Original Article

Indian Pharmaceutical Industry's Supply Chain Challenges: An Overview.

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Abstract

The pharmaceutical supply chain is very crucial for the overall industry. A crucial role is played by the Indian Pharmaceuticals industry when we consider the global pharmaceuticals industry. Indian pharmaceutical industry fulfils a large portion of the global pharmaceutical demand. After Covid-19 pandemic, many retail outlets have mushroomed everywhere in India though it is good for the business development, it puts a lot of pressure on the existing infrastructure of the supply chain. The level of responsiveness of the supply chain determines how quickly it can satisfy consumer demand. The pharmaceutical industry is ensuring good service levels as it operates at a 95 percent service level.

This research paper identifies challenges in pharmaceutical supply chain. Researcher also narrowed down these challenges into two as Supply chain responsiveness and Service level. Here researcher suggested that to enhance Supply chain responsiveness and Service level, pharmaceutical industry should apply new techniques such as AI & ML.

Keywords: Supply Chain, Supply Chain Responsiveness, Service Level

INTRODUCTION:

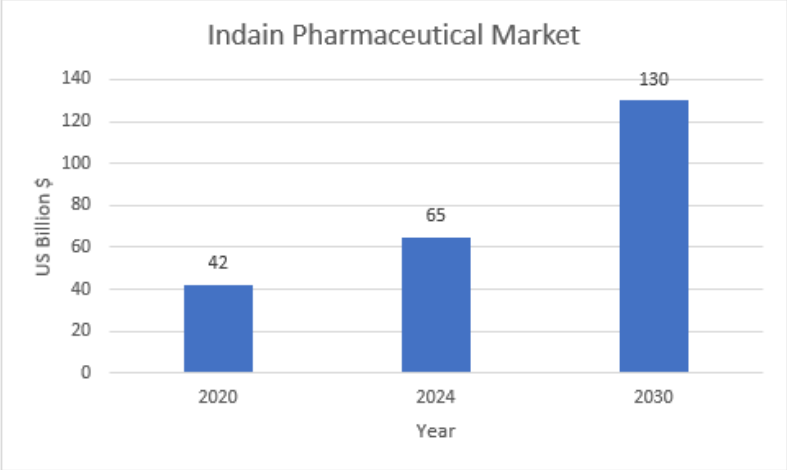
Supply Chain is lifeline of pharmaceutical industry. According to Sunil Chopra, 'All the entities involved, whether directly or indirectly and which are completing a consumer request are included in a supply chain (Sunil Chopra, 2015). Along with the manufacturer and suppliers, the supply chain also consists of transporters, warehouses, retailers, and even the actual customers.' The supply chain is the series of links connecting to buyer to supplier. The activities involved in supply chain are primarily focusing on delivering goods or services to consumer. Logistics focuses on systematic transportation including storage facility. The supply chain focuses on consumer need with time bound strategic solution. A pharmaceutical firm is a for-profit organization that has a license to manufacture, market, and/or distribute medications, most frequently in the context of healthcare (Science Daily). According to Wikipedia, the pharmaceutical industry is one that researches, creates, manufactures, and distributes pharmaceutical drugs for usage as pharmaceuticals to be given to patients (or self-administered) with the intention of curing them, immunizing them, or relieving their symptoms. Pharmaceutical firms may sell both brand-name and generic drugs as well as medical equipment.

The pharmaceutical supply chain is made up of all the parties engaged in the manufacture and distribution of pharmaceuticals, from the raw ingredients to the finished goods. The pharmaceutical supply chain involves a wide number of stakeholders, including suppliers, wholesale distributors, and pharmacy benefit managers. The stakes are quite high for pharmaceutical businesses in this dynamic and uncertain environment. Ineffective drug marketing hurts the company's reputation and its ability to retain customers, as well as any potential gains in the future. Public health can be adversely affected by a weak supply chain.

INDIAN PHARMACEUTICAL INDUSTRY:

In the pharmaceutical industry across the world, India's pharmaceutical sector has significant share. According to the Invest india website, India is rated third globally for pharmaceutical production by volume and fourteenth globally for pharmaceutical production by value. India produces the majority of the world's vaccines and is the largest producer of generic medications, contributing 20% to global supplies. India is home to the largest number of US-FDA authorised pharmaceutical plants outside of the US, with over 10,500 manufacturing facilities and more than 3,000 pharmaceutical companies. In 60 therapeutic areas, India's pharmaceutical industry offers 60,000 generic brands. Generic pharmaceuticals, OTC medications, API/bulk medications, vaccines, contract research & manufacturing, biosimilars, and biologics are a few of the crucial areas.

The Indian pharmaceutical industry supplies approximately 50% of the vaccines supplied around the world, 40% of the generic drugs consumed in the US, and 25% of all of the medicines that are used in the UK, according to the India Brand Equity Foundation. A total of approximately 10,500 manufacturing facilities and 3,000 medicinal businesses make up the domestic pharmaceutical industry. India holds a significant place in the world's pharmaceutical industry. The nation also possesses a sizable pool of scientists and engineers that might propel the sector forward to new heights.



Source: https://www.ibef.org/industry/pharmaceutical-india

More than 200 nations around the world receive Indian pharmaceutical exports, with the US serving as the largest market. With generic medications making up 20% of all exports, the nation is the top generic drug supplier in the world.

LITERATURE REVIEW:

The pharmaceutical market is expanding rapidly. After Covid-19 pandemic, many retail outlets have mushroomed everywhere in India. It is good for business development but it put up pressure on existing supply chain infrastructure. These issues affect the standard of healthcare services and, in particular, make it difficult to use an effective and efficient delivery strategy (Chassin, 2013). On the other hand, pharmaceutical industry should focus on the production, improving productivity & delivery efficiency. The pharmaceutical sector must also take into account patient happiness and safety in terms of flexibility, dependability, speed-time, and cost (Guerrini et al., 2018). Supply chain responsiveness is another factor; it is a measurement of how quickly the supply chain is able to respond to the demands of the customers. This capability might lessen the chance of product destocking brought on by unforeseen increases in demand. Because of these, retailers are able to stock vast amounts of product (Gunasekaran A, 2008). A supply chain transports medications from a manufacturer's warehouse to the wholesalers, the retail pharmacies, the hospital pharmacies, and ultimately to the customers. Contrarily, the flow of information and capital begins with end users and proceeds through a variety of routes and finally ending up with the producers (Chandrasekaran N, 2003). Due to a number of factors, including a shorter product life cycle, an increase in mergers and acquisitions, changing consumer behaviour, and competitiveness, academicians have developed a model based on the product life cycle in the pharmaceutical sector (Eitelwein O, 2014). This demonstrates that the pharmaceutical industry can use sound supply chain methods to address the issues raised above (Bhakoo et al., 2012). It emphasises how important pharmaceutical supply chain optimization is for delivering services that are both affordable and of good quality (Uthayakumar,2013).

Effect of Covid -19 Pandemic:

The pharmaceutical sector is essential to the delivery of high-quality services. It was brought to light during the pandemics when the supply chain for medicines was disrupted. Moreover, the hoarding and withholding of pharmaceutical supplies from buying nations, which results in shortages or disruptions of the nations' pharmaceutical supply chains (Betti F, 2020). Additionally, lockdowns, such as those that occurred in the initial phase of the corona virus pandemic, resulted in restrictions on internal and external movement, which had a significant impact on the delivery and transportation of pharmaceutical supplies during that time (Morris P, 2019). Imports of active medicinal ingredients have been disrupted as a result of corona virus outbreak in India. A Global Data investigation discovered more than 50 medications are in danger of negative manufacturing consequences since it is essential to production. Additionally, it impedes the creation of novel pharmacological drugs (Sydney Strong, 2020). As the pharmaceutical industry continues to grapple with the novel coronavirus's consequences, it is especially concerned about the effects of the corona virus pandemic on its supply chains (Nikita, 2021)

Reverse logistics is a further component of the supply chain for the pharmaceutical sector. At various points in the supply chain and remanufacturing process, it entails gathering client products and identifying the component pieces in order to either reclaim or discard them. The necessity for reverse logistics solutions in the pharmaceutical business stems from the enormous volume of goods and a huge amount of capital involved (Tannu Sharm, 2020).

RESEARCH METHODOLOGY

In this research article, the role of supply chain management in the pharmaceutical industry is investigated. Through wide literature review, researcher tries identify key areas of concern in the industry. Additional secondary data-based research into the pharmaceutical industry and supply chain is presented in the study.

Objectives:

1. To identify impact of pandemic on pharmaceutical supply chain.
2. To find challenges in the pharmaceutical supply chain.
3. To find possibility of application of fintech techniques in pharmaceutical supply chain.

ANALYSIS AND DISCUSSIONS:

Customer service, inventory levels, and supply chain expenses make up the three components of the pharmaceutical supply chain. Across the whole supply chain, the pharmaceutical industry makes sure that its products are accessible. According to a joint study, the pharmaceutical sector's commitment to product quality also assures high service standards. It runs at a service level of 95%, which is 3.5% below the FMCG companies in India that are best in their class and 4.5% below the global pharmaceutical companies that are best in their class. The type of product has a significant impact on the costs in the supply chain. Supply chain costs can be greatly raised by specialised cold chain needs for vaccinations and other complicated formulations. The best-in-class Indian pharmaceutical companies surpass the best-in-class international pharmaceutical and global FMCG companies by a combined 8 percentage points in terms of inventory levels. There are several stocking places as a result of fragmentation. Through stockists, clearing and forwarding agencies, and other intermediaries, India has a multitiered distribution network. Pharmaceutical companies sometimes keep higher stock levels than other businesses, even at the risk of having to write down out-of-date inventory, as a result of lengthy manufacturing lead times and regulatory requirements.

The pharmaceutical sector was at the centre of the Covid-19 crises. There were several difficulties the industry had to deal with, from managing impacted patients to supply chain interruptions. Patients, who should be the main focus of this conversation, were significantly impacted by drug and equipment shortages brought on by supply chain issues. These problems also negatively impacted the daily operations of the healthcare industry (Libin, 2022).

The Indian pharmaceutical supply chain has undergone a significant transition as a result of issues like unorganised last mile service providers, inadequate warehousing facilities, a shortage of qualified labour, and the sluggish adoption of digital technologies. The Indian pharmaceutical supply chain, however, has maintained a steadfast pillar in the fight against COVID-19 throughout the pandemic. The supply chain offers a remedy for the lack of access to life-saving medications, vaccinations, and crucial surgical supplies for COVID-19 in Tier I cities as well as Tier II cities and villages (Cyrus, 2021).

Infrastructure and transportation issues have a significant impact on pharmaceutical logistics in India. Due to India's poor road infrastructure, it takes longer to distribute medications to isolated rural areas, which necessitates specialised packaging and raises concerns about their short shelf lives (Sandeep, 2012).

The Indian pharmaceutical market has experienced rapid growth over the previous five years, with a compound annual growth rate of 16% starting in 2016. If the business keeps growing at the same rate, it will have a market worth US$ 877 billion (about 65 lakh crores) by 2030. Due to the industry's swift and consistent expansion, it added jobs and helped the economy grow, directly employing 4.7 million people. The fragmentation, complexity, opaqueness, lack of adaptation, and inefficiency of India's pharmaceutical supply chain are the paper's top five issues. Additionally, the cost to the economy and patient safety associated with product recalls, theft, and counterfeiting is also covered. This discussion is complemented by information gleaned from our primary research with industry stakeholders (Neetu, 2022).

A paradigm shift in Indian drug delivery system has occurred. Prior to 1990, pharmaceutical businesses operated their own depots and warehouses, a separate distribution structure that has now been supplanted by clearing and forwarding brokers (CFAs). These companies are a part of the supply chain and are largely in charge of keeping products in storage (stock) and sending SKUs to stockists upon request. Typically, businesses maintain one to three CFAs in each Indian state. An organisation may employ a total of 25 to 35 CFAs. A stockist (a regional distributor), as opposed to a CFA, may manage the stock of multiple companies at once (often 5–15 depending on the metro area), and may even be able to handle 30–50 different manufacturers. After 30-45 days (a common credit or time restriction), the stockist in turn pays directly for the goods in the name of the pharmaceutical firm. The corporation pays CFAs annually, once or twice, based on the proportion of total product turnover.

Supply chain optimization is greatly aided by the use of AI and blockchain. Utilizing data analytics, blockchain, and AI, one may plan for cargo consolidation based on region, urgency, and specific transit infrastructure requirements. In order to choose the most expedient and economical route for the shipment, this data can also be used for route optimization.

Robotics and IoT have also been utilised to automate warehouses, driverless vehicles, drone-based deliveries, and other tasks that can be crucial for supply chains for pharmaceuticals that must maintain a specific temperature. In addition to reducing time and labour, efficient digitization of processes can foster proactive consumer involvement, foster trust, and increase productivity (Cyrus, 2021).

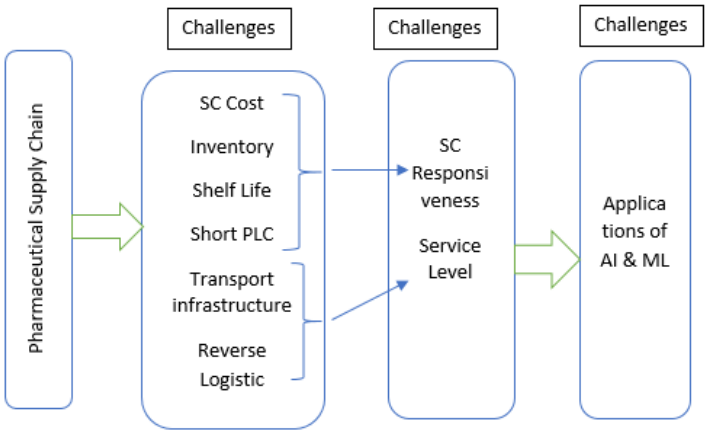


Figure1: Re-shaping the pharmaceutical supply chain

This research paper identifies challenges in pharmaceutical supply chain through wide literature review and concluded that the major challenges in pharmaceutical supply chain are 1] Supply Chain Cost, 2] Inventory Management 3] Shelf Life 4] Transport Infrastructure 5] Reverse Logistics 6] Short Product Life Cycle. These six challenges are commonly faced by pharmaceutical companies with addition of one or two more challenges depending upon their supply chain structure. In Covid-19 pandemic, pharmaceutical industries realised importance of well-structured supply chain and importance of responsible chain partners.

The supply chain cost increases because pharmaceutical industries do not have flexible supply chain. (Pwc Report-Pharma 2020). The inventory management is very crucial in pharmaceutical industry as product variety is to much and it follows batch manufacturing system. IF inventory is not properly management, then it will result in inventory piling up. The shelf life is also a challenge for pharmaceutical supply chain as imbalanced demand supply management and a greater number of retailers. In our country transport infrastructure is developing very fast, still it become area of concern for pharmaceutical industry as supply chain has to reach every concern of the country. As the drugs have short life cycle, it is necessary to provide drugs to right hands in minimum time. If it product drug expires useful period, then it has to bring back and disposed. Here revere logistics plays important role.

These six challenges now, clubbed and presented as two challenges. The challenges SC Cost, Inventory management, Shelf Life and Short PLC are clubbed together under umbrella of Supply chain responsiveness. While reverse logistics and transport infrastructure could be clubbed together under the umbrella- Service Level.

Researcher suggest that if pharmaceutical industry should go for the techniques like Just-In- Time (JIT) techniques for improvement in supply chain responsiveness. Programs have been developed by businesses like Novartis and Roche in Basel to utilise JIT principles (Pharmaceutical Technology, 2009). Though reverse logistics and Supply chain infrastructure are external factors, but it resulted in efficiency of supply chain service level. The pharmaceutical supply chain should identify effective way for enhancing service level by proper coordination among stakeholders.

The pharmaceutical supply chain must use new technology- Artificial Intelligence, Block Chain and Machine Learning. The effectiveness of supply chain become more effective by application of advanced techniques.

CONCLUSION:

The pharmaceutical supply chain is very crucial for the industry. This research paper identifies challenges in pharmaceutical supply chain through wide literature review and concluded that the major challenges in pharmaceutical supply chain are 1] Supply Chain Cost, 2] Inventory Management 3] Shelf Life 4] Transport Infrastructure 5] Reverse Logistics 6] Short Product Life Cycle. These six challenges are commonly faced by pharmaceutical companies with addition of one or two more challenges depending upon their supply chain structure. In Covid-19 pandemic, pharmaceutical industries realised importance of well-structured supply chain and importance of responsible chain partners. These six challenges are narrow down to two- Supply chain responsiveness and Service Level. Researcher suggested that to cope with these two challenges, pharmaceutical industry must us techniques such as JIT, Block chain, Machine Learning etc.

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