

# Supply Chain Management System in Indian Pharmaceutical Industries: Strategies and Best Practices

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**Abstract:** The Indian Pharmaceutical Industry incurs almost one third of its total cost from supply chain management systems. The SCM costs are relatively higher in India than other countries of the world amounting to 13 % of India's GDP (Adhikari & Bora, 2014). For having an effective supply chain management system, it is required to have procurement of raw materials, raw materials turned into finished good and then further moved out in market for distribution. The major aspect in relation to SCM is the lack of knowledge on the various SCM related issues and strategies, most of the industries spend a lot of amount on the SCM issues and high resentment is on one specific problem i.e. of reduction in operational cost. However, the effectiveness also depends on SCM to be indispensable in maintaining expenses and seek ways to reduce cost thereby increasing the sales of the company. The purpose of the study is to explore various strategies and best practices involved which are used by the Indian business leaders of Pharma industries and finding out ways to maximize sourcing, distribution, inventory and its management. The methodology used is a single case study on various aspects with the semi-structured interview to collect data. The research design used on data sources identified were: observations, semi-structured Interview and documents of the industry. For the Identification of the challenges and their solutions in SCM strategies the proposed theory of Goldratt's (1990), Theory of constraints was used as conceptual framework. The results of the study is a significant contribution to the business practices in the industries, increase in supply chain effectiveness, their strength and weakness, reducing organizational operational cost and socially finding the reputation of industries in ensuring the on time availability of their medicines in market. The study also relates, aims in identifying and implementing the best practices in various processes of Supply chain management by facilitating the increased availability, distribution of medicine, profitability and reduced operation cost.

**Keywords:** Effectiveness, Operation cost, profitability, SCM.

## 1 Introduction

The pharmaceutical supply chain management system varies from developing to developed countries in terms of their function, organization, financing and ideal characteristics of best performers of supply Chain we refer to Choi, Narasimhan & Kim [1]. A strong Supply chain management in pharmaceutical industry can transform the organization in generation maximum profits by making the better use of available assets and resources and positively acting to customers demand. There is a need of sustainable indicators. Lack of effective SCM can cause problems for organizations we refer to Vanessa Nappi Henrique Rozenfield [2]. The focus of this qualitative study is to determine the best practices and successful SCM practices & strategies to opt for which can be used to reduce the costs associated with SCM. A successful SCM strategy helps in lowering down the expenses thereby increasing the sales of the company. SCM practices if followed enables the leading organizations to realign their supply chain to distinct set of concepts by providing various functioning solutions for any enterprise required for supply, demand planning and forecasting, sourcing and procurement, and supply chain execution refer to Naresh Susarla & Karimi [3]. The connection and nodes in a supply chain achieve functions that contribute to the value of goods transported through the chain. Any connection that does not work well reduces the overall effectiveness of the whole supply chain processes. Effective and efficient supply chain processes are vital to reduce the product cost while maintaining quality and ensure the availability of inventory. To be successful in market the industries must ensure the practice of effective SCM. It has been observed that the general business problem is that some Indian healthcare business organizations spends a large amount of money on SCM issues. This problem arises because of the lack of knowledge of strategies and best practices to be followed to reduce the high costs associated with SCM. The companies can apply the best practices results to create and deliver better services in SCM.

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Improved services will help the continued increased investment in building up a better SCM structure by introducing cost saving measures on contingency planning and risk mitigation. Also, the best practices if followed may assist many companies' leaders in implementing the right forecasting models, encourage movement into new markets, and spend necessary capital for improving and modernizing the whole SCM system we refer to Narayana, S.A., Pati, R.K. and Vrat, P. [4].

### Objective:

The objective of the study was:

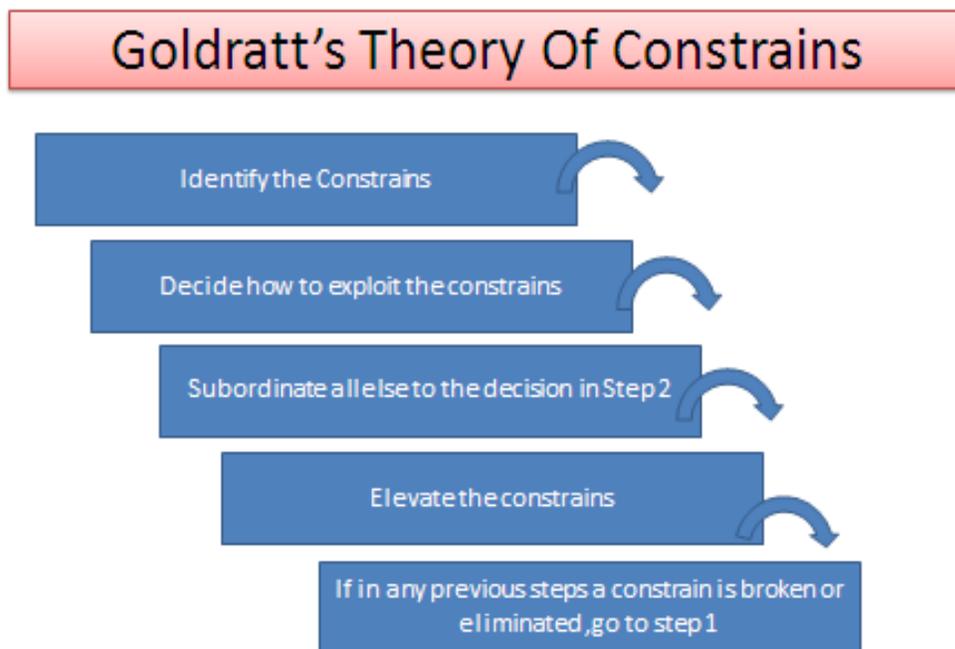
1. To provide thoughtful and meaningful information on various SCM strategies and best practices
2. To explore significant challenges that Indian business leaders follow to reduce high costs associated with SCM.

### 2 Research Design/Methodology:

The case study research design is used to approach to explore SCM related problems. The research design includes the secondary data sources from various journals, books, newsletters, websites, observations etc. The qualitative analysis also focused on semi structured interviews.

### Conceptual Framework:

Goldratt's Theory of Constrains (1990) was used as conceptual framework for the study. The TOC system is based on system-based management philosophy that seeks to understand and identify the core causes that limit a system from achieving higher performance in relation to its goal (Goldratt,1990). The TOC method used in the study is associated with the identification of challenges and SCM strategies and to find solutions. The TOC paradigm states that every single firm must have one single constrains, which is defined as an element or a factor that limit the system from doing more of what it was designed to accomplish (Goldratt, cox, & whitfrod,1992). There are three but distinct interrelated areas of TOC: logistics, performance measurement, and logical thinking (Cox & Spencer,1997).



**Fig: 1 Flow chart depicting the Goldratt's theory of constrains.**

The TOC application in logistics category includes logistical challenges, scheduling methods and value added tax analysis. Performance measurement determines whether the organization is making money. Development factors incorporate the solutions for an effective SCM. The above Fig:1 shows the suggested steps of TOC proposed by Goldratt for business improvement processes. The focus of the TOC theory is to maximize the system's performance.

### Efficient Supply Chain Distribution & its significance:

In the recent advances over the years, the pharmaceutical industry has evolved to emerging diseases using latest knowledge

and technology. Various dimensions have been set up in business of pharmacy as the industry has been changing in terms of its indispensable role to address various diseases. In the advancement there has been a radical overhaul and a noticeable structural reorganization of pharmaceutical companies we refer to Singh, R.K., Kumar, R. and Kumar, P. [5] Some of the essential elements of this organization include drug discovery, delivery mechanisms, launching and marketing, and distribution and production.

The simulation and dynamics involved in supply chain is the major tool in assessing the impact of organization's operational cost developed a standard approach for modelling the dynamics of supply chain for testing it on different pharmaceutical processes. The model developed incorporates both physical and business processes. Pharmaceutical physical business process includes manufacturing, distribution and warehousing Dubey, J. and Dubey, R.,[6].

### **The various strategies for business development:**

According to the world health organisation, the global pharmaceutical market in coming years is estimated in billions annually. The figure is expected to rise drastically poised to grow USD \$55 billion by 2020. To maintain high volumes and stay profitable, companies in the industry can employ a number of business –development strategies.

### **Technology Based Strategy:**

Technological innovations is a profitable business strategy opted by many pharma industries. Investment in such trends has proved out to be very effective in increasing the desired turnover in the firm's business. Such technological innovation enables a pharmacy industry to deal with challenges by reaching more consumers and suppliers, receiving instant feedback at cheaper cost. One such strategies is using e-detailing, whereby a company communicates a product's details on the internet. This eases the consumers to get all desired information about their product in one click access, where they can schedule appointments online and learn about the contents, available discount and prescription of the product or have the company address their questions in real time Vinita Srivastava, Meenakshi Handa, Anupama Vohra [7]. A pharmaceutical company can also use a phone application to have consumers have a check on the risks and benefits of a product on their available contacts. A technology- based business development strategy boosts innovations of drug enhancement or production of new drugs. Use of e- pharmacy is the latest innovation in pharmaceutical product, where it has become easy for consumers to have access to various available drugs in one click. refer to Min Zhang, Kulwant S. Pawar, Janat Shah, Peeyush Mehta [8].

### **Operational Marketing and Sales:**

An operational marketing and sales strategy is paramount for a pharmaceutical company's growth and profitability. A report by U.S. Bureau of Statistics in October 2011 indicated that the total value of pharmaceutical drug consumed in the US market up to 37%. A marketing sales and business strategies. Strategic sourcing shifts the company and teams focus from just looking at the purchase price, to understanding the dynamics of the total cost of owning or consuming a product or service. For the important spend areas, procurement teams are abandoning the outmoded practice of receiving multiple bids and electing a supplier simply on price. Valentina De Marchi, Elisa Giuliani, Roberta Rabellotti [9]. Instead, they consider many other factors that impact the total cost of ownership. Most of the total cost is comprised of operating costs, training costs, warehousing cost, environmental costs, quality costs, transportation costs and calculation of the overall value we refer t Ab Talib, M. S., & Abdul Hamid [10].

### **Partnership and Mergers:**

Partnership and outsourcing are a daily occurrence in the pharmaceutical industry. Seeking for and actualizing sustainable mergers is a good business development strategy for a pharmaceutical industry. Management centre Europe reports that mergers of pharmaceutical companies will contribute more than 50 percent of industry's future growth in the global markets. By combining their resources, pharmaceutical companies leverage their strengths to increase market share and influence. To capture value of a deal, such a business strategy must cover post –merger management issues, such as effectively integrating workplace cultures and system we refer to Alsmadi, M., Almani, A., & Khan, Z. [11].

## Supply Chain Management – Key Issues

ISSUE	CONSIDERATIONS
<b>Network Planning</b>	<ul style="list-style-type: none"> <li>• Warehouse locations and capacities</li> <li>• Plant locations and production levels</li> <li>• Transportation flows between facilities to minimize cost and time</li> </ul>
<b>Inventory Control</b>	<ul style="list-style-type: none"> <li>• How should inventory be managed?</li> <li>• Why does inventory fluctuate and what strategies minimize this?</li> </ul>
<b>Supply Contracts</b>	<ul style="list-style-type: none"> <li>• Impact of volume discount and revenue sharing</li> <li>• Pricing strategies to reduce order-shipment variability</li> </ul>
<b>Distribution Strategies</b>	<ul style="list-style-type: none"> <li>• Selection of distribution strategies (e.g., direct ship vs. cross-docking)</li> <li>• How many cross-dock points are needed?</li> <li>• Cost/Benefits of different strategies</li> </ul>
<b>Integration and Strategic Partnering</b>	<ul style="list-style-type: none"> <li>• How can integration with partners be achieved?</li> <li>• What level of integration is best?</li> <li>• What information and processes can be shared?</li> <li>• What partnerships should be implemented and in which situations?</li> </ul>
<b>Outsourcing &amp; Procurement Strategies</b>	<ul style="list-style-type: none"> <li>• What are our core supply chain capabilities and which are not?</li> <li>• Does our product design mandate different outsourcing approaches?</li> <li>• Risk management</li> </ul>
<b>Product Design</b>	<ul style="list-style-type: none"> <li>• How are inventory holding and transportation costs affected by product design?</li> <li>• How does product design enable mass customization?</li> </ul>

Source: Simchi-Levi

41

**Fig. 2 Chart summarizing the key issues of SCM.**

### New Markets Access:

Accessing new functioning markets is a critical business strategy in the highly in the competitive pharmaceutical industry. Emerging global markets present a good opportunity to pharmaceutical companies. A report released by MCE in 2012 estimates that 80 percent of the economic growth in the next decade will arise from emerging markets Barney, J. B. [12]. The strategy needs guidelines on how to recruit salespeople who understand how to sell products in emerging markets. To remain competitive in new markets, pharmaceutical companies also must offer high quality and differentiated products and services

### Offshore to Nearshore Sourcing Strategies:

In order to reduce the transportation cost and products travel time many firms are shifting their supply chain strategies from offshore to nearshore. The nearshoring offers additional benefits such as reducing the disruption at the shipping ports and avoiding the cross-country movements of the products. The shorter distance will reduce the risks of delays to the transportation aspects of the supply chain management. This shift appears to be beneficial for both the customer and to the supply chain. It would lessen the transportation cost of the reducing the product cost also impacting the freight costs, revenue and inventory we refer to Deshpande,[13].

### Lean Inventory strategies:

Lean strategies adopted by companies include just in time delivery, small, fast and frequent delivery methods using a dedicated fleet of transportation vehicles. The lean theory and practice have a aim of reducing inventory costs that would enable the firms to have more revenue If they choose to have more revenue there is no longer any option for the companies because of the rising oil prices. Moreover, there is a strong need to maintain balance between inventory and transportation. Resulting to which companies have implemented a hybrid of the inventory and transportation strategies that would focus on shortage of products and reduction of transportation cost Assey, M. J. [14]. A firm's revenue increases because inventory is more available to fill the demands of the market with a shorter lead time. The fact that the transportation costs would replace the inventory cost does not mean that the inventory aspect would become less significant in the logistic supply chain. Quite opposite, these hybrid inventory and transportation strategies would highlight the balance between inventory and transportation costs

## Best Practices in Pharma Supply Chain Management:

An organizations competitive advantage creates a defensible position in the market over its competitors. It includes the ability of the firm to be able to differentiate itself from its competitors in the market. The empirical literature on competitive advantage reveals that “identifying price/cost, quality, delivery and flexibility as important competitive capabilities” Askin, R. G., Baffo, I., & Xia, M [15]. Considering the organizational performance, it is all about whether the organization has achieved its market as well as financial goal. A framework for competitive advantage includes price, quality, delivery time, and product innovation. The short-term objectives of SCM refers to the increased productivity of the production phase and to reduce the inventory cycle time. The long-term objective of SCM is to increase the market share of the organization, as well as increase in profit of all members involved in supply chain thereby increasing the organizational performance Bhattacharya, A., Kumar, S. A., Tiwari, M. K., Talluri[16].

## Best Practices redefining the supply chain process:

Unlike other industries, like high -tech and consumer goods, pharma companies need to focus on the following six initiatives as best practices are:

- **Connect and collaborate using a business network.**
- **Understanding the real demand.**
- **Control the quality at CMOs (Contract Manufacturing Operations).**
- **Quick re-planning across the network.**
- **Managing Distribution Partners.**
- **Supply Chain Operating Network.**
- **Connect and collaborate using a business network:**

A digital business network is the foundation of a multi-enterprise supply chain, connecting all supply chain partners electronically via cloud. Unlike the old model of creating point to point connections, this is a multi-tier network connecting everyone, like internet does, allowing all partners to work along in sync. This facilitates and enables both end to end visibility and collaboration needed to support business interactions among different sectors. Such practice enables to get the level of real time visibility and coordination among all supply chain partners that is required for efficient functioning Gupta, M. M., & Andersen, S. S[17]

## Best Practices to Pharma Supply Chain Disruptions Johnson & Johnson

1. Business continuity/ supply chain integrity is a matter of corporate culture (CREDO-based) focused upon **prevention**
2. **Alignment** of accountability and practices up and down supply chain from raw material sourcing through end customer.
3. **Planning & exercises** are vital to crisis management. Plans & policies must be documented, tested, modified and accessible
4. **Collaboration** with external organizations and experts is critical to any business enterprise (emergency response teams, civic leaders, gov't. agencies, regulators, etc)
5. Extreme **due diligence** on your sources of supply and their suppliers (incl. D&B); create end-to-end visibility of product flow
6. Auditing/sampling is less effective than real time **visibility & control**
7. Never compromise your principles of **safety and compliance**



**Fig: 3 Best practices to pharma supply chain disruption**

## Understanding the real demand:

Demand forecasts are only an educated guess of what future demand will be. For their business, the most innovative pharma

companies are following consumer product companies: capturing vast amount of demand related information which is then fed into demand sensing solution to better predict true demand. This indicates going all the way to point of sale data or using signals like weather forecast data or trends as followed on social media. The improved demand picture is then propagated to all supply chain partners, ensuring that the suppliers, distributors and CMOs all are aligned Rohita Kumar Mishra. [18].

### **Control the quality at CMOs (Contract Manufacturing Operations):**

Pharma companies need to ensure end to end traceability. As external parties such as CMOs, are increasingly involved, pharma must have visibility into partners manufacturing operations to track product quality across multi -tier, multi enterprise supply chain,. This clearly indicates that there will be direct connect to CMOs manufacturing execution system to capture all relevant data for different stages of production. This type of association will provide very minute visibility check to track the material flow, processing steps and associated parameters such as yields or test results H Abbas, JA Farooque [19].

### **Quick re-planning across the network:**

The traditional planning system followed lack the fast problem resolution and correct decision support capabilities required to manage trade-offs or to suggest alternative scenarios offered by state of art planning applications. Kapoor, D., Vyas, R. B., & Dadarwal, [20]. With the efficient business networks, companies can trace end to end supply chain and are not only restricted to in house operation. With the pace of changing time the requirement is to detect and respond quickly to the changes in demand and supply. These tools allow rapid evaluation of new information on unexpected demand change and easily also compare alternative available plans to select best option and distribute amongst all suppliers via business network Dolgui, A., M. K. Tiwari, Y. Sinjana, S. K. Kumar, and Y. J. Son, [21].

### **Managing Distribution Partners:**

Pharma companies are increasingly relying on external partners for transportation, warehousing and other value-added services. Ensuring the product availability means smoothly and efficiently managing distribution partners. This also includes getting complete downstream inventory visibility and inventory strategies Baryannis, G., S. Validi, S. Dani, and G. Antoniou [22]. Proactively managing means allocating to different channels to optimally and profitably delivering the right product to right customers and make reliable commitments ensuring the key when competing for shelf space at drug store chain and pharmacies Saberi, S., M. Kouhizadeh, J. Sarkis, and L. Shen.[23].

### **Supply Chain Operating Network:**

New strategies use the experience of consumer product companies but take into account these specifics of the pharma industry. A cloud-based network to enable end to end visibility and collaboration amongst supply chain partner, combined with the decision support application that leverage the data in the network is the best set up practice to help in the growth of business Kumar, M., Basu, P., & Avittathur, B. [24] The business benefits are substantial:

- Up to date, end to end supply chain visibility shared across all partners.
- Full control of CMOs as required for traceability and serialization.
- Higher on shelf availability, with lower inventories.
- Through small channel allocations, better margins and following best practices for achievers of higher market share.

The faster the adoption of all above practices by the companies, the faster the move to be achievers of desired targets capturing benefits and putting up themselves ahead of all peers Brusset, X., & Teller, C. [25].

## **3 Results and Discussion**

The entire paper focuses on the existing best practices and strategies. This paper tends to discuss the main trends dictating the need of new approach to manufacturing and distribution process of medicines, together with some technique and technology introduced will help the industries to make necessary changes required. Most importantly few pharma companies have supply chain capable of meeting tomorrow's needs. Numerous forces both external and internal are reshaping the environment in which the industry operates. So here it becomes important for all pharma industries to act according to the changing trends and reconfiguring their operations.

## **4 Conclusion:**

Pharma needs to utilize the latest technology to maintain agility, and hence competitiveness, across the supply chain. The pharmaceutical industry has been one of the best -performing industries of the past decades with pharma companies excelling

in many disciplines (research and development, manufacturing, sales and marketing) maintaining the highest safety and quality standards. As a result, both sales and profits have risen more than in most countries. Yet, in recent years, the industry has been facing significant challenges. The competitive intensity has significantly increased with the fast rise of generic. The overall product portfolio has grown more complex, with more niche products for new markets. For over the counter (OTC) products, large drug store chains are imposing the same high standards (e.g. on shelf availability, promotions) as they do to customer product companies. Healthcare providers and government reforms continue to put strong downward pressure on prices. Quality regulations, the rise of the counterfeited drugs and the serialization mandate are forcing pharma companies to make their supply chain more robust to ensure full traceability. All of this is putting new demands on the supply chain to help address these challenges and bring products to market cost-effectively and required service level. In addition, pharma companies are increasingly relying on a global network of R&D partners, suppliers, logistics providers and contract manufacturing organizations (CMOs) to develop, test, produce, ship and distribute their products. Using specialized outsourcing partners for key supply chain activities provides companies with significant cost and flexibility benefits.

The most important best practices include reducing challenges to distribution and logistics, implementing the appropriate forecasting and replenishment techniques, and spending more on improving processes and collaboration. In conclusion, leaders of health care companies should continue using these strategies and expand them to reduce or eliminate weak areas of supply chain process to reduce cost in SCM.

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