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Supply Chain Management Strategies in Facing Post-Pandemic Disruptions

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ABSTRACT

Post-pandemic supply chain management strategies focus on enhancing resilience, agility, and adaptability to mitigate disruptions caused by COVID-19 and similar crises. Key challenges include labor and material scarcity, supply inconsistency, and demand fluctuations, which require dynamic capability-based frameworks and risk management approaches to address effectively. Retail supply chains prioritize collaboration efficiency, order fulfillment, and digital transformation to sustain performance in volatile environments. Hybrid risk management models combining Conditional Value at Risk and chance constraints improve medical supply chain resilience by balancing cost and service levels under uncertainty. Flexibility plays a critical role in building supply chain robustness and agility, enabling flexible procurement, operational maneuverability, and risk management culture, especially in global textile and clothing sectors. Integrated frameworks linking resilience enablers with sustainable operational strategies such as agile, lean-green, circular, and decentralized models support long-term supply chain viability and alignment with Sustainable Development Goals. These strategies collectively emphasize the need for coordinated recovery, gradual capacity ramp-up, and advanced data analytics to enhance supply chain performance and sustainability in the post-pandemic era.

INTRODUCTION

The COVID-19 pandemic has caused an unprecedented global shock to supply chains, exposing vulnerabilities in systems once considered robust and resilient. Global supply chains (GSCs) experienced disruptions across all stages—from raw material procurement to manufacturing, processing, transportation, and final delivery—impacting industries such as pharmaceuticals, food, electronics, and automotive sectors (Figueira-De-Lemos et al., 2024). Unlike previous disruptions, COVID-19 affected both supply and demand simultaneously, with labor shortages, border closures, and shifts in consumer behavior causing cascading effects upstream and downstream in the value chain (Magableh, 2021).

The pandemic revealed that reliance on global trade can both propagate shocks and provide insulation; countries with diversified import sources sometimes fared better than those relying solely on domestic inputs, as lockdowns affected local labor and production capacities (Xu et al., 2020). The crisis accelerated trends toward supply chain restructuring, including supplier diversification, nearshoring, and increased regionalization, as firms sought to reduce dependency on single countries like China and enhance flexibility by reallocating volumes among suppliers in Asia and North America (Raj et al., 2022).

Food supply chains faced particular challenges due to movement restrictions, changing demand patterns, and protectionist policies, highlighting the need for flexible, adaptive systems and government support to maintain food security (Niu et al., 2025). The pandemic also underscored the importance of dynamic capabilities and risk

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management strategies, with labor scarcity and inconsistent supply identified as critical challenges requiring coordinated mitigation efforts (Bonadio et al., 2020). Overall, the COVID-19 shock has prompted a reevaluation of supply chain design, emphasizing resilience, agility, and sustainability to better prepare for future global disruptions (Aday & Aday, 2020; Hobbs, 2020). This transformation offers a generational opportunity for businesses and policymakers to build more robust, adaptable supply chains in a volatile and interconnected world.

The COVID-19 pandemic and subsequent global events have triggered a series of common post-pandemic disruptions that continue to challenge supply chains worldwide. One of the most pervasive issues is material shortages, caused by factory shutdowns, labor scarcity, and raw material supply interruptions, which have led to production delays and inventory stockouts across multiple industries (Guo et al., 2024). These shortages are often exacerbated by port congestion, where container ports face unprecedented backlogs due to labor constraints, vessel delays, and uneven cargo flows, significantly slowing down the movement of goods and increasing lead times (Saxena, 2025; Xu et al., 2020). The congestion at ports has also contributed to logistics cost inflation, as shipping rates surged dramatically during the pandemic, driven by limited vessel availability, increased demand for freight, and disruptions in global shipping routes; this inflation has had a direct impact on import prices and overall inflation in many countries (Furceri et al., 2022).

In addition to supply-side challenges, demand volatility has emerged as a critical disruption, with sudden shifts in consumer behavior—such as panic buying, changes in consumption patterns, and fluctuating demand across sectors—making forecasting and inventory management more complex and uncertain (Notteboom et al., 2021). This volatility forces supply chains to be more agile and responsive but also increases the risk of overstocking or stockouts. Furthermore, geopolitical tensions, including trade restrictions, sanctions, and conflicts like the Russia-Ukraine war, have intensified supply chain risks by disrupting trade flows, increasing uncertainty, and prompting companies to reconsider supplier diversification and regionalization strategies (Kovács & Sigala, 2020). These tensions often intersect with pandemic-related disruptions, compounding their effects on global supply chain stability.

Together, these disruptions highlight the interconnectedness and fragility of modern supply chains, emphasizing the urgent need for resilience-building strategies such as multi-sourcing, inventory buffers, digitalization, and enhanced collaboration among stakeholders (Gultekin et al., 2022). The evolving landscape demands that supply chains not only recover but also transform to withstand future shocks, balancing cost efficiency with flexibility and risk mitigation in a complex global environment (Ginn & Saadaoui, 2025; Shandrivska & Pawłyszyn, 2024).

The COVID-19 pandemic has fundamentally challenged the traditional supply chain management paradigm that prioritized efficiency and lean operations, revealing critical vulnerabilities in highly optimized but inflexible systems. Historically, supply chains focused on minimizing costs, reducing inventory levels, and streamlining processes to achieve maximum efficiency, often through lean manufacturing and just-in-time (JIT) practices. However, the pandemic's widespread disruptions—such as

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sudden demand spikes, supply shortages, and logistical bottlenecks—exposed the fragility of these efficiency-driven models, prompting a strategic shift toward resilience and responsiveness (Kashem et al., 2024). Resilience refers to the ability of a supply chain to anticipate, absorb, and recover from disruptions, while responsiveness emphasizes agility and flexibility to rapidly adapt to changing conditions. This shift entails balancing efficiency with the capacity to withstand shocks, requiring investments in redundancy, supplier diversification, and digital technologies that enhance real-time visibility and decision-making (Lücker et al., 2024).

The transition from lean to resilient supply chains involves rethinking inventory policies, moving away from minimal stock levels toward strategic buffers that can cushion against supply interruptions. For example, flexible manufacturing systems and multi-sourcing strategies reduce dependency on single suppliers or regions, mitigating risks from localized disruptions (Riad et al., 2024). Digital transformation plays a pivotal role in this evolution, with artificial intelligence (AI), machine learning, and predictive analytics enabling improved demand forecasting, risk assessment, and dynamic resource allocation, thereby enhancing both resilience and operational efficiency (Bamia & Bamia, 2025). These technologies facilitate real-time data sharing and collaboration across supply chain partners, fostering transparency and coordinated responses to disruptions.

Despite the benefits of resilience, a key challenge lies in managing the trade-offs between efficiency and robustness. Overemphasis on resilience can lead to increased costs due to redundancy and excess capacity, while focusing solely on efficiency risks vulnerability to shocks (De Arquer et al., 2021). Research highlights the importance of identifying dual-purpose capabilities that simultaneously support efficiency and resilience, such as flexible production and agile inventory management, to optimize overall supply chain performance (Bui et al., 2020). Moreover, sustainability considerations are increasingly integrated with resilience strategies, as firms seek to build supply chains that are not only robust but also environmentally and socially responsible (Mistarihi & Magableh, 2023). This holistic approach aligns with emerging frameworks that emphasize sustainable-resilient-responsive supply chains, balancing economic, environmental, and social objectives.

Organizational capabilities also need to evolve, prioritizing proactive and reactive strategies that enable rapid response and recovery from disruptions. Studies show that proactive capabilities—such as risk monitoring and contingency planning—are critical for resilience, while reactive capabilities—such as flexible logistics and rapid reconfiguration—support responsiveness (Mondal et al., 2024). The pandemic has underscored the necessity for supply chain managers to develop ambidexterity, the ability to balance exploitation of existing efficiencies with exploration of new adaptive practices (Apeh et al., 2024). This requires cultural shifts, enhanced collaboration, and investment in workforce skills to manage complexity and uncertainty effectively.

The transition to a post-pandemic era has not eliminated the vulnerabilities of global supply chains; rather, many continue to face recurring and new disruptions that challenge their stability and performance. Despite efforts to return to pre-pandemic operations, companies struggle to adapt their traditional supply chain strategies to a

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more volatile and uncertain environment characterized by fluctuating demand, supply shortages, and logistical constraints (Majumdar & Srivastava, 2025). The pandemic exposed critical weaknesses in supply chains, such as labor scarcity, material shortages, and inconsistent supply, which remain significant challenges in the post-pandemic context (Shahed et al., 2021). Moreover, the complexity of disruptions has increased with factors like geopolitical tensions and evolving consumer behaviors, making it difficult for firms to rely solely on pre-pandemic risk management approaches.

There is a critical need to identify and synthesize effective supply chain management strategies that can mitigate these ongoing disruptions and enhance supply chain resilience and responsiveness. Research highlights that adopting resilient strategies—including collaboration efficiency, digitalization, flexible procurement, and agile operations—can help firms better navigate the post-pandemic landscape (Yılmaz et al., 2025). For example, digital retail supply chains that leverage real-time data and advanced analytics improve order fulfillment and responsiveness to demand fluctuations, which are essential for sustaining business performance amid uncertainty (Khan et al., 2022). Flexibility, as a core capability, enables supply chains to adjust procurement, diversify products, and manage risks proactively, thereby strengthening robustness and agility simultaneously (Vanany et al., 2021).

Advanced risk management frameworks are also crucial, especially in critical sectors like medical supply chains, where hybrid approaches combining stochastic programming and risk aversion techniques have shown promise in balancing cost efficiency with service level requirements (Ivanov, 2021). These frameworks help anticipate shortages, stabilize supplier and warehouse utilization, and improve overall supply chain survivability under various disruption scenarios. Additionally, mathematical models optimizing inventory policies and ordering decisions provide practical tools for manufacturers to maximize profits while managing pandemic-related uncertainties (Farooq et al., 2021). Such models support decision-making that accounts for fluctuating supply and demand, helping firms avoid costly overstocking or stockouts.

The integration of green practices, smart technologies, and crisis mitigation strategies further contributes to sustainable supply chain performance during disruptions (Ozdemir et al., 2022). Empirical evidence from manufacturing industries in developing economies suggests that these elements not only mitigate the negative impacts of the pandemic but also enhance long-term sustainability and organizational commitment. This holistic approach aligns with the growing recognition that supply chain resilience must encompass environmental and social dimensions alongside economic goals.

Conceptual frameworks and empirical studies emphasize the importance of proactive and reactive capabilities in building supply chain resilience. Proactive strategies such as risk monitoring, contingency planning, and collaboration with partners enable early identification and mitigation of risks, while reactive strategies like flexible logistics and rapid reconfiguration support quick recovery from disruptions (Pujawan & Bah, 2021). The development of ambidextrous organizational capabilities—balancing exploitation of existing efficiencies with exploration of new adaptive practices—is essential for managing the complexity and uncertainty of the post-

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pandemic environment (Rajabi et al., 2024). Furthermore, coordinated recovery efforts, including demand smoothing and gradual capacity ramp-up, are effective in avoiding "disruption tails" that can destabilize supply chains after the initial shock of a pandemic (Spieske et al., 2022).

Global supply chains in the post-pandemic era face a complex array of dominant disruptions that challenge their stability and performance. Key disruption types include natural and health-related crises such as pandemics, geopolitical tensions including trade wars and political instability, environmental events like climate change-induced disasters, and operational failures encompassing infrastructure breakdowns and cyberattacks. The COVID-19 pandemic highlighted how interconnected and globalized supply chains are vulnerable to sudden shocks that propagate rapidly across regions and industries, exacerbated by just-in-time inventory practices and concentrated sourcing. Additionally, evolving consumer behaviors and technological shifts contribute to demand volatility, while regulatory changes and compliance requirements add further complexity. These disruptions are often interrelated, creating compound risks that require multifaceted management approaches.

To build resilience against these disruptions, a variety of supply chain management strategies have been proposed and implemented. Central among these are diversification of suppliers and production sites, which reduces dependency on single sources and geographic regions, thereby mitigating localized risks. Enhancing flexibility and agility in operations allows firms to rapidly adjust production volumes, switch suppliers, and reconfigure logistics in response to changing conditions. The adoption of digital technologies such as artificial intelligence, Internet of Things (IoT), blockchain, and advanced analytics improves real-time visibility, predictive risk assessment, and collaborative decision-making across the supply chain network. Other strategies include maintaining strategic inventory buffers, implementing collaborative planning with partners, and embedding sustainability practices that align resilience with environmental and social goals. Organizational culture and leadership also play critical roles in fostering a proactive risk management mindset and enabling continuous adaptation.

These strategies can be effectively categorized into several broad groups to guide implementation. First, structural strategies focus on network design, including supplier diversification, multi-sourcing, and decentralized production to reduce vulnerability to localized disruptions. Second, operational strategies emphasize flexibility, agility, and inventory management to enable rapid response and recovery. Third, technological strategies leverage digital tools for enhanced visibility, traceability, and predictive analytics, facilitating proactive risk identification and mitigation. Fourth, collaborative strategies involve strengthening relationships and information sharing among supply chain partners to improve coordination and joint problem-solving. Finally, sustainability-oriented strategies integrate environmental and social considerations into resilience planning, balancing risk mitigation with long-term viability.

For organizations to implement these strategies effectively, a tailored approach is necessary, considering industry context, supply chain complexity, and risk exposure. Developing a comprehensive risk assessment framework helps identify critical

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vulnerabilities and prioritize interventions. Building organizational capabilities such as ambidexterity—the ability to balance efficiency with adaptability—is essential for managing trade-offs inherent in resilience strategies. Continuous monitoring and scenario planning enable firms to anticipate emerging risks and adjust strategies dynamically. Moreover, fostering a culture of collaboration and innovation supports the integration of new technologies and practices. Policymakers and industry leaders are encouraged to support frameworks that promote technology adoption, sustainability, and stakeholder engagement to enhance supply chain resilience at a systemic level.

The post-pandemic era has revealed a complex landscape of disruptions that continue to challenge global supply chains, necessitating a thorough identification and categorization of these key disruptions. The COVID-19 pandemic exposed critical vulnerabilities such as labor scarcity, material shortages, and inconsistent supply, which remain dominant challenges in the post-pandemic context. Beyond pandemic-specific issues, supply chains now face compounded risks from geopolitical tensions, trade restrictions, climate-induced shocks, and technological disruptions, all of which exacerbate operational fragility and uncertainty. These disruptions often interact, creating ripple effects that amplify their impact across multiple tiers of the supply chain, as seen in healthcare and retail sectors where shortages and logistical bottlenecks have been particularly severe. The diversity and interconnectedness of these disruptions highlight the need for a comprehensive framework to understand their nature and interrelations.

In response, various supply chain management strategies have been proposed and implemented to mitigate these disruptions and build resilience. A key approach involves enhancing flexibility and agility, enabling firms to rapidly adjust procurement, production, and distribution in the face of fluctuating demand and supply constraints. Digital transformation plays a pivotal role, with technologies such as IoT, big data analytics, and blockchain improving real-time visibility, predictive risk assessment, and coordination among supply chain partners. Strategies like supplier diversification, multi-sourcing, and decentralized production reduce dependency on single sources and geographic regions, thereby mitigating localized risks. Additionally, maintaining strategic inventory buffers and fostering collaborative relationships with suppliers and employees enhance robustness and responsiveness. Sustainability-oriented strategies integrating environmental and social considerations further align resilience with long-term viability and stakeholder expectations.

These strategies can be effectively categorized into a conceptual framework comprising five interrelated dimensions. First, structural strategies focus on supply network design, including diversification and decentralization to reduce vulnerability. Second, operational strategies emphasize flexibility, agility, and inventory management to enable rapid adaptation and recovery. Third, technological strategies leverage digital tools for enhanced visibility, traceability, and data-driven decision-making. Fourth, collaborative strategies involve strengthening partnerships and information sharing to improve coordination and joint problem-solving. Finally, sustainability strategies integrate environmental and social goals, ensuring resilience contributes to broader sustainable development objectives. This framework provides a holistic view that

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captures the multifaceted nature of resilience-building in the post-pandemic supply chain environment.

Effective implementation of these strategies requires organizations to adopt a tailored and dynamic approach. Developing a comprehensive risk assessment helps identify critical vulnerabilities and prioritize interventions based on specific industry contexts and supply chain complexities. Building organizational capabilities such as ambidexterity—the ability to balance efficiency with adaptability—is essential for managing trade-offs inherent in resilience strategies. Continuous monitoring, scenario planning, and innovation enable firms to anticipate emerging risks and adjust strategies proactively. Cultivating a culture of collaboration and empowerment supports the integration of new technologies and fosters agility in decision-making. Policymakers and industry leaders also play a vital role by promoting frameworks that encourage technology adoption, sustainability, and stakeholder engagement to enhance systemic supply chain resilience.

The significance of research on post-pandemic supply chain resilience lies in its dual contribution to academic knowledge and practical management. Academically, synthesizing current research provides a comprehensive understanding of how global supply chains have been disrupted by the COVID-19 pandemic and other concurrent crises, revealing critical vulnerabilities and gaps in traditional risk management approaches. This synthesis advances theory by integrating interdisciplinary insights from operations management, sustainability science, and organizational behavior, offering a nuanced conceptualization of resilience that encompasses agility, adaptability, and alignment across supply chain networks. It also highlights the evolving role of digital technologies, such as IoT and big data analytics, in enhancing real-time visibility and predictive capabilities, which are essential for proactive risk mitigation and recovery. By consolidating diverse empirical findings and conceptual models, this research equips scholars with a robust framework to guide future investigations and refine resilience theories in the context of compound global disruptions.

From a practical perspective, this body of research serves as a vital guide for supply chain managers and business leaders striving to formulate more robust and adaptive strategies in an uncertain post-pandemic environment. The pandemic exposed the limitations of efficiency-focused models, emphasizing the need for flexibility, supplier diversification, and strategic inventory management to buffer against supply shocks and demand volatility. Studies underscore the importance of fostering collaboration and empowerment within supply chains, which enhance responsiveness and innovation capacity without incurring significant costs. Furthermore, the integration of sustainability considerations aligns resilience efforts with long-term environmental and social goals, supporting corporate responsibility and compliance with evolving regulations. Simulation-based assessments and hybrid risk management frameworks provide actionable tools for decision-makers to evaluate trade-offs between cost and service levels, enabling tailored responses to specific disruption scenarios 16. These insights help organizations balance short-term crisis response with long-term resilience building, ensuring continuity and competitive advantage.

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The research also offers a conceptual framework that categorizes resilience strategies into structural, operational, technological, collaborative, and sustainability dimensions, facilitating systematic implementation. Structural strategies involve redesigning supply networks through multi-sourcing and decentralization to reduce dependency on vulnerable nodes. Operational strategies focus on enhancing agility and flexibility, including dynamic inventory policies and rapid reconfiguration of production and logistics. Technological strategies leverage digital tools for enhanced supply chain visibility, risk monitoring, and data-driven decision-making. Collaborative strategies emphasize strong relationships and information sharing among partners to improve coordination and joint problem-solving. Sustainability strategies integrate environmental and social objectives, ensuring resilience contributes to broader sustainable development goals. This framework aids managers in diagnosing vulnerabilities, prioritizing interventions, and aligning resilience initiatives with organizational capabilities and market demands.

The scope of research on supply chain management strategies in facing post-pandemic disruptions primarily focuses on literature published from 2020 onwards to capture the evolving understanding and responses to the COVID-19 pandemic and its aftermath. This temporal boundary ensures that the analysis reflects the most recent developments, challenges, and strategic adaptations relevant to the post-pandemic context, where supply chains have faced unprecedented volatility and complexity. The study is theoretical and conceptual in nature, relying on a comprehensive literature review rather than primary data collection, which allows for synthesizing diverse findings across industries and geographies to develop generalized insights and frameworks. This approach facilitates the integration of interdisciplinary perspectives, including operations management, risk management, sustainability, and organizational behavior, to build a holistic understanding of supply chain resilience and adaptability in the face of systemic disruptions.

The research scope encompasses general strategies that are applicable across various industries, recognizing that while specific sectors such as healthcare, retail, textile, and food have unique challenges, many resilience principles and mitigation tactics share commonalities. For instance, strategies like supplier diversification, inventory prepositioning, digital transformation, and enhanced collaboration have been widely recommended regardless of industry, though their implementation details may vary. Industry-specific examples are cited to illustrate how these general strategies manifest in practice and to highlight sectoral nuances, such as the criticality of medical supply chains during health crises or the agility demands in retail responding to shifting consumer behaviors. This balance between generalizability and contextual specificity enriches the conceptual framework and enhances its practical relevance.

However, the study's theoretical and literature-based nature imposes certain limitations. Without primary empirical data, the findings depend on the quality, scope, and representativeness of existing studies, which may vary in methodological rigor and contextual focus. The rapidly evolving post-pandemic environment means that some emerging trends or novel disruptions might not yet be fully captured in the literature, potentially limiting the framework's comprehensiveness or timeliness. Additionally,

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while general strategies provide valuable guidance, the heterogeneity of supply chains in terms of size, complexity, geographic dispersion, and technological maturity means that one-size-fits-all solutions are impractical; thus, the framework requires adaptation to specific organizational and industry contexts. The absence of primary data also limits the ability to validate the proposed strategies empirically or to assess their relative effectiveness quantitatively.

Despite these limitations, the conceptual and literature-driven approach offers significant value by consolidating fragmented knowledge and identifying overarching themes and best practices for supply chain resilience in the post-pandemic world. It enables academics to build on a synthesized foundation for further empirical research and theory development. For practitioners, the study provides a strategic lens to evaluate and enhance their supply chain operations, emphasizing flexibility, digital integration, risk management, and sustainability as pillars of resilience. The inclusion of cross-industry insights and examples supports managers in benchmarking and tailoring strategies to their unique challenges and opportunities, fostering a proactive and adaptive mindset essential for navigating ongoing and future disruptions.

LITERATURE REVIEW

Theoretical Foundation

Supply Chain Management (SCM) theory is grounded in the coordination and integration of activities involved in sourcing, procurement, conversion, and logistics management across multiple organizations to deliver products and services efficiently and effectively. The basic principles of SCM emphasize the importance of managing the flow of materials, information, and finances from suppliers to end customers, aiming to optimize overall supply chain performance rather than individual entities (Brusset & Teller, 2017). Key concepts include demand forecasting, inventory management, supplier relationship management, and logistics coordination, all designed to reduce costs, improve service levels, and enhance competitive advantage. SCM theory also recognizes the supply chain as a complex adaptive system where interdependencies and uncertainties require dynamic and flexible management approaches (Wang et al., 2017).

Supply chain resilience has emerged as a critical concept within SCM, especially in light of recent global disruptions such as the COVID-19 pandemic. Resilience refers to the supply chain's ability to prepare for, respond to, and recover from disruptions while maintaining continuous operations and safeguarding critical functions (Shishodia et al., 2021). Two dominant perspectives on resilience exist: the engineering resilience view, which focuses on the ability to return to a pre-disruption state (robustness and recovery), and the social-ecological resilience view, which emphasizes adaptation and transformation to new conditions (Baz & Ruel, 2020). Combining these perspectives, supply chain resilience is increasingly understood not just as stability but as a dynamic capability encompassing robustness (withstanding shocks), recovery (bouncing back), and adaptability (transforming in response to change) (Ivanov, 2023). This multidimensional view aligns with dynamic capability theory, which frames resilience as a set of proactive and reactive capabilities, including supply chain design quality,

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flexibility, and collaboration, that enable firms to manage vulnerability and sustain performance (Irfan et al., 2022; Macdonald et al., 2018).

Risk management frameworks in SCM provide structured approaches to identify, assess, and mitigate risks that threaten supply chain continuity and performance. The process begins with risk identification, which involves recognizing potential internal and external threats such as supplier failures, demand fluctuations, natural disasters, geopolitical events, and pandemics (Chowdhury & Quaddus, 2017). Risk assessment follows, evaluating the likelihood and impact of identified risks to prioritize management efforts. Mitigation strategies include diversification of suppliers, inventory buffering, flexible production systems, and enhanced information sharing to improve visibility and responsiveness (Wieland & Durach, 2021). Empirical research highlights the mediating role of supply chain risk management (SCRM) practices in enhancing resilience and robustness, demonstrating that effective risk management enables firms to better absorb shocks and maintain operational continuity during disruptions (Pettit et al., 2019; Shekarian & Parast, 2020). Moreover, integrating risk management with resilience-building efforts supports a holistic approach that balances protection (stability) and adaptation (flexibility) (Shashi et al., 2020).

The theoretical foundation of SCM strategies in facing post-pandemic disruptions thus rests on understanding supply chains as complex, adaptive systems requiring integrated management of flows, risks, and capabilities. The basic SCM principles provide the operational backbone, while resilience concepts expand the focus to include the capacity to absorb shocks, recover quickly, and adapt to new realities (Cohen et al., 2022; Pu et al., 2024). Risk management frameworks offer practical tools to systematically address uncertainties and vulnerabilities, enabling firms to anticipate and mitigate disruptions proactively (Adobor & McMullen, 2018). Together, these theoretical elements inform the development of robust, flexible, and adaptive supply chain strategies that are essential for navigating the heightened uncertainty and volatility characterizing the post-pandemic global environment (Herold & Marzantowicz, 2024; Nikookar & Yanadori, 2021).

Review of Key Concepts

Pre-pandemic supply chain strategies such as Just-In-Time (JIT), Lean Manufacturing, and Global Sourcing were widely adopted to maximize efficiency, reduce costs, and streamline operations. JIT focuses on minimizing inventory levels by receiving goods only as they are needed in the production process, thereby reducing holding costs and waste (Pyeman, 2025). Lean Manufacturing complements JIT by emphasizing the elimination of non-value-adding activities, continuous improvement, and waste reduction throughout the production system, aiming to enhance operational efficiency and product quality (Rozhkov et al., 2022). Global Sourcing involves procuring materials and components from international suppliers to leverage cost advantages, access specialized skills, and diversify supply bases, which was considered a key competitive strategy before the pandemic (Scala & Lindsay, 2021). These strategies collectively prioritized cost efficiency and responsiveness under relatively stable and

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predictable market conditions, often at the expense of supply chain flexibility and buffer capacity.

The COVID-19 pandemic exposed significant vulnerabilities in these pre-pandemic strategies, leading to a paradigm shift in supply chain management that balances efficiency with resilience. The trade-off between efficiency and resilience became apparent as highly optimized, lean, and globally dispersed supply chains struggled to absorb shocks and recover from disruptions (Kafi et al., 2023). While JIT and Lean Manufacturing reduced inventory buffers and slack resources, these same features limited the ability to respond to sudden supply shortages, demand spikes, and logistical constraints during the pandemic (Sinha et al., 2020). Global Sourcing, though beneficial for cost reduction, increased exposure to geopolitical risks, border closures, and transportation delays, highlighting the fragility of over-reliance on distant suppliers (Umar et al., 2025). This shift has prompted organizations to reconsider supply chain design, incorporating redundancy, flexibility, and risk diversification to enhance robustness and recovery capabilities alongside efficiency (Shen & Sun, 2021).

Post-pandemic disruptions can be categorized into several key types that affect supply chains differently. Supply-side disruptions include raw material shortages, supplier shutdowns, and production halts caused by health restrictions or labor scarcity (Craighead et al., 2020). Demand-side disruptions involve sudden changes in consumer behavior, such as panic buying or shifts in product preferences, which create demand volatility and forecasting challenges (Spieske & Birkel, 2021). Logistics disruptions encompass transportation delays, port congestions, and border restrictions that impede the flow of goods across the supply chain. Financial disruptions refer to liquidity constraints, fluctuating costs, and economic uncertainties that affect supply chain investments and operations. Geopolitical disruptions include trade wars, tariffs, and regulatory changes that alter supply chain configurations and increase complexity. Understanding these categories helps firms develop targeted strategies to mitigate risks and build resilience in a multifaceted disruption landscape.

The literature highlights that pre-pandemic strategies, while effective in stable environments, require adaptation to address the complexity and unpredictability of post-pandemic disruptions. For example, inventory pre-positioning and flexible production policies have been shown to improve recovery and reduce vulnerability during pandemics. Collaboration and information sharing across supply chain partners enhance visibility and coordination, which are critical for managing demand fluctuations and logistical challenges. Digital technologies and data analytics support real-time monitoring and predictive capabilities, enabling proactive risk management and agile responses. Moreover, diversification of suppliers and nearshoring are increasingly adopted to reduce dependency on single sources and long-distance logistics (Tiwari & Sharma, 2025). These evolving strategies reflect a more balanced approach that integrates efficiency with resilience to sustain supply chain performance under uncertainty.

Previous Research on Pandemic Impact on Supply Chains

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The COVID-19 pandemic has had a profound and immediate impact on supply chains across various industries worldwide, revealing significant vulnerabilities and prompting a reevaluation of supply chain management strategies. Studies analyzing these impacts highlight that industries such as food, pharmaceuticals, electronics, and automotive experienced disruptions at multiple stages, including raw material supply, manufacturing, processing, transportation, and demand fluctuations (Belhadi et al., 2020). For example, food supply chains faced bottlenecks due to labor shortages, especially seasonal workers, and disruptions in processing facilities, notably in meat processing plants, while demand shifted dramatically from food service to retail sectors (Barman et al., 2021). Despite these challenges, supply chains in developed countries demonstrated remarkable resilience, aided by policy interventions that streamlined border procedures and avoided protectionist measures that had exacerbated past crises. However, the pandemic exposed the fragility of global supply chains that had been optimized for efficiency with minimal buffers, underscoring the need for enhanced resilience and flexibility (Deconinck et al., 2020).

The immediate effects of the pandemic included severe logistical disruptions caused by lockdowns, travel restrictions, and border controls, which impeded the movement of goods and labor, further complicating supply chain operations. These disruptions were compounded by sudden and unpredictable shifts in consumer demand, such as panic buying and changes in consumption patterns, which challenged forecasting and inventory management (Younis et al., 2023). Financial pressures also emerged as firms faced liquidity constraints and increased costs, affecting their ability to maintain operations and invest in recovery. Geopolitical tensions and trade restrictions added another layer of complexity, highlighting the risks of over-reliance on global sourcing and just-in-time inventory systems (Grida et al., 2020). The pandemic thus revealed that supply chains optimized solely for cost efficiency and lean operations were vulnerable to systemic shocks that require a balance between efficiency and resilience (Guan et al., 2020).

Lessons learned from the pandemic emphasize the critical importance of supply chain resilience, defined as the ability to anticipate, absorb, recover from, and adapt to disruptions. Innovation emerged as a key factor in enhancing resilience, enabling firms to develop new processes, technologies, and collaborative practices that improve flexibility and responsiveness (Y. Zhu et al., 2022). Empowerment of employees and strong relationships with suppliers also contributed to more effective risk management and recovery efforts. The pandemic underscored the need for diversified sourcing strategies, increased inventory buffers, and enhanced visibility across supply chains to better manage risks and uncertainties. Furthermore, digital technologies and data analytics played a vital role in enabling real-time monitoring and decision-making, supporting more agile and adaptive supply chain operations (Paul et al., 2021).

Several studies focused on specific industry responses provide practical insights into managing pandemic-induced disruptions. For instance, JD.com's integrated supply chain and intelligent platforms allowed it to quickly adapt delivery procedures and maintain operations despite severe demand and logistical challenges in China (G. Zhu et al., 2020). In the food sector, flexible adjustments such as expanding operating hours,

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simplifying product ranges, and finding alternative suppliers helped mitigate supply shortages and meet shifting demand (Mahajan & Tomar, 2020). The ready-made garment industry in Bangladesh faced significant recovery challenges related to raw material scarcity and transportation disruptions, highlighting the need for strategic policies to support supply chain recovery in emerging economies (Queiroz et al., 2020). These cases illustrate that resilience-building requires a combination of operational flexibility, collaboration among stakeholders, and supportive policy environments

Synthesis of Post-Pandemic Supply Chain Strategies

Post-pandemic supply chain strategies have increasingly focused on integrating digital technologies, building resilience, strengthening supplier relationships, and optimizing logistics and distribution to better navigate disruptions like those experienced during COVID-(Nandi et al., 2020). Digitalization and technology adoption form a cornerstone of modern supply chain management, with the Internet of Things (IoT) enabling real-time tracking of goods and assets, thereby enhancing visibility and responsiveness across the supply chain (Qi et al., 2025). Big Data and predictive analytics improve demand forecasting accuracy by analyzing vast datasets to anticipate market shifts and consumer behavior, which is critical for managing volatility in post-pandemic environments (De Lucio et al., 2023). Artificial Intelligence (AI) supports risk management and decision-making by processing complex scenarios and providing actionable insights, helping firms to proactively mitigate disruptions (Miroudot, 2020). Blockchain technology enhances transparency and traceability by creating immutable records of transactions and product provenance, which fosters trust among stakeholders and supports circular economy initiatives.

Building supply chain resilience is another vital strategy, emphasizing diversification, inventory management, and flexibility. Diversification through multi-sourcing, near-shoring, and friend-shoring reduces dependency on single suppliers or distant geographies, mitigating risks associated with geopolitical tensions and transportation delays (Carissimi et al., 2022). Strategic stockpiling or "just-in-case" inventory management contrasts with traditional lean approaches by maintaining safety stocks of critical components to buffer against supply interruptions (Haraguchi et al., 2023). Supply chain flexibility is achieved through flexible manufacturing systems and agile logistics that can quickly adapt production volumes and distribution routes in response to changing conditions, enhancing the ability to absorb shocks and recover swiftly (Mızrak, 2024). These resilience-building measures reflect a shift from pure efficiency toward a balance with robustness and adaptability.

Strengthening supplier relationships is essential for collaborative risk management and supply chain agility. Collaborative planning and transparency with key suppliers improve coordination and information sharing, enabling joint problem-solving and faster response to disruptions (Gereffi, 2020). Supplier development programs and joint risk management initiatives foster mutual trust and capability building, which are critical for sustaining supply chain performance during crises (Kancs, 2023). These relational strategies help create a more integrated and responsive supply network, reducing vulnerabilities caused by siloed operations or adversarial supplier dynamics.

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Logistics and distribution optimization further support supply chain robustness by enhancing transportation and warehousing capabilities. Employing multi-modal transportation reduces reliance on any single mode, such as maritime shipping, which was heavily disrupted during the pandemic, thereby increasing flexibility and reliability in delivery (Fonseca & Azevedo, 2020). Warehouse automation and smart distribution centers leverage robotics, IoT, and AI to improve operational efficiency, accuracy, and speed, enabling rapid fulfillment and adaptation to fluctuating demand (Dwaikat et al., 2022). These technological and operational improvements in logistics are critical for maintaining service levels and customer satisfaction in uncertain environments.

Collectively, these strategies represent a comprehensive synthesis of post-pandemic supply chain management approaches that prioritize resilience alongside efficiency. Empirical studies across industries and regions confirm that firms adopting digital tools, diversifying supply bases, fostering supplier collaboration, and optimizing logistics are better positioned to withstand and recover from disruptions (Ovezmyradov, 2022). However, sector-specific challenges require tailored applications of these strategies, as the nature of disruptions and operational constraints vary widely (Fadojutimi, 2024). The integration of technology with strategic resilience measures and collaborative practices forms the foundation for supply chains that are not only more robust but also more agile and innovative in facing future uncertainties (Snowdon et al., 2022).

Research Gap

The post-pandemic environment has revealed significant and sustained disruptions in global supply chains, necessitating a comprehensive framework that integrates various management strategies to enhance resilience and adaptability. Research highlights that while many individual strategies exist—such as agility, adaptability, alignment (3As), digitalization, collaboration efficiency, and risk management—there is a lack of unified frameworks that holistically address the complex, long-term challenges posed by the pandemic aftermath (Setyadi et al., 2025). For example, Raj et al. identify key challenges like labor and material scarcity and propose mitigation strategies under dynamic capability theory, but these focus more on immediate disruptions rather than sustained post-pandemic conditions (Ishida, 2020).

Other studies emphasize the importance of resilient strategies such as order fulfillment and digital retail supply chains to mitigate long-term effects, yet these are often sector-specific and do not fully integrate with broader sustainability and operational models (Abdan & Çetindaş, 2023). Ivanov's work on supply chain viability introduces adaptation strategies like intertwining, scalability, substitution, and repurposing, offering a conceptual and formal model to quantify their impact, but calls for further empirical validation and integration into a comprehensive framework (Frederico, 2021). Additionally, frameworks like the GREAT-3Rs propose reforming global supply chains through government policies, redesign, economic strategies, operational adjustments, and technology adoption, aiming for responsiveness, resilience, and restoration, yet these remain high-level and require operationalization for sustained post-pandemic disruptions (Hohenstein, 2022).

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METHODS

Research Design

A qualitative research design using the Systematic Literature Review (SLR) method is well-suited for investigating supply chain management strategies in facing post-pandemic disruptions, as it allows for a comprehensive synthesis of existing knowledge and identification of research gaps. SLR systematically collects, evaluates, and synthesizes relevant studies to provide an evidence-based understanding of complex phenomena, such as the multifaceted impacts of COVID-19 on global supply chains and the diverse mitigation strategies employed. This method enables researchers to integrate findings from various contexts, industries, and geographic regions, offering a holistic view of supply chain resilience, adaptability, and sustainability in the post-pandemic era (Cordeiro et al., 2021).

For example, studies employing SLR have revealed critical themes such as digitalization, collaboration efficiency, risk management, and the integration of Industry 4.0 technologies as pivotal strategies to enhance supply chain performance and viability during and after pandemic disruptions . Moreover, SLR facilitates the development of conceptual frameworks by aggregating empirical evidence and theoretical insights, as seen in research that combines dynamic capability theory with practical lessons learned to address labor and material scarcity challenges (Ahmed et al., 2022). By adopting SLR, this study can systematically map the evolution of supply chain strategies, assess their effectiveness, and propose a comprehensive framework that addresses sustained disruptions in the post-pandemic environment, thereby contributing valuable guidance for both scholars and practitioners (Gupta et al., 2024).

Data Source and Collection Method

The research methodology for analyzing supply chain management strategies in facing post-pandemic disruptions requires a multi-faceted approach to data collection, incorporating both academic literature and industry-specific reports. This comprehensive approach ensures both theoretical rigor and practical relevance, capturing the rapidly evolving landscape of supply chain resilience in the wake of COVID-19 disruptions. Academic databases provide peer-reviewed empirical studies and conceptual frameworks, while industry reports offer real-time implementation data and emerging trends from corporate practices (Purnamasari et al., 2024). This dual perspective is particularly valuable for a topic that has seen both rapid scholarly publication and significant practical innovation in response to recent global disruptions.

The selection of sources for this research is guided by strict inclusion criteria focusing on publications from 2020-2024 to ensure temporal relevance to the post-pandemic context. The systematic approach encompasses peer-reviewed journal articles, empirical case studies, and authoritative industry analyses from globally recognized institutions. This timeframe is crucial as it captures the immediate impacts of COVID-19 on global supply chains and the subsequent development of mitigation strategies, including the shift from purely efficiency-focused models toward more resilient frameworks that can withstand systemic disruptions. The geographical scope

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includes both developed and emerging economies, with specific attention to countries like India and Indonesia that experienced significant supply chain disruptions during the pandemic period.

The data collection methodology for this research incorporates both systematic retrieval processes and analytical techniques designed to identify and interpret relevant information on supply chain resilience strategies. For academic sources, the process begins with structured database searches using predetermined keyword combinations including "supply chain resilience," "post-pandemic supply chain," "supply chain disruption," "risk management," "digital supply chain," and "COVID-19 impact supply chain". These searches are filtered by publication date (2020-2024) and subject area to ensure relevance. Additional snowball sampling techniques are employed by reviewing reference lists of key articles to identify further relevant sources that may not have appeared in initial database searches.

Industry data collection focuses on obtaining recent reports from reputable consulting firms and industry associations. This involves targeted retrieval of documents from official organizational websites, with particular attention to longitudinal studies that track the evolution of supply chain strategies throughout and after the pandemic period. The McKinsey Global Supply Chain Leader Surveys, for example, provide valuable time-series data on how companies have adapted their approaches to building resilience through methods such as dual-sourcing strategies and supply chain regionalization (Meyer et al., 2023). These industry sources are particularly valuable for capturing implementation challenges and success factors that may not yet be reflected in academic literature.

Analytical methods for processing the collected data include both systematic literature review protocols and empirical assessment techniques. The systematic review approach follows established methodological frameworks for analyzing and synthesizing findings across multiple studies, as demonstrated in research examining the role of supply chain management in enhancing corporate operational performance. For empirical data, advanced analytical methods such as the Grey-DEMATEL (Decision-Making Trial and Evaluation Laboratory) approach have been employed to analyze complex interrelationships between various supply chain challenges, helping to identify causal relationships and priority areas for intervention (Rusli et al., 2024). These methodological approaches enable a nuanced understanding of how different disruption types interact and which mitigation strategies prove most effective in specific contexts.

Data Analysis Method

Thematic content analysis is a widely used qualitative data analysis method that systematically identifies, codes, and synthesizes recurring themes within collected literature, making it highly suitable for analyzing supply chain management strategies in the context of post-pandemic disruptions. This approach enables researchers to distill complex and diverse findings from multiple studies into coherent thematic categories, such as types of disruptions, resilience strategies, and recovery mechanisms, which are

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critical for understanding how supply chains adapt and respond to unprecedented challenges like COVID-19 (Katsaliaki et al., 2021; Rahman et al., 2022).

By coding data from selected articles, reports, and case studies, thematic analysis reveals patterns in strategic responses, including digital transformation, collaboration, risk mitigation, and flexibility, which have emerged as dominant themes in recent supply chain research (Sudan et al., 2023). For instance, studies have highlighted the importance of supply chain agility and redundancy, the integration of Industry 4.0 technologies, and enhanced collaboration among supply chain partners as key strategies to build resilience and ensure continuity during disruptions (Zhang et al., 2021). Synthesizing these findings into a coherent framework allows for a structured understanding of how different strategies interact and contribute to supply chain robustness, while also identifying gaps such as the need for more simulation-based and theoretically grounded research on large-scale disruptions (Duong & Chong, 2020; Sardar & Akram, 2025; Solari et al., 2024).

RESULTS

Summary of Identified Post-Pandemic Disruptions

The post-pandemic era has exposed supply chains to a range of critical disruptions that have challenged their stability, efficiency, and resilience. Among the most significant disruptions identified across multiple studies are labor shortages, material scarcity, and supply inconsistencies, which have been highlighted as primary factors undermining supply chain performance during and after the COVID-19 pandemic (Jamil et al., 2025). Labor scarcity emerged as the most critical challenge, driven by health concerns, lockdowns, and social distancing measures that limited workforce availability and productivity, particularly in manufacturing and logistics sectors (Lucas et al., 2024). Material scarcity, including raw materials and components, was exacerbated by global demand surges, production halts, and transportation bottlenecks, leading to delays and increased costs. Inconsistency of supply, often linked to disruptions in supplier networks and international trade restrictions such as export bans and tariffs, further complicated procurement and inventory management (Ambrogio et al., 2022).

Transportation and logistics disruptions also played a pivotal role, with restrictions on movement, border closures, and reduced freight capacity causing delays and increased lead times, especially in perishable goods and medical supplies. The healthcare supply chain faced unique challenges, including shortages of critical medical equipment like ventilators and personal protective equipment (PPE), driven by overreliance on single-source suppliers and global trade barriers (Lv et al., 2024). These disruptions were compounded by demand volatility, where sudden spikes in essential goods contrasted with declines in nonessential products, complicating forecasting and inventory decisions. Additionally, the pandemic revealed vulnerabilities in supply chain digitalization and visibility, underscoring the need for real-time monitoring and agile decision-making to respond to rapidly changing conditions (A. Kumar et al., 2020).

Other critical disruptions include the ripple effect, where localized disturbances propagate through interconnected supply networks, amplifying impacts across regions and industries. Social and regulatory disruptions, such as changing government policies,

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lockdowns, and health protocols, introduced further complexity and uncertainty (Naqvi, 2025). The cumulative effect of these disruptions has highlighted the fragility of lean, just-in-time supply chains and the necessity for strategies emphasizing flexibility, redundancy, and localization (Saleheen & Habib, 2022). Overall, the literature converges on a clear set of critical post-pandemic disruptions: labor and material shortages, supply inconsistency, transportation bottlenecks, demand volatility, healthcare supply vulnerabilities, and systemic ripple effects, all of which require integrated mitigation strategies to build resilient and adaptive supply chains for the future (Dura et al., 2025).

Framework of Supply Chain Management Strategies

A comprehensive framework for supply chain management strategies in the post-pandemic era can be organized into three main thematic categories: Technological, Strategic, and Relational strategies. These themes collectively address the multifaceted disruptions caused by the COVID-19 pandemic and other global shocks, enabling supply chains to enhance resilience, agility, and sustainability.

The digital transformation of supply chains has accelerated dramatically in response to pandemic-induced disruptions, with organizations leveraging advanced technologies to enhance visibility, predictability, and responsiveness across their operations. These technological capabilities form the foundational infrastructure upon which many other resilience strategies depend, enabling organizations to detect disruptions earlier, model potential impacts, and implement countermeasures more effectively (Kayikci et al., 2021; Panwar et al., 2022).

End-to-end supply chain visibility has emerged as a critical priority, with 87% of supply chain professionals describing it as "critically important" for effective disruption management (Basit et al., 2023). This visibility enables organizations to monitor the status of materials, components, and finished goods throughout the supply network, providing early warning of potential disruptions and facilitating more coordinated responses. Advanced Transportation Management Systems (TMS) now offer real-time tracking capabilities, allowing companies to monitor shipment locations, conditions, and estimated arrival times, thereby identifying potential delays earlier and implementing contingency plans proactively (Chaitanya et al., 2025). Similarly, Warehouse Management Systems (WMS) digitize inventory data, providing accurate, real-time information on stock levels across distribution networks—a capability that proved invaluable during pandemic-related inventory shocks (Schleifenheimer & Ivanov, 2024).

The implementation of Internet of Things (IoT) devices has further enhanced visibility by enabling continuous monitoring of environmental conditions, machine performance, and product integrity throughout the supply chain. IoT sensors can track parameters such as temperature, humidity, vibration, and location, transmitting alerts when predefined thresholds are breached. This capability is particularly valuable for quality-sensitive shipments such as pharmaceuticals, food products, and high-value electronics, where conditional deviations can result in significant losses (Bechtsis et al., 2021). During the pandemic, companies with established IoT capabilities were better positioned to monitor the flow of essential goods through constrained logistics corridors and redirect shipments as needed to avoid bottlenecks.

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Artificial intelligence (AI) and machine learning (ML) applications have dramatically improved supply chain forecasting, risk assessment, and decision-support capabilities. These technologies excel at identifying patterns within large, complex datasets—including those generated by IoT devices, ERP systems, and external sources—enabling more accurate predictions of potential disruptions and their likely impacts (B. Kumar & Sharma, 2021). Predictive analytics models can forecast supplier vulnerabilities, transportation delays, and demand fluctuations based on both historical data and real-time inputs, allowing organizations to implement preemptive mitigation strategies. For instance, AI algorithms can analyze geopolitical events, weather patterns, and market indicators to identify potential disruptions before they fully manifest, providing valuable lead time for response planning (Ocampo et al., 2022).

Beyond prediction, prescriptive analytics recommends specific actions to optimize supply chain performance amid disruptions. These systems can model the potential outcomes of different response strategies—such as rerouting shipments, altering production schedules, or tapping alternative suppliers—enabling more informed and effective decision-making under uncertainty (Mishra et al., 2021; Sharma et al., 2020). During the pandemic, companies leveraging these capabilities were better able to dynamically reallocate inventory across networks, balance capacity constraints, and prioritize customer orders based on predefined business rules and real-time conditions.

Blockchain technology has emerged as a powerful tool for enhancing transparency, traceability, and trust across complex supply networks. By providing an immutable, distributed ledger of transactions, blockchain enables all authorized participants to access a single version of truth regarding product movements, certifications, and ownership transfers (Eberi-Kalu, 2024). This capability proved particularly valuable during the pandemic for verifying the authenticity of critical medical supplies and personal protective equipment, where counterfeit products proliferated in response to shortages.

The decentralized nature of blockchain also enhances security and resilience by eliminating single points of failure in record-keeping systems. This characteristic became increasingly important as supply chain partners sought to maintain accurate records despite facility closures, remote work arrangements, and communication challenges during lockdowns (Montoya-Torres et al., 2021; Taqi et al., 2020). Additionally, blockchain-based smart contracts can automate certain transactions—such as payments or ownership transfers—upon fulfillment of predefined conditions, reducing administrative burdens and potential disputes during high-stress disruption scenarios.

Table 1. Technological Strategies for Supply Chain Resilience

Technology Category	Specific Applications	Primary Benefits	Implementation Challenges
Digital Integration & Visibility	TMS, WMS, IoT sensors	Real-time tracking, inventory visibility, early disruption detection	Integration with legacy systems, data standardization, cost
Advanced Analytics & AI	Predictive analytics, machine learning,	Disruption prediction, optimized response	Data quality requirements,

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	demand forecasting	planning, dynamic allocation	specialized talent needs, model accuracy
Blockchain	Distributed ledgers, smart contracts, authentication	Enhanced traceability, reduced counterfeiting, automated transactions	Industry adoption, scalability issues, regulatory considerations

DISCUSSION

The effectiveness of supply chain management strategies in the post-pandemic context stems from their ability to address the complex, interconnected disruptions revealed by COVID-19, while balancing cost, flexibility, and resilience. These strategies are effective because they integrate technological, strategic, and relational dimensions that collectively enhance supply chain adaptability and survivability under volatile conditions. For instance, digitalization enables better diversification by providing real-time data analytics and visibility, which allow firms to identify alternative suppliers quickly and adjust procurement plans dynamically, thus mitigating risks associated with supplier disruptions and material scarcity (Dubey et al., 2021). The use of advanced analytics supports agility, adaptability, and alignment (the 3As), which are critical for responding to demand volatility and supply inconsistencies, ultimately improving disruption performance (Fasan et al., 2021). Moreover, strategic measures such as supplier diversification, manufacturing flexibility, and backup suppliers build structural robustness, reducing dependency on single sources and enabling rapid shifts in production to meet changing demand patterns (Mathiyazhagan et al., 2023). Relational strategies, including collaboration efficiency and strong buyer-supplier relationships, foster trust and information sharing, which are essential for coordinated risk management and faster recovery from disruptions (Okeagu et al., 2020).

The interrelationship between these strategies amplifies their effectiveness. Digital technologies not only improve operational visibility but also facilitate relational strategies by enabling transparent communication and collaborative platforms among supply chain partners. This integration supports strategic flexibility by allowing firms to simulate scenarios, optimize resource allocation, and implement contingency plans more effectively (Chilicaus et al., 2025). For example, the hybrid risk management framework combining Conditional Value at Risk (CVaR) and chance constraints demonstrates how advanced risk assessment tools can balance cost efficiency with service level requirements, enhancing medical supply chain resilience during disruptions. Similarly, innovation and empowerment, identified as key resilience factors, depend on both technological adoption and relational trust to be successfully implemented, highlighting the synergy between these dimensions (Rinaldi et al., 2022).

However, implementing these strategies involves significant challenges and trade-offs. Cost is a major consideration, as investments in digital infrastructure, supplier diversification, and flexible manufacturing can be substantial, potentially impacting short-term profitability. Firms must balance the expense of building redundancy and flexibility against the benefits of increased resilience, which may not be immediately quantifiable. Additionally, complexity increases with diversification and collaboration, requiring sophisticated coordination mechanisms and risk management capabilities to

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avoid inefficiencies and conflicts. There is also the risk of over-reliance on technology, which may introduce vulnerabilities such as cybersecurity threats or system failures if not properly managed. Furthermore, cultural and organizational barriers can hinder relational strategies, as trust and collaboration require time and effort to develop, especially across global and diverse supply chain networks (Agarwal et al., 2024). Regulatory uncertainties and geopolitical tensions add another layer of complexity, affecting the feasibility and stability of strategic decisions like supplier diversification and localization

CONCLUSION

The COVID-19 pandemic has profoundly disrupted global supply chains, exposing vulnerabilities and accelerating the need for adaptive and resilient supply chain management strategies. The collective research highlights that effective post-pandemic supply chain strategies must integrate technological innovation, strategic flexibility, and relational collaboration to address the multifaceted challenges revealed by the crisis. Technological adoption, including Industry 4.0 tools such as data analytics, IoT, and digital platforms, enhances supply chain visibility, agility, and responsiveness, enabling firms to better anticipate and react to disruptions. Strategic measures like supplier diversification, manufacturing flexibility, and backup sourcing build structural robustness, reducing dependency on single points of failure and allowing rapid adjustment to fluctuating demand and supply conditions. Relational strategies focusing on collaboration efficiency and strong buyer-supplier relationships foster trust and coordinated risk management, which are critical for recovery and long-term sustainability.

A key insight from the literature is the interdependence of these strategies, where technological capabilities enable more effective strategic and relational practices. For example, digitalization supports real-time information sharing and scenario planning, which facilitate supplier diversification and collaborative decision-making. Frameworks such as the GREAT-3Rs emphasize the importance of combining government policies, supply chain redesign, economic strategies, operational adjustments, and technology adoption to achieve responsiveness, resilience, and restoration across pandemic stages. Moreover, hybrid risk management approaches that integrate advanced risk assessment tools like Conditional Value at Risk (CVaR) and chance constraints have demonstrated superior performance in balancing cost efficiency with service level requirements, particularly in critical sectors like medical supply chains.

Despite their effectiveness, implementing these strategies involves trade-offs and challenges. Investments in technology and diversification can be costly and complex, potentially impacting short-term financial performance. Managing increased complexity requires sophisticated coordination and risk management capabilities to avoid inefficiencies and conflicts. Additionally, relational strategies demand time and effort to build trust and collaboration, which can be difficult across global and culturally diverse networks. The risk of over-reliance on technology also introduces vulnerabilities such as cybersecurity threats. Furthermore, geopolitical uncertainties and regulatory changes complicate strategic decisions like supplier localization and network redesign.

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The pandemic has also underscored the importance of dynamic capabilities and adaptation strategies such as intertwining, scalability, substitution, and repurposing to maintain supply chain viability under severe uncertainty. Post-pandemic recovery requires managing "disruption tails" through coordinated demand smoothing and gradual capacity ramp-up to stabilize production and inventory dynamics. Retail supply chains, in particular, benefit from prioritizing collaboration efficiency, order fulfillment, and digital transformation to meet evolving consumer behaviors and ensure sustainability.

REFERENCES

Abdan, E. B. K., & Çetindaş, A. (2023). The Impact of Supply Chain Strategies on Logistics Performance: A Study in the Post Covid-19 Pandemic Period. *Gaziantep University Journal of Social Sciences*. https://doi.org/10.21547/jss.1275490

Aday, S., & Aday, M. (2020). Impacts of COVID-19 on Food Supply Chain. *Food Quality and Safety*. https://doi.org/10.1093/fqsafe/fyaa024

Adobor, H., & McMullen, R. (2018). Supply chain resilience: a dynamic and multidimensional approach. *The International Journal of Logistics Management*. https://doi.org/10.1108/ijlm-04-2017-0093

Agarwal, P., Malhotra, S. K., & Swami, S. (2024). The role of smart technologies in managing supply chain post pandemic: an exploratory scientific procedures and rationales for systematic literature review. *Journal of Science and Technology Policy Management*. https://doi.org/10.1108/jstpm-07-2023-0106

Ahmed, H., Ahmed, S., Khan, M., & Ali, S. (2022). Sustainable supply chain in emerging economies during and post COVID-19 pandemic: a systematic literature review and future research directions. *International Journal of Emerging Markets*. https://doi.org/10.1108/ijoem-01-2022-0092

Ambrogio, G., Filice, L., Longo, F., & Padovano, A. (2022). Workforce and supply chain disruption as a digital and technological innovation opportunity for resilient manufacturing systems in the COVID-19 pandemic. *Computers & Industrial Engineering*, *169*, 108158. https://doi.org/10.1016/j.cie.2022.108158

Apeh, C. E., Odionu, C. S., Bristol-Alagbariya, B., Okon, R., & Austin-Gabriel, B. (2024). Reviewing healthcare supply chain management: Strategies for enhancing efficiency and resilience. *International Journal of Multidisciplinary Research and Growth Evaluation*. https://doi.org/10.54660/.ijmrge.2024.5.1.1209-1216

Bamia, A., & Bamia, F. (2025). SCRGD: Supply Chain Resilience in the Face of Global Disruptions. *International Business Research*. https://doi.org/10.5539/ibr.v18n2p80

Barman, A., Das, R., & De, P. (2021). Impact of COVID-19 in food supply chain: Disruptions and recovery strategy. *Current Research in Behavioral Sciences*, *2*, 100017. https://doi.org/10.1016/j.crbeha.2021.100017

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**

Basit, A., Wang, L., Nazir, S., Mehmood, S., & Hussain, I. (2023). Managing the COVID-19 Pandemic: Enhancing Sustainable Supply Chain Performance through Management Innovation, Information Processing Capability, Business Model Innovation and Knowledge Management Capability in Pakistan. *Sustainability*. https://doi.org/10.3390/su151813538

Baz, J. El, & Ruel, S. (2020). Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era. *International Journal of Production Economics*, *233*, 107972. https://doi.org/10.1016/j.ijpe.2020.107972

Bechtsis, D., Tsolakis, N., Iakovou, E., & Vlachos, D. (2021). Data-driven secure, resilient and sustainable supply chains: gaps, opportunities, and a new generalised data sharing and data monetisation framework. *International Journal of Production Research*, *60*, 4397–4417. https://doi.org/10.1080/00207543.2021.1957506

Belhadi, A., Kamble, S., Jabbour, C., Gunasekaran, A., Ndubisi, N., & Venkatesh, M. (2020). Manufacturing and service supply chain resilience to the COVID-19 outbreak: Lessons learned from the automobile and airline industries. *Technological Forecasting and Social Change*, *163*, 120447. https://doi.org/10.1016/j.techfore.2020.120447

Bonadio, B., Huo, Z., Levchenko, A., & Pandalai-Nayar, N. (2020). Global supply chains in the pandemic. *Journal of International Economics*, *133*, 103534. https://doi.org/10.1016/j.jinteco.2021.103534

Brusset, X., & Teller, C. (2017). Supply chain capabilities, risks, and resilience. *International Journal of Production Economics*, *184*, 59–68. https://doi.org/10.1016/j.ijpe.2016.09.008

Bui, T.-D., Tsai, F.-M., Tseng, M., Tan, R., Yu, K., & Lim, M. (2020). Sustainable supply chain management towards disruption and organizational ambidexterity: A data driven analysis. *Sustainable Production and Consumption*, *26*, 373–410. https://doi.org/10.1016/j.spc.2020.09.017

Carissimi, M. C., Prataviera, L., Creazza, A., Melacini, M., & Dallari, F. (2022). Blurred lines: the timeline of supply chain resilience strategies in the grocery industry in the time of Covid-19. *Operations Management Research*, *16*, 80–98. https://doi.org/10.1007/s12063-022-00278-4

Chaitanya, K., Hajarath, R., & Vummadi, J. (2025). Rebuilding Trust in Global Supply Chains: Strategic Supplier Collaboration in a Post-COVID World. *Economic Sciences*. https://doi.org/10.69889/07afw535

Chilicaus, G. C. F., Licapa-Redolfo, G., Ballesteros, M. A. A., Otazú, C. D. C., Miranda, S. J. A., Castillo, M. M. F., Ijiri, G. L. C., De Los Ángeles Guzmán Valle, M., & Castillo, J. C. A. (2025). Digital Transformation and Sustainability in Post-Pandemic Supply Chains: A Global Bibliometric Analysis of Technological Evolution and Research Patterns (2020–2024). *Sustainability*. https://doi.org/10.3390/su17073009

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Chowdhury, M., & Quaddus, M. (2017). Supply chain resilience: Conceptualization and scale development using dynamic capability theory. *International Journal of Production Economics*, *188*, 185–204. https://doi.org/10.1016/j.ijpe.2017.03.020

Cohen, M., Cui, S., Doetsch, S., Ernst, R., Huchzermeier, A., Kouvelis, P., Lee, H., Matsuo, H., & Tsay, A. (2022). Bespoke supply-chain resilience: The gap between theory and practice. *Journal of Operations Management*. https://doi.org/10.1002/joom.1184

Cordeiro, M., Santos, L., Angelo, A., & Marujo, L. (2021). Research directions for supply chain management in facing pandemics: an assessment based on bibliometric analysis and systematic literature review. *International Journal of Logistics Research and Applications*, *25*, 1313–1333. https://doi.org/10.1080/13675567.2021.1902487

Craighead, C., Ketchen, D., & Darby, J. (2020). Pandemics and Supply Chain Management Research: Toward a Theoretical Toolbox*. *Decision Sciences*, *51*, 838–866. https://doi.org/10.1111/deci.12468

De Arquer, M., Ponte, B., & Pino, R. (2021). Examining the balance between efficiency and resilience in closed-loop supply chains. *Central European Journal of Operations Research*, *30*, 1307–1336. https://doi.org/10.1007/s10100-021-00766-1

De Lucio, J., Díaz-Mora, C., Mínguez, R., Minondo, A., & Requena, F. (2023). Do firms react to supply chain disruptions? *Economic Analysis and Policy*. https://doi.org/10.1016/j.eap.2023.07.004

Deconinck, K., Avery, E., & Jackson, L. (2020). Food Supply Chains and Covid-19: Impacts and Policy Lessons. *EuroChoices*, *19*, 34–39. https://doi.org/10.1111/1746-692x.12297

Dubey, R., Bryde, D., Blome, C., Roubaud, D., & Giannakis, M. (2021). Facilitating artificial intelligence powered supply chain analytics through alliance management during the pandemic crises in the B2B context. *Industrial Marketing Management*, *96*, 135–146. https://doi.org/10.1016/j.indmarman.2021.05.003

Duong, L., & Chong, J. (2020). Supply chain collaboration in the presence of disruptions: a literature review. *International Journal of Production Research*, *58*, 3488–3507. https://doi.org/10.1080/00207543.2020.1712491

Dura, B. S., Nadeem, S. P., Garza-Reyes, J., Alemu, A., Tabar, B. R., Zapata, D. H., & Kreie, A. (2025). The role of technology in developing resilient supply chains: a systematic literature review during the COVID-19 pandemic and the disruptions of economic sanctions. *Journal of Humanitarian Logistics and Supply Chain Management*. https://doi.org/10.1108/jhlscm-03-2024-0036

Dwaikat, N., Zighan, S., Abualqumboz, M., & Al-Kalha, Z. (2022). The 4Rs supply chain resilience framework: A capability perspective. *Journal of Contingencies and Crisis Management*. https://doi.org/10.1111/1468-5973.12418

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Eberi-Kalu, O. (2024). Sustainable Post-Covid-19 Global Supply Chain Management: Conceptual Framework. *International Journal of Management Research and Economics*. https://doi.org/10.20944/preprints202308.1894.v2

Fadojutimi, B. (2024). Exploring the critical factors in pharmaceutical supply chains revealed during COVID-19 and addressing missing links. *World Journal of Advanced Research and Reviews*. https://doi.org/10.30574/wjarr.2024.24.1.3283

Farooq, M., Hussain, A., Masood, T., & Habib, M. (2021). Supply Chain Operations Management in Pandemics: A State-of-the-Art Review Inspired by COVID-19. *Sustainability*. https://doi.org/10.3390/su13052504

Fasan, M., Zaro, E. S., Zaro, C. S., Porco, B., & Tiscini, R. (2021). An empirical analysis: Did green supply chain management alleviate the effects of COVID-19? *Business Strategy and the Environment*, *30*, 2702–2712. https://doi.org/10.1002/bse.2772

Figueira-De-Lemos, F., Silva, S., Pinto, R. P., & Kury, B. (2024). Impacts and Trends on Global Supply Chain After COVID-19 Outbreak. *Thunderbird International Business Review*. https://doi.org/10.1002/tie.22401

Fonseca, L., & Azevedo, A. (2020). COVID- 19: outcomes for Global Supply Chains. *Management & Marketing. Challenges for the Knowledge Society*, *15*, 424–438. https://doi.org/10.2478/mmcks-2020-0025

Frederico, G. (2021). Towards a Supply Chain 4.0 on the post-COVID-19 pandemic: a conceptual and strategic discussion for more resilient supply chains. *Rajagiri Management Journal*. https://doi.org/10.1108/ramj-08-2020-0047

Furceri, D., Carrière-Swallow, Y., Deb, P., Jimenez, D., & Ostry, J. (2022). Shipping costs and inflation. *Journal of International Money and Finance*, *130*, 102771. https://doi.org/10.1016/j.jimonfin.2022.102771

Gereffi, G. (2020). What does the COVID-19 pandemic teach us about global value chains? The case of medical supplies. *Journal of International Business Policy*, *3*, 287–301. https://doi.org/10.1057/s42214-020-00062-w

Ginn, W., & Saadaoui, J. (2025). Do Supply Chain Disruptions Matter for Global Economic Conditions? *The World Economy*. https://doi.org/10.1111/twec.13713

Grida, M., Mohamed, R., & Zaied, A. (2020). Evaluate the impact of COVID-19 prevention policies on supply chain aspects under uncertainty. *Transportation Research Interdisciplinary Perspectives*, *8*, 100240. https://doi.org/10.1016/j.trip.2020.100240

Guan, D., Wang, D., Hallegatte, S., Davis, S., Huo, J., Li, S., Bai, Y., Lei, T., Xue, Q., Coffman, D., Cheng, D., Chen, P., Liang, X., Xu, B., Lu, X., Wang, S., Hubacek, K., & Gong, P. (2020). Global supply-chain effects of COVID-19 control measures. *Nature Human Behaviour*, *4*, 577–587. https://doi.org/10.1038/s41562-020-0896-8

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Gultekin, B., Demir, S., Gunduz, M. A., Cura, F., & Ozer, L. (2022). The logistics service providers during the COVID-19 pandemic: The prominence and the cause-effect structure of uncertainties and risks. *Computers & Industrial Engineering*, *165*, 107950. https://doi.org/10.1016/j.cie.2022.107950

Guo, Y., Liu, F., Song, J.-S., & Wang, S. (2024). Supply chain resilience: A review from the inventory management perspective. *Fundamental Research*, *5*, 450–463. https://doi.org/10.1016/j.fmre.2024.08.002

Gupta, N., Gunawan, I., & Kamineni, R. (2024). Analysing resilience and leagility in post-pandemic sustainable supply chain management: a systematic literature review. *Built Environment Project and Asset Management*. https://doi.org/10.1108/bepam-10-2022-0151

Haraguchi, M., Neise, T., She, W., & Taniguchi, M. (2023). Conversion strategy builds supply chain resilience during the COVID-19 pandemic: A typology and research directions. *Progress in Disaster Science*, *17*, 100276. https://doi.org/10.1016/j.pdisas.2023.100276

Herold, D., & Marzantowicz, Ł. (2024). Neo-institutionalism in supply chain management: from supply chain susceptibility to supply chain resilience. *Management Research Review*. https://doi.org/10.1108/mrr-08-2023-0572

Hobbs, J. (2020). Food supply chains during the COVID-19 pandemic. *Canadian Journal of Agricultural Economics/Revue Canadienne d'agroeconomie*, *68*, 171–176. https://doi.org/10.1111/cjag.12237

Hohenstein, N.-O. (2022). Supply chain risk management in the COVID-19 pandemic: strategies and empirical lessons for improving global logistics service providers' performance. *The International Journal of Logistics Management*. https://doi.org/10.1108/ijlm-02-2021-0109

Irfan, I., Sumbal, M., Khurshid, F., & Chan, F. (2022). Toward a resilient supply chain model: critical role of knowledge management and dynamic capabilities. *Ind. Manag. Data Syst.*, *122*, 1153–1182. https://doi.org/10.1108/imds-06-2021-0356

Ishida, S. (2020). Perspectives on Supply Chain Management in a Pandemic and the Post-COVID-19 Era. *IEEE Engineering Management Review*, *48*, 146–152. https://doi.org/10.1109/emr.2020.3016350

Ivanov, D. (2021). Exiting the COVID-19 pandemic: after-shock risks and avoidance of disruption tails in supply chains. *Annals of Operations Research*, 1–18. https://doi.org/10.1007/s10479-021-04047-7

Ivanov, D. (2023). Two views of supply chain resilience. *International Journal of Production Research*, *62*, 4031–4045. https://doi.org/10.1080/00207543.2023.2253328

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Jamil, H., Anjum, L., Nohri, A. R., Sama, G., Hamza, A., & Asif, S. (2025). RESILIENCE IN PHARMACEUTICAL SUPPLY CHAIN DURING PANDEMICS: A NARRATIVE REVIEW. *Insights-Journal of Life and Social Sciences*. https://doi.org/10.71000/bh4tn830

Kafi, A., Zainuddin, N., Saifudin, A. B. M., Shahron, S. A., Razalli, M., Musa, S., & Ahmi, A. (2023). Meta-analysis of food supply chain: pre, during and post COVID-19 pandemic. *Agriculture & Food Security*, *12*, 1–22. https://doi.org/10.1186/s40066-023-00425-5

Kancs, d'Artis. (2023). Uncertainty of supply chains: Risk and ambiguity. *The World Economy*. https://doi.org/10.1111/twec.13534

Kashem, M., Shamsuddoha, M., & Nasir, T. (2024). Digital-Era Resilience: Navigating Logistics and Supply Chain Operations after COVID-19. *Businesses*. https://doi.org/10.3390/businesses4010001

Katsaliaki, K., Galetsi, P., & Kumar, S. (2021). Supply chain disruptions and resilience: a major review and future research agenda. *Annals of Operations Research*, *319*, 965–1002. https://doi.org/10.1007/s10479-020-03912-1

Kayikci, Y., Kazançoğlu, Y., Lafçı, Ç., Gozacan-Chase, N., & Mangla, S. (2021). Smart circular supply chains to achieving SDGs for post-pandemic preparedness. *J. Enterp. Inf. Manag.*, *35*, 237–265. https://doi.org/10.1108/jeim-06-2021-0271

Khan, S., Waqas, M., Xue, H., Ahmad, N., & Yu, Z. (2022). Adoption of innovative strategies to mitigate supply chain disruption: COVID-19 pandemic. *Operations Management Research*, *15*, 1115–1133. https://doi.org/10.1007/s12063-021-00222-y

Kovács, G., & Sigala, I. F. (2020). Lessons learned from humanitarian logistics to manage supply chain disruptions. *Journal of Supply Chain Management*, *57*. https://doi.org/10.1111/jscm.12253

Kumar, A., Luthra, S., Mangla, S., & Kazançoğlu, Y. (2020). COVID-19 impact on sustainable production and operations management. *Sustainable Operations and Computers*, *1*, 1–7. https://doi.org/10.1016/j.susoc.2020.06.001

Kumar, B., & Sharma, A. (2021). Managing the supply chain during disruptions: Developing a framework for decision-making. *Industrial Marketing Management*, *97*, 159–172. https://doi.org/https://doi.org/10.1016/j.indmarman.2021.07.007

Lucas, T., Guimarães, R. D., Vasconcellos, M. S. G., Lins, I., Moura, M. D. C., & De Siqueira, P. G. S. C. (2024). RESILIENCE OF CRITICAL SUPPLY CHAINS IN PANDEMICS: A MODEL PROPOSAL FOR HEALTH PERSONAL PROTECTIVE EQUIPMENT SOCIALLY OPTIMAL DISTRIBUTION. *Operations Research for Health Care*. https://doi.org/10.1016/j.orhc.2024.100420

Lücker, F., Timonina-Farkas, A., & Seifert, R. (2024). Balancing Resilience and Efficiency: A Literature Review on Overcoming Supply Chain Disruptions. *Production and*

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska Volume 2, 2025, pp 787-820

Operations Management, *34*, 1495–1511. https://doi.org/10.1177/10591478241302735

Lv, Z., Qiao, L., Mardani, A., & Lv, H. (2024). Digital Twins on the Resilience of Supply Chain Under COVID-19 Pandemic. *IEEE Transactions on Engineering Management*, *71*, 10522–10533. https://doi.org/10.1109/tem.2022.3195903

Macdonald, J., Zobel, C., Melnyk, S., & Griffis, S. (2018). Supply chain risk and resilience: theory building through structured experiments and simulation. *International Journal of Production Research*, *56*, 4337–4355. https://doi.org/10.1080/00207543.2017.1421787

Magableh, G. (2021). Supply Chains and the COVID-19 Pandemic: A Comprehensive Framework. *European Management Review*, *18*, 363–382. https://doi.org/10.1111/emre.12449

Mahajan, K., & Tomar, S. (2020). COVID-19 and Supply Chain Disruption: Evidence from Food Markets in India†. *American Journal of Agricultural Economics*, *103*, 35–52. https://doi.org/10.1111/ajae.12158

Majumdar, A., & Srivastava, S. (2025). Building Resilience Through Flexibility to Mitigate Pandemic Disruption: A SAP–LAP Analysis of Textile and Clothing Supply Chain. *Global Journal of Flexible Systems Management*. https://doi.org/10.1007/s40171-024-00435-7

Mathiyazhagan, K., Majumdar, A., & Appolloni, A. (2023). Guest editorial: Resilience in sustainable supply chain post-COVID-19: future pathways. *The International Journal of Logistics Management*. https://doi.org/10.1108/ijlm-07-2023-603

Meyer, B. H., Prescott, B. C., & Sheng, X. S. (2023). The impact of supply chain disruptions on business expectations during the pandemic. *Energy Economics*, *126*, 106951. https://doi.org/https://doi.org/10.1016/j.eneco.2023.106951

Miroudot, S. (2020). Reshaping the policy debate on the implications of COVID-19 for global supply chains. *Journal of International Business Policy*, *3*, 430–442. https://doi.org/10.1057/s42214-020-00074-6

Mishra, R., Singh, R., & Subramanian, N. (2021). Impact of disruptions in agri-food supply chain due to COVID-19 pandemic: contextualised resilience framework to achieve operational excellence. *The International Journal of Logistics Management*. https://doi.org/10.1108/ijlm-01-2021-0043

Mistarihi, M., & Magableh, G. (2023). Prioritization of Supply Chain Capabilities Using the FAHP Technique. *Sustainability*. https://doi.org/10.3390/su15076308

Mızrak, F. (2024). Resilience and Innovation Strategies: How Businesses Adapt to Supply Chain Disruptions in the Post-Pandemic Era. *Politik Ekonomik Kuram*. https://doi.org/10.30586/pek.1497718

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Mondal, A., Giri, B. K., Roy, S., Deveci, M., & Pamučar, D. (2024). Sustainable-resilient-responsive supply chain with demand prediction: An interval type-2 robust programming approach. *Eng. Appl. Artif. Intell.*, *133*, 108133. https://doi.org/10.1016/j.engappai.2024.108133

Montoya-Torres, J., Muñoz-Villamizar, A., & Mejía-Argueta, C. (2021). Mapping research in logistics and supply chain management during COVID-19 pandemic. *International Journal of Logistics Research and Applications*, *26*, 421–441. https://doi.org/10.1080/13675567.2021.1958768

Nandi, S., Sarkis, J., Hervani, A., & Helms, M. (2020). Redesigning Supply Chains using Blockchain-Enabled Circular Economy and COVID-19 Experiences. *Sustainable Production and Consumption*, *27*, 10–22. https://doi.org/10.1016/j.spc.2020.10.019

Naqvi, M. (2025). INTEGRATED MANUFACTURING & SUPPLY CHAIN IN A PANDEMIC ENVIRONMENT. *INTERNATIONAL JOURNAL OF SUPPLY CHAIN MANAGEMENT*. https://doi.org/10.34218/ijscm_02_01_003

Nikookar, E., & Yanadori, Y. (2021). Preparing supply chain for the next disruption beyond COVID-19: managerial antecedents of supply chain resilience. *International Journal of Operations & Production Management*. https://doi.org/10.1108/ijopm-04-2021-0272

Niu, Y., Werle, N., Cohen, M., Cui, S., Deshpande, V., Ernst, R., Huchzermeier, A., Tsay, A., & Wu, J. (2025). Restructuring Global Supply Chains: Navigating Challenges of the COVID-19 Pandemic and Beyond. *Manuf. Serv. Oper. Manag.*, *27*, 1025–1036. https://doi.org/10.1287/msom.2024.0879

Notteboom, T., Pallis, T., & Rodrigue, J. P. (2021). Disruptions and resilience in global container shipping and ports: the COVID-19 pandemic versus the 2008–2009 financial crisis. *Maritime Economics & Logistics*, *23*, 179–210. https://doi.org/10.1057/s41278-020-00180-5

Ocampo, L., Aro, J. L., Evangelista, S. S., Maturan, F., Atibing, N. M., Yamagishi, K., & Jr, E. S. (2022). Synthesis of strategies in post-COVID-19 public sector supply chains under an intuitionistic fuzzy environment. *Socioecon Plann Sci*, *85*, 101–340. https://doi.org/https://doi.org/10.1016/j.seps.2022.101340

Okeagu, C., Reed, D., Sun, L., Colontonio, M., Rezayev, A., Ghaffar, Y., Kaye, R., Liu, H., Cornett, E., Fox, C., Urman, R., & Kaye, A. (2020). Principles of supply chain management in the time of crisis. *Best Practice & Research. Clinical Anaesthesiology*, *35*, 369–376. https://doi.org/10.1016/j.bpa.2020.11.007

Ovezmyradov, B. (2022). Product availability and stockpiling in times of pandemic: causes of supply chain disruptions and preventive measures in retailing. *Annals of Operations Research*, 1–33. https://doi.org/10.1007/s10479-022-05091-7

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Ozdemir, D., Sharma, M., Dhir, A., & Daim, T. (2022). Supply chain resilience during the COVID-19 pandemic. *Technology in Society*, *68*, 101847. https://doi.org/10.1016/j.techsoc.2021.101847

Panwar, R., Pinkse, J., & De Marchi, V. (2022). The Future of Global Supply Chains in a Post-COVID-19 World. *California Management Review*, *64*, 5–23. https://doi.org/10.1177/00081256211073355

Paul, S., Chowdhury, P., Moktadir, Md. A., & Lau, K. (2021). Supply chain recovery challenges in the wake of COVID-19 pandemic. *Journal of Business Research*, *136*, 316–329. https://doi.org/10.1016/j.jbusres.2021.07.056

Pettit, T., Croxton, K., & Fiksel, J. (2019). The Evolution of Resilience in Supply Chain Management: A Retrospective on Ensuring Supply Chain Resilience. *Journal of Business Logistics*. https://doi.org/10.1111/jbl.12202

Pu, G., Cui, Z., & Qiao, J. (2024). Management antecedents of supply chain resilience: An integrating perspective. *Journal of Contingencies and Crisis Management*. https://doi.org/10.1111/1468-5973.12551

Pujawan, I., & Bah, A. (2021). Supply chains under COVID-19 disruptions: literature review and research agenda. *Supply Chain Forum: An International Journal*, *23*, 81–95. https://doi.org/10.1080/16258312.2021.1932568

Purnamasari, R., Hasanudin, A. I., Zulfikar, R., & Yazid, H. (2024). Optimizing sustainable growth: Data, policies, and supply chains in Indonesia's public sector. *Social Sciences & Humanities Open*, *10*, 101–104. https://doi.org/https://doi.org/10.1016/j.ssaho.2024.101104

Pyeman, J. (2025). Pandemic Disruptions and Supply Chain Resilience: A Retail Food Perspective. *Journal of Information Systems Engineering and Management*. https://doi.org/10.52783/jisem.v10i8s.1098

Qi, B., McCauley, E., Baxter, K., Poo, M., & Lau, Y.-Y. (2025). A Manufacturing Industry Perspective on Pandemic-Induced Supply Chain Disruptions. *Businesses*. https://doi.org/10.3390/businesses5010008

Queiroz, M., Ivanov, D., Dolgui, A., & Wamba, S. (2020). Impacts of epidemic outbreaks on supply chains: mapping a research agenda amid the COVID-19 pandemic through a structured literature review. *Annals of Operations Research*, *319*, 1159–1196. https://doi.org/10.1007/s10479-020-03685-7

Rahman, T., Paul, S., Shukla, N., Agarwal, R., & Taghikhah, F. (2022). Supply chain resilience initiatives and strategies: A systematic review. *Comput. Ind. Eng.*, *170*, 108317. https://doi.org/10.1016/j.cie.2022.108317

Raj, A., Mukherjee, A. A., De Sousa Jabbour, A., & Srivastava, S. (2022). Supply chain management during and post-COVID-19 pandemic: Mitigation strategies and

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

practical lessons learned. *Journal of Business Research*, *142*, 1125–1139. https://doi.org/10.1016/j.jbusres.2022.01.037

Rajabi, R., Shadkam, E., & Khalili, S. M. (2024). Design and Optimization of a Pharmaceutical Supply Chain Network under COVID-19 Pandemic Disruption. *Sustainable Operations and Computers*. https://doi.org/10.1016/j.susoc.2024.04.002

Riad, M., Naimi, M., & Okar, C. (2024). Enhancing Supply Chain Resilience Through Artificial Intelligence: Developing a Comprehensive Conceptual Framework for AI Implementation and Supply Chain Optimization. *Logistics*. https://doi.org/10.3390/logistics8040111

Rinaldi, M., Murino, T., Gebennini, E., Morea, D., & Bottani, E. (2022). A literature review on quantitative models for supply chain risk management: Can they be applied to pandemic disruptions? *Computers & Industrial Engineering*, *170*, 108329. https://doi.org/10.1016/j.cie.2022.108329

Rozhkov, M., Ivanov, D., Blackhurst, J., & Nair, A. (2022). Adapting supply chain operations in anticipation of and during the COVID-19 pandemic. *Omega*, *110*, 102635. https://doi.org/10.1016/j.omega.2022.102635

Rusli, U., Masnia, Usman, A., & Mediaty. (2024). A Systematic Literature Review: The Role of Supply Chain Management in Enhancing Corporate Operational Performance. *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE)*, *8*(1), 1076–1090. https://doi.org/https://doi.org/10.31538/iijse.v8i1.5981

Saleheen, F., & Habib, M. M. (2022). Global Supply Chain Disruption Management Post Covid 19. *American Journal of Industrial and Business Management*. https://doi.org/10.4236/ajibm.2022.123021

Sardar, M. F., & Akram, M. U. (2025). Global Supply Chain Disruptions: A Systematic Review of Risk Identification, Assessment, and Mitigation Strategies. *ACADEMIA International Journal for Social Sciences*. https://doi.org/10.63056/acad.004.03.0334

Saxena, V. (2025). Impact of Global Supply Chain Disruptions on Indian Manufacturing and Retail: A Big Data Perspective. *International Scientific Journal of Engineering and Management*. https://doi.org/10.55041/isjem03849

Scala, B., & Lindsay, C. (2021). Supply chain resilience during pandemic disruption: Evidence from healthcare. *Supply Chain Management: An International Journal*. https://doi.org/10.1108/scm-09-2020-0434

Schleifenheimer, M., & Ivanov, D. (2024). Pharmaceutical retail supply chain responses to the COVID-19 pandemic. *Annals of Operations Research*. https://doi.org/10.1007/s10479-024-05866-0

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska Volume 2, 2025, pp 787-820
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Setyadi, A., Pawirosumarto, S., & Damaris, A. (2025). Toward a Resilient and Sustainable Supply Chain: Operational Responses to Global Disruptions in the Post-COVID-19 Era. *Sustainability*. https://doi.org/10.3390/su17136167

Shahed, K., Azeem, A., Ali, S., & Moktadir, Md. A. (2021). A supply chain disruption risk mitigation model to manage COVID-19 pandemic risk. *Environmental Science and Pollution Research International*, 1–16. https://doi.org/10.1007/s11356-020-12289-4

Shandrivska, O., & Pawłyszyn, I. (2024). Disruptions In the Modern Economy and Their Consequences On The Functioning of Supply Chains. *Communications of International Proceedings*. https://doi.org/10.5171/2024.4425524

Sharma, A., Adhikary, A., & Borah, S. (2020). Covid-19's impact on supply chain decisions: Strategic insights from NASDAQ 100 firms using Twitter data. *Journal of Business Research*, *117*, 443–449. https://doi.org/10.1016/j.jbusres.2020.05.035

Shashi, Centobelli, P., Cerchione, R., & Ertz, M. (2020). Managing supply chain resilience to pursue business and environmental strategies. *Business Strategy and The Environment*, *29*, 1215–1246. https://doi.org/10.1002/bse.2428

Shekarian, M., & Parast, M. M. (2020). An Integrative approach to supply chain disruption risk and resilience management: a literature review. *International Journal of Logistics Research and Applications*, *24*, 427–455. https://doi.org/10.1080/13675567.2020.1763935

Shen, Z., & Sun, Y. (2021). Strengthening supply chain resilience during COVID-19: A case study of JD.com. *Journal of Operations Management*. https://doi.org/10.1002/joom.1161

Shishodia, A., Sharma, R., Rajesh, R., & Munim, Z. (2021). Supply chain resilience: A review, conceptual framework and future research. *The International Journal of Logistics Management*. https://doi.org/10.1108/ijlm-03-2021-0169

Sinha, D., Bagodi, V., & Dey, D. (2020). The Supply Chain Disruption Framework Post COVID-19: A System Dynamics Model. *Foreign Trade Review*, *55*, 511–534. https://doi.org/10.1177/0015732520947904

Snowdon, A., Saunders, M., & Wright, A. (2022). The Emerging Features of Healthcare Supply Chain Resilience: Learning from a Pandemic. *Healthcare Quarterly*, *25 2*, 44–53. https://doi.org/10.12927/hcq.2022.26889

Solari, F., Lysova, N., Romagnoli, G., Montanari, R., & Bottani, E. (2024). Insights from 20 Years (2004–2023) of Supply Chain Disruption Research: Trends and Future Directions Based on a Bibliometric Analysis. *Sustainability*. https://doi.org/10.3390/su16177530

Spieske, A., & Birkel, H. (2021). Improving supply chain resilience through industry 4.0: A systematic literature review under the impressions of the COVID-19 pandemic.

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska **Volume 2, 2025, pp 787-820**
"The Role of Research in Economics, Management, Accounting to Realizing Sustainable Development"

Computers & Industrial Engineering, *158*, 107452. https://doi.org/10.1016/j.cie.2021.107452

Spieske, A., Gebhardt, M., Kopyto, M., & Birkel, H. (2022). Improving resilience of the healthcare supply chain in a pandemic: Evidence from Europe during the COVID-19 crisis. *Journal of Purchasing and Supply Management*, *28*, 100748. https://doi.org/10.1016/j.pursup.2022.100748

Sudan, T., Taggar, R., Jena, P., & Sharma, D. (2023). Supply chain disruption mitigation strategies to advance future research agenda: A systematic literature review. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2023.138643

Taqi, H. Md. M., Ahmed, H., Paul, S., Garshasbi, M., Ali, S., Kabir, G., & Paul, S. (2020). Strategies to Manage the Impacts of the COVID-19 Pandemic in the Supply Chain: Implications for Improving Economic and Social Sustainability. *Sustainability*, *12*, 9483. https://doi.org/10.3390/su12229483

Tiwari, P., & Sharma, P. K. (2025). Analysing the Impact of Supply Chain Disruptions on Medical Equipment Availability During Pandemics. *International Journal of Research Publication and Reviews*. https://doi.org/10.55248/gengpi.6.0325.1217

Umar, M., Ahmad, R., & Wilson, M. (2025). Assessing Supply Chain Resilience in Pandemics: Building a Three-Dimensional Haddon Matrix. *SAGE Open*. https://doi.org/10.1177/21582440251335561

Vanany, I., Ali, M., Tan, K., Kumar, A., & Siswanto, N. (2021). A Supply Chain Resilience Capability Framework and Process for Mitigating the COVID-19 Pandemic Disruption. *IEEE Transactions on Engineering Management*, *PP*, 1–15. https://doi.org/10.1109/tem.2021.3116068

Wang, J., Dou, R., Muddada, R., & Zhang, W. (2017). Management of a holistic supply chain network for proactive resilience: Theory and case study. *Comput. Ind. Eng.*, *125*, 668–677. https://doi.org/10.1016/j.cie.2017.12.021

Wieland, A., & Durach, C. (2021). Two perspectives on supply chain resilience. *Journal of Business Logistics*. https://doi.org/10.1111/jbl.12271

Xu, Z., Elomri, A., Kerbache, L., & Omri, A. (2020). COVID-19s impacts on Global Supply Chains: Facts and Perspectives. *IEEE Engineering Management Review*. https://consensus.app/papers/covid19s-impacts-on-global-supply-chains-facts-and-xu-elomri/d7068b1faab45d3e8315bead2f091615/

Yılmaz, Ö. F., Guan, Y., & Yılmaz, B. G. (2025). A hybrid risk management framework for resilient medical supply chain design in the post-pandemic era. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2025.144854

Younis, H., Alsharairi, M., Younes, H., & Sundarakani, B. (2023). The impact of COVID-19 on supply chains: systematic review and future research directions. *Operational Research*, *23*, 1–31. https://doi.org/10.1007/s12351-023-00790-w

E-ISSN 3089-1566
Proceeding Accounting, Management, Economics Uniska Volume 2, 2025, pp 787-820

Zhang, Q., Fan, W., Lu, J., Wu, S., & Wang, X. (2021). Research on Dynamic Analysis and Mitigation Strategies of Supply Chains under Different Disruption Risks. *Sustainability*. https://doi.org/10.3390/su13052462

Zhu, G., Chou, M., & Tsai, C. (2020). Lessons Learned from the COVID-19 Pandemic Exposing the Shortcomings of Current Supply Chain Operations: A Long-Term Prescriptive Offering. *Sustainability*. https://doi.org/10.3390/su12145858

Zhu, Y., Flori, E., Pattarin, F., & Paterlini, S. (2022). The Worldwide Impact of COVID-19 on Supply Chains. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4115032

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