IMPACT OF PANDEMICS SITUATIONS ON LOGISTICS- SPECIAL REFERENCE WITH INDIAN MARKET

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Abstract

A focus on connected and lean supply networks has been a priority for Indian firms before to the COVID- 19 outbreak, with the purpose of enhancing supply chain efficiency. Due to previously un recognized supply chain deficiencies, the pandemic has placed the majority of Indian firms at risk for supply chain disruptions of severe scale (SCDs). Many studies have been done on supplychain disruptions and transportation disruptions in general, but there hasn't been any done in the context of Indian enterprises, therefore we've developed a new model for are liable transportation and advanced logistics system (ALS) to speed up supply chain recovery (SCR). Using grey literature, we have discovered and reviewed a variety of material on SCDs, TI and ALS. According to the study, transportation and logistics services have been severely delayed, as well as time delays and cargo cancellations, due to a shortage of freight space, restricted circulation, port closures, and a delayed customs clearance procedure in India. As a consequence, logistics services such as consignment production and shipping have been severely impacted. Despite the fact that firms are working hard to recover from SCDs when restrictions are eased, the SCR is still relatively slow owing to the insufficient usage of robust TI and ALS. A transportation audit and an ALS assessment were required for these companies. Our novel approach to coping with SCDs is based on ALS and highly intelligent transportation networks.

Keywords: *Logistics, Supply Chain Management, Distributions, and Transports*

Introduction

COVID-19 has infected a significant number of individuals throughout the world (Sohrabietal., 2020). Industrial supply chain disruptions (SCDs) have emerged from the world wide lock down, with key manufacturing centers shutting down. Supply chain disruptions (SCDs) are unforeseen and unplanned events that cause a halt in the flow of goods across the supply chain (Craigheadetal., 2007). As a consequence of the shutdown of industrial activities and the suspension of transportation, raw material and intermediate supply prices have increased throughout the world (Maffioli, 2020). Since border restrictions have been put in place, human mobility and transportation have been placed under unprecedented pressure, which has resulted in a major setback for international trade. There have been major operational shutdowns and revenue losses as well as late deliveries and a poor effect on the company's image due to disruptions in actual product flow, product mobility, and the supply chain this relationship between trade and transportation freight has been shown to be quite robust. Due to the growth in transportation freight costs, supply chains have been significantly disrupted. Supply chain

responsiveness and efficiency are influenced by transportation, which is a crucial logistical driver. A responsive supply chain and transport flexibility allow for the delivery of more products to customers (Ghavamifaretal., 2018). A wide variety of variables and sub factors led to supply chain disruptions. Transportation and supply networks were adversely disrupted by inclement weather, for example (Sheffi, 2015). However, the COVID-19 outbreak presents a major danger to supply chain mobility and creates new degrees of uncertainty. The COVID-19 has had an influence on all modes of transportation, including air, rail, road, and marine, although the impacts have been felt in different ways. A company's ability to recover from a slump in business depends on its ability to detect and mitigate supply chain risks using cutting-edge SCM methodologies and stringent mitigation measures via supply chain risk management (SCRM). An efficient mitigation and recovery plan should be developed by all parties involved in case of logistical or transportation failure. In spite of this, nothing is known regarding the impact of COVID-19 on SCDs, despite this. This is why we conducted a comprehensive study on Supply Chain, SCDs and SC Min relation pandemics like the COVID-19 to identify research gaps and, as a result of these findings, proposed mitigation strategies including a logistics and transportation recovery model and prescribing short-term as well as long-term measures for fast recovery of firms from transportation disruptions in the Indian context..

Literature Review:

Supply chain disruptions have been an increasing topic in SCM research has company practices such as outsourcing, manufacturing, supply, and inventory have grown more unpredictable and subject to rising business risks (Zsidisin, 2003). Consequently, supply networks have grown more exposed to interruptions caused by business risk (Craighead et al., 2007). In part, this is due to the fact that supply chains are more sensitive and complicated now that both upstream and downstream suppliers are involved (Blackhurstet al.,2005). In order to be successful, companies must coordinate their efforts with the most crucial suppliers and consumers. A company's operational and financial performance may be significantly affected by SCD risks, which is critical for building resilience against SCDs (Hen dricks and Singhal, 2003). As of 2011, (Bodeetal.,2011). Researchers studied these dangers inorder to learn more about supplychain disruptions and their impact on supply networks (Kleindorferand Saad, 2005). It has had an influence on many firms' lean and international corporate designs as a result of COVID-19 (Ivanov, 2020). Because of the pandemic's impact on manufacturing and logistics, supply chains were strained and organizations were more vulnerable to SCDs. For supply chains without SCR mechanisms like stockpiling for risk reduction and sub contracting capacity as well as strong channel distribution networks and flexible manufacturing technologies, the protracted lockdown has significantly affected demand for labour, materials as well as delivery. As cited by Arazetal. Almost 94% of Fortune 1000 companies have been affected by the COVID- 19 because to SCDs in affected countries (Linton and Vakil, 2020). The pandemic-induced lockdown cut both demand and supply dramatically, necessitate in government intervention. SCR may make use of a variety of risk mitigation strategies, including inventory, subcontracting, emergency supplies and transportation, and digital monitoring systems (Dolguietal.,2020; Xuetal.,2020).COVID-19'simpact on SCDs has yet to be properly investigated (Sarkis et al., 2020). The unique circumstances of COVID-19 necessitated the development of novel strategies for dealing with SCDs. There has to be a departure from earlier efforts at SCD management to make these techniques workable. Due to the long-term stoppage of nearly all productive activity, which necessitated massive state aid, demand and supply have reduced dramatically. Global supply

chains (GSCs) and the COVID-19 pandemic's associated threats need Immediate and thorough control, Mamanietal. (2013) and Büyüktahinetal. (2018), for example, looked at outbreaks of epidemics and company operations. The advent of the COVID-19 pandemic confirmed the economic importance of supply chains (Linetal., 2020). The COVID-19 pandemic, which has also increased the incidence of SCDs, has put global production in jeopardy (Araz et al., 2020). As a consequence of manufacturing, distribution, and transportation challenges, the economy has seen a decrease in mobility. SCDs and ordinary corporate operations have been affected (Lin et al., 2020).Transportation and logistics have been severely disrupted by natural disasters (Tang and Musa, 2011; Sheffi, 2015) and other unexpected occurrences. Delays in the transit of commodities from one stage of the supply chain to another are what we mean by the term "transportation" (Zhen et al., 2016). Disruptions in transportation and logistics systems have severely disrupted supplychains (Baghalianetal., 2013; Chen and Chen,2014;Tanetal.,2020). Some economic operations have been interrupted and transportation networks have been disrupted by the COVID-19 pandemic, which has imposed pandemic-induced restrictions. As a result of these considerations, freight volumes have been altered by supply networks. Many major delays in transportation and logistics have occurred as a consequence of the COVID-19 pandemic, which has led in a decrease in air freight capacity and a slowdown in customs clearance. When products and consignments are delayed, it's because they've had to be re-routed or released early. Express shipping services like FedEx, DHL, and UPS have become more important in logistics and supplychains as e-commerce and online shopping have risen in popularity. However, e-commerce service providers have witnessed exceptional grow thin the face of the epidemic of COVID-19 As of 2019, India's e-commerce market is predicted to expand data compound annual growth rate of19.6percent, reaching a total value of US$98.4 billion. It is expected that e-commerce payments would expand by 25.9 percent in 2020 because of consumers' preference for online shopping platforms over brick and mortar ones. (GD, the year 2020.) Transport and logistics services are critical to SCR's capacity to react to pandemics like COVID-19. As a consequence, SCDs have had a particularly negative effect on transportation and logistics. SCDs in India havereceivedlittleattentionfromCOVID-19 due to the pandemic's influence on transportation and logistics and the ramifications for these diseases, this is why we made a min or attempt to fill in some of the information gaps about the pandemic's influence on transportation and logistics systems and to suggest an SCR mitigation model to cope with transportation and logistics disruptions and consequent SCDs.

Objectives:

COVID-19's impact on India's transportation and logistics networks and SCRM necessitated the development of a transportation risk management model that incorporates short-term and long-term measures to assist companies' recover from the effects of COVID-19. Transport and logistics have also lately done strongly in India. Considerations such as how organizations may make better use of their transportation assets while also avoiding possible problems were part of our operationalization efforts. Finding relevant information to support our study goals was made possible via a mix of web searches and in- person interviews. Secondary data and information have also been assessed using the theoretical approach and data triangulation. The triangulation method was used to performa comprehensive literature review and construct a transportation risk management model. Through the use of a triangulation method, the model's originality and validity were both improved, as were its testability in the event of a future calamity like to the COVID-19 pandemic. Contribution of Logistics for the Development of Indian Economy(GDP):

Logistics solutions that cover the whole supply chain are in demand in India now and in the future. Such an effort would include integrating assets, services and digital platforms. The market contains a wide range of players, ranging from small exporters and importers to medium-sized and big dealers and international organizations. As the industry unifies, standardizes procedures, updates technology, and evolves digitally, we should expect to see more interaction between modes of transportation and third-party service providers. Many customers now a day are on the lookout for solutions that might save them both money and time while yet meeting their individual requirements. Complex supply chain difficulties may be solved with the rise of third- and fourth-party logistics (3PL) organizations. The future integration of transportation modes will be ensured by the development of MMLPs, streamlined economic corridor routes, and intermodal terminals that connect various means of transportation. In the supply chain for COVID-19, the Cold Chain Logistics business is already having a positive impact. Coldchain and preservation infrastructure facilities using cutting-edge technology will continue to grow from the farm to the client. Last-mile deliveries, for example, may be handled by a fleet of electric automobiles to help the industry grow and innovate, investors such as venture capitalists and large corporations will invest in logistics start-ups.

Technology Disruptions:

New-age technology has made a fundamental impact in the logistics business. An estimated 1.5 trillion dollars in personal wealth and an additional 2.4 trillion dollars in societal wealth might be realized by 2025, based on forecasts from the World Economic Forum (2016).Technology will be used to create novel solutions and disrupt the status quo in the logistics industry in the future. Logistics market leaders will use technologies like Internet of Things (IoT), Blockchain, Cloud Computing and advanced/big data analysis in order to create end-to-end lean and smart solutions. Supply-chain expenses may be reduced via the use of autonomous automobiles, wear able devices, and warehouse digitalization and automation. Fast-paced technology changes will continue to result in real-time supply chain visibility.

GOI initiatives in the Logistics Sector:

Increasing retail sales, government reforms, transportation sector expansion, and the E-commerce sector are all predicted to fuel the growth of the logistics industry in India in 2021.Online freight platforms and aggregators have grown in popularity in India's logistics industry because of the country's need for lower entry barriers and lower startup costs. As manufacturing contributes between 25 and 30 percent of India's GDP by 2025, the country's warehousing industry is expected to grow at a rapid pace. The logistics sector in India is predicted to growth CAGR of 10.5 percent between 2019 and 2025. Increasing e-commerce could also boost the logistics industry in the future. By looking at increased investments and trade, it seems that the freight business in India is in excellent health. An annual CAGR of 5to6 percent is expected for port capacity growth between now and 2022, adding 275-325 metric tons (MT). Indian Railways has set a 2030 freight volume goal of 3.3 billion tons, an increase from 2017's 1.1 billion tons. A total of 17 million tons of cargo would be handled by Indian airports by the year 2040. Due to a lack of infrastructure, automated material handling equipment, and skilled labour, India's air cargo industry is lagging behind the rest of the world. "Indian Logistics Industry Forecast, 2020" (Report Linkers).The National Logistics Policy of India, which is expected to be released this year, aims to simplify the movement of goods throughout the country. There will be emphasis on re-engineering, digitalization, multi-modal transportation,

EXIM trade, and other areas of development in major sectors takes care of a lot in one shot. A well-executed policy would make it easier for India to rise in the Logistics Performance Index.

Contribution of Logistics Sector in Overall GDP:

The logistics sector's contribution to the total GDP has not been collected at this time. GAV during the previous three years is shown in the following table: (Value in Rs Crore)

S.No	Sector	At current prices		
		2018-19(3rd RE)	2019-20(2nd RE)	2020-21(1st RE)
1	Railways	1,23,596	1,35,477	1,36,807
2	Road Transport	5,36,552	5,65,438	4,47,164
3	Water Transport	13,059	13,350	13,418
4	Air Transport	12,730	22,508	10,323
5	Services incidental to transport	1,03,341	1,03,301	98,710
6	Storage	18,597	19,513	19,628
7	Total GVA	1,71,75,128	1,83,55,109	1,80,57,810

(Source: National Accounts Division, M/o Statistics and Programme Implementation)

(RE:Revised Estimates). According to the PM Gati Shakti National Master Plan, multimodal connections to economic zones have been approved by the government. In order to ensure that people and goods can move freely throughout this area, the plan aims to integrate all of the multimodal infrastructure projects and address any infrastructure gaps that may arise. Economic development and long-term sustainability can be achieved with PM Gati Shakti's approach. This plan calls for a shift in the economy, improved multimodal connectivity, and improved logistical efficiency. Synergies between global infrastructure and logistics are expected to enhance productivity and accelerate economic development. Constructing this highway would expand the nation's transportation infrastructure, which will in turn provide new opportunities for economic development and job creation through enhancing interoperability. You may learn about the current level of multi-modal connection a head of time in order to make an informed investment decision. In a written response to the Lok Sabha today, the Minister of State for Commerce and Industry, ShriSom Parkash, said this.

Recent Performance of India's Transportation and Logistics: Industry 4.0-

Companies should embrace and integrate Industry 4.0 into their logistics and transportation systems if they want to build logistics 4.0 of their own. It was decided to use the phrase "Logistics 4.0" for the integration of logistical systems with cyber-physical system developments. It is essential that the logistics industry implements the following technological applications in order to achieve logistics4.0 success: resource planning, warehouse management systems, transportation management systems, intelligent transportation systems, and information security. Using these apps, transportation may become more flexible and adaptive, and recover more rapidly from disruptions, which might benefit them. Using a mix of flexibility, agility, and redundancy, companies have been able to boost supply chain resilience (Parast and Shekarian, 2019). It is essential to have a TMS in order to take advantage of Internet of Things (IoT) technology and the sub sequent shift to Industry4.0 Logistics4.0 makes use of real-time and on-the-fly data to enhance logistical efficiency and effectiveness. Using GPS effectively requires the TMS system to keep track of vehicles, manage freight movement, negotiate with carriers,

consolidate shipments, and communicate with the ITS system.

Vendor Management System:

Vendor-managed inventory has proven to be a successful business strategy for Wal-other Mart's stores (VMI). With VMI, suppliers, manufacturers, distributors, and retailers can work together more effectively. This information may be shared electronically between upstream and downstream parties to better assess the effect of the transportation interruption. Additionally, it may be used to investigate the supplyand demand side impacts of transportation interruptions. Through EDI, distributors' inventory may be managed by the manufacturer, and the distributor's vehicle requirements can be established correspondingly. It is possible for the manufacturer's raw material stocks and production plans to be reviewed by the supplier through the electronic data interchange (EDI).

SupplyChain Freight Visibility:

It is vital that organizations' supplychain partners have insight into their freight operations in the even to fan interruption, such as the COVID-19. In times of crisis, transportation networks may place a premium on supply chain transparency. Consequently, businesses should used at a like traffic patterns and weather conditions for demand adjustment or supply diversion or route optimization based on real-time strategic information like weather and road or port conditions. Non-integrated supplychains are less efficient in terms of logistics than integrated systems. Sensor technologies from the Internet of Things(IoT)have shown to be crucial in the tracking of shipments. IoT devices attached to parcels enabled cloud-based inventory control. Real-time container monitoring, greater fuel economy, preventive maintenance, and proactiveratherthanreactivecontaineroperationsaresomeofthebenefitsofInternetofThings-based container management, it is possible to minimize the effect of a transportation stoppage during a crisis by cooperating with IoT and logistics firms

Carrier Relationship Management:

Long-term success for shippers, suppliers, and carriers may be achieved by working together to strike a balance between cost and performance. This is referred to as "carrier relationship management." It's possible for the team to have a broader perspective when everyone is aware of and supportive of one another's goals. Carriers, for example, need longer lead times to meet agreed-upon service requirements when capacity is restricted but predictable. Shippers may be required to work on shorter-than-usual timelines in order to keep up with consumers' requests for same-day pick-up, rapid delivery, and personalized service. These two sets of requirements were traditionally seen as Irreconcilable competitive environment. Every one of them would be arguing, blaming one other, and holding on to their own ideas. Today, shippers and carriers must work together more collaboratively to find common goals, complementing needs, and feasible long-term opportunities. In the event of a disruptive event like COVID- 19, organizations may be able to better respond to the new possibilities and threats they face.

Digital Supply Network:

Most firms lack an end-to-end supply chain perspective and agility in order to manage with today's uncertain climate. DSN, an abbreviation for digitally linked information and transportation networks, provided companies with a virtually infinite amount of real-time visibility. Among the issues that DSNs address include a lack of visibility, sluggish response times, conflicting goals, and a nine effective risk management approach. If you want to build a

DSN, it has to be quick, scalable, intelligent, and network- enabled. Supplychain disruptions may benefit from advanced data analytics capabilities. DSNs may enhance supplychain collaboration and open communication with both upstream and downstream suppliers as a consequence of the replacement of the previous supplychain. Fortunately, there are work around for the COVID-19 issue' transportation problems.

Optimization of Transport and Logistics Resources

Enterprises in the post-COVID-19 economic recovery must use flexible and innovative risk mitigation approaches to use available resources to smooth and safeguard the supply chain across sectors. Recommendations for flexible use of resources from the COVID-19 supply chain recovery include shifting ocean cargo to air, transforming empty passenger aircraft into passenger-freighters by incorporating belly cargo; freight consolidation; warehouses close to the point of origin or destination; conversions to distribution and fulfillment hubs; strategic use of ocean freight as floating storage; and careful timing. A high-performing logistics system will need transportation and logistics companies to function more effectively via resource allocation that is both flexible and innovative when demand fluctuates. Identifying planning gaps and the requisite internal and external resources is a prerequisite for implementing a more effective response via an autonomous plan. Logistics is a multi-billion dollar sector that ensures goods arrive onscheduleattheirultimatedestination.FMCGandconsumerdurablesareonlytwoofthemany industriesthatgenerategoods.Oncethethingshavebeendeliveredandsold,the ultimate consumermay finally get their hands on the products. Logistics play a role in the transportation of goods from a company to a customer. In contrast, logistics include much more than "transportation." Various logistical operations or services may be performed by a single organization. To send a product from your warehouse to a dealer, for example, the inventory in your warehouse must be rebalanced (because goods are leaving). Additionally, you must keep note of how long each item took to leave your warehouse and how long it took forittoreachatitsultimatedestinationItisimperativethatthemerchandisebetreatedwithcarewhilein transit so that it may be sold as is. Keeping note of any returns from the dealer is also vital.

Operations in logistics or Logistics functions

Processing of orders: A logistical operation may thus be initiated and managed by the commercial department of the business as a whole, once the terms of payment and delivery have been met, the order is turned over to the commercial department for processing they are accepted by a commercial team and sent to the warehouse for processing, ten goods will be sent to the client as soon as payment is received by a commercial staff that inserts the money into the system. A common practice in business entries is to subtract warehouse inventory from the totals. The available inventory will be immediately reduced by 10 units if the commercial team authorizes a purchase order for10 units in order to avoid duplicate purchasing. This is a vital step in the logistics process since any mistakes here (such as erroneous quantities or delivery addresses) might have a significant impact on the whole supply chain.

The processing of materials: Material handling in a warehouse involves wider-angle festivities. It comprises organizing the goods in the warehouse in a manner that expedites the processing of orders. As if that weren't enough of a problem, it happens all the time in warehouses. If you're a small business with less than 100 products, transferring one it mesa breeze, every time an order came in, the owner of this little firm would have to go looking for the order and the product. In order to discover it, he'll have to go through all 100 of his stuff, and then reorganize his inventory

to accommodate the new item. A hundred times as many people might be affected. It is not uncommon for large firms to have warehouses that are half a mile long. It's difficult to fathom just how much inventory there is in the warehouse at any one moment. Without knowing where the inventory is located or how to get it to the distribution center, the warehouse manager's productivity and efficiency will suffer. As a result, logistics plays a key part in the management of commodities. Logistics management depends greatly on the proper storage and distribution of items in the warehouse. This becomes more important as the warehouse grows. Amazon uses robots, AI, and humans to manage its inventory. On average, Amazon is said to ship 16 lakh packages every single day. Deliveries are made every hour at a rate of 70,000 per hour. Suppose Amazon did not have the most advanced equipment and methods for material handling.

Control of inventory: A company may have purchased 100 units of a product, but only 10are needed. This money, which may be utilized as working capital, is earning interest at the banks. Yet another organization required 500 units but only manufactured 200 because they believed demand would be lower than anticipated. As a result of the cancellation of the orders, this is a lost potential cost. A firm that has produced at least 100 units is good. In order to keep manufacturing costs low, they maintain a tight watch on the market. Thanks to the example given above, you now have a better understanding of the relevance of inventory management in logistical operations. The importance of inventory management in logistics has increasedasaresultoftheusageofvariousproductiontechniques.Leanmanufacturingandjust-in-time production are examples of strategies that decrease inventory management expenses (JIT).

Access to a vehicle: Freight forwarding is one of the most time- and money-consuming logistics activities. Because of the high cost of fuel, transportation is prohibitively expensive. Fuel is costly, regardless of whether it's gasoline, diesel, or natural gas. –To keep transportation expenses down, firms spend hundreds of dollars every year. To put it another way, transportation is the movement of goods from the producer to the distributor or dealer, and from there to the final customer. In most cases, a corporation is only obligated until the goods is delivered to the distributor or the dealer. In the end, the distributor is responsible for making deliveries to the customer. The business has to compensate for the lower profit margin of the dealer by boosting the dealer’s profit margin. A company's storage and inventory management systems must be effective if it hopes to cut transportation expenses. For transportation costs, economies of scale have a considerable role. "Splitting the bulk" was used by FMCG as a cost-cutting measure while also boosting logistical capabilities.

Transporting: Consumers who are strolling the aisles of a supermarket or hypermarket may see a box that piques their interest and motivates them to make a purchase. It's also possible to use bulk transport packaging, which is designed to keep huge volumes of the product safe while yet enabling it to be moved between locations. Goods packaged improperly will be lost or damaged before they reach their intended destination. This results in significant financial losses for the company. Therefore, packaging costs a considerable lot, especially for export markets. Even if the packaging only costs 2% or less of the product's worth, the whole cost of the packing will be incurred if it is damaged or lost in transportation.

Conclusion:

In order to address the supply gaps common to ordinary business operations, Indian firms have turned to integrated and lean supply chains. Due to government-imposed economic restrictions, including shipping delays throughout the world, COVID-19 has led in enormous SCDs, which severely impacted the routine operations of the firms. Transportation and logistics services are being severely disrupted in India because of a lack of freight capacity, a lack of mobility, ports that are closed, and difficulty with normal customs procedures. Due to delays and rerouting caused by manufacturing, shipping, and logistical services, final customers have also been affected. Resilient transport and ALS might help firms in times of economic crises, such as the COVID-19 pandemic. SCDs have become more common, and the government has gradually lifted most of its restrictions; nonetheless, a lack of robust TI and ALS has slowed the recovery process by businesses. It is critical that organizations evaluate their current transportation and ALS systems in order to speed up the SCR process. A large number of SCDs using intelligent transportation systems and ALS can be handled using the methods that we've described. As part of the process of implementing and optimizing the suggested model, firms should also look at the challenges and opportunities that may arise.

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