

MEASURING IMPACT ON "SUPPLY CHAIN" PERFORMANCE AND EVALUATING THE IMPACT OF PROPOSED LOGISTICS STRATEGIES ON RESILIENCE

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Abstract

This paper compares the existing logistics practices in managing "Supply Chain" and their effectiveness with regards to "Supply Chain performance" and the response of these strategies to disruption. Globalization has made supply chains susceptible to disruptions from either a natural origin, political instabilities, or even in technological activities. The actual study uses quantitative and qualitative analysis, through the use of questionnaires and follow up semi structured interviews with the participants drawn from "Supply Chain" functional positions within different organizations, to evaluate the impact of the respective strategies on key "Supply Chain performance" indicators such as; cost, time and quality. The research also establishes that effective logistics strategies are effective in improving both outcomes and resource protection in the process; knowledge that could be helpful to organisations that are interested in improving the viability of their logistics networks.

Keywords

"Supply Chain Performance", "Supply Chain Resilience", Logistics Strategies, Technology Adoption.

1. Introduction:

The "Supply Chain" is the artery of trade as well as an economic body, acting as a lifeline that brings together suppliers, producers, distributors and retailers all in a bid to supply goods and services. Nonetheless as the world becomes a global village supply chains have also become a risk factor as they may be exposed to disruptions such as natural disasters, political instabilities, and poor technological infrastructure. Disruption can have an effect on the performance of supply chains which is usually measured by factors such as cost, delivery reliability and customers' satisfaction.

The term 'Resilience here when used in relation to 'Supply Chain' management means the ability of a given 'Supply Chain' to operate in situations where there are any interferences but at the same time retain or recover easily most of its functionality. "Supply Chain" that is strong is one that has



defense mechanism that shelters it from shocks and or have the ability to recover some of the grounds it lost in the operations when the situation becomes tough as a result of some events. As the disruptions happening more often and getting severe organizations need to look for ways to achieve supply chain robustness thereby supply chain can continue to work optimally in highly uncertain conditions. The details of logistics strategies are crucial to the reinforcement of supply chains. The above mentioned strategies can help to lessen the susceptibility of the organization to disruptions by increasing the effectiveness of handling the logistics functions and by guaranteeing the uninterrupted supply of materials.

2. Review of Literature

Researchers have studied supply chain resilience intensely since the last ten years because complex global supply chains remain weak to disruptions. Supply chains maintain performance continuity through disruptions by anticipating threats and responding to events according to definitions provided by Christopher and Peck (2004). The criticality of managing supply chain resilience originated from multiple barriers which include climate change and geopolitical uncertainties with supply chain constraints.

Supplier diversification constitutes an extremely effective method to increase resilience. Organizations achieve material supply continuity through their practice of acquiring materials from multiple suppliers thus protecting themselves from single-supplier breakdowns. Technology applications act as the primary force behind supply chain adaptability improvements. Real-time tracking through IoT and blockchain technologies allows supply chain managers to take quick necessary remedial steps during disruptions according to Gunasekaran et al. (2015).

The process of inventory management acts as a fundamental requirement for building resilience. JIT systems and safety stock management give organizations a built-in safety reserve to safeguard against disruptions (Henderson, 2006). Supply chain coordination excellence and team collaboration boost organizational resilience through material and risk information sharing which lets companies prevent disruptions (Simchi-Levi et al., 2014). Organizations that involve their partners in improved collaboration experience better speed to recovery along with increased flexibility. Organizations that build supply chain operations with integrated risk management practices will stay ready to handle new risks (Ponomarov & Holcomb, 2009).

3. Research Gap



Existing research about supply chain resilience strategies has numerous unaddressed areas according to scholars. Most empirical research that examines theoretical frameworks lacks diversity in terms of industrial sectors and geographic areas for conclusive testing. The lack of research exists in two areas: first it addresses how advanced technologies such as IoT and blockchain support resilience and second it investigates challenges in integration and expenses from technology adoption. Supplier diversification stands out as a universal resilience strategy yet the scientific community lacks enough research on the relationship between diversification and cost to operational efficiency. Research concerning risk management in supply chains centers its analysis on response methods instead of developing predictive measures for risk assessment and prevention strategies. The exploration of existing knowledge gaps will help understand better ways to improve supply chain resilience in our unpredictable global market.

4. Objectives

1. In order to provide valuable insights about the current performance of supply chains within varied industries.

2. To analyze what important logistic strategies increase the overall resilience of the supply chain.

3. In this discussion, the author outlined some of the common logistics strategies to enhance "Supply Chain" performance especially on aspects such as cost, delivery reliability, and customer satisfaction.

4. Material & Methods

The study employed a mixed-methods approach, combining quantitative and qualitative research to evaluate the impact of logistics strategies on "Supply Chain" performance and resilience.

Data Collection:

• **Surveys:** A structured survey was distributed to "Supply Chain" professionals across industries, focusing on logistics strategies and their impact on performance (e.g., cost, delivery time, customer satisfaction) and resilience to disruptions.

Sample:

• **Survey:** 300 professionals were targeted, with 150 respondents completing the survey.

5. Results & Discussion



The research outlined several important findings relating to the effect of logistics strategies on the "Supply Chain" performance and vulnerability. Described in detail below are these findings together with a work table that captures the effects of the four logistics strategies on the "Supply Chain" performance and responsiveness.

Logistics Strategy	Impact on Performance	Quantitative Findings
Supplier Diversification	Reduces dependency on single	20% higher performance score
	suppliers, ensuring continuity	in reliability and customer
	during disruptions	satisfaction
Technology Adoption (IoT, Predictive Analytics)	Improves "Supply	30% faster response time and
	Chain"visibility and response	improved operational
	times to disruptions	efficiency
Inventory Management	Ensures continuity of	Reduced downtime and
(Buffer Stock, Strategic	operations during supply	improved product availability
Placement)	shortages	during disruptions
Collaboration & Information Sharing	Enhances responsiveness and transparency with suppliers and partners	25% higher customer and partner satisfaction ratings

Impact on "Supply Chain" Resilience:

Logistics Strategy	Impact on Resilience	Quantitative Findings
Risk Management	Enables quicker recovery and	40% higher recovery rate
Frameworks	minimizes disruption impact	during disruptions
Response Time Optimization	Reduces reaction time and enhances decision-making during disruptions	35% faster response times with predefined logistics protocols

Key Findings from Data Analysis:

• Supplier Diversification: The study revealed a marked decline in organisations' "Supply Chain" disruption where organisations had diversified their suppliers. It emerged that these companies received better scores in reliability and customer satisfaction by at least 20% to those companies that operated with a single supplier. Such diversification made it easy to change to other supplier because one was often hit by a disruption.

• Technology Adoption: Those companies implementing IoT based real time tracking devices and tools along with predictive analytically upgraded their "Supply Chain"sightedness qualitatively. The study done revealed that such technologies enhanced faster response time, better operating efficiency by a remarkable 30% in companies that utilize them. There was also a strong



aspect of predictive in the way that companies were able to predict disruptions to supply chains and change the manner in which they planned logistics.

• Inventory Management: Corporations who had kept inventory and opted for strategic inventory positioning proved to have carried on with their operations despite the interferences. Such practices the companies with these practices recording minimized downtimes and guarantee of a consistent product reliability especially in markets that are characterized by raw material volatility.

• Collaboration & Information Sharing: The analysis also revealed that firms which were collecting and openly exchanging risk information and sounds alerts regarding potential disruptions with suppliers enjoyed 25% higher customer and partner satisfaction. Sharing of information enabled the adoption of anticipatory measures, hence enhancing the position of the companies.

Resilience-Oriented Strategies:

• Risk Management Frameworks: The survey also found out that organisations that have already implemented risk management strategies from the onset had developed mechanisms of early detection of these risks. To the actual question, the authors found that companies with these frameworks had a 40% higher recovery rate than their less prepared counterparts who were less capable of recovering quickly.

• Response Time Optimization: The study also highlighted the importance of optimized response times. Companies with predefined logistics protocols were able to react to disruptions more quickly, resulting in 35% faster response times. This quick response time minimized the impact of disruptions and improved recovery processes.

6. Conclusion

The findings in this research confirm the significance of logistics initiatives such as changing multiple suppliers, adopting technology solutions, controlling inventories, and fostering dynamics networks on the "Supply Chain"and "Supply Chain"readiness. First, the data analysis indicated that where organizations use these approaches that there would be less detrimental effects from disruptions, higher customer satisfaction, and increased operational efficiency.Second, organisations with effective risk management and better response time on average had a higher ability to bounce back from disruptions.

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