

The Impact of the great lockdown and COVID 19 Global pandemic on Supply chain and e-commerce

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Abstract:

Purpose: The goal of this paper is to investigate the effects of great lockdowns and the global COVID-19 pandemic on supply chains and e-commerce, as well as social views toward new technologies as a result of this global COVID-19 pandemic.

Approach: A review of the supply chain and e-commerce markets was conducted and research data collected on the impacts of lockdowns and disruptions due to the global COVID-19 pandemic.

Findings: An unusual occurrence, the coronavirus pandemic, has brought global supply chains (SCs) and e-commerce to the general public's attention. Since its emergence, it has had an impact on every aspect of life, the most important of which is the supply chain. The outbreak of COVID-19 and its repercussions have negatively affected enterprises, families, and the overall economy. The downturn in retail and commerce has impacted production, particularly for non-essential items. Global supply-chain disruptions have made it harder for manufacturers and distributors to replace or refill inventories. On the other hand, an increase in e-commerce sales was noticed. People turned towards online shopping because of COVID-19. As governments imposed lockdown and people were restricted to their homes, they converted to digital technology. People shop from home, supply at home, and even work from home; the supply chain sector was largely affected, and supply chain 's revenue have fallen since the COVID-19 epidemic.

Research limitations: The current results are based on short-term impacts; hence, further studies are needed to analyze the long-term impacts of the global COVID-19 pandemic.

Originality/value: Although several studies have been conducted on supply chain and e-commerce individually. This paper investigates the relationships between supply chain disruptions and e-commerce.

Keywords: COVID-19, Supply chain, E-commerce, Impacts, Crisis

Paper Type: Research Paper

List of Abbreviations:

FMCG: Fast Moving Consumer Goods

LDCs: Least Developed Countries

PPE: Personal Protective Equipment

SCM: Supply Chain Management

UNCTAD: United Nations Conference on Trade and Development

1 Introduction

COVID-19 (coronavirus disease of the year 2019) is an infectious illness. It has globally emerged since its first appearance in China in December 2019. In March, restrictions on travel and manufacturing during the outset of the global epidemic caused supply chain management (SCM) to confront significant challenges in coping with unanticipated demand for certain commodities (Meyer et al., 2021). Critical to global supply chain activity, the transportation sector has been partly shut down since the implementation of the lockdown. A total of 3.9 billion people were under lockdown at its peak in April 2020 in more than 90 countries. Global supply networks were interrupted, which had a detrimental impact on global economic and industrial activities.

E-commerce has made it easier for firms to expand their customer base by offering more affordable and effective distribution methods. A virus known as the Coronavirus has had a profound effect on global e-commerce. According to a recent study, more than half of customers shun physical and mortar stores and busy settings. In addition, 36% of those polled said they would wait until they had the coronavirus vaccination before going shopping in person. COVID-19 has varying impacts on different items, which implies that COVID-19 has a significant influence on specific products and a more negligible effect on others. This pandemic encourages people to avoid going out and keep a distance from their friends and family, and prefer to work from home (Bhatti et al., 2020).

The pandemic pushed the buyers to use the internet for their business and make it a regular habit. Additionally, sellers in e-commerce confront several obstacles, including delivery delays, issues with movement control, social distance, and lockout. Because they have no other choice, people continue purchasing despite the long delivery and shipping procedure. Because of this, people are turning to technology (Nivethitha et al., 2020). This paper aims to shed light on the effects of the COVID-19 on the fields of supply chain and e-commerce.

2 Methods

2.1 Data Collection

For data collection, we conducted surveys from different scientific platforms like, Google scholar, Science Direct, PubMed, Research Gate, Willey online library, and some magazines like Fortune. In this short survey, almost 19 papers were downloaded from these data gathering tools, 15 papers of which, described the "Covid-19 Crises and Supply Chain", and a small number (4 papers) described the "Covid-19 Crises and E-Commerce". The main reason for using this survey is that, following the Covid-19 breakdown, there has been a huge rush to examine Covid-19's effects in many sectors in order to assess the pandemic's severity and suggest protective measures. As a result, an online survey of the most relevant and credible papers provided a thorough understanding of the lockdown impacts in the e-commerce and supply chain sectors. However, there are also some limitations to the survey method, as the original research in surveyed papers may include inaccurate data due to the lack of interest from participants and which may lead to improper findings.

To choose the survey sample, the researcher uses a framework called sampling design. The researcher chooses a sample size of 60 people to conduct the study. In order to acquire data on the effect of COVID-19 on supply chain and e-commerce industry, the respondents have agreed to participate in the survey. The researcher uses a 7-point Likert scale to create the survey questions (Hasanat et al., 2020). Data from respondents who have agreed to participate in the study may now be collected more easily and efficiently. The researcher also collects data from respondents using a random sampling procedure. As part of achieving the study's goals, the researcher is shown to be doing data collection in this manner.

2.2 Data Analysis

By reviewing the collected papers from different online sources, we analyzed the described impacts of lockdowns and the overall impacts of the global pandemic Covid-19 on the supply chain and e-commerce. Different scientific papers that describe the impacts of COVID-19 are summarized in this research paper. Various elements were assessed by comparing their current value to their prior year's value. We mainly focused on review aspects.

It is necessary to analyze quantitative data in order to conduct data analysis. As a result, the

researcher employs a quantitative research strategy as it allows for more precise data collection. The researcher uses SPSS statistical analysis software. This way, researchers are able to collect the replies sequentially, which aids in the accurate representation of data.

3 Literature Review

3.1 Covid-19 Crises and Supply Chain

In recent years, many disease outbreaks have occurred, with the WHO reporting 1438 epidemics in 2011–2018 (Hudecheck et al., 2020). But the current COVID-19 epidemic stands out from the others. If anything, it has had a more significant effect on people's lives than earlier epidemics. Before the WHO deemed the COVID-19 outbreak a pandemic on March 11, 2020, Fortune magazine reported on supply chain disruptions affecting 94% of Fortune 1000 companies (Fortune, 2020). The supply chain has been badly disrupted due to the pandemic affecting all nodes and edges simultaneously. For instance, there has been a rise in the demand for required commodities like PPE, ventilators, and dry and tinned meals. As a result of these difficulties, supply, transportation, and production cannot operate at their full potential. Closure of borders, restriction of supplies, disruption of vehicle movement and global commerce, labor scarcity, and the preservation of physical distance in industrial facilities are only some of the measures that may be used (Amankwah-Amoah, 2020b). The pandemic is predicted to have a considerable influence on worldwide international commerce due to its varied implications on supply chains and other financial and economic difficulties.

A poll conducted between December 2020 and February 2021 found that 39 percent of supply chain executives in Malaysia were affected by the COVID-19 pandemic. In contrast, 18% of supply chain executives reported an increase in revenue as a result of the epidemic. Due to travel limitations, the pandemic significantly impacted the worldwide supply chain (Figure 1).

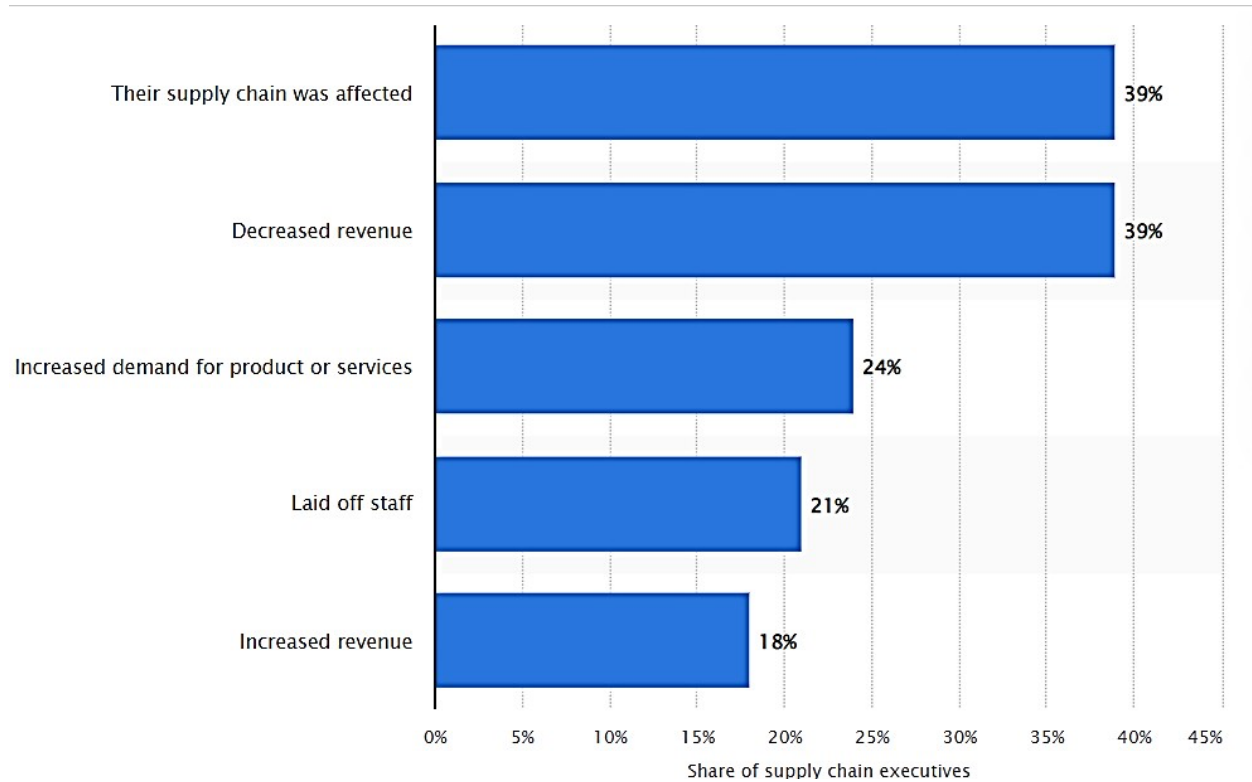


Figure 1: Share of supply chain executive (Hirschmann, 2021)

3.1.1 Supply management

Supply management has been severely impacted by governments imposing complete or partial lockdowns throughout the globe, prohibiting vehicles' movement to stop the spread of the virus (Ivanov & Das, 2020). Globalization has made it easier for businesses to get resources from all around the world. Manufacturers have been affected by the unexpected suspension of overseas suppliers' activities due to local limitations imposed by lockdowns.

3.1.2 Production management

In the field of production management, suppliers' failures may cause severe delays and backlogs for firms. It is also worth noting that several governmental initiatives, such as shortened office hours and alternate workdays to preserve social separation, have affected the output capacity of firms (Leite et al., 2020).

3.1.3 Transportation and logistics management

All types of transportation have been affected by the restrictions on vehicle mobility in transportation and logistics management (Gray, 2020). The flow of products has been disrupted as a result of these delays, and worldwide business has been hampered (Deaton & Deaton, 2020). Global logistics and distribution are changing at an alarming rate. Supply chains have been negatively impacted by physical outlet disappearances or regional operations, despite firms' attempts to boost their online sales capability.

3.1.4 Relationship management

Due to this epidemic, supply chain relationship management has been compromised. One research found that supply chain partners' social connections were restricted in scope (Baveja et al., 2020). This decrease in interactions has led to a loss of completeness in information, leading to ambiguity in communication and a lack of accuracy. Furthermore, this has resulted in a drop in supplier participation, making it more difficult for firms to promote a cooperative strategy that involves all stakeholders (Remko, 2020).

3.1.5 The performance or financial management

The financial performance of supplier networks and overall cash inflow has been reduced more than any other factor, according to the articles reviewed. The lengths of the restrictions or lockdowns, as well as the number of countries where they are implemented, have a substantial impact on the financial losses caused. Furthermore, the severity of losses is affected by the facilities' closures and reopenings at various supply chain levels (Ivanov, 2020a).

3.1.6 Sustainability

The last set of consequences to consider is those related to sustainability management. Researchers have discovered that the organization's sustainability efforts have been harmed as they strive to stay afloat (Sharma et al., 2020a). There has been a decrease in focus on workplace health and safety since the pandemic began. Businesses dealing with perishable commodities are frequently left with considerable volumes of garbage and unsold items as a result of transit delays and demand changes (Trautrim et al., 2020).

Several of these insights have had an impact on supply chain management in general, rather than just one particular section of it. An interruption in the functions of a supply chain might cause issues for other parts of the system (Gunessee & Subramanian, 2020). This suggests that all activities have been halted (Queiroz et al., 2020). The interplay of these pressures on demand, supply, relationships, logistics, transportation, and production may bring supply chains to a standstill (Yuen et al., 2020).

3.2 Covid-19 Crises and E-Commerce

Despite Covid-19's potentially detrimental impacts, global online commerce is expanding. Because of the pandemic, customers were more reliant on the internet and began integrating it into their daily lives. As a result, e-commerce companies have faced many issues, including long delivery times, difficulties in controlling movement or social distance, and even complete lockdowns. Even when shipping and supplies take longer than planned, clients continue to buy because they have no other alternative. As a result of the pandemic, people were forced to adhere to technology. Several goods, on the other hand, are quite popular. Hand sanitizers, toilet paper, disposable gloves, food, and dairy products are just a few of the items that retail outlets are unable to give to their clients (Bhatti et al., 2020).

After the pandemic outbreak, internet retail sales are predicted to surge by 17 percent in 2019. Fast-moving consumer goods (FMCG), health and pharma, accessories and fashion, and electronic or home appliances saw sales increase by an average of 133% (Sharma, 2020). The worldwide epidemic of COVID-19 has had a significant impact on e-commerce. With the US achieving a total of \$351.9 billion in sales in 2019, Europe's economy is predicted to grow at a 6.0 percent annual rate through 2025, bringing in \$565.9 billion dollars in revenue (Statista, 2021).

Ongoing research into digital consumer behavior and customer insights and value propositions has led to new e-commerce marketing guidelines. Consumption and purchase patterns were drastically altered due to the COVID-19 crisis

3.2.1 Covid-19 and customer behavior

The COVID-19 epidemic and government limitations had an impact on customer behavior. Customers of all ages were more likely to purchase products and services online during the COVID-19 crisis, but Baby Boomers were the most influential. Since the COVID-19 issue started, 43 percent of all respondents have purchased online, up from 12 percent prior, demonstrating a major shift in digital purchasing.

Furthermore, the frequency of purchases rose. When the COVID-19 issue occurred, just 9.8 percent of respondents reported doing their weekly shopping online, compared to 25 percent of respondents who reported doing so now. The vast majority of these shoppers stated that they plan to continue making online purchases in the future. In today's world, customer-shop interactions are increasingly taking place online. Figure 2 depicts the increase in retail turnover from July 2019 to July 2020 due to the COVID-19 crisis.



Figure 2: Retail turnover, year-on-year change July 2019-2020 (OECD, 2020)

3.2.2 Impact on business and policy responses:

Social media use and online retail sales have increased as a result of the epidemic. There have also been changes in consumption behavior, motivated by the necessity to acquire needed products. E-commerce enterprises rely heavily on their own websites, social media, and online stores to generate revenue. Since the commencement of the COVID-19 crisis, both channels have seen increased growth. More than two-thirds of those affected by the COVID-19 situation have seen a shift in their sales mix. In addition, the results of the poll show that more people are turning to the internet to find necessities. During the COVID-19 crisis, third-party online markets had the highest growth in sales of groceries, medicine, health and hygiene items, restaurant delivery, and financial services.

Cash on delivery is still the most common method of payment, notwithstanding the rapid expansion of e-payments. Cashless payment systems have seen an increase in popularity as people's spending patterns have changed. 60% of e-commerce and 70% of third-party marketplaces are witnessing a greater growth rate in mobile money payments, followed by e-banking and credit card transactions. As a result, since the beginning of the pandemic, cash on delivery has continued to rise, particularly in LDCs, as customers have increasingly resorted to online shopping.

Despite the fact that the epidemic has provided a chance for many digital-driven business models, the commercial future for many e-commerce enterprises seems uncertain. The online surveys showed that 66% of participants' expenditures have increased because of the COVID-19 situation. Survey respondents indicated that their staff has either been steady or is expected to grow in the near future. Still, 44% of respondents reported having to reduce their employment.

For nations that want to reap the benefits of the e-commerce boom, they must overcome the preexisting bottlenecks in the system, which have been exacerbated in the wake of the epidemic. The most common issues faced by the respondents were supply chain and trade logistics disruptions, as well as costly Internet connections. More than 60% of respondents said logistics and trade facilitation were difficult because of supply chain disruptions caused by lockdowns, company closures, and blocked borders. In addition, more than half of those surveyed said their operations were hindered by logistical issues stemming from mobility limitations. The high cost of broadband

services was cited by more than half of those who took the survey. In addition, the COVID-19 respondents advocated for e-commerce regulations and tactics to be improved. E-commerce ecosystems in the examined nations have been strengthened by the current pandemic in important and interrelated policy areas that are critical for inclusive e-commerce growth.

Numerous actions, both public and private, have been taken by governments and businesses in response to the pandemic's problems and economic consequences (Figure 3). Respondents to a study indicated that adopting or upgrading national e-commerce strategies is the most important action taken by governments, which may be understood as a fresh focus on e-commerce in the face of the epidemic. Advertising efforts, skills training programs, and lower e-payment transaction costs will follow to improve e-commerce exposure. Nonetheless, approximately one-fourth of those polled said that no steps had been taken to aid the e-commerce industry. Public sector fast scans conducted in 12 countries demonstrate that nine out of the 12 nations studied had adopted some type of sector liquidity assistance. Internet and e-payments expenses have been reduced, as well as logistical efforts have been supported by other initiatives (UNCTAD, 2020).

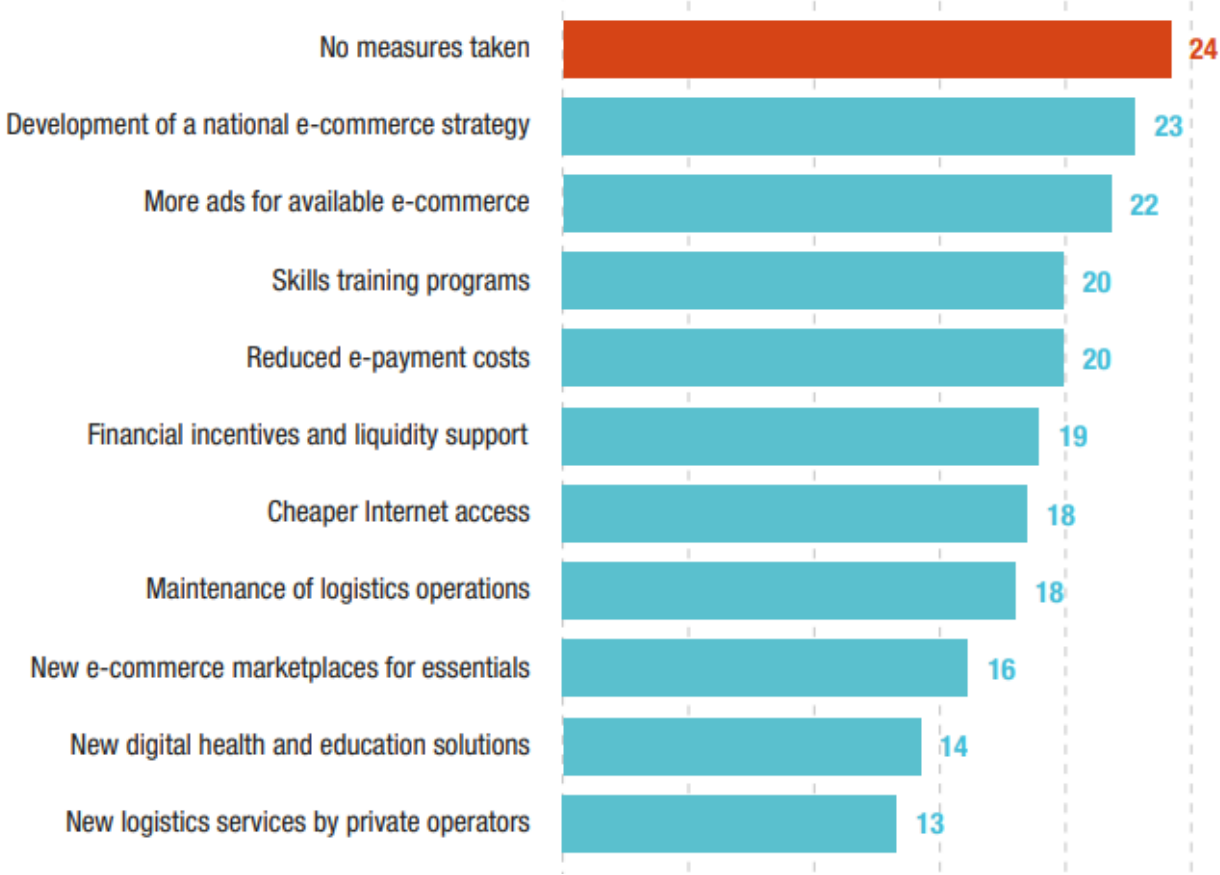


Figure 3: Business facilitation measures taken during COVID-19 crisis

As a result of governments and private sector efforts, e-commerce has become more accepted by consumers and businesses alike. It was also noted by respondents that e-commerce services have become more accessible to both enterprises and customers, thanks to the problems they have faced and the actions taken by both the public and private sectors. According to them, there has been a growth in online financial transactions, which has reduced losses in certain circumstances.

As a result of the COVID-19 issue, increased public-private collaboration has been accelerated. Access to capital for e-commerce companies, on the other hand, remains a major roadblock to economic recovery and expansion. As a result of the COVID-19 situation, online retailers have taken action. Over 40% of the enterprises surveyed participated in either public-private sector partnership efforts or just private sector activities. Many people were left out since they didn't know about the efforts or didn't have the professional connections to become engaged. Only 14% of those polled were able to get further cash. 65 percent of the companies polled had sought extra funding, but only one in five had been successful in doing so.

The necessity for e-commerce enabling measures in COVID-19 recovery plans has been noted by respondents. The majority of those that took part in the study said that one of the most important aspects of their COVID-19 recovery strategies was establishing a clear national e-commerce strategy. The Internet and broadband connectivity, as well as electronic payments through mobile and other devices, were among the top economic recovery initiatives advocated.

A robust multi-stakeholder alliance is required to support nations' efforts to promote inclusive e-commerce growth in the global community. UNCTAD's mobilization of e-Trade for all cooperation may be helped by UNCTAD's mobilization of COVID-19 recovery strategies for developing countries and LDCs. United Nations Resident Coordinators and other international organizations are collaborating with UNCTAD and other organizations to ensure that e-commerce is incorporated into national development plans and international development cooperation frameworks worldwide.

4 Discussion

In this paper, we analyzed how COVID-19 and the great lockdown impacted the supply chain and e-commerce sectors. According to the data, the large lockdowns during this pandemic have had a negative impact on the supply chain industry in terms of shipping delays, manufacturing delays, and increased prices. Customers will benefit from cheaper prices and better service as retailers rethink their production and delivery processes. Businesses will seek to strengthen their supply networks' resilience in the long run by focusing on digitalization and decentralization. As a sign of the pandemic's supply and demand concerns, the bare shelves of 2020 will be remembered. Merchants may take a breather now that some aspects are back to normal, but shipping and logistical issues persist. Shipment delays, shipping costs, and production delays are the top supply chain challenges firms anticipate facing in the coming year. According to a survey commissioned by Shopify and performed by Forrester Consulting on its behalf, they have good reason to be worried. The health rules and constraints that suppliers and shipping agencies must deal with are ever-changing. Global energy and raw material shortages in industrial centers like China are also affecting the supply of everything from milk to technological devices (Sutherland & Hancock, 2021).

As a result of shipping container shortages, carrier and freight service charges have risen dramatically. In 2019, the cost of shipping a 40-foot container from Asia to the United States was less than \$2,000 USD (Murray, 2021).

As early as October 2021, the same service will cost roughly \$10,000, or up to \$25,000 if an importer pays for the luxury of 'on-time delivery,' which is a cost that is inevitably passed down to merchants. In order to ease some of the congestion, port hours will be extended to 24 hours a day and new air freight services will be introduced (Bloomberg News, 2021).

Delivering items to their final destination is at risk due to a lack of workers. Supply chain concerns have been worsened by online merchants' overstocking of items for customers to panic-buy. System "normalization" is predicted to take place no earlier than 2023 at the earliest (Tan, 2021).

Even after the epidemic is over, the global logistics network is still vulnerable to political instability, natural calamities, and regulatory changes. COVID-19's impacts were not an exception: Disruptions to the supply chain are occurring more often and with greater intensity. According to McKinsey, industrial output is interrupted every 3.7 years on average. According to several

analysts, supply chain difficulties have become the new normal. In October 2021, supply chain analyst Rebecca Heilweil told Vox's explained podcast that "there are other global crises afoot" that will influence global manufacturing. In the future, "there is no reason to believe that this system will not be vulnerable to additional issues."

In the meantime, established firms are making significant attempts to accommodate customers' desires for speedy delivery. In order to meet the Christmas sales pressure, Walmart and Home Depot rented their own vessels and containers for \$40,000 per day (Miranda, 2021).

Retailers must alter their supply chains strategically to stay afloat, changing everything from the way and where items are created to the storage locations and the methods by which they are delivered to consumers.

As a result of manufacturing shortages and shipping port delays, merchants must decide whether or not to pass these costs on to their consumers. Brands' reputations are also harmed by these issues. It's very uncommon for customers to resort to rivals when items are delayed or unavailable in a world where 60% of consumers demand same-, next-, or two-day delivery.

As a result of the challenges posed by worldwide shipping delays, merchants are already taking action, with 43 percent modifying their shipping strategy and 45 percent preparing to expand their production capacity. Reexamination of plans, on the other hand, should not only be a precautionary measure. Innovating in the acquisition and transportation of goods will help both consumers and businesses.

Online shopping has grown rapidly since its start, and there is still plenty of potential for expansion. COVID-19 has pushed the e-commerce business farther into the mainstream because of consumers' reluctance to purchase at brick-and-mortar establishments. During the epidemic, clients were unable to purchase items at physical shops due to a lack of access and restrictions on mobility. A wide range of products are available to buyers through internet retail, and sellers may reach a huge geographic region with minimum resources. Compared to pre-lockdown order quantities, e-commerce platform sales have surged dramatically. The data suggest that more people are purchasing kitchen staples, personal care goods, and food online. Furthermore, the demand for necessary and hygienic items is rising, so online platforms must guarantee that consumers' needs are served properly in order to keep them happy. The fact that consumers are increasingly shifting their purchases to the internet emphasizes the necessity for online platforms to work on improving the customer journey. This is because increasing revenue alone will not guarantee long-term growth. If Indian online merchants want to compete effectively in the country, they will need to

expand their infrastructure spending and look for lucrative collaborations with local retail outlets. The country's large e-commerce enterprises may be able to do this more swiftly. Smaller enterprises, on the other hand, will almost certainly have to focus their efforts on meeting rising client demand. A new normal situation would need to rethink traditional brick-and-mortar establishments as well. Online retailers are not expected to replace brick-and-mortar shops in nations like India. These stores will have to up their game by using smart technology. Online merchants, like any other business, will have to constantly come up with new ideas and initiatives in order to keep their customers interested (Dinesh & MuniRaju, 2021).

5 Conclusion

COVID-19 has had an impact on the entire supply chain sector. Manufacturers of completed goods, who are commonly supplied across the value chain, are unable to obtain raw materials from overseas sources. Consequently, inflation has increased, and the number of goods distributed across the value chain has decreased. The supply chain sector has responded to the impact of COVID-19 by adopting efficient strategies to maintain production and delivery to customers. To avoid stock-outs, alternative approaches include the use of technology to gather orders from customers, strategic partnerships between manufacturers and distributors, and inventive inventory management. This strategy has worked well and should be continued in the future.

According to this report, e-commerce enterprises and third-party online marketplaces in underdeveloped nations have also been affected by the epidemic. As this crisis unfolds, it is impossible to forecast the degree of the changes that will take place. Different levels of e-commerce readiness and variable degrees of reform implementation will substantially affect the long-term impact. This may be extrapolated from this research.

6 References

- Amankwah-Amoah, J. (2020). Note: Mayday, Mayday, Mayday! Responding to environmental shocks: Insights on global airlines' responses to COVID-19. *Transportation Research Part E: Logistics and Transportation Review*, 143, 102098.
- Baveja, A., Kapoor, A., & Melamed, B. (2020). Stopping Covid-19: A pandemic-management service value chain approach. *Annals of Operations Research*, 1.
- Bhatti, A., Akram, H., Basit, H. M., Khan, A. U., Raza, S. M., & Naqvi, M. B. (2020). E-commerce trends during COVID-19 Pandemic. *International Journal of Future Generation Communication and Networking*, 13(2), 1449-1452.
- Bloomberg News. (2021). JD logistic goes plane shopping to tap air freight demand. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2021-10-18/jd-logistics-goes-shopping-for-planes-to-tap-air-freight-demand>
- Deaton, B. J., & Deaton, B. J. (2020). Food security and Canada's agricultural system challenged by COVID-19. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 68(2), 143-149.
- Dinesh, S., & MuniRaju, Y. (2021). Scalability of e-commerce in the COVID-19 era. *International Journal of Research-GRANTHAALAYAH*, 9(1), 123-128.
- Gray, R. S. (2020). Agriculture, transportation, and the COVID-19 crisis. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 68(2), 239-243.
- Gunessee, S., & Subramanian, N. (2020). Ambiguity and its coping mechanisms in supply chains lessons from the Covid-19 pandemic and natural disasters. *International Journal of Operations & Production Management*: 1-23.
- Hasanat, M. W., Hoque, A., Shikha, F. A., Anwar, M., Hamid, A. B. A., & Tat, H. H. (2020). The impact of coronavirus (COVID-19) on e-business in Malaysia. *Asian Journal of Multidisciplinary Studies*, 3(1), 85-90.
- Hirschmann, R. (2021). Impact Of COVID-19 On the Supply Chain Sector Malaysia2020-2021. *Statista*. Retrieved from <https://www.statista.com/statistics/1235332/malaysia-covid-19-impact-on-supply-chain-sector/>.
- Hudecheck, M., Sirén, C., Grichnik, D., & Wincent, J. (2020). How companies can respond to the Coronavirus. *MIT Sloan Management Review*.

- Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, 136, 101922.
- Ivanov, D., & Das, A. (2020). Coronavirus (COVID-19/SARS-CoV-2) and supply chain resilience: A research note. *International Journal of Integrated Supply Management*, 13(1), 90-102.
- Jílková, P., & Králová, P. (2021). Digital Consumer Behaviour and eCommerce Trends during the COVID-19 crisis. *International Advances in Economic Research*, 27(1), 83-85.
- Leite, H., Lindsay, C., & Kumar, M. (2020). COVID-19 outbreak: Implications on healthcare operations. *The TQM Journal*.
- Meyer, A., Walter, W., & Seuring, S. (2021). The impact of the coronavirus crisis on supply chains and their sustainability: A text mining approach. *Frontiers in Sustainability*, 2, 3.
- Miranda, L. (2021). Big retailers book pricey private cargo ships in holiday scramble. *NBC News*. Retrieved from <https://www.nbcnews.com/business/consumer/big-retailers-book-pricey-private-cargo-ships-holiday-scramble-n1277321>
- Murray, B. (2021). ‘Just Get Me a Box’: Inside the Brutal Realities of Supply Chain Hell. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/features/2021-09-16/supply-chain-issues-shortages-and-delayed-shipping-through-2023>
- Nivethitha, V., Manjula, S., & Mallika, V. (2020). Impacts of Covid 19 on E-Commerce in India. *The International Journal of Analytical and Experimental Modal Analysis*, 851-858.
- OECD, (2020). E-commerce In the Time Of COVID-19. Retrieved from <https://www.oecd.org/coronavirus/policy-responses/e-commerce-in-the-time-of-covid-19-3a2b78e8/>.
- Queiroz, M. M., Ivanov, D., Dolgui, A., & Wamba, S. F. (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*, 1-38.
- Remko, V. H. (2020). Research opportunities for a more resilient post-COVID-19 supply chain—closing the gap between research findings and industry practice. *International Journal of Operations & Production Management*, 40(4), 341-355.
- Sharma, A., Adhikary, A., & Borah, S. B. (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.
- Sharma, K. (2020). A Surge In E-Commerce Market In India After Covid-19 Pandemic. *Gap Gyan-A Global Journal Of Social Sciences*, 3(4), 54-57.
- Sherman, E., (2020). 94% of the Fortune 1000 are seeing coronavirus supply chain disruptions: Report. *Fortune* [Magazine]. Retrieved from <https://fortune.com/2020/02/21/fortune-1000-coronavirus-china-supply-chain-impact/>
- Statista. (2021). eCommerce report 2021. *Statista*. Retrieved from <https://www.statista.com/study/42335/ecommerce-report/>.
- Sutherland, J., & Hancock, T. (2021). China's Energy Crisis Is Hitting Everything From iPhones to Milk. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2021-10-07/china-s-energy-crisis-envelops-an-already-slowng-global-economy>
- Tan, W. (2021). Panic ordering by retailers is making the supply chain crisis 'even worse'. CNBC. Retrieved from <https://www.cnbc.com/2021/10/20/retailers-manufacturers-over-ordering-amid-supply-chain-crisis.html>
- Trautrim, A., Schleper, M. C., Cakir, M. S., & Gold, S. (2020). Survival at the expense of the weakest? Managing modern slavery risks in supply chains during COVID-19. *Journal of Risk Research*, 23(7-8), 1067-1072.
- United Nations Conference on Trade and Development [UNCTAD]. (2020). COVID-19 and e-commerce: impact on businesses and policy responses. Retrieved from https://unctad.org/system/files/official-document/dt1stictinf2020d2_en.pdf
- Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The psychological causes of panic buying following a health crisis. *International journal of environmental research and public health*, 17(10), 3513.