

Supply Chain Resilience Strategies and Overview

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Abstract: Supply Chain Resilience refers to the ability to address and anticipate the unexpected events, disruptions, even in pandemic situation and come out with the adaptation and recovery to evolve the continuous supply chain and logistics network design. Resilient supply chain maintains the smooth continuity of network by reduction of disruption risks and establishes customer satisfaction. Over the last few years, COVID-19, extreme weather events, Trade war and shifting geopolitical landscape have underscored the vulnerability of supply chains to disruptions. The leadership highlights importance of building resilient supply chains from then and digitalization of process can be leveraged. It certainly requires structured approach that an organization may build supply chain resilience by adopting several techniques like AI, Machine Learning (ML), Implementing supply chain control towers etc.

Keywords: Supply Chain Resilience, Artificial Intelligence (AI), Machine Learning (ML), Just in time (JIT), Just in Case (JIC), Internet of Things (IoT), block chain, Stock keeping unit (SKU), Cost to company (CTC), SCM.

1. Why Supply Chain Resilience Important

Since COVID-19 pandemic global supply chain and logistics network got disrupted absolutely and the reason huge shortage and delays in critical raw materials supplies observed and since then the organizations focused on the requirement of supply chain resilience to overcome such environment and to maintain a stable supply chain network. All the organizations want to build up a resilient supply chain by identifying risks, significant gaps in network and finding ability to mitigate the same. Adding to this it has been observed that the frequency and magnitude of disruption getting increased also. It includes several disasters like hurricane, cyclone, massive flood, earthquake, trade war etc which in turn impact global supply chain a lot and to overcome such situation resilience much require to establish a continuous supply over the market and daily customer needs to be satisfied.

Building Resilient supply chain provides several benefits to organization including Improved business continuity that ensures continuous improved operations with optimize inventory management, minimize downtime and enhance customer satisfaction. Better risk mitigation by proactive identifying of risks factors and make strategies to stabilize the system is a wise approach to SCM. Resilient supply chain also enhances agility and flexibility so that there will be a quick response generates and diversifying the suppliers to get raw materials in time with cost economic approaches. Cost

reduction and sustainability and compliance also an important part of resilient supply chain as it offers an ethical sourcing as well as renewable energy which in turn meets stakeholder's demand. Apart from this though cost of technologies might be high in short term, but it will be beneficial for long term cost optimization.

2. Building Resilient Supply Chain

Achieving supply chain resilience is not without its challenges. Supply chains are often complex and involve multiple stakeholders, making it difficult to ensure seamless co-ordination and communication. The dynamic nature of global markets and the unpredictability of disruptions add complexity in system and hence the building of resilience is necessary to response quickly. To build resilience in an organization there are four steps may be followed.

A. Identifying Risks Proactively

Anticipating risks is the cornerstone for any supply chain resilience and it will help to build resistance capacity to network. While many of the organizations trust over their internal data base to examine any risk however several time it has been found there are some floating demands that disrupts the analysis. To overcome such situation currently generative AI (Artificial Intelligence), cloud computing, machine learning (ML) evolves at high range, and many organizations use such technologies to get better and correct analytics. Identifying the risks potential is a necessary task to make the strategy of better solution.

B. Prioritize Response and Action Plan

Some strategies to build supply chain resilience and minimise the impact of disruptions includes diversifying the procurement basket which have at least dual sourcing contracts for all materials. Preference for suppliers who operate across multiple locations, focus on product design to avoid dependence on highly specialised components if possible. Action plan to provide quick response to any disruption includes to create capacity and inventory buffers which create flexibility for production network and for safety stocks that get replenished with quantities that factor in demand fluctuations. The buffer stocks may vary sku wise and the calculations can be dynamically represented by algorithms powered by AI. Response priority always depends on Improved collaboration and communication with partners to gain near real time insights

that impact procurement, inventory deployment.

C. Monitoring and Recalibration of Network

continuous monitoring and recalibration based on the feedback is needed which ultimately help to optimize the supply chain resilient. For recalibration implement of Supply Chain Tower is necessary in all terms. Supply chain control tower is an integrated set of capabilities, supply chain skills and processes supported by advanced technologies. It enables proactive decision making based on real time information and analytics. This help to build improvement in recovery and resistance towards disruption.

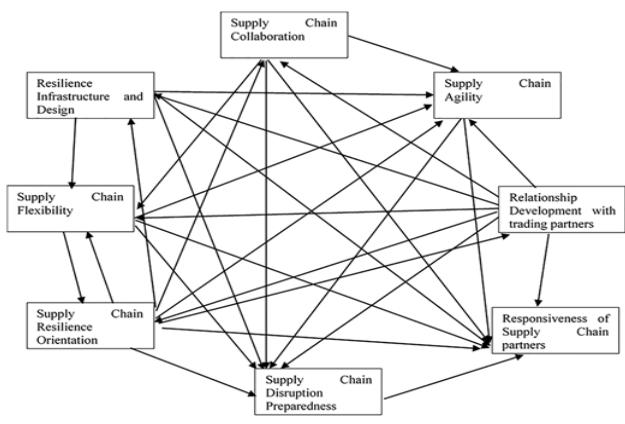


Fig. 1.

3. Supply Chain Resilience Strategies

To strengthen supply chain resilience, companies can consider a combination of proactive planning, technology adoption and operational flexibility. Focus to be given to logical forecasting which means correct analysis of seasonal data and disruption frequency and plot market demand accordingly vs supply and current stocks. Also inventory management and flexibility of suppliers' management may take a considerable impact to fix resilient strategies.

A. Forecasting

Effective customer and market demand forecasting requires visibility across the entire supply chain to anticipate demand, identify risks and proactively manage disruptions. In this case advance demand planning and forecasting tools may be an important pillar to improve entire Supply chain. The advance tools may help the optimization of safety stocks in a microlevel so that all customer demand can be honoured. For example, companies can explore tools such as AI-driven demand forecasting or blockchain for improved supply chain transparency and predictive insights.

Additionally, a comprehensive risk management plan needs to be implemented which regularly updated with input from key stakeholders and this can help businesses identify, prioritize and respond to potential supply chain risks more effectively.

B. Inventory Management

Inventory levels are affected by the level of customer service, demand variations and flexibility in business operation. Inventory decisions fall in a high-risk area and have deep

impact on business operations. Without a proper inventory marketing may face loss of sales and customer satisfaction. In response to longer lead times and increased supply chain disruptions, businesses are reimagining their inventory management strategies. Many customer shifts from Just in time (JIT) to Just in Case (JIC) model for which logical inventory management is critical for all organization. Tools such as different software implementations will help to analyse historical market data and seasonal data to provide strategic forecasting considering standard deviation. Companies are also adopting automated tools to mitigate supply chain bottlenecks and ensure material availability. Using real-time data analytics, businesses can dynamically adjust inventory levels in response to shifting market conditions.

C. Supplier Management

For Supply Chain resilience collaborations and supplier relationships are most essential to mitigate the disruption and risks. Currently to predict the market demand and customer satisfaction inventory planning is most important so that there will be no losses to encounter and related to this many organizations trust multiple suppliers for getting continuous supply of raw materials. To mitigate supply chain risks continuous monitoring of suppliers' performance metrics such as quality, delivery and capacity required at a high level. Companies use diversification of suppliers' niche to overcome the disruptions. Strategically diversifying an ecosystem of partnerships through multisourcing can minimize the impact of regional or geopolitical disruptions and improving flexibility. On the contrary it is also necessary to get the feedback from suppliers against which potential supply risks can be detected. These will help to address the issue for an organization before escalating.

4. Challenges to Building Resilience and Overcome Disruptions

Despite several advantages of supply chain resilience there are few challenges that organizations faced while attempting to build and maintain resilient supply chain.

A. Globalization

To manage the global supply chain, organizations anticipate several complex globalizations of supply due to many geopolitical instability, logistics viability, delayed transportation and risks of natural disasters as supply chain has no barrier. The issue facing at border areas maximum and effective risks always to be monitored.

B. Technological Insufficiency

Many organizations still lack adopting technologies and infrastructures such as AI, ML, cloud computing, IoT (Internet of things) and block chains. Implementing these significantly affect cost to company and to manage complex operations. Believing over such technologies and significant investments on it sometimes faced a big challenge for building resilient supply chains.

5. Conclusion

So, early detection of risks, wise analysis of feedback data, implementing new technologies and skilled manpower are the pillars to build up supply chain resilience. More we analyse the historical data with several metrices reduces challenges of supply chain network and finally implementing of technologies will give strength to overcome disruptions. Integration of architecture in different layers ultimately directs real time tracking of disruption and supply chain network might be optimized and stabilized.

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