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# Supply Chain Management in Garment Manufacturing Units

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## Abstract

The textile and garment industry in India is a major contribution to the country's GDP. The Indian textile and garment industry has widespread recognition and acclaim, both at home and abroad. It is widely regarded as one of the most significant works of its kind. There is a great deal of variation in structure, operation, and performance between the various enterprises that make up India's textile and clothing sector. “Large, highly organised, capital-intensive corporations that control the bulk of the market's brand value coexist in this sector with smaller, non-integrated spinning, weaving, finishing, and clothing and accessories firms or handicrafts dominated by handlooms as well as power looms. Around 14% of industrial production, 4% of GDP, & 17% of export income today come from India's textile sector.” It employs more over 35 million people, making it the country's second largest industry after agriculture. In 2010-2011, the total square feet of textiles produced was 59556 million, of which the mill sector was responsible for 2205 million.

**Keywords:** Textile, garment industry, global market, structural, operational, performance differences, handicrafts, apparel-making, employment.

## Introduction

The manufacture of fibers and yarns is only one link in the garment supply chain, which also includes garment fabrication, garment assembly, distribution, and retail (Sen, 2008; Varukolu and Poaps, 2009). There is a wide range of sizes and types of businesses participating in the various links of India's garment industry's supply chain. Differences occur not just between members of two stages, depending on operational and structural variability, but also between different counterparts competing at the same stages. The value added by the supply chain is between 300% and 400% from the raw material stage to the final garment, but there is a clear distinction between the actors and their activities at each level, which requires careful thought from supply chain practitioners (Verma, 2000). Yet, there are numerous small and major businesses involved in various supply chains simultaneously, with substantial variability across members, and “asserting their membership with either the organized or the unorganized sector (National Productivity Council, 2010; EXIM Bank, 2008). To fully comprehend the structure and dynamics of the whole supply chain of the Indian textile industry, a detailed examination of each individual step is required.”

Although the Indian garment industry is among the best in the world, it is not without its challenges, including a lack of uniform infrastructure and a wide variety of organizational structures among the many competitors. Companies who are already struggling with supply chain and logistical concerns are impacted further by these problems. Later in the research, we examine the fundamental supply chain difficulties confronting the Indian apparel sector. These are difficulties that every firm and significant participant in this market faces. In order to improve a company's efficiency, responsiveness, and competitiveness, it is necessary to tailor the architecture of its supply chain framework to its specific needs.

**Stages of the Supply Chain**

The creation of fibers is the very first step in the process of making clothes. All types of fiber are required to create a finished garment. Natural fibers are those derived from plants, whereas synthetic fibers are those created in a lab. Farm-grown plant fibers like cotton, linen, jute, and bamboo, as well as animal fibers like wool, fur, and silk, are all considered natural fibers (Sen and Reddy, 2011; Tanchis, 2008). (Beckwith, 2008; Sen, 2008; Wilson, 2001). The agriculture businesses generate natural fibers.

“Artificial fibers including polyester, nylon, acrylic, Rayon, and acetate are often manufactured from coal, petroleum, and castor oil.. Blended fibers, which consist of both natural and synthetic fibers, are still another kind of fiber. India produced 1233.61 million kg of synthetic fibers in 2011-12 (India Stat)” (Tanchis, 2008)

Yarn and spinning come next, after the fiber production stage. Consequently, the process of transforming the natural and synthetic fibers into yarns is the next step in the production of garments. At the spinning mills of this region, fiber is prepared for further processing into yarn by mechanical means, where it is held in the lengthwise side or twisted together (Wilson, 2001).

There are both standard and specialized yarns available. Fabrication occurs after yarn spinning. “Weaving, knitting, and the non woven process make up the bulk of the garment supply chain, with woven textiles made by interlacing two threads in the lengthwise and widthwise orientations. Knitting is weaving together loops of yarn, which may be created automatically or by hand using a set of knitting needles. Fabric is produced using the non woven technique by looping, fastening, knotting, plaiting, or twisting the yarn in a manner different from weaving or knitting. There are many different types of fabric manufacturers in India's garment business, however the industry may be roughly broken down into two categories: The organized sector, which includes large-scale and technologically advanced composite mills, and the unorganized sector, which comprises of tiny weavers and knitters, mostly operating out of their homes and using handlooms, powerlooms, and knitting machines” (Chandra, 2006). Dyeing, printing, and finishing are all steps in the textile production process (EXIM Bank, 2008).

Manufacturing Clothes There are several steps involved in the garmenting process (Dveraja, 2011; Gereffi and Memedovic, 2003), including: Designing, the process wherein multiple designs and their variations are generated in response to market trends, consumer wants, and demand predictions (Dveraja, 2011; Sen, 2008; EXIM Bank, 2008). Businesses may employ their own in-house designers or hire freelance designers from a variety of design studios. Fabric is then cut into the

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appropriate shapes and sizes for each design variation once the patterns have been chosen. Stitching then secures the parts together in the specified order following the design's specifications.

The cutting and sewing operations are often handled in-house by Indian garment manufacturers, however some businesses instead use local contract manufacturers to carry out these tasks after being supplied with patterns and specifications. Some businesses, however, do their own cutting and then outsource the stitching to local manufacturers who are familiar with the specifications. When the garment has been sewn and prepped, it is either returned to the manufacturer or sent to a third party for finishing, during which the garment is cleaned, pressed, and otherwise finished. Any disconnected actions from earlier steps that were left unfinished due to time constraints have now been completed. Following completion, it is packaged, labeled, and sent via the proper logistics system and network to the locations where it will be sold.

The produced garment is then sold to consumers. There are several different retail formats in the Indian garment business (Sinha, 2004; Bharathi, 2010; Sharma, 2012; Jun et al., 2004; Sen, 2008), each having its own unique structure, philosophy, and methods of operation. Retailers like Wills Life Style, Koutons, Zara, etc., which focus on selling the brand's specialized apparel and accessories, dominate the Indian market. These stores are often owned or franchised by the garment manufacturer. There are department shops like Shoppers Stop, Globus, and Westside that have a broad variety of clothing items and accessories and are organized into several sections based on product, service, and control differentiations (Sharma, 2012; Bharathi, 2010). Big Bazaar and Vishal Mega Mart are examples of Full Line discount stores (Sinha, 2004), “which offer medium- to low-priced branded products and assortments and employ a value-based pricing strategy to attract the middle- and lower-middle-class Indian customers who make up the country's majority and thus boost customer turnover.”

Coordination between the movement of information and the movement of goods and materials is crucial in the garment industry's supply chain. Information about client orders, wants, and market requirements and trends flows backward from customers to retailers, who in turn pass it on to manufacturers, who in turn pass it on to suppliers, resulting in a forward flow of material and product. Companies in India are doing better in their respective industries when they have greater synchronization between the flow of information and the movement of physical goods.

**Snags and Issues in SCM in India’s Garment Industry**

There is a lot of room for improvement in supply chain management methods in India compared to other industrialized nations, “especially in the apparel sector (Jayaram and Avittathur, 2012; Sahay and Mohan, 2003; Sahay, et al., 2003). The Indian garment industry has undergone a number of economic as well as industrial reforms (Bhandari and Maiti, 2007), and it is showing signs of improvement in terms of both economic and productivity” (Joshi and Singh, 2010). Nevertheless, the supply chain of Indian garment companies remains fraught with problems that must be solved before the industry can achieve global competitiveness (Sahay et al., 2006). Inventory management (Sahay and Mohan, 2003), transparency, waste, and responsiveness are only few of the problems that plague Indian businesses.

The lifespans of innovative and fashion-forward garments, in particular, are among the shortest in the manufacturing industry (Patil et al., 2010; Richardson, 1996). As both consumer taste and market fashion are very unpredictable, their demand fluctuates rapidly. Hence, it calls for an optimal inventory level, with neither too much nor too little stock on hand (Walters, 2003; Muckstadt and Sapra, 2010).

Overstocking leads to obsolescence and warehouse space being used up by items that aren't selling. Low inventory causes out of stocks and missed sales, while excessive stock must be dumped at a sale at a loss (Fisher et al. 2000). The garment sector, known for its unpredictability, presents a particularly challenging environment for inventory management in Indian businesses (Sahay and Mohan, 2003).

Overstocking of certain sorts of assortments, which are trending toward obsolescence and impeding the route of needed items, is a common problem for India's garment manufacturers. Several of these businesses, including those with prominent market positions, keep an excessive amount of stock on hand. Koutons, a clothing retailer in India, claims to have the greatest inventory levels in the country, with eight months' worth of stock on hand at any one time (Jayaram & Avittathur, 2012). In comparison, Pantaloon retains their stock for three months, Shoppers Stop for two, and Trent for two as well (Singh, 2010).

Despite its rapid turnover and erratic demand, the garment industry must deal with a persistent problem: excessively long lead times (Choi and Sethi, 2010). In the apparel industry, the purchasing cycle often begins a year in advance, and production orders for the next seasons are placed and processed anywhere from six months to a full year before the actual seasons in which the items will be needed and sold in shops (Al-Zubaidi and Tyler, 2004; Birtwistle et al. 2006). The likelihood of excessive inventory holding and the associated issue of overstocking rises in proportion to the length of the lead time, reducing responsiveness. The garment business in India has a significant challenge in attempting to predict the demand for the next season or year and place orders a year in advance, despite the fact that market trends and client requests may fluctuate significantly.

Supply chain transparency (Lamming et al. 2001; Svensson, 2004) may be enhanced by the timely and correct dissemination of information, therefore visibility (Bartlett, 2007) is crucial (Chan, 2003; Lamming et al. 2001). The bullwhip effect occurs when there is a discrepancy between actual needs, orders placed, and delivered stock due to inaccurate inventory estimations made at different points in the supply chain (Lee et al. 1997). “Obsolescence of inventory, overstocks of the current inventory in shops, and stock outs of the running inventory which is in demand are extremely typical difficulties caused by a lack of visibility, which limits real time traceability of the inventory.”

The lack of coordination and excessive inventory levels in the Indian textile sector may be traced back to the fundamental issue of poor visibility at every stage of the supply chain. Longer lead times and less visibility in the supply chain make it difficult for clothing manufacturers to respond quickly to changes in consumer and market demand.

In order to maximize profits and meet customers' demands, businesses in the supply chain often work together by exchanging relevant data (Dabas and Sternquist, 2012), making shared decisions, and dividing up the rewards (Simatupang and Sridharan, 2002). Supply chain participants (Cao et al.,

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2008) and those in other industries (via co-marketing alliances) need to work together for collaborative practices to be effective (Ahn et al. 2010). “Top management commitment, information sharing, trust among the supply chain partners, long-term partnerships, and risk and reward sharing are recognized as the primary characteristics impacting supply chain cooperation in India's garment business” (Anbanandam et al. 2011).

**Improved Supply Chain Framework**

Successfully adapting to shifting market conditions, fluctuating consumer needs, and a host of other issues calls for a well-thought-out strategic supply chain structure. The first challenge that faces supply chain planners when developing a strategic framework for India's garment industry is which supply chain models are most suited to the variety of products sold in India's various marketplaces. It is important for a clothing manufacturer's product plan to align with its supply chain strategy (Fisher, 1997; Chopra and Meindl, 2007). Value development and customer focus in the supply chain phases (Khan, 2013; Riemann, 2013; Sultan and Saurabh, 2013) are essential steps for every supply chain. The efficiency will come from a supply chain strategy that is well-suited to the product type, while the consequences of not doing so might be catastrophic. Immediately reorganizing the supply chain when the issue has been identified is the only option. The sooner the issue is detected, the less damage there will be and the more quickly the system may be restored, but the later the problem is identified, the longer it will take to recover (Sterman, 2000). If a supply chain doesn't work for a certain product, it has to be rethought (Fisher, 1997).

**Strategic Fit of SCM Framework**

It is possible to classify the garments on the Indian market as either personalized or standard. There is a combination of the customisation and standardization, where they range from low to high degrees of customization and in the same manner from high to low degrees of standardization, so it is unusual to find a garment product that is simply one or the other. The following categories are useful for describing the phenomenon:

a) Customization High
b) customization and standardization as Modern
**c)** Standardization High

Fisher (1997), Christopher and Towill (2002), and Naylor et al. (2005) all stress the need of tailoring your supply chain strategy to the specifics of your product (1999). Fisher (1997) identifies two types of products: “those with high demand variability and high profit margins, and those with high product variety, short product life cycles, and high profit margins, which require a responsive supply chain, also called an agile supply chain” by Christopher and Towill (2002). Market, fashion, and consumer expectations are all taken into account in the extensive customization of these goods. Fisher (1997) describes a second kind of product with extended life cycles, predictable demand that doesn't fluctuate much, and low supply chain costs as "functional goods," for which he recommends an efficient supply chain, later coined the "lean supply chain" by Christopher and Towill (2002). There is a great degree of uniformity in these goods. Naylor et al. (1999) contrast this with their description of leagility, which combines lean and agile supply chains. Strategic compatibility

between product category and supply chain structure is also crucial (Chopra and Meindl, 2007). The supply chain has to be nimble when goods are highly customized to suit individual tastes and current trends.

As high customisation is targeted at specific clients and a certain fashion, it necessitates a prompt response, which in turn generates high volatility and high unpredictability. Conversely, a lean supply chain is needed for industries with strong standardization, stagnant demand across time, and minimal profit margins. Whereas products that fall somewhere in the middle need a more nimble supply chain. Figure 3 shows how the Chopra and Meindl Model of Strategic Fit influences the strategic fit between supply chain strategy and product type. This is necessary since the degree of customization and standardization vary from product to product (2007). Supply chain strategies should have as much variety as the products they serve. If the gap between these two numbers is small, the strategic fit will be good, and if it's large, the opposite will be true. Garment manufacturers may maximize their productivity by positioning their strategy framework as close to the zone of strategic fit as feasible.

## Conclusion

There is a wide range of sizes and types of businesses operating in India's clothing sector. Companies function, market, and provide for their clients in different ways. Despite its potential, the Indian supply chain has several difficulties due to constraints such as inventory management, lead time, cooperation, technology, logistics, and transportation. Although these are the most pressing problems that need fixing if garment businesses are to become efficient, responsive, and competitive in the market, they can be fixed if the industry starts using a supply chain strategy that takes into account their specific size, operational requirements, and customer focus. The nature of the products and services being offered should inform the supply chain's approach to meeting demand. The overlap between product and supply chain strategies is an area that needs attention for businesses.

Issues like product and error traceability, visibility, the real-time monitoring of consumer demand, cooperation, and expanded use of POS data may all be addressed with the use of QR practices, CPFR, VMI, RFID technology, and other Information Technology (IT) strategies. There is room for further investigation into these questions. structures.

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