

An Overview of Supply Chain Disruptions in the Future

Dr. C. Sengottuvelu, CPM(ISM-USA), Professor, Dept. of PG Management Studies
Acharya Bangalore B-School, Bengaluru-560 091, India. Email : dr.sengottuvelu@acharyabbs.ac.in

Abstract

Supply disruption plays a great role in the business of the firm. Over the last few years we have seen major incidents (disruptions) that have affected the supply chains of major global manufacturers, but what is becoming increasingly significant to these manufacturers is the need for access to real-time supply chain visibility. This paper reveals the classifications of supply disruptions and its impact on their business growth, strategies, market share and financial results of the company. This paper also focuses the supply chain disruptions in the future due to Internet of Things (IOT), applications of smart devices, use of mobile technology, quick response- last mile delivery, competition between supply chains, price cut strategies, product availability, managing demand variability and product recalls. Examples such as automobile cars recalls, and packaged food products recalls were also emphasized. The discussion is of qualitative nature covering supply chain disruptions and its impact on business. The study also highlights the various facets of managing supply chain disruptions.

1. Introduction

Lengthy supply chains are increasingly proving to be a source of concern in the face of supply chain disruptions in sourcing, production, distribution of products and services and product recalls. The supply chain disruptions may be caused by natural disasters such as heavy rain and floods, earth quakes, internal conflicts or natural calamities etc. These situations have created greater demands on companies to keep

supply chains flexible and integrate disruption risk management into every facet of supply chain operations (Janat Shah, 2009).

In the past, major supply chain risks were due to delays in supply of materials, issues related to multilateral trade between countries. Maintenance of low inventory often put supply chains at a huge risk. Disruptions in a supplier's operations have caused substantial losses to companies in the past. Supply chain disruptions can be classified on the basis of their effects into six major types: disruption in supply, disruption in transportation, disruption at facilities, disruption in communication and disruption in demand. But, supply chain disruption in the future are due to Internet of Things (IOT), applications of smart devices, use of mobile technology, quick response- last mile delivery, competition between supply chains, price cut strategies, product availability, managing demand variability and product recalls.

2. Supply Chain Disruptions

Over the last few years we have seen major incidents (disruptions) that have affected the supply chains of major global manufacturers, but what is becoming increasingly significant to these manufacturers is the need for access to real-time supply chain visibility.

Two distinct notions that encompass supply chain visibility:

- i. Visibility of products (raw through finished products)
- ii. Visibility of the financial supply chain in terms of money flow and risk

Impact of supply chain disruption:

- i. Disruption can have a major impact on all parties across the supply chain.
- ii. It can negatively impact the supply of materials from manufacturing plants through to customers, as well as alter the flow of money.

2.1 Supply Chain Disruptions in the Future

Changes are continuous and also dynamic. Companies are constantly looking for changes in terms of setting their competitive priorities such as cost competitiveness, quick last mile delivery, quality standards, and product flexibility. These changes are certainly create some level of disruptions in their supply chains.

The supply chain disruptions in the future are:

- i. Internet of Things (IoT)
- ii. Applications of smart devices
- iii. Use of mobile technology
- iv. Quick Response- last mile delivery
- v. Competition between supply chains
- vi. Price cut strategies
- vii. Product Availability
- viii. Managing demand variability
- ix. Supply chain disruptions due to Product Recalls

Let us examine the various supply chain disruptions in the future:

i. Internet of Things (IoT):

Gartner says a 30 time's increase in internet connected physical devices will significantly alter now the supply chain operates. By 2020, more than half of major new business processes will incorporate some element of IoT up to 26 Billion internet connected smart devices will be installed, generating revenue of \$300 Billion by the end of the decade. According to Forrester, 58% to 77% surveyed organizers consider **locating objects, containers and personnel** as the top priorities for IoT functions. Traditionally, companies were

having their own logistics or they use to hire the services from logistics service providers. The movement of goods either from OEMs to their customers or from their suppliers to manufacturing facilities were carried by the company itself or by logistics service providers. But, then, the commonly faced problems were delays in shipment, wrong deliveries and time consuming process of shipping documents, tracking, and receipt of goods due to human errors and limitations in handling large number of documents. But, now, application of RFID tags, WiFi tags, Bluetooth, Block chain technology coupled with predictive analytics etc are the future of logistics and supply chain management (Arnold, 2018).

ii. Application of Smart Devices :

Kamarajar Port Ltd (KPL) is all set to implement a full-fledged Radio Frequency Identification (RFID) system to track movement of men, materials, and laden vehicles within its premises on real time basis. The implementation of RFID system is one of the initiatives of Ease of Doing Business under the Shipping Ministry.

The implementation of RFID will benefit trade immensely in terms of time and cost reduction. The implementation of RFID system will significantly enhance the security of the port, speed up the movement, track each and every movement of men and material across the port and prevent revenue leakage and any malfunction at the gate.

On an average at least 600 people and 400 vehicles enter the port daily and it takes several minutes for vehicles to enter or exit the premises. So the user can avail single entry or multiple entry passes through online web based request system or they can get it at the entrance.

It is an integrated intelligent system comprising issue of RFID based pass to move and monitor men and materials, for entry and exit of vehicles

with boom barriers and flap barriers, automatic vehicle identification with RFID tags and number plate system. The integration of payment gateway and the display system at the Port entry gates are also included. Application of GPS systems, sensor technologies etc are creating supply chain disruptions.

iii. Use of Mobile Technology:

The speed of information, access can be a key determinant of a company's success and the supply chain is the most critical one in need to have speed. Installing mobile PCs in service velocity can improve performance when using Global Positioning System (GPS) for accurately tracking the vehicle location. Using mobile PCs or mobile handsets is one of the best ways to improve the visibility and velocity of supply chain to provide excellent customer service (Cheryl Bikdowski, 2018). Example, Asian Paints India Ltd (APIL) a largest paint manufacturing company uses mobile technology in inventory and warehouse management. All their Regional Sales Officers (RSOs) are enabled to know and update their warehouse stock on real time basis. This facilitates their RSOs to book the sales and demand management efficiently. E-retail companies are good examples for using mobile technology as part of their Sales and Operations Planning (SOP).

iv. Quick Response- Last mile delivery:

Quick response to the customers requirement are heavily influenced by cost, time, flexibility and inventory. So, last mile delivery is very important for the company to leverage its competitiveness. For example, the dabbawalas have partnered with Flipkart's delivery network eKart Logistics. The dabbawalas will collect Flipkart marketplace shipment from the delivery hubs and deliver it the customers-while packing their dabbas .

This partnership is an effort to explore newer delivery channels and opportunities by partnering with this unique community of

experts. The initial pilot will be for prepaid orders and when the service expands the company will roll-out for cash on deliveries also. The Dabbawalas of Mumbai are one of the most reliable and trusted brands in the city. Their unique delivery system has been smooth, reliable and has survived the test of time-even under extreme conditions that are a typical city like Mumbai. So, Flipkart is partnering with Mumbai Dabbawalas and leveraging this unique expertise to enhance their last mile delivery capabilities.

v. Competition between supply chains:

As more and more companies compete on a global basis and have supply chain that span the globe, that their competitive position in the market increasingly does depend on their SCM processes. Excellence in SCM dictates significant aspect of customer satisfaction, operating performance (industry, profit margin etc) (Randy Liitleson, 2018). For example, Apple Inc, The company wouldn't be Apple without excelling at SCM. (Supply Chain Excellence at Apple). Further, AMR Research study demonstrates that there is a direct correlation between supply chain excellence and the key performance indicators (KPIs). So, competition is no longer between companies but between supply chains (Fastener News Desk, 2017).

vi. Price Cut strategies :

Pricing is one of the four pillars of marketing, along with product, promotion and place. Companies may use temporary discount or permanent price reductions as part of marketing strategy. Companies may also offer extra qty on selling units or additional services by maintaining price (Sam Ashe-Edmunds, 2018). Examples, packaged food products 13% extra on 53 grams of biscuits or 175 grams plus 50 grams extra for the same price in the case of detergent soaps.

vii. Product Availability:

The level of product availability is measured using the cycle service level or the fill rate. The level of product availability measures the fraction of customers' demand that is satisfied from available inventory. The level of product availability is also referred to as the customer service level. The level of product availability is an important component of any supply chain responsiveness.

A supply chain can use a high level of product availability to improve its responsiveness and attract customers. This increases revenues for the supply chain by increasing sales and ensuring products availability when customers come to make a purchase. High level stock out can create lot supply chain disruptions, so, cost of understocking (CU) has to be minimized.

viii. Managing demand variability:

Demand variability in supply chain is measure of how much variability can occur in the demand from customers. In other words, it is the variability between what is expected to happen and what really happens. The demand variability can lead to 'Bullwhip Effect' in SCM. Bullwhip effect is a phenomenon occurs in supply chains due to distorted and inaccurate information. Companies do adopt to reduce the demand variability by taking measures such as accurate forecasting, tailored sourcing, and backordering, order gaming, postponement strategy etc (Sunil Chopra & Peter Meindle, 2013).

ix. Supply chain disruptions due to product recalls:

Product recalls can create supply chain disruptions in both upstream and downstream supply chains. Examples, Car makers have recalled 2 million vehicles in the past four years to fix manufacturing defects. The ratio is one car recalled for every four sold in the country. Nestle Maggis two minute noodles recall has

created lot of supply chain disruptions for the company. During 2015, Nestle recalled its popular noodle brand Maggi. 27000 tons of finished products were recalled from their Retail Outlets (ROs) across the country. Disposal was a challenging task to Nestle. This has resulted in market loss, business loss, consumer brand fell from 98% to 3%, and all their eight factories were idled for six months across the country. Hundreds of their suppliers had stopped their supplies. Sometimes companies are considering the supply disruptions / crisis are great opportunities.

3. Conclusion

Managing supply chain disruptions involves managing certain events that have low probability of occurrence but have high impact on supply chain performance (Sengottuvelu, 2008). Firms that have configured their supply chain design and operations to handle high level demand uncertainty effectively are known as responsive supply chains. Firms that have configured their supply chain design and operations to handle high levels of demand uncertainty and supply chain disruptions effectively are known as agile supply chains. For functional products, the supply chain should be physically efficient and for innovative products, the supply chain should be more market responsive. The Dell Computer Company showed that shifting from the traditional efficient supply chain used in the computer industry to a supply chain can be profitable. This is not followed, then, we could anticipate supply chain disruptions. In future, the supply chain disruptions are more of technology centric, data analytics, quick response, managing demand variability, and event based disruptions etc.

References

1. Andrew Arnold (2018). How the Internet of Things Impacts Supply Chain. Forbes Media LLC, USA.
2. Cheryl Bikdowski (2018). Five benefits of using mobile technology. Supply Management, CIPS, USA.

3. Fisher (1997). What is the Right Supply Chain for Your Product?. Harvard Business Review, March -April 1997 Pp. 83-93.
4. Forrester & Zebra (2014). Internet of Things Solution Deployment Gained Momentum Arising Firms Globally.
5. How to reduce demand variability in SCM (2016). Westford University College, School of Business & Information Technology, retrieved from www.westford.com on October 15th, 2018.
6. Janat Shah (2009). Supply Chain Management - Text and Cases. Pearson Education in South Asia, New Delhi.
7. Lee J. Krajewski & Larry P. Ritzman (2000). Operations Management -Strategy and Cases. Addison Wiley -Pearson Education, Delhi.
8. Randy Littleson (2018). Companies do not compete, supply chains compete. Supply chain optimization. Purdue University, Manufacturing Extension Partnership.
9. Sam Ashe-Edmuds (2018). Is cutting prices a good marketing strategy. Newspapers LLC, USA.
10. Sengottuvelu, C (2008). Measuring supply chain performance in FMCG and Manufacturing Industries. Ph.D Thesis submitted to Aligarh Muslim University, Aligarh.
11. Sunil Chopra & Peter Meindl (2013). Supply Chain Management: Planning, Analysis and Strategies. Upper Saddle River, N.J. Prentice Hall of India, New Delhi.