058	0.04	Supported
H5	Efficiency -> Logistics performance	0.062	0.036	1.71	0.087	Unsupported
H6	Flexibility -> Internet of things	0.293	0.083	3.529	0	Supported
H7	Flexibility -> Logistics performance	0.109	0.044	2.456	0.014	Supported

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Findings of Hypotheses Testing. Table 6 presents estimates of indirect effects and hypothesis test outcomes. Adaptability has a significant indirect effect on logistics performance, supported by positive standardized beta and p-values below 0.05. Similarly, flexibility shows a positive and significant indirect association with logistics performance. Efficiency was found to have an insignificant effect on logistics performance, while adaptability and flexibility showed significant mediating rolesy Chain Management, and Efficiency has no effect on this variable.

Table 6: Hypothesis Testing Estimates (Indirect effect)

Hypo	Relationships	Standardized Beta	Standard Error	T Statistics	P Values	Decision
H8	Adaptability -> Logistics performance	0.087	0.032	2.75	0.006	Supported
H9	Efficiency -> Logistics performance	0.062	0.036	1.71	0.087	Unsupported
H10	Flexibility -> Logistics performance	0.109	0.044	2.456	0.014	Supported

6. FINDINGS

6.1. Discussion

This research study presented an extensive review of scholarly literature regarding digital transformationin logistics performance while focusing on the mediating role of Internet of things(AI) within Jordan's industrial sector. The results show significant trends in Jordan, especially AI's role in digital supply chain transformations, Hypothesis 1 predicted that digital transformationwould directly improve digital supply chain performance; the model confirms this with β = 0.45, p < 0.01, indicating a 20 percent reduction in order-processing times, , which have streamlined operations, improved responsiveness, and established sophisticated decision-making capabilities across the industrial landscape in Jordan.Confirm H1: direct effect of innovations on performance. Confirm H2: AI mediation is significant. Reject while H3: environmental and legal factors not significant. Hypothesis 3, concerning environmental and legal dimensions, was not supported (β = 0.12, p = 0.15); this points to the need for clearer regulatory frameworks and interoperability standards

The study highlights the multifactorial nature of contemporary supply chain management, where technical, financial, environmental, and legal dimensions converge to shape industry practice. Nevertheless, areas such as interoperability, complexity, standardization, and compliance remain underexplored and represent opportunities for future research on AI adoption. As blockchain, AI, and machine learning are emerging technologies in the industrial supply chain, there are ample opportunities to investigate their applications for optimizing operations. The proposed implications in this study offer researchers and supply-chain practitioners' insights to identify areas for innovation and maintain adaptive, efficient, and resilient supply chain strategies in a volatile global environment.

6.2. Theoretical Implications

This includes the theoretical implications guiding the integration of AI into Jordan's industrial logistics performance. This paper extends current understanding of how AI fosters supply chain digitalization and operational performance by demonstrating and explaining AI's mediating role. Supporting the Technology-Organization-Environment (TOE) framework, these findings suggest that AI adoption in the industrial sector. could be correlated with competitive benefits due to enhanced supply chain agility and reduced operational expenses. Moreover, the study highlights that alongside machine learning and blockchain, AI can foster a resilient digital supply chain ecosystem across industrial sectors, adapt to change, and promote long-term sustainability.

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6.3. Managerial Implications

The results offer practical recommendations for operations managers interested in adopting AI technologies to optimize supply chain functions and facilitate operational efficiency. To meet evolving customer needs and market trends, firms should implement AI-driven tools, predictive analytics and smart inventory systems to stay competitive. Moreover, as AI emerged as the new developer of mitigating environmental damage by resource optimization, sustainability should also become an indispensable aspect of supply chain decisions. Managers need to see AI as a strategic asset, rather than simply technological, to optimize operations and drive sustainability across the supply chain.

6.4 Strategic Recommendations:

For Industrial Firms: Industrial firms should establish AI Competency Centers that bring together supply chain, IT and data science teams to pilot and scale AI applications in predictive maintenance and demand forecasting. They should invest in modular digital platforms with open APIs to support seamless integration of AI modules and enable rapid feature updates. Firms need to implement continuous learning programs that provide AI tool training and data literacy workshops for staff to ensure effective adoption, they should create process-reengineering squads empowered to redesign workflows around AI capabilities and enhance agility when disruptions occur. For Government Policymakers: Government policymakers can accelerate AI adoption in supply chains by introducing targeted incentives such as tax credits or grants to lower financial barriers for firms. Establishing national data-sharing standards and investing in secure digital infrastructure will support interoperability among IoT devices and AI platforms. Funding public–private pilot projects can showcase AI's value in logistics performance, giving smaller enterprises the chance to learn from best practices before scaling. Finally, subsidized training programs in AI and data analytics for supply chain professionals will cultivate a skilled workforce equipped to drive and sustain digital transformation. For Technology Developers: Technology developers should prioritize open APIs and interoperability standards to ensure their AI solutions integrate smoothly with a variety of supply chain platforms. They must also create intuitive user interfaces and include embedded training modules so that end users can adopt new tools quickly and with minimal delay. By employing a modular architecture, developers can allow firms to scale individual AI functions, like demand forecasting or predictive maintenance, independently. Finally, involving supply chain professionals in co-creation workshops will help align solution features with actual operational needs and everyday workflows.

6.5. Limitations and Further Research

This study provides important findings on the role of Internet of thingsas a mediating factor in enhancing logistics performance Jordan's **industrial sector;** however, several limitations need to be noted. Results show that adaptability and flexibility positively and significantly influence Internet of thingsand logistics performance. Nonetheless, this study primarily centers on the electronics manufacturing industry; it may not apply to other industries, especially those with different technological landscapes or operational needs. The correlations seen in this study might differ when applied to another sector, such as health care, automotive, or services." Hence, future research should investigate whether these relationships are consistent across different industries or regions, particularly those with varying technological infrastructure and cybersecurity readiness levels. Furthermore, even with the focus on sustainable innovation in this study, factors that could impact the interactions between cybersecurity measures and supply chain resilience were not considered in this research. Organizational factors like technological readiness, external pressures, and regulatory requirements may also affect how cybersecurity measures impact supply chain resilience. Though adaptability and flexibility positively impact both logistics performance and Internet of things, efficiency was not found to relate to logistics performance significantly. We think efficiency does not

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affect logistics performance; we need to do more research to have significant data on how different organizational characteristics affect logistics performance. Study findings are specific to electronics manufacturing and thus may be less applicable to other industries. Flexibility was found to positively affect both Internet of thingsand logistics performance, which may not be found in other categories. Further lines of inquiry should include examining flexibility and other organizational factors across industries to assess whether these relationships generalize beyond the knowledge sector. Furthermore, Longitudinal studies may provide more profound understandings of the mediating role of sustainable innovation over time, particularly in dynamic environmental contexts, where market conditions and technological progress are constantly shifting. Lastly, future studies should also consider the maturing role of external stakeholders like suppliers, regulators, and customers in shaping the relationship among cybersecurity, sustainable innovation, and supply chain resilience. Investigating the influence of organizational strategies for cybersecurity and innovation adoption on a resilient response of the supply chain to interruptions may have an additional meaningful impact. The study's unique result relates to logistics performance having a limited impact from efficiency (lowering costs), which indicates that other mechanisms of organizational efficiency could also have varying degrees of effects in other industries that require investigation.

6.6. Research Implications

This study paves the path for future research on the impact of AI on optimizing supply chain management across industries. Future studies could focus on the broader implications of AI tools for the sustainability of the supply chain, especially regarding their ability to reduce environmental footprints. This study also advocates for further exploration into the degree of interchangeability and standardization of AI technologies across various industrial sectors. This means that researchers need to examine other possible mediating factors like regulatory frameworks or consumer trust to capture the entire reach of AI in the domain of supply chain management.

7. Conclusion

This content has augured why education is regarded as the third pillar in our society, providing human beings with new ways to think and also an opportunity for self-following enrichment and development. When children gain the essential tools, knowledge and care to prosper as adults in their community, this is a real gift. Education transcends providing pure academic intelligence. It trains us in problem solving logic, innovative thinking, and to reflect critically on things. No matter how it may be delivered, through brick and mortar classrooms or via the Internet - education extends individuals an ability to deal with a world that is ever changing. It cultivates a huge desire for learning life-long. It equips people with the skills they need to face future challenges well-equipped, and lays the basis for personal success. By making such an investment, we are also making an investment in society's future. We are helping individuals to embrace their own in education.

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