Enhancing Supply Chain Visibility and Resilience Through Information Systems Integration

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Article

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Abstract: This study examines the incorporation of information technology to improve visibility and resilience in supply networks. Amid increasing global complexity and volatility, enterprises must embrace innovative digital technology to maintain competitiveness and adaptability. This research utilizes qualitative methodologies, namely in-depth interviews with industry experts and practitioners, to investigate the impact of integrated information systems on supply chain performance. The results indicate that effective integration enhances operational efficiency and promotes real-time data exchange, allowing companies to make prompt, informed choices. The research identifies key themes, including the need of cooperation among supply chain partners, the disruptive effects of technologies like artificial intelligence and blockchain, and the need to cultivate a culture of innovation and trust. Moreover, the study underscores the difficulties encountered in the deployment of these technologies, including financial implications and the need for qualified staff. The research highlights that leadership dedication and a conducive organizational culture are crucial for surmounting these hurdles and successfully harnessing digital change. This study enhances the comprehension of how integrated information systems may enhance supply chain resilience and visibility, providing significant insights for both practitioners and scholars. By underscoring the strategic significance of these systems, businesses may improve their capacity to address disruptions, maintain operational excellence, and attain sustainable development in a fluctuating business landscape.

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1. Introduction

In today's globalized economy, supply chains have become increasingly complex and interconnected, necessitating robust systems to manage and mitigate potential disruptions. The integration of information systems (IS) into supply chain management has emerged as a pivotal strategy to enhance both visibility and resilience. By leveraging advanced digital technologies, organizations can achieve real-time monitoring, predictive analytics, and seamless communication across all tiers of the supply chain, thereby fortifying their operations against unforeseen challenges. The concept of supply chain resilience refers to the ability of a supply chain to anticipate, prepare for, respond to, and recover from unexpected events that could disrupt operations. This resilience is crucial for maintaining operational performance and ensuring customer satisfaction in the face of adversities. Recent studies have highlighted the significant role that digital technologies play in bolstering this resilience. For instance, Alkhatib and Momani (2023) examined Jordanian manufacturing firms and found that the adoption of digital tools significantly improved supply chain resilience and operational performance. Their research underscores the importance of integrating IS to enhance the agility and robustness of supply chains (Emon & Khan, 2024). One of the primary benefits of integrating information systems into supply chain management is the improvement of visibility. Enhanced visibility allows organizations to monitor their supply chains in real-time, providing critical insights into inventory levels, production schedules, and shipment statuses. This

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real-time data enables companies to make informed decisions swiftly, reducing the likelihood of disruptions. Al-Talib et al. (2020) emphasized that implementing Internet of Things (IoT) technology in supply chains facilitates real-time tracking and data collection, which are essential for proactive decision-making and disruption management. Moreover, the integration of information systems fosters better collaboration among supply chain partners (Khan & Emon, 2024). By sharing accurate and timely information, organizations can synchronize their operations more effectively, leading to improved coordination and reduced inefficiencies. This collaborative approach not only streamlines processes but also builds trust among partners, which is vital for joint problem-solving during disruptions. Atieh Ali et al. (2024) explored the relationship between digital supply chains and resilience, finding that effective information sharing among partners significantly enhances the overall sustainability and responsiveness of the supply chain. Artificial Intelligence (AI) and Machine Learning (ML) are among the advanced technologies being integrated into supply chain information systems to predict potential disruptions and optimize operations. By analyzing vast amounts of data, AI can identify patterns and forecast future risks, allowing companies to implement preventive measures proactively. Belhadi et al. (2024) conducted an empirical investigation and concluded that AI-driven innovations substantially enhance supply chain resilience and performance, especially in dynamic environments. Blockchain technology is another innovation contributing to supply chain visibility and resilience (Emon et al., 2025). By providing a decentralized and immutable ledger of transactions, blockchain ensures transparency and traceability throughout the supply chain. This transparency is crucial for verifying the authenticity of products, preventing fraud, and ensuring compliance with regulatory standards. Bischoff and Seuring (2021) discussed the opportunities and limitations of public blockchain-based supply chain traceability, highlighting its potential to improve trust and collaboration among stakeholders (Khan et al., 2025). The integration of information systems also supports the development of agile supply chains capable of responding swiftly to market changes and disruptions. Agility in supply chain management refers to the ability to quickly adjust operations in response to unforeseen events. Information systems facilitate this agility by providing real-time data and analytics, enabling organizations to reconfigure their supply chains as needed. Fayezi and Zomorrodi (2015) emphasized the role of relationship integration, supported by information systems, in developing supply chain agility and flexibility. However, the integration of information systems into supply chains is not without challenges. Data security and privacy concerns are paramount, as the increased connectivity and data sharing can expose organizations to cyber threats. Ensuring the integrity and confidentiality of sensitive information requires robust cybersecurity measures and protocols. Additionally, the implementation of advanced information systems necessitates significant investment in technology and training, which can be a barrier for some organizations. Despite these challenges, the benefits of integrating information systems into supply chain management are substantial. By enhancing visibility, fostering collaboration, and enabling predictive analytics, information systems strengthen the resilience of supply chains, allowing organizations to navigate the complexities of the modern global market effectively. As digital technologies continue to evolve, their integration into supply chain management will become increasingly critical for organizations aiming to maintain competitiveness and operational excellence (Emon et al., 2024). The integration of information systems into supply chain management is a transformative approach that enhances both visibility and resilience (Khan et al., 2024). Through the adoption of digital technologies such as IoT, AI, and blockchain, organizations can achieve real-time monitoring, predictive analytics, and improved collaboration among supply chain partners. These capabilities are essential for anticipating disruptions, responding effectively to unforeseen events, and maintaining operational performance in a dynamic global environment. As evidenced by recent studies, the strategic implementation of information systems is a key driver in building robust and agile supply chains capable of withstanding and thriving amid challenges.

2. Literature Review

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The integration of information systems in supply chain management has been a critical area of research, emphasizing how digitalization enhances visibility, resilience, and overall efficiency. The increasing complexity and global interconnectedness of supply chains necessitate robust information-sharing mechanisms that can mitigate disruptions and improve decision-making. One of the key themes in the literature is the role of information sharing in improving supply chain performance. Kembro and Näslund (2014) critically analyzed empirical studies on information sharing in supply chains and highlighted that while many firms claim to share information effectively, there are still significant gaps in implementation. The barriers to effective information sharing include trust issues, technological limitations, and the unwillingness of firms to share competitive intelligence. Information sharing is fundamental for supply chain agility, which enables firms to respond swiftly to disruptions and changing market conditions. Li et al. (2006) found that timely access to supply chain information enhances agility by reducing lead times and improving responsiveness. Similarly, Li and Lin (2006) emphasized that the quality of shared information, including accuracy, completeness, and timeliness, directly impacts decision-making efficiency and operational performance. Risk management is another crucial aspect of supply chain integration that has gained considerable attention in academic research (Khan & Emon, 2025). Khan and Burnes (2007) argued that risk management should be embedded into supply chain strategies to mitigate vulnerabilities associated with globalization and outsourcing. They proposed a research agenda focusing on identifying risk factors and developing frameworks for proactive risk mitigation. Kleindorfer and Saad (2005) explored different types of disruption risks, including natural disasters, supplier failures, and market fluctuations, and emphasized the need for resilience-building strategies. The adoption of digital technologies, such as big data analytics and artificial intelligence, plays a significant role in predicting and mitigating risks. Mishra et al. (2018) conducted a bibliometric analysis of big data applications in supply chain management and found that predictive analytics enhances risk assessment and decision-making capabilities. The ability to analyze vast amounts of data in real-time allows firms to identify potential disruptions before they escalate, leading to proactive rather than reactive risk management. The concept of supply chain resilience has evolved significantly over the years, with scholars focusing on strategies to enhance survivability and adaptability. Ivanov and Dolgui (2020) introduced the concept of intertwined supply networks, emphasizing that traditional linear supply chain models are no longer sufficient in the face of complex disruptions. Their research suggested that firms should adopt network-based approaches that allow for redundancy, flexibility, and real-time visibility. Jüttner et al. (2003) highlighted the importance of risk-sharing mechanisms among supply chain partners, arguing that collaboration and trust are essential for achieving resilience. Kamalahmadi and Parast (2016) reviewed the literature on supply chain resilience and identified key principles, including redundancy, flexibility, visibility, and agility. They suggested that integrating digital technologies into supply chain operations strengthens these principles, making firms more adaptable to unforeseen disruptions (Khan et al., 2024). Another important area of research is the impact of information technology (IT) capabilities on supply chain performance. Liu et al. (2013) found that IT capabilities significantly improve firm performance by enhancing absorptive capacity and supply chain agility. Their study demonstrated that firms with advanced IT infrastructures can process and utilize information more effectively, leading to better decision-making and operational efficiency. Lu et al. (2016) explored the competencies required for e-commerce professionals in China and found that firms investing in IT skills and training gain a competitive advantage in digital supply chain management (Khan et al., 2024). The ability to leverage IT for seamless communication and process automation reduces operational bottlenecks and improves supply chain coordination. The role of lean management in mitigating supply chain disruptions has also been extensively studied. Marley and Ward (2013) investigated how lean principles can serve as countermeasures for normal disruptions in supply chains. Their research demonstrated that lean management enhances efficiency by eliminating waste and optimizing resource utilization. However, they also cautioned that overly lean supply chains may lack the redundancy needed for resilience, making them vulnerable to severe disruptions. This trade-off

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between efficiency and resilience has been a subject of debate in supply chain literature. Mason-Jones and Towill (1999) argued that firms should adopt a balanced approach, integrating both lean and agile strategies to optimize performance while maintaining flexibility. Supply chain integration has been recognized as a key factor in improving performance and resilience. Narasimhan and Kim (2002) studied the relationship between supply chain integration and firm performance in Japanese and Korean firms and found that high levels of integration lead to improved efficiency and customer satisfaction. Their research emphasized the need for both internal and external integration, where firms align their internal processes with external partners to achieve seamless coordination. Norrman and Jansson (2004) provided a case study of Ericsson's proactive supply chain risk management approach following a serious supplier accident. They demonstrated that integrating risk management strategies with supply chain operations enables firms to recover more quickly from disruptions. Global supply chain risk management has become increasingly relevant due to the growing interdependence of markets. Manuj and Mentzer (2008) identified various risk management strategies, including avoidance, control, cooperation, and flexibility. Their research suggested that firms operating in global supply chains must adopt a combination of these strategies to mitigate risks effectively. The COVID-19 pandemic further highlighted the vulnerabilities of global supply chains, reinforcing the need for digital integration and resilience-building strategies. Knowledge sharing within supply chains has been linked to innovation and competitive advantage. Lin (2007) examined the impact of knowledge sharing on firm innovation capability and found that organizations that actively share knowledge among partners are more likely to develop innovative solutions. This finding is particularly relevant in the context of digital supply chains, where rapid technological advancements require continuous learning and adaptation. Firms that encourage knowledge sharing through digital platforms and collaborative networks gain insights into emerging trends and best practices, enhancing their ability to innovate and stay competitive. The importance of supply chain visibility has been underscored in multiple studies (Emon & Khan, 2024). Visibility refers to the ability of firms to track and monitor supply chain activities in real-time. Li et al. (2006) emphasized that visibility reduces uncertainty and enhances decision-making efficiency. With advancements in blockchain technology, supply chain visibility has improved significantly. Blockchain provides an immutable record of transactions, ensuring transparency and traceability. Bischoff and Seuring (2021) examined blockchain applications in supply chain management and found that it enhances trust among partners by providing verifiable and tamper-proof records (Rahman et al., 2024). However, they also highlighted challenges, such as scalability issues and regulatory concerns, that must be addressed for widespread adoption. The literature also highlights the role of supply chain agility in responding to market dynamics. Mason-Jones and Towill (1999) described agility as the ability of a supply chain to adjust to changing conditions quickly. Their research emphasized the need for real-time data access and flexible manufacturing processes to achieve agility. Li et al. (2006) further elaborated on the role of information sharing in enhancing agility, suggesting that firms that share demand and supply data in real-time can adjust their production schedules and inventory levels more efficiently. The integration of digital technologies into supply chain management has transformed traditional business models (Rahman et al., 2024). Mishra et al. (2018) discussed the impact of big data analytics on supply chain operations, highlighting that data-driven decision-making improves forecasting accuracy and operational efficiency. The ability to analyze structured and unstructured data in real-time enables firms to anticipate demand fluctuations and optimize inventory management. Similarly, Lu et al. (2016) explored the evolving skills required for digital supply chain professionals, emphasizing that firms must invest in IT training and digital competencies to remain competitive. The literature provides extensive insights into the integration of information systems in supply chain management, emphasizing the benefits of enhanced visibility, resilience, and efficiency (Rahmana et al., 2024; Fuada et al., 2024). Information sharing emerges as a critical factor in improving supply chain performance, with studies highlighting its role in enhancing agility and decision-making. Risk management strategies are essential for mitigating disruptions, with scholars emphasizing the importance of predictive analytics and digital integration. Supply

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chain resilience has been a dominant theme, with researchers advocating for network-based models that allow for redundancy and flexibility. IT capabilities significantly impact firm performance, enabling real-time data processing and seamless communication. The trade-off between lean and agile strategies has been widely debated, with scholars suggesting a balanced approach. Knowledge sharing enhances innovation, while blockchain technology improves supply chain visibility and transparency. The growing reliance on big data analytics and AI further reinforces the need for digital transformation in supply chain management. As the global business environment continues to evolve, integrating information systems will remain a key priority for firms seeking to enhance their supply chain resilience and performance.

3. Research Methodology

The research was conducted using a qualitative approach, focusing on in-depth interviews to explore the complexities of information sharing, risk management, and resilience in supply chain management. The study aimed to gather insights from industry professionals with direct experience in managing supply chain operations. A total of 46 interviews were conducted with participants from various industries, including manufacturing, retail, logistics, and technology. The selection of participants was based on purposive sampling to ensure that only individuals with relevant expertise and experience in supply chain management were included in the study. Interviewees were primarily supply chain managers, logistics coordinators, procurement officers, and IT specialists responsible for digital integration in their respective organizations. The interviews were semi-structured, allowing for a balance between guided discussion and open-ended responses. This approach ensured that key themes related to information sharing, risk management, and resilience were addressed while allowing participants to elaborate on their experiences and perspectives. Each interview lasted between 45 to 60 minutes and was conducted either in person or via online video conferencing platforms. The use of digital communication tools enabled the inclusion of participants from different geographical locations, providing a more diverse and comprehensive dataset. Prior to conducting the interviews, participants were provided with an overview of the study and were assured of confidentiality and anonymity. Informed consent was obtained from all participants, and they were given the option to withdraw at any stage of the research. The interviews were recorded with permission and later transcribed for analysis. The transcription process ensured accuracy in capturing the participants' responses, which were then subjected to thematic analysis. Thematic analysis was employed to identify recurring patterns, trends, and insights from the interviews. This method involved coding the transcribed data, categorizing responses into themes, and interpreting the findings in relation to existing literature. The primary themes that emerged included challenges in information sharing, strategies for risk mitigation, the role of digital technologies, and approaches to enhancing supply chain resilience. The analysis process was iterative, with themes being refined and cross-checked to ensure reliability and consistency. To enhance the credibility of the findings, triangulation was applied by comparing interview data with existing literature and industry reports. This process ensured that the insights gained from the participants aligned with broader industry trends and academic perspectives. Additionally, member checking was conducted, where selected participants were given the opportunity to review and validate the interpretations of their responses. This step helped to minimize researcher bias and ensure that the findings accurately represented the participants' views. The study encountered certain limitations, including the potential for response bias, where participants may have provided socially desirable answers. Efforts were made to mitigate this by ensuring that questions were neutral and non-leading. Another limitation was the sample size, which, while sufficient for qualitative research, may not fully represent the diversity of perspectives across all industries. However, the depth of insights obtained from the interviews contributed to a comprehensive understanding of the research topic. The methodology employed in this study facilitated a rich exploration of supply chain challenges and strategies. The qualitative approach, combined with thematic analysis and validation techniques, ensured the reliability and

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relevance of the findings. The study provided valuable insights into the role of information sharing, risk management, and resilience-building strategies in modern supply chain management.

4. Results

The results of the study provided an in-depth understanding of the integration of information systems for improved visibility and resilience in supply chains. Participants shared various perspectives on the role of digital technologies, information sharing, and risk management strategies in enhancing supply chain performance. The findings indicated that companies that had successfully integrated information systems experienced significant improvements in visibility, decision-making efficiency, and responsiveness to disruptions. The ability to access real-time data allowed supply chain managers to identify potential risks early, optimize logistics operations, and enhance collaboration across various stakeholders. This level of transparency was particularly beneficial in industries with complex supply chains, where multiple suppliers and logistics providers needed to coordinate seamlessly. One of the key findings from the interviews was the importance of real-time data analytics in managing supply chain operations. Participants highlighted that having access to accurate and timely data reduced uncertainties and enabled proactive decision-making. In organizations where information systems were effectively integrated, managers could monitor inventory levels, track shipments, and anticipate demand fluctuations with greater precision. This was particularly relevant during periods of market volatility or unexpected disruptions, such as natural disasters, pandemics, or geopolitical conflicts. Companies that lacked real-time visibility into their supply chains often struggled with inefficiencies, delays, and increased costs due to reactive decision-making. Another critical insight that emerged was the role of information sharing in fostering collaboration among supply chain partners. Many participants emphasized that trust and transparency were crucial in building resilient supply chains. Companies that adopted integrated information systems were able to share data with suppliers, logistics providers, and customers in a more structured and secure manner. This collaborative approach facilitated better demand forecasting, streamlined production planning, and improved order fulfillment rates. However, several participants noted that data security and privacy concerns remained a significant challenge. Some organizations were hesitant to share critical supply chain information due to fears of data breaches or competitive disadvantages. This hesitation often resulted in fragmented information flows, leading to inefficiencies and a lack of synchronization between different supply chain partners. The study also revealed that digital transformation played a pivotal role in supply chain resilience. Organizations that leveraged advanced technologies such as artificial intelligence, blockchain, and the Internet of Things were better equipped to handle disruptions and adapt to changing market conditions. Participants noted that AI-driven predictive analytics helped in identifying potential risks before they escalated, allowing companies to develop contingency plans in advance. Blockchain technology, on the other hand, was recognized for its ability to enhance supply chain traceability and security. Several participants discussed how blockchain applications enabled greater accountability by providing an immutable record of transactions and product movements. This was particularly valuable in industries where compliance and regulatory requirements were strict, such as pharmaceuticals and food supply chains. While the benefits of digital integration were evident, several challenges were also highlighted by participants. One of the most frequently mentioned challenges was the high cost associated with implementing and maintaining information systems. Many organizations, especially small and medium-sized enterprises, found it difficult to allocate sufficient financial resources for upgrading their supply chain technologies. The initial investment in software, hardware, and training posed a significant barrier, limiting the widespread adoption of integrated information systems. Additionally, resistance to change was another key challenge. Several participants shared experiences where employees and management were reluctant to adopt new technologies due to a lack of technical expertise or fear of job displacement. Overcoming this resistance required extensive training programs, change management initiatives, and a clear demonstration of the long-term benefits of digital integration. Another major finding was the impact

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of supply chain disruptions on operational efficiency and how integrated information systems contributed to risk mitigation. Participants described various types of disruptions, ranging from supplier failures to transportation delays and cyber threats. Companies with robust digital infrastructure were able to respond more effectively to these challenges by quickly identifying alternative suppliers, rerouting shipments, or adjusting production schedules. Some participants shared case studies of how their organizations had navigated supply chain crises by leveraging digital tools. For instance, during the COVID-19 pandemic, businesses that had already implemented cloud-based supply chain management systems were able to maintain operations remotely, while those relying on traditional methods faced severe disruptions. The research also explored the role of automation in enhancing supply chain efficiency. Many participants acknowledged that automation technologies, such as robotic process automation and autonomous logistics, had significantly reduced manual errors and increased operational speed. Warehouses equipped with automated sorting and inventory management systems experienced fewer stockouts and order processing errors. Similarly, the adoption of autonomous vehicles and drones for last-mile delivery was seen as a game-changer in logistics, improving delivery speed and reducing human dependency. However, concerns were raised regarding the potential loss of jobs due to automation. Some participants expressed the need for a balanced approach, where automation complemented human labor rather than replacing it entirely. The findings further indicated that supply chain visibility was a key factor in achieving sustainability goals. Several participants highlighted how digital technologies had enabled organizations to track their carbon footprint, optimize transportation routes, and reduce waste. Companies that incorporated sustainability metrics into their supply chain management systems were able to make more environmentally conscious decisions, such as selecting eco-friendly suppliers or optimizing packaging materials. This shift towards sustainability was not only driven by regulatory requirements but also by increasing consumer demand for ethical and transparent supply chains. Some participants noted that integrating sustainability into supply chain operations required collaboration with external partners, as well as investments in data-driven sustainability initiatives. Another significant aspect that emerged from the study was the role of supply chain agility in responding to market fluctuations. Organizations that had adopted agile supply chain strategies were able to quickly adjust to changing customer demands, supplier constraints, and economic shifts. Integrated information systems played a crucial role in enabling agility by providing real-time insights into market trends and operational performance. Several participants described how their organizations had leveraged cloud-based platforms to enhance flexibility, allowing them to scale operations up or down based on demand fluctuations. This agility was particularly beneficial in industries such as fashion and electronics, where consumer preferences changed rapidly. The study also examined the role of leadership and organizational culture in the successful integration of information systems. Many participants emphasized that digital transformation required strong leadership commitment and a culture of innovation. Organizations where top management actively supported technology adoption experienced smoother implementation processes and higher employee engagement. Conversely, companies with rigid hierarchies and resistance to change struggled to integrate digital tools effectively. Some participants shared examples of how leadership-driven digital initiatives had transformed their supply chain operations, fostering a more data-driven decision-making culture. The impact of geopolitical and economic uncertainties on supply chain resilience was another key finding. Participants discussed how trade restrictions, tariffs, and political instability had influenced their supply chain strategies. Organizations with integrated information systems were better prepared to navigate these uncertainties by diversifying supplier networks, optimizing sourcing strategies, and leveraging scenario-based planning. Some participants highlighted how real-time analytics had helped their organizations assess potential risks associated with global trade disruptions and adjust their operations accordingly. This ability to anticipate and respond to geopolitical risks was seen as a crucial advantage in an increasingly uncertain business environment. Additionally, the study explored the impact of customer expectations on supply chain digitalization. Many participants noted that modern consumers demanded greater transparency,

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faster deliveries, and personalized experiences. Companies that had integrated digital technologies into their supply chain operations were better positioned to meet these expectations. For instance, real-time tracking systems allowed customers to monitor their orders, while AI-driven demand forecasting enabled businesses to stock products more efficiently. Several participants mentioned that customer-centric supply chain strategies not only improved customer satisfaction but also enhanced brand loyalty and competitive advantage. In analyzing the overall effectiveness of integrated information systems, the study found that organizations with a well-executed digital strategy experienced significant performance improvements. Enhanced data accuracy, streamlined workflows, and predictive analytics contributed to better decision-making and risk management. However, the extent of success varied depending on factors such as industry type, company size, and technological maturity. Some participants pointed out that companies with fragmented legacy systems faced challenges in achieving seamless integration, leading to data silos and operational inefficiencies. Overcoming these challenges required a phased approach to digital transformation, where outdated systems were gradually replaced with modern, interoperable technologies. The findings of this study provided a comprehensive understanding of the role of information systems in enhancing supply chain visibility and resilience. The integration of digital technologies facilitated real-time decision-making, improved collaboration, and strengthened risk management capabilities. However, challenges such as high implementation costs, resistance to change, and data security concerns remained significant barriers. Despite these challenges, organizations that successfully adopted integrated information systems experienced notable improvements in operational efficiency, agility, and sustainability. The insights gained from this research highlighted the transformative potential of digital integration in modern supply chain management and underscored the importance of strategic investments in technology-driven solutions.

Table 1. Role of Real-Time Data in Supply Chain Visibility.

Theme	**Key Insights**	**Examples from Interviews**
Real-time data access	Enhances decision-making and responsiveness	"We can predict disruptions before they happen."
Improved visibility	Reduces uncertainty and inefficiencies	"Tracking shipments in real-time saves costs."
Proactive risk management	Identifies supply chain vulnerabilities early	"We re-route shipments instantly if delays occur."

The findings highlight the significance of real-time data in modern supply chains. Managers who have access to real-time information experience fewer disruptions and make more informed decisions. The ability to track shipments, monitor inventory, and anticipate delays improves supply chain performance. Participants described how real-time analytics had helped their organizations become more proactive rather than reactive, reducing inefficiencies and optimizing resources.

Table 2. Information Sharing and Supply Chain Collaboration.

Theme	**Key Insights**	**Examples from Interviews**

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Trust in partnerships	Strengthens collaboration between stakeholders	"When we share data, suppliers work better with us."
Transparency	Reduces risks and improves forecasting	"Knowing our supplier's stock levels helps us plan."
Security concerns	Limits willingness to share critical data	"We are careful about what we share to avoid risks."

The study reveals that information sharing is crucial for enhancing supply chain collaboration. Participants explained that when companies exchange critical data, they can better forecast demand and optimize inventory. However, security concerns sometimes limit data exchange, leading to inefficiencies. Trust between partners plays a significant role in determining how much information is shared, affecting overall supply chain performance.

Table 3. Digital Transformation and Supply Chain Resilience.

Theme	**Key Insights**	**Examples from Interviews**
AI-driven analytics	Helps predict and mitigate disruptions	"Our AI tool flags potential delays early."
Blockchain security	Enhances transparency and traceability	"Blockchain makes transactions more secure."
Cloud integration	Improves remote access and data management	"We manage operations efficiently from anywhere."

The adoption of digital technologies has contributed to stronger supply chain resilience. Participants explained how artificial intelligence, blockchain, and cloud-based systems helped their organizations manage risks and improve efficiency. AI-powered analytics enabled early detection of disruptions, while blockchain enhanced trust and security across supply networks. Cloud integration further supported remote monitoring, allowing for seamless operations across different locations.

Table 4. Challenges in Implementing Digital Supply Chain Systems.

Theme	**Key Insights**	**Examples from Interviews**
High implementation costs	Limits adoption, especially for SMEs	"It's expensive, and we struggle with budgets."

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Resistance to change	Employees fear job loss or complexity	"People worry about automation replacing them."
Legacy system integration	Causes delays in digital transformation	"Our old systems don't work with new technology."

Despite the advantages of digital integration, several barriers hinder its widespread adoption. Cost remains a major concern, particularly for smaller businesses that lack the financial resources to invest in new technologies. Resistance to change was also highlighted, with employees expressing concerns about automation affecting job security. The compatibility of legacy systems with modern technologies further complicates digital transformation efforts, slowing progress in some organizations.

Table 5. Impact of Supply Chain Disruptions and Digital Readiness.

Theme	**Key Insights**	**Examples from Interviews**
Supplier failures	Disrupt production and inventory	"When a supplier fails, we scramble for alternatives."
Transportation delays	Lead to higher costs and inefficiencies	"Delays increase warehousing expenses."
Cyber threats	Pose risks to data security and operations	"We faced a cyberattack that delayed shipments."

Supply chain disruptions are a recurring challenge for organizations, affecting production and logistics. Participants detailed how supplier failures and transportation delays often led to financial losses. Companies with strong digital infrastructure were better prepared to respond to disruptions, while those lacking digital readiness struggled. Cyber threats also emerged as a major risk, highlighting the need for stronger cybersecurity measures in supply chain management.

Table 6. Automation and Supply Chain Efficiency.

Theme	**Key Insights**	**Examples from Interviews**
Reduced manual errors	Increases accuracy in inventory management	"Automation reduced stock miscounts by 90%."
Faster order processing	Enhances speed and efficiency	"Our order fulfillment is twice as fast now."

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Job displacement concerns	Creates workforce adaptation challenges	"People worry that robots will replace them."

The role of automation in supply chain management has led to significant efficiency gains. Participants explained how automation technologies improved order accuracy and processing speed while reducing manual workload. However, concerns about job displacement emerged as a key issue. Some organizations addressed this by upskilling employees, ensuring that technology complemented human labor rather than replacing it entirely.

Table 7. Sustainability and Supply Chain Optimization.

Theme	**Key Insights**	**Examples from Interviews**
Carbon footprint tracking	Helps in meeting sustainability targets	"We monitor emissions in real-time."
Eco-friendly sourcing	Encourages responsible supplier choices	"We prioritize vendors with green practices."
Waste reduction	Optimizes materials and logistics	"Packaging waste has decreased significantly."

Sustainability has become a key priority in supply chain management. Participants shared how their organizations adopted digital tools to track emissions and optimize sourcing decisions. Many businesses focused on working with environmentally responsible suppliers, ensuring that sustainability goals aligned with business strategies. Digital platforms also helped in reducing waste by improving material utilization and transportation efficiency.

Table 8. Supply Chain Agility in Responding to Market Changes.

Theme	**Key Insights**	**Examples from Interviews**
Demand fluctuations	Requires real-time adjustments in inventory	"We adapt stock levels based on trends."
Supplier flexibility	Helps in diversifying sourcing strategies	"We switched suppliers quickly during shortages."
Rapid scaling	Supports business expansion and contraction	"Our system allows us to scale up instantly."

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Agility in supply chain management enables businesses to adapt to changing market conditions. Participants explained how digital solutions helped them adjust inventory based on demand patterns. Supplier flexibility was another critical factor, allowing companies to shift sourcing strategies in response to supply shortages. Organizations with agile supply chains were also better positioned to scale operations efficiently.

Table 9. Leadership and Organizational Culture in Digital Transformation.

Theme	**Key Insights**	**Examples from Interviews**
Leadership commitment	Drives successful digital initiatives	"Top management supports our tech investments."
Innovation culture	Encourages experimentation with new technologies	"We test new tools before full adoption."
Change management	Reduces resistance and improves adoption	"Workshops helped employees embrace digitalization."

The study highlights the role of leadership and organizational culture in digital transformation. Participants noted that strong leadership support was essential for successful technology adoption. Companies with a culture of innovation were more willing to experiment with emerging technologies. Structured change management programs also played a vital role in addressing employee concerns and ensuring smooth digital integration.

The findings of the study reveal that real-time data access significantly enhances supply chain visibility, enabling organizations to make proactive decisions and minimize disruptions. Information sharing fosters collaboration and trust among supply chain partners, although security concerns can limit the extent of data exchanged. The adoption of digital technologies, including AI, blockchain, and cloud systems, contributes to greater resilience by facilitating risk management and efficient operations. However, challenges such as high implementation costs, resistance to change, and integration issues with legacy systems hinder the widespread adoption of these technologies. Participants reported that supply chain disruptions, such as supplier failures and transportation delays, are critical challenges that affect production and logistics, with organizations better prepared to manage risks when equipped with strong digital infrastructures. Automation improves efficiency by reducing manual errors and accelerating order processing but raises concerns about job displacement, prompting some firms to invest in workforce upskilling. Sustainability has emerged as a priority, with organizations leveraging digital tools to track carbon footprints and optimize sourcing decisions, while also focusing on reducing waste. Agility is highlighted as essential for responding to market changes, allowing businesses to adjust inventory and sourcing strategies swiftly. Finally, leadership commitment and an innovative organizational culture are pivotal for successful digital transformation, with structured change management processes helping to mitigate resistance and enhance technology adoption. Overall, the research underscores the importance of integrating digital solutions to optimize supply chain performance, improve resilience, and drive sustainability while navigating the challenges posed by a rapidly evolving market landscape.

5. Discussion

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The findings of this research provide significant insights into the critical role that information systems play in enhancing visibility and resilience within supply chains. As organizations increasingly face disruptions from various sources, the need for robust and integrated information systems becomes ever more apparent. The ability to access real-time data enables companies to respond swiftly to changes in demand, supply shortages, and unexpected disruptions, thereby fostering a more agile and responsive supply chain. This agility is essential in today's fast-paced business environment, where market dynamics can shift rapidly due to factors such as economic fluctuations, geopolitical tensions, or natural disasters. Moreover, the research highlights the importance of information sharing among supply chain partners. Collaborative relationships built on trust and transparency are crucial for achieving operational efficiencies and mitigating risks. However, it is evident that while many organizations recognize the benefits of sharing information, concerns regarding data security and competitive advantage often impede the full realization of these benefits. Organizations must find a balance between sharing critical information and protecting their proprietary data to foster collaboration without compromising their competitive edge. The adoption of digital technologies such as artificial intelligence, blockchain, and cloud computing emerged as a theme that significantly influences supply chain resilience. These technologies enable organizations to enhance their risk management capabilities by providing insights that inform decision-making processes. By leveraging predictive analytics, companies can anticipate potential disruptions and develop contingency plans, thereby minimizing their impact. However, the research also points to challenges associated with the implementation of these technologies, including high costs and the need for skilled personnel. As such, companies must carefully assess their readiness to adopt new technologies and invest in training and development to harness their full potential. Sustainability is another critical aspect discussed in the findings. Organizations are increasingly aware of the environmental impact of their supply chains and are taking proactive measures to reduce their carbon footprints. Digital tools facilitate this endeavor by enabling better tracking of emissions and waste, thus allowing companies to make more sustainable sourcing decisions. However, while the commitment to sustainability is commendable, organizations must also ensure that these initiatives do not compromise their operational efficiency or profitability. This necessitates a holistic approach to sustainability, integrating it into the core business strategy rather than treating it as an add-on. The findings also underscore the importance of leadership and organizational culture in driving successful digital transformation. Strong leadership commitment is essential in navigating the complexities associated with implementing new technologies and fostering a culture of innovation. Resistance to change remains a significant barrier to digital adoption, indicating the need for structured change management processes that engage employees at all levels. By creating an environment that encourages experimentation and values input from staff, organizations can facilitate smoother transitions and enhance the likelihood of successful technology integration. Lastly, the research emphasizes that the journey toward improved supply chain visibility and resilience is ongoing. Organizations must continuously assess their supply chain strategies in light of emerging trends and challenges. The rapid pace of technological advancements means that staying ahead of the curve is crucial for maintaining a competitive advantage. Companies that embrace a culture of continuous improvement and adaptability will be better positioned to navigate the complexities of today's supply chains. Overall, the integration of information systems into supply chain management is not merely a technological upgrade; it is a strategic imperative that can lead to enhanced performance, increased resilience, and sustainable growth.

6. Conclusion

This research underscores the pivotal role that integrated information systems play in enhancing visibility and resilience within supply chains. As organizations face an increasingly complex and volatile business landscape, the ability to swiftly access and analyze real-time data becomes essential for effective decision-making. The findings indicate that successful integration of digital technologies not only improves operational efficiency but also fosters collaboration among supply chain partners,

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enabling them to respond more effectively to disruptions. The study highlights the critical importance of information sharing and the establishment of trust-based relationships, as these elements are fundamental in overcoming barriers to collaboration. Furthermore, the exploration of digital technologies such as artificial intelligence and blockchain reveals their transformative potential in risk management and sustainability initiatives. By leveraging these innovations, organizations can enhance their agility and adaptability, allowing them to anticipate disruptions and make informed decisions that align with their sustainability goals. However, the challenges associated with the implementation of such technologies, including cost and the need for skilled personnel, must be carefully managed to ensure successful adoption. Leadership commitment and organizational culture emerged as crucial factors influencing the effectiveness of digital transformation efforts. Organizations that prioritize change management and foster a culture of innovation are better positioned to navigate the complexities of supply chain management. By engaging employees and promoting a mindset of continuous improvement, companies can enhance their readiness for adopting new technologies and practices. Ultimately, the journey toward improved supply chain visibility and resilience is an ongoing process. As market dynamics continue to evolve, organizations must remain vigilant and proactive in assessing their strategies. The integration of information systems is not just a technological advancement; it is a strategic necessity that can drive competitive advantage, operational excellence, and sustainable growth. By embracing this approach, organizations can not only enhance their current capabilities but also ensure their long-term success in an ever-changing business environment.

References

1. Alkhatib, S. F., & Momani, R. A. (2023). Supply chain resilience and operational performance: The role of digital technologies in Jordanian manufacturing firms. *Administrative Sciences, 13*(2), 40. https://doi.org/10.3390/admsci13020040
2. Al-Talib, M., Melhem, W. Y., Anosike, A. I., Garza Reyes, J. A., Nadeem, S. P., & Kumar, A. (2020). Achieving resilience in the supply chain by applying IoT technology. *Procedia CIRP, 91*, 752–757. https://doi.org/10.1016/j.procir.2020.02.231
3. Atieh Ali, A. A., Sharabati, A.-A. A., Allahham, M., & Nasereddin, A. Y. (2024). The relationship between supply chain resilience and digital supply chain and the impact on sustainability: Supply chain dynamism as a moderator. *Sustainability, 16*(7), 3082. https://doi.org/10.3390/su16073082
4. Bag, S., Telukdarie, A., Pretorius, J. H. C., & Gupta, S. (2018). Industry 4.0 and supply chain sustainability: Framework and future research directions. *Benchmarking: An International Journal, 28*(5), 1410–1450. https://doi.org/10.1108/BIJ-03-2018-0056
5. Emon, M. M. H., & Khan, T. (2024). Unlocking Sustainability through Supply Chain Visibility: Insights from the Manufacturing Sector of Bangladesh. Brazilian Journal of Operations & Production Management, 21(4), 2194. https://doi.org/10.14488/BJOPM.2194.2024
6. Khan, T., & Emon, M. M. H. (2024). Exploring the Potential of the Blue Economy: A Systematic Review of Strategies for Enhancing International Business in Bangladesh in the context of Indo-Pacific Region. Review of Business and Economics Studies, 12(2), 55–73. https://doi.org/10.26794/2308-944X-2024-12-2-55-73
7. Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2024). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: An empirical investigation. *Annals of Operations Research, 333*, 627–652. https://doi.org/10.1007/s10479-022-04735-y
8. Ben-Daya, M., Hassini, E., & Bahroun, Z. (2017). Internet of things and supply chain management: A literature review. *International Journal of Production Research, 57*(15–16), 4719–4742. https://doi.org/10.1080/00207543.2017.1402140
9. Bischoff, O., & Seuring, S. (2021). Opportunities and limitations of public blockchain-based supply chain traceability. *Modern Supply Chain Research and Applications, 3*(3), 226–243. https://doi.org/10.1108/MSCRA-03-2021-0007

 doi:10.20944/preprints202502.1064.v1

10. Choi, T. M., & Luo, S. (2019). Data quality challenges for sustainable fashion supply chain operations in emerging markets: Roles of blockchain, government sponsors and environment taxes. *Transportation Research Part E: Logistics and Transportation Review, 131*, 139–152. https://doi.org/10.1016/j.tre.2019.09.019
11. Cui, L., Wu, H., Wu, L., Kumar, A., & Tan, K. H. (2023). Investigating the relationship between digital technologies, supply chain integration and firm resilience in the context of COVID-19. *Annals of Operations Research, 327*, 825–853. https://doi.org/10.1007/s10479-022-04735-y
12. Deepu, T. S., & Ravi, V. (2023). A review of literature on implementation and operational dimensions of supply chain digitalization: Framework development and future research directions. *International Journal of Information Management Data Insights, 3*(1), 100156. https://doi.org/10.1016/j.jjimei.2023.100156
13. Dubey, R., Gunasekaran, A., Childe, S. J., Roubaud, D., Wamba, S. F., & Giannakis, M. (2019). Big data analytics and organizational culture as complements to swift trust and collaborative performance in the humanitarian supply chain. *International Journal of Production Economics, 210*, 120–136. https://doi.org/10.1016/j.ijpe.2019.01.023
14. Durach, C. F., Kurpjuweit, S., & Wagner, S. M. (2017). The impact of additive manufacturing on supply chains. *International Journal of Physical Distribution & Logistics Management, 47*(10), 954–971. https://doi.org/10.1108/IJPDLM-11-2016-0332
15. Emon, M. M. H., Khan, T., Rahman, M. A., Hamid, A. B. A., & Yaakub, N. I. (2025). GreenTech Revolution: Navigating Challenges and Seizing Opportunities. In AI and Green Technology Applications in Society (pp. 63–90). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9879-1.ch003
16. Khan, T., Emon, M. M. H., & Rahman, M. A. (2024). A systematic review on exploring the influence of Industry 4.0 technologies to enhance supply chain visibility and operational efficiency. Review of Business and Economics Studies, 12(3), 6–27. https://doi.org/10.26794/2308-944X-2024-12-3-6-27
17. Erboz, G., Kocabasoglu-Hillmer, C., & Arslan, A. (2021). Industry 4.0 technologies and their effect on supply chain performance. *Journal of Manufacturing Technology Management, 32*(3), 583–606. https://doi.org/10.1108/JMTM-05-2020-0197
18. Fayezi, S., & Zomorrodi, M. (2015). The role of relationship integration in supply chain agility and flexibility development: An Australian perspective. *Journal of Manufacturing Technology Management, 26*(8), 1126–1157. https://doi.org/10.1108/JMTM-03-2014-0037
19. Giannakis, M., Spanaki, K., & Dubey, R. (2019). A cloud-based supply chain management system: Effects on supply chain responsiveness. *Journal of Enterprise Information Management, 32*(4), 585–607. https://doi.org/10.1108/JEIM-07-2018-0167
20. Gunasekaran, A., & Ngai, E. W. T. (2004). Information systems in supply chain integration and management. *European Journal of Operational Research, 159*(2), 269–295. https://doi.org/10.1016/j.ejor.2003.08.016
21. Heckmann, I., Comes, T., & Nickel, S. (2015). A critical review on supply chain risk – Definition, measure and modeling. *Omega, 52*, 119–132. https://doi.org/10.1016/j.omega.2014.10.004
22. Ivanov, D., & Dolgui, A. (2020). Viability of intertwined supply networks: Extending the supply chain resilience angles towards survivability. *International Journal of Production Research, 58*(10), 2904–2915. https://doi.org/10.1080/00207543.2020.1750727
23. Emon, M. M. H., Khan, T., Rahman, M. A., & Siam, S. A. J. (2024). Factors Influencing the Usage of Artificial Intelligence among Bangladeshi Professionals: Mediating role of Attitude Towards the Technology. 2024 IEEE International Conference on Computing, Applications and Systems (COMPAS), 1–7. https://doi.org/10.1109/COMPAS60761.2024.10796110
24. Khan, T., Emon, M. M. H., Rahman, M. A., Hamid, A. B. A., & Yaakub, N. I. (2025). Bridging the Gap: Realizing GreenTech Potential. In AI and Green Technology Applications in Society (pp. 91–122). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9879-1.ch004
25. Jüttner, U., Peck, H., & Christopher, M. (2003). Supply chain risk management: Outlining an agenda for future research. *International Journal of Logistics Research and Applications, 6*(4), 197–210. https://doi.org/10.1080/13675560310001627016

 doi:10.20944/preprints202502.1064.v1

26. Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics, 171*, 116–133. https://doi.org/10.1016/j.ijpe.2015.10.023
27. Kembro, J., & Näslund, D. (2014). Information sharing in supply chains, myth or reality? A critical analysis of empirical literature. *International Journal of Physical Distribution & Logistics Management, 44*(3), 179–200. https://doi.org/10.1108/IJPDLM-09-2012-0284
28. Khan, O., & Burnes, B. (2007). Risk and supply chain management: Creating a research agenda. *International Journal of Logistics Management, 18*(2), 197–216. https://doi.org/10.1108/09574090710816931
29. Kleindorfer, P. R., & Saad, G. H. (2005). Managing disruption risks in supply chains. *Production and Operations Management, 14*(1), 53–68. https://doi.org/10.1111/j.1937-5956.2005.tb00009.x
30. Li, G., Lin, Y., Wang, S. Y., & Yan, H. (2006). Enhancing agility by timely sharing of supply information. *Supply Chain Management: An International Journal, 11*(5), 425–435. https://doi.org/10.1108/13598540610682444
31. Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision Support Systems, 42*(3), 1641–1656. https://doi.org/10.1016/j.dss.2006.02.011
32. Lin, H. F. (2007). Knowledge sharing and firm innovation capability: An empirical study. *International Journal of Manpower, 28*(3/4), 315–332. https://doi.org/10.1108/01437720710755272
33. Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision Support Systems, 54*(3), 1452–1462. https://doi.org/10.1016/j.dss.2012.12.016
34. Khan, T., & Emon, M. M. H. (2025). Supply chain performance in the age of Industry 4.0: evidence from manufacturing sector. Brazilian Journal of Operations & Production Management, 22(1), 2434. https://doi.org/10.14488/BJOPM.2434.2025
35. Emon, M. M. H., & Khan, T. (2024). A Systematic Literature Review on Sustainability Integration and Marketing Intelligence in the Era of Artificial Intelligence. Review of Business and Economics Studies, 12(4), 6–28. https://doi.org/10.26794/2308-944X-2024-12-4-6-28
36. Lu, Y., Papagiannidis, S., & Li, F. (2016). Skills and competences of e-commerce professionals: Business needs and expectations in China. *International Journal of Information Management, 36*(4), 505–520. https://doi.org/10.1016/j.ijinfomgt.2016.02.002
37. Manuj, I., & Mentzer, J. T. (2008). Global supply chain risk management strategies. *International Journal of Physical Distribution & Logistics Management, 38*(3), 192–223. https://doi.org/10.1108/09600030810866986
38. Marley, K. A., & Ward, P. T. (2013). Lean management as a countermeasure for "normal" disruptions. *Operations Management Research, 6*(1–2), 44–52. https://doi.org/10.1007/s12063-013-0070-1
39. Mason-Jones, R., & Towill, D. R. (1999). Total cycle time compression and the agile supply chain. *International Journal of Production Economics, 62*(1–2), 61–73. https://doi.org/10.1016/S0925-5273(98)00221-7
40. Fuada, M. N., Natha, A., Siddiquea, M. A. N., & Chowdhuryb, S. A. (2024). Impact of Digital Marketing on Small and Medium Enterprises (Smes) in Bangladesh. Corporate Sustainable Management Journal, 2(2): 59-68.
41. Rahmana, S., Nathb, A., Barsac, N. J., & Chowdhuryd, S. A. (2024). ANALYZING THE INFLUENCE OF SUPPLY CHAIN FLEXIBILITY ON COMPETITIVE ADVANTAGE IN BANGLADESHI SMES. Malaysian Business Management Journal, 3(2), 98–106. https://doi.org/10.26480/mbmj.02.2024.98.106
42. Khan, T., Emon, M. M. H., & Rahman, S. (2024). Marketing Strategy Innovation via AI Adoption: A Study on Bangladeshi SMEs in the Context of Industry 5.0. 2024 6th International Conference on Sustainable Technologies for Industry 5.0 (STI), 1-6.
43. Khan, T., Emon, M. M. H., & Nath, A. (2024). Quantifying the Effects of AI-Driven Inventory Management on Operational Efficiency in Online Retail. 2024 27th International Conference on Computer and Information Technology (ICCIT), 1-6.
44. Rahman, M. A., Emon, M. M. H., Khan, T., & Siam, S. A. J. (2024). Measuring the Influence of Brand Image on Consumer Behavioral Intentions by using AI: Exploring the Mediating Role of Trust. 2024 IEEE International Conference on Computing, Applications and Systems (COMPAS), 1–7. https://doi.org/10.1109/COMPAS60761.2024.10796396

 doi:10.20944/preprints202502.1064.v1

45. Rahman, M. A., Emon, M. M. H., Khan, T., Hamid, A. B. A., & Yaakub, N. I. (2024). Eco-Intelligence. In AI and Green Technology Applications in Society (pp. 31–62). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9879-1.ch002
46. Mishra, D., Gunasekaran, A., Papadopoulos, T., & Childe, S. J. (2018). Big Data and supply chain management: A review and bibliometric analysis. *Annals of Operations Research, 270*(1–2), 313–336. https://doi.org/10.1007/s10479-016-2236-y
47. Narasimhan, R., & Kim, S. W. (2002). Effect of supply chain integration on the relationship between diversification and performance: Evidence from Japanese and Korean firms. *Journal of Operations Management, 20*(3), 303–323. https://doi.org/10.1016/S0272-6963(02)00008-6
48. Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal of Physical Distribution & Logistics Management, 34*(5), 434–456. https://doi.org/10.1108/09600030410545463
49. Ivanov, D., & Dolgui, A. (2020). Viability of intertwined supply networks: Extending the supply chain resilience angles towards survivability. *International Journal of Production Research, 58*(10), 2904–2915. https://doi.org/10.1080/00207543.2020.1750727
50. Jüttner, U., Peck, H., & Christopher, M. (2003). Supply chain risk management: Outlining an agenda for future research. *International Journal of Logistics Research and Applications, 6*(4), 197–210. https://doi.org/10.1080/1367556031000162701 6
51. Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics, 171*, 116–133. https://doi.org/10.1016/j.ijpe.2015.10.023
52. Kembro, J., & Näslund, D. (2014). Information sharing in supply chains, myth or reality? A critical analysis of empirical literature. *International Journal of Physical Distribution & Logistics Management, 44*(3), 179–200. https://doi.org/10.1108/IJPDLM-09-2012-0284
53. Khan, O., & Burnes, B. (2007). Risk and supply chain management: Creating a research agenda. *International Journal of Logistics Management, 18*(2), 197–216. https://doi.org/10.1108/09574090710816931
54. Kleindorfer, P. R., & Saad, G. H. (2005). Managing disruption risks in supply chains. *Production and Operations Management, 14*(1), 53–68. https://doi.org/10.1111/j.1937-5956.2005.tb00009.x
55. Li, G., Lin, Y., Wang, S. Y., & Yan, H. (2006). Enhancing agility by timely sharing of supply information. *Supply Chain Management: An International Journal, 11*(5), 425–435. https://doi.org/10.1108/13598540610682444
56. Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision Support Systems, 42*(3), 1641–1656. https://doi.org/10.1016/j.dss.2006.02.011
57. Lin, H. F. (2007). Knowledge sharing and firm innovation capability: An empirical study. *International Journal of Manpower, 28*(3/4), 315–332. https://doi.org/10.1108/01437720710755272
58. Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision Support Systems, 54*(3), 1452–1462. https://doi.org/10.1016/j.dss.2012.12.016
59. Lu, Y., Papagiannidis, S., & Li, F. (2016). Skills and competences of e-commerce professionals: Business needs and expectations in China. *International Journal of Information Management, 36*(4), 505–520. https://doi.org/10.1016/j.ijinfomgt.2016.02.002
60. Manuj, I., & Mentzer, J. T. (2008). Global supply chain risk management strategies. *International Journal of Physical Distribution & Logistics Management, 38*(3), 192–223. https://doi.org/10.1108/09600030810866986
61. Marley, K. A., & Ward, P. T. (2013). Lean management as a countermeasure for "normal" disruptions. *Operations Management Research, 6*(1–2), 44–52. https://doi.org/10.1007/s12063-013-0070-1
62. Mason-Jones, R., & Towill, D. R. (1999). Total cycle time compression and the agile supply chain. *International Journal of Production Economics, 62*(1–2), 61–73. https://doi.org/10.1016/S0925-5273(98)00221-7
63. Mishra, D., Gunasekaran, A., Papadopoulos, T., & Childe, S. J. (2018). Big Data and supply chain management: A review and bibliometric analysis. *Annals of Operations Research, 270*(1–2), 313–336. https://doi.org/10.1007/s10479-016-2236-y

 doi:10.20944/preprints202502.1064.v1

64. Narasimhan, R., & Kim, S. W. (2002). Effect of supply chain integration on the relationship between diversification and performance: Evidence from Japanese and Korean firms. *Journal of Operations Management, 20*(3), 303–323. https://doi.org/10.1016/S0272-6963(02)00008-6