RISK & RESILIENCE IN HOLISTIC VALUE CHAIN MANAGEMENT (BSOM072)

AS2: Individual Business Study Report

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Opportunities in Supply Chain System

1. Big data for supply chain analytics

Making amendments to the supply chain management systems has been a question of interest ever since the system was formalized. The need for this is obvious as SC analytics bring in a voluminous array of data (Nguyen et al., 2017). This is where the need for big data comes in for SC management.

Big Data in SC analytics makes use of the previous data as well as the contemporary records to generate solutions to risks encountered, or even beforehand, with accuracy never discerned before (Addo-Tenkorang and Helo, 2016). It allows for a strategic, data-oriented making of decisions to counter risks and ensure resilience of the SC management system.

Although the concept of Big Data is still somewhat in a developmental phase, however, once it evolves, it will help in reducing costs and provide an improved level of decision making in SC management systems. Here's how Big Data offers the opportunity to revolutionize SC analytics.

Revolution in Supply Chain Analytics By Employing Big Data			
#	Use Case	Advantage Factor (when Big Data is employed)	Attributes
1	Bringing about efficiency in operations of SC	●Planning operational shift of staff in retail shops or in industrial manufacturing units ●Making use of data for prediction of crime flashpoints (Addo-Tenkorang and Helo, 2016). ●Using data to ensure top-notch SC management (Q.Chen, Preston, and Swink, 2015)	✔ enhanced output rate as of better staff performnce due to appropriate staffing schedule ✔ Crimes avoidance with real-time monitoring ✔ Accurate prediction of delivery dates, allows automation of warehouse
2	Gaining information about customer experience for future reference and enhanced experience level	●Utilizing consumer usage patterns data to predict future consumer behaviour ●Circumventing 'out of stock' to guarantee customer satisfaction (Addo-Tenkorang and Helo, 2016).	✔ Helps with prediction of network growth and in planning out network expansions effectively. ✔ Helps in scaling economies of scale of SC
3	Assessing the developmental needs of new in-demand products	●Devloping and introducing new in-demand products in the market ●Coming up with better ways of marketing for new products	✔ Adding products to the pipeline leading to increased revenue generation ✔ Expanding customer base

2. Working towards ease in Supply Chain Complexity

Regardless of the type of business, manufacturing or services, sourcing products from other countries has become a usual norm globally by businesses to gain a competitive advantage over their rivals. This has put forward numerous challenges like dependency on limited suppliers (Gunasekaran, Subramanian, and Rahman, 2015), unproductive buyer-supplier conversations, extended delivery times, and other transactional issues that hinder the efficacy of the SC management system.

In other words, these challenges impose complexities in the entire process, thereby, causing higher costs and declined operating performance of the SC system (Isik, 2011). These, therefore, require an urgent address for SC resilience. Even though, conquering the SC complexities entirely is a question out of scope, but, working towards them in keeping them under control and their avoidance in near future can be effectively managed in four stages (Isik, 2011) reflected in the diagram below:

Managing Complexity in Supply Chains

3. Fostering Supply Chain Talent Management

The role of Human Resource Management (HRM) is a crucial thing to consider in SC management systems (Hoek, Gibson, and Johnson, 2020). And although the role of talent management is usually focused on executive and managerial posts of the SC management system, however, the concerned issues apply to all jobs within the system (Cappelli, 2009). Negligence in talent management results in demand-supply mismatch (Cappelli, 2009), that arise due to either having too many employees on board or having tool little of the talent needed for proper skills deployment. To stand out against their competitors and provide value, companies need to possess SC performance that is exceptionally of an outclass level and this is possible only when supply chains are geared with capable talent.

Fostering supply chain talent is the opportunity most manufacturing companies miss out on, or rather, they simply fail to pinpoint the key roles of SC leaders and managers in HRM (Hoek, Gibson, and Johnson, 2020). This ultimately results in shortfalls in SC talent management, causing risks to raise concerns.

Challenges in Supply Chain System

1. Inventory Management

Quantification of supply and its vulnerability in supply chains has been a topic of priority for most organizations. While supply and demand are the two main challenging factors to it, other factors like the environmental and political conditions and the process of execution of the SC management also plays a significant role in developing a vulnerability to SC system (Blos, Ming and Yang, 2012)

It's not only the 'out of stock' matter, but also, the 'over-excessive stock' that raises risk concerns. Disruptions in stockpile management have an adversarial effect on both costs and revenue generation models of the firm (Ponomarov, and Holcomb, 2009). This simply caters to a challenging situation for firms to maintain efficacy in their supply chains by mitigating risks and forging supply chain systems that are more resilient (Christopher and Peck, 2004).

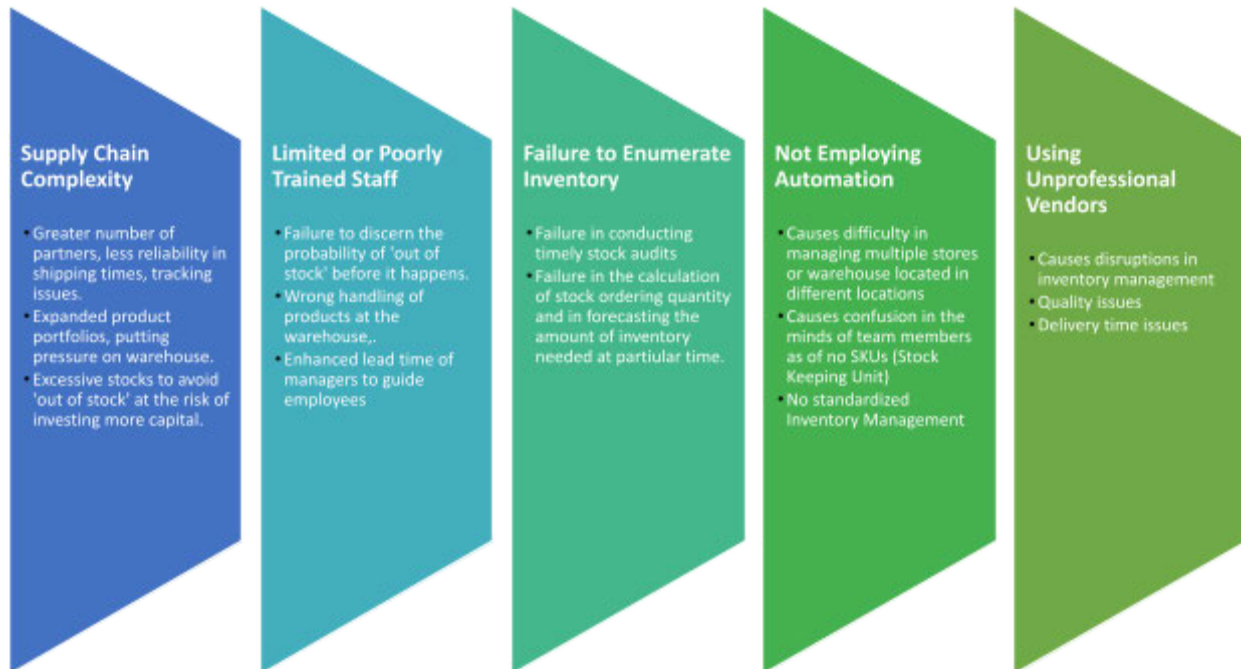Figure 2 shows problems in inventory management which render maintaining stocks a challenge to SC management system.

Supply Chain Complexity	Limited or Poorly Trained Staff	Failure to Enumerate Inventory	Not Employing Automation	Using Unprofessional Vendors
• Greater number of partners, less reliability in shipping times, tracking issues. • Expanded product portfolios, putting pressure on warehouse. • Excessive stocks to avoid 'out of stock' at the risk of investing more capital.	• Failure to discern the probability of 'out of stock' before it happens. • Wrong handling of products at the warehouse,. • Enhanced lead time of managers to guide employees	• Failure in conducting timely stock audits • Failure in the calculation of stock ordering quantity and in forecasting the amount of inventory needed at partular time.	• Causes difficulty in managing multiple stores or warehouse located in different locations • Causes confusion in the minds of team members as of no SKUs (Stock Keeping Unit) • No standardized Inventory Management	• Causes disruptions in inventory management • Quality issues • Delivery time issues

Figure 1 Problems that make Inventory Management a Challenge (Scribbr, 2019)

2. Maintaining Efficient Transportation

Even if the SC management succeeds at putting in place an effective Inventory Management system, it still isn't adequate for reducing the costs and providing good customer satisfaction (Mason et al., 2003). According to Gilmore and Tompkins (2000), supply chain's TMS(Transport Management System) is crucial in holding together the supply chain management by keeping in track the physical goods flow. (Mason et al., 2003)

With the trend of globalized supply chain systems, maintaining efficient transportation has emerged as a challenge that requires a critical address. That's because wide distances between

suppliers and final market locations add exceptional uncertainty in delivery times that often cause disruptions in SC continuity (Colicchia, Dallari, and Melacini, 2010).

Oftentimes, some economic and political crises, or acts of crime and violence like terrorism, enforce enhanced operational redundancies, which further aggravate challenges in supply chain's TMS (Sheffi, 2001). As a consequence, shipment's routing, scheduling, tracking, tracing, freight payment and auditing get affected, rendering SC inefficient.

3. Maintaining Financial Flows

Finance outflows and inflows are a real challenge in determining the economical outputs of SC activities. As challenging as it sounds, most firms fail at conducting required examinations and proper optimization of capital costs. This results in aggravated investment risks and capital costs of funding projects (Pfohl, 2009).

Maintaining financial flows in SC is of course important as it has a direct impact on the overall SC management system. Additionally, companies that perform monthly cash flow planning have higher survival rates than those that do not (Marivate, 2014).

Every task in SC management begins with financing and capital plans with deliberate decisions of value creation and ends only after the payment is received at customer premises (Hofmann, 2005). At the intersection of finance and logistics management of the SC, the entire process requires efficiency in maintaining financial flows to coordinate resilience in SC.

Critical Discussion: Managing Risks and Coordinating Resilience in Supply Chain of Johnson&Johnson

Introduction

Efficacy in supply chain management plays a critical role in discerning the fate of any business. Regardless of the intriguing, modish designed products in its pipeline, if a supply chain fails at coordinating the timely delivery of products that a business's sales department vows to provide, your business will simply fail at embellishing an epitome of elegance in the marketplace. Therefore, a need for managing risks and coordinating resilience in supply chain management is a topic of great solicitude for all firms out there.

Here is a critical discussion on how one of the leading firms in SC management - Johnson&Johnson - employs the tactics of managing risks and ensuring resilience in their supply chain.

Overview

Johnson&Johnson, a multinational medical device company has made its way in the 3rd spot in the top 25 best supply chain retaining firms (Ivanov, 2021). Even with the pandemic gaining its highest peak momentum, the firm has stood out against most of the risks that challenged its supply chain management.

Supply risk management, which involves first identifying and then mitigating those risks for resilience and avoidance in future is a process that has become an industry in itself. And even though risks are bound to surround from all directions i.e. from within the SC management system or outside of it, however, in some sectors, most of it comes from external sources (Azadegan, and Dooley, 2021). These external risk sources might be natural or environmental. Take for instance the pandemic, before it hit, everyday use items, specifically, toilet paper and paper towels went out of stock in most retail markets. While the general public or consumers were trying to decipher what happened there? And other supply chains taking a crash course in supply and demand, the experts at J&J in SC management were confident with the company's SC resilience. They tackled the situation through the resilience in their SC along with the confidence in their abilities to circumvent disruptions. As a consequence, the multinational medical company's SC was successful in providing hospitals, pharmacies, and people with all the needed medications globally (Brody, 2020). How did they do it? Let's learn down below.

Approach J&J Employed

Paul Stoffels, chief scientific officer at J&J, on giving a work progress timeline update on company's first-quarter conference call (as of the year 2020), stated that the company was conducting *"several processes in parallel, many at its own risk, rather than in sequence"* to speed up the development of in-demand items and ease potential distributions. (Sagonowsky, 2020)

The company went an extra mile to regulate its supply chain, particularly at its own risk, to cater to the pharmaceutical, medical, and other health care demands of people during the alienated pandemic times.

Going an extra mile in a situation that is itself complicated enough is a step that not all supply chains can handle as did J&J. What made their SC stand out? It turns out that it was the miracle of high-tech geared tools and algorithms that the company employed in its SC management system which not only helped in circumventing risks but also, made their supply system resilient

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even during the rough times. Following were some high-tech tools and algorithms J&J deployed in its SC management system.

1. Analyzing a rapid surge in demand for products

In the initial stages of pandemic breakout, the company's supply chain detected a rapid surge, almost doubled in frequency, in the demand for pharmaceutical products used for treating fever and mild pains. This detection triggered the alarms to supply chains to take possible measures for the rapid surge in demand beforehand.

As a measure to resolve the surge, the management halted the production of other more complex formulas and tended to the production of in-demand products on a top priority basis. Plants were functional 24/7, with trade-offs in product manufacturing pertaining to other less in-demand products. By doing so, the company's pipeline remained resilient with products people needed the most in difficult times. All this was made possible by leveraging data science technology and complex algorithms which were able to monitor typical customer order patterns and pointing out any deviations encountered (Latif, et al., 2020).

2. Planning ahead of time for situations like the pandemic

Using the high computerized risk-simulation technology the company was able to plan its supply chain ahead of time. The risk-simulation technology makes predictions collecting real-time data of staff-level duties and rates of production for typical products to discern the probability of worst-case scenarios that can impose risks to an overall SC management system. Generally, the automation system is designed such that it makes use of both physical and real-time data to automatically cater to the emergency response of supply-demand in a particular region. (Khan, and Javaid, 2020)

3. Ensuring Timely Delivery of products

Being a multinational pharmaceutical, medical device, and health care items manufacturing company, the demand for its products exist globally. The company, therefore, has to deliver its goods supply globally to keep the consumers facilitated with health care needs. The company made use of track and trace sensors geared with the GPS tech, these travel alongside the shipment which allows end-to-end visibility and ensures timely delivery of products as promised. (Tatineni and Demetsky, (2005)

These were some of the key high-tech gear that allowed risk circumventing and ensuring resilience in SC at J&J. Kevin Whitehead, head of the digital strategy at Janssen Pharmaceutical Company of J&J says, "All our supply chain teams have a role to play, we all work together." (Brody, 2020)

Practical Recommendations: Improving Supply Chain Resilience of Emergent BioSolutions (J&J vaccine manufacturing partner)

Company's Overview

Emergent BioSolutions is a multinational biopharmaceutical company that partnered with J&J for manufacturing its variant of the Covid-19 vaccine. It is the same company that manufactures AstraZeneca vaccines too.

Why Emergent BioSoultions?

Towards the end of March, this year, the news of the covid-19 vaccine variant of the J&J company being contaminated went circulating on media (LaFraniere, Weiland and Stolberg, 2021). Even though the probability of mix-ups in SC and its procurement is normal, but when it comes to a high-profile company like the J&J, it somewhat develops a sense of distrust amongst the public leaving them agape with the question lurking in their minds, "What would have happened there?".

Evidently, there was some handling and procurement issue in the supply chain management of the manufacturing plant. Since the plant at trouble, that manufactured faulty vaccines under the label of J&J was the one being operated by Emergent BioSolutions company, turns out the fault was in their supply chain management.

What was the reason that accounted for such risk mishap in its SC and how can the company work on improving it to ensure better SC resilience in the future, here are some practical recommendations down below:

Recommendation#1: Digitalisation of Supply Chain's Procurement Operations

The main reason for the FDA's decision of laying waste to about 60 million J&J vaccine doses was that the ingredients of vaccines got mingled accidentally by the working staff at Emergent BioSolution manufacturing plant which resulted in a shipment delay of around 24 million vaccine doses (Ehrmann, 2021). This certainly raised questions about the company's hiring process, specifically because back then the company had hired hundreds of new employees for mass-producing vaccines.

The best practice to circumvent such issues in the future would be to keep track of supplier's performance at every stage, to ensure supplier's compliance with all aspects and procedures of manufacturing involved. This includes every process, from goods manufacturing procedure follow up to assurance of product quality. It is the responsibility of procurement to make newly onboarded suppliers vetted and scrutinize their performance levels.

Generally, it requires prolonged scrutiny checks, the process of which was mainly cut off by the company in order to mass-produce the vaccines as fast as possible and this led to a very catastrophic situation. Additionally, the mishap of vaccine contamination went undiscovered for days until the J&J Company ran a quality checks algorithm on it. This accounts for traceability issues in the Emergent BioSolutions supply chain which failed to detect the issue at the earliest. Traceability is yet another area where a firm's procurement is held responsible.

The practical solution to all this lies in employing digital systems for procurement across the chain which utilizes DSS (Digital Supplier Selection) approach that helps improve firm's performance levels (agility, visibility and decision making). It also helps with mitigating such mishaps and avoids risks beforehand (Sharma and Joshi, 2020).

It is, however, crucial to note that digitalization of the procurement system does not means that a labour force won't be required. Rather, people would still be present to monitor things, it's that the processes of procurement will speed up to help procurement staff attend to the need of acting fast without cutting off the scrutiny process and vetting of newly onboarded suppliers.

Recommendation#2: Adopting a mindset that comes up with strategies for risk management

The decision of the Emergent BioSolutions Company of cutting off suppliers vetting process during the need of acting fast was a poorly calculated decision that failed to take into account the probabilities of every arising risk against that decision. The miscalculation caused a huge loss of both resources and time, simply because the surge for developing vaccines was so crucial that it imparted a sudden need of urgency in the company's supply chain. Looking at the matter from another side, it becomes evident that the decision making managers at the company lacked the practice of adopting a risk management mindset. They relied on short-term thinking with a key focus on immediate results (Wu, Olson and Dolgui, 2015). As a result, the company was forced to dispose of 60 million doses of the vaccine down the drain.

Practically, by adopting a risk management mindset, they would have had taken into account the costs of risk rectification, and long term missed opportunities (Olson and Dash, 2010). It can also help them in discerning a more accurate probability and the likelihood of the risk and the financial and economic impact it will have on a firm's SC resilience. Not every type of risk is recoverable, as was the case happened with those vaccines. This requires management to understand the need for costs as well as benefits analysis of each and every one of the possible mitigation actions present (Wu, Olson and Dolgui, 2015).

Additionally, adopting a risk management mindset also helps managers in identifying the pinch-points of their supply chain which can help at large with improving SC's resilience. More precisely, it will help in sensibly managing risks, naturally (Michel-Kerjan, 2015).

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