

STUDY OF FACTORS AFFECTING SUPPLY CHAIN MANAGEMENT AND RISK IN PANDEMIC SITUATION

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Abstract

The goal of this study is to make supply chain activity more sustainable by lowering the likelihood of disruption during pandemic COVID 19. Two subcategories of the multifaceted supply chain risks are operational risks and disruptive risks. Disruption risks directly affect how the supply chain network is constructed as a result of the temporary suspension of transportation linkages between various industries, vendors, and distribution centres. Downstream in the supply chain, the ensuing supply shortfall and delivery difficulties have a negative cascade effect that lowers performance in terms of productivity, revenue, and service quality. This study looks into the impact of the COVID-19 pandemic on supply chain management activities. It tries to appreciate the challenges that develop during a pandemic and recognised experiences in order to construct more resilient supply networks in the future. Therefore, the goal of this research was to ascertain how well attempts to increase resilience may help to reduce the consequences of a disruption and aid in recovery. To a certain extent, interruptions can all be minimised by resilience-building efforts, but the epidemic has surpassed these limits. As a result, in addition to disrupting supply networks, it has harmed capacities for creating resilience. Our main finding is that firms that fostered resilience better were also less affected by the disturbance.

Keywords: Supply chain resilience, supply chain risks, COVID-19.

Introduction

Supply chain risks have an effect on a wide range of stakeholders. Strategic risks are those that prevent the fulfilment of corporate objectives, whereas operational risks are those that result in disruptions to the organization's routine business operations. The fear of not having enough money to run their firm and having problems paying their payments is one of their financial concerns. Furthermore, disruption risks are linked to low-frequency, high-impact events like natural catastrophes and human-caused harm. Disruption risks have an immediate and considerable influence on the supply chain's functionality as well as its long-term viability. The researchers should concentrate on methods to improve supply chain activity sustainability while simultaneously lowering the chance of disruption. Two subcategories of the multifaceted supply chain risks are operational risks and disruptive risks. Downstream in

the supply chain, the ensuing supply shortfall and delivery difficulties have a negative cascade effect that lowers performance in terms of productivity, revenue, and service quality. The three main elements of the risk management process are strategy, architecture, and protocols. Many businesses have used a variety of formal risk-reduction strategies. The COVID-19 outbreak, which has impacted numerous global supply networks, has been one of the most serious disruptions in recent years used a grey-based digraph-matrix approach to investigate how the COVID-19 pandemic adversely affected supply chains. Additionally, they offered recovery plans for supply chain bottlenecks brought on by the COVID-19 epidemic.

Managers of supply chain risk are interested in decision-making tools that can help them predict disruption scenarios, emphasise the vulnerability of certain network segments, and track and detect disruptions in real-time. Numerous supply chain disruptions brought on by these catastrophes led to significant delivery delays, drops in income and sales, and production halts that had an impact on employee utilisation. It was discovered that disruption has an effect on supply chain performance both directly and indirectly by reducing stock returns and businesses' capacity for market competition. Analysis of post-pandemic recovery processes as well as breakdowns and changes in the supply chain during the COVID-19 pandemic provide as additional proof of the vital need for digital twins for supply network mapping and visibility assurance. It is acknowledged that interruptions cannot be predicted since they vary in kind and nature, are too random and unpredictable to be precisely identified, quantified, or anticipated. Nevertheless, amid the pandemic situation brought on by COVID-19, there were little needs on the market. Producers are attempting to improve the production of required commodities in order to meet this increased demand. Demand, however, keeps increasing as the virus worsens and people buy basics out of fear. Due to a dearth of raw materials, inadequate production capacity, transportation bottlenecks, and customers' inclination for panic buying, demand for basics increases during a pandemic.

Objectives of the study

1. To assess how well supply chain management strategies performed in a pandemic context.
2. To evaluate the elements influencing risk and supply chain management in a pandemic context.
3. To propose recommendations for effective supply chain management to decision-makers.

Literature review

In 2020, Kelpini presented a digital supply chain, which is a computerised model that shows network conditions in real time at any given moment. In order to minimise supply chain disruption issues, this study examines the factors underlying the design and execution of digitalization. The identification of linkages between risk information, disruption modelling, and performance evaluation is made possible by combining model-based and data-driven methodologies.

According to Matthew Chu Yan Si (2019), the corona virus outbreak is still having a big influence on the global economy and ecology. Smallholder farmers in developing economies and regions have found it challenging to prosper as a result of the pandemic's disruption of the supply chain for agricultural goods. Technology, however, may hold hope for improving the situation of farmers who are in risk even in a crisis like the COVID-19 era. For the poor nations' post-COVID-19 supply networks to be strong and sustainable, particularly for smallholder farmers participating in global value chains, we propose the necessary digital transformation. We build on lessons discovered in both developed and developing countries to achieve this.

Anurag Verma (2021). The ongoing COVID-19 outbreak has had a significant influence on various industries' global supply networks, as was mentioned. A major deficit of supply exists because of the astronomically rising demand for many necessities on a global scale. According to this study, providers of necessities were able to meet rising consumer demand and timely supply by cutting the risk reaction time and boosting production capacity, preventing financial shocks to enterprises. According to this study, if the suggested recovery strategies are put into place later than anticipated, vital item manufacturers could encounter supply, demand, and financial shocks. Methods for alleviating the lack of essential products were carefully investigated in this study. Additionally, it offered compatible remedies and recovery strategies to address the problem in the highly disruptive event caused by COVID-19.

MukataVerma 2020 published their research. The COVID-19 pandemic's effects on the economy and society have caused supply networks to come under growing pressure to change and adapt in an environment of financial restraint. Delays in the supply chain may cause food product shortages for manufacturers, shippers, and retailers. Semi-structured interviews were employed in the study as a qualitative approach to achieve this end. Small and medium-sized businesses (SMEs) were found to commonly operate on a restricted budget and lack a defined supply chain. The study examines the supply chains of SMEs in the food

industry during the COVID-19 pandemic. Additionally, it simplifies the literature on the supply chain during emergencies like the current COVID-19 epidemic and enables the development of useful recommendations for these businesses to improve.

Jing Shaw (2021). Due to increased global market competitiveness, firms are now more concerned with their own performance than the performance of their supply chains. This study looks into the strategies currently in use to strengthen supply chain resilience to transportation-related supply chain disruptions. The study also makes an effort to create a novel approach to address the limits in light of the serious flaws in the existing strategies that have been discovered. This study presents an integrated cost and risk management approach to boost resilience. The work adds to the field of risk management by suggesting a tactic that can increase supply chain resilience while being economically viable.

Smriti and Ragini (2021), the corona virus epidemic has gravely impacted the world's supply chain. Two major obstacles are reducing disruption risk and establishing sustainability in the supply chain. This study aimed to pinpoint the stakeholder needs and crucial success criteria for the sustainability project in South Carolina during this pandemic. The study's scientific quality comes from its contribution to the framework model for sustainable supply chain activities during the COVID-19 pandemic, from its identification of stakeholders' demands and CSFs through its prioritising of these CSFs. Social isolation, emergency backup facilities, and emergency logistics systems are cited as the top three success criterion. The suggested strategy offers operations and supply chain managers a step-by-step guide for creating successful plans for sustainability activities both during and after the pandemic epidemic.

Research methodology

We've talked about how researchers' study plans use both qualitative and quantitative research methods. It should be used in conjunction with the qualitative component. In-depth interviews, which use a qualitative approach, and a questionnaire, which use a quantitative approach, were established in response to the requirement for diverse data collection methodologies. In each case, we conducted extensive interviews, which assisted us in developing a questionnaire that was given to the candidates. Prior to starting the interviews, it was crucial to decide which demographic samples would be best able to provide their knowledge and experiences on the issue we are examining. By agreeing to the terms of the consent form, the informants also permitted the submission of data regarding the participating organisation. Additionally, participants were advised that the data they provided would be

anonymized before being used to present the empirical findings, making it difficult for the reader to understand what the various informants had said.

Risk in pandemic situation

The basis of supply chain resilience is an organization's capacity to maintain and enhance its operational and competitive position in the market. Businesses would need to adapt, respond, and take preventative measures to reduce delays since the new corona virus has created a quickly changing environment. If an organisation has the ability to dynamically synergize, integrate, and rebuild its strengths, it can overcome challenging situations. This encourages us to consider the idea of dynamic capacities. Because the pandemic changed the environment and because this management theory is dynamic, it was chosen over others like the resource-based view of the organisation. To situations that aren't changing, however, the resource-based perspective is more appropriate.

1. Variability in demand

Consumer shopping patterns will change as a result of the COVID-19 outbreak, which will disrupt demand. The COVID-19 pandemic epidemic has significantly impacted industrial sector businesses and their upstream suppliers, resulting in historically low demand for specific commodities. The worry about contracting the virus through interpersonal contact or ingestion of specific products is a big factor in this. The markets for food and home goods have been impacted by consumer misinformation as a result of social media accusations associating eating chicken to Covid-19. Many people are changing their consumption patterns to only include the most basic meals each day as a result of financial instability and income loss, which is lowering the consumption of pricey goods.

2. Delays in delivery

Finding a balance between the amounts of time needed to purchase, produce, and deliver a product to a consumer and their tolerance for waiting is the main difficulty for practically every organisation. Furthermore, customers are not known for having long attention spans, particularly when alternative options are accessible. Additionally, not all firms are fully aware of it because the time it takes to purchase raw materials is now dependent on external suppliers and outside of their control. Especially in locations that come under the containment or restricted category, the Covid-19 pandemic has resulted in restrictions on the flow of goods and supplies.

3. Supply variability

Due to supply-side capacity restrictions, volatility in the price and quantity, and the COVID-19 pandemic, there is a substantial disruption. Supply shortages as well as other problems have affected India's Micro, Small, and Medium-Sized Enterprises (MSMEs). In addition, there were several inconsistencies in the supply of essentials throughout the country. Since the start of the pandemic. All supply chain partners, from wholesalers to retailers, have been hoarding products, which has caused an unnaturally low supply. It goes without saying that these activities will lead to supply limitations, erratic prices, and irregular supplies, all of which will make it more difficult for the supply chain to operate effectively. All supply chain partners, from wholesalers to retailers, have been hoarding products, which has caused an unnaturally low supply. It goes without saying that these activities will lead to supply limitations, erratic prices, and irregular supplies, all of which will make it more difficult for the supply chain to operate effectively. In reality, the supply chain is a network of different businesses.

4. Labour shortage

A startling number of these employees have been negatively harmed by the lockdown and confinement measures. The majority of these workers do manual material handling, loading, and unloading work. Agriculture and logistics are anticipated to be among the industry's most badly hit by this reverse migration due to their reliance on migrant workers and informal nature. Every manufacturing and service sector relies on its labour, particularly in emerging nations like India that are heavily dependent on the informal economy. Due to the enormous number of displaced migrant workers, labour shortages are a big problem and a substantial impediment to the supply chain's normal operation.

5. Capacity constraints

Panic buying has grown during the lockdown for basics, but India hasn't seen a similar trend for all kinds of commodities. The COVID-19 outbreak has reduced consumer confidence, and it is expected that they will be spending less money for a very long period. When supplies are overstocked in warehouses and regional distribution centres while they wait for demand to pick up later, storage and capacity concerns may arise. Long-term excessive inventory holding may cause potential damage, issues with perishability, and working capital constraints, which would impact the liquidity of businesses along the entire supply chain.

6. Problems with delivery

In response to client requests during the epidemic to prevent physical touch areas, many businesses have changed their supply chains. Increasingly, professionals and businesses are

discussing how to create a robust supply chain. Brands are either integrating with last mile delivery partners or switching to completely captive in-house delivery services in an effort to attract customers. When there is a lockdown, the bulk of metropolitan areas fall under the containment and red zone categories, making it challenging for last-mile delivery partners to transport goods to customers' homes.

Facilitators of improving supply chain

With the aid of a strong supply chain, businesses can give excellent service, react swiftly to customer requests, and control costs and net working capital. Businesses may use our six supply chain resilience pillars—three of which assist organisations better absorb shocks and three of which help them react to disruptions more quickly—to achieve that balance and benefit from it.

1. Improved efficiency:

Using buffers and strategic inventories, resilient organisations are better able to deal with shocks in ongoing, end-to-end supply chain operations. By promptly transitioning from primary to secondary material flow pathways and changing providers in the event of significant disruptions, they reduce the likelihood of a complete network shutdown and other negative effects. A company's efforts to survive shocks should be supported by three pillars: reorganising the worldwide network, developing new guidelines for supply chain buffers, and ruthlessly managing suppliers.

2. Modernising the world network

The strategic use of redundancy, such as dual sourcing, allows for flexibility in a strong supply, production, and distribution network. Others include vertical integration, which brings manufacture of crucial components in-house, close shoring, which lessens reliance on intricate international logistics. A thorough risk assessment can serve as the foundation for deciding how to balance flexibility, efficiency, and effectiveness while constructing a global network.

3. Modifying the Supply Chain

A corporation must create a multi-echelon inventory strategy that is effective and routinely produces new inventory targets at supply chain nodes with high volatility in order to foster resilience. Additionally, depending on usage data, companies may consider defining new capacity utilisation goals and figuring out the cues that suggest when to add capacity or activate ready-to-use capacity. Additionally, it's critical to coordinate order fulfilment strategies with client needs.

4. Proactive supplier administration

High-resilience companies evaluate the importance of their suppliers and modify their interactions with them to guarantee the availability of resources. Additionally, they have access to data on several levels of suppliers, which enables them to fully assess upstream risks. Additionally, the business incorporates outside data from social media analysis or market research into the risk evaluations. A better awareness of risks enables the company to produce products and services on time and to a higher standard while minimising costs. The company has included the dashboards into both its customary supplier-management practises and digital platforms.

5. Reacting with extraordinary promptness

Businesses that are robust to disruptions and cyclical swings adopt agile, silo-breaking techniques of collaboration across many functions and geographies. Normal deviations are managed through transparency, and future-looking dangers and possibilities are shown through simulation. They also make use of tried-and-true procedures and analytical tools to react quickly to periodic volatility and slight disturbances. They are able to respond fast because of efficient processes, in-depth knowledge of the impacts on material flows, and rigorous system management.

6. Multi-enterprise supply chain management.

High-resilience companies are conscious that their ability to respond to unanticipated events is frequently limited by the capabilities of the third parties who support their whole supply chain. To accelerate the pace of activity, they create complete transparency and encourage teamwork. Distribution networks, logistical service providers, and suppliers at various levels are all included in this visibility. Insights from analytical engines powered by artificial intelligence are used by resilient businesses to support adaptive decision-making. They also coordinate their internal and external operations to maximise performance from beginning to end. They reinforce their plans that cover monthly or longer time horizons by utilising sales and operations execution approaches throughout the entire supply chain in order to adjust to changes in supply and demand. Their quick analyses of a variety of events provide them the ability to respond more quickly and successfully.

Conclusion

However, due of how unexpected their length and breadth are, pandemics are unique. The COVID-19 epidemic has caused a level of commercial disruption that is unprecedented. All industries have been touched by significant changes in the dynamics of supply and demand.

Additionally, because the pandemic disrupted markets so quickly, companies were unable to create risk-aversion strategies and were therefore unprepared for the disruption when it arrived. As a result, they had to react to the disturbance right away. The perishable major economic engine has a distinct significance among all other sectors since it meets people's needs. Therefore, the goal of this research was to ascertain how well attempts to increase resilience may help to reduce the consequences of a disruption and aid in recovery. To a certain extent, interruptions can all be minimised by resilience-building efforts, but the epidemic has surpassed these limits. As a result, in addition to disrupting supply networks, it has harmed capacities for creating resilience. Our main finding is that firms that fostered resilience better were also less affected by the disturbance. Some businesses are more exposed than others, and researchers have already made an effort to explain why. Companies in the global supply chain are more vulnerable to pandemic-related disruptions than those in the service or industrial sectors.

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