IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

ANALYSIS OF SUPPLY CHAIN AND LOGISTICS USING EXPERIMENTAL APPROACHES STRATEGIC MANAGEMENT IN THE GARMENT INDUSTRY

Syed Nadeem Ahmed Alvi[1], Dr Rajkumargiri N Gosavi[2]

[1]Research scholar, Dr Panjabrao Deshmukh Institute of Management, Technology & Research, Nagpur

[2]Professor, Dhanwate National college, Nagpur

Abstract : An increasingly attractive market for globalisation is emerging in India, one of the world's fastest-growing nations. A company's productivity may be affected by how they handle its supply chain. The garment and textile sector is a reliable generator of export earnings due to the high value added goods it consistently produces. Mass manufacturing and the deployment of heavy labour are necessitated by the wide variety of commodities in this business. Countless entities participate at each stage of the intricate and worldwide textile supply chain. A procedure that begins on one continent and ends on another might include acquiring raw materials, production, and shipping. India aspires to achieve a level of global prominence never before seen, becoming a key actor in the worldwide supply chain. Finding the most cost-effective, timely, and sufficient sources of labour, machinery, materials, and capital is an integral part of the garment supply chain. Improvements in operational efficiency, processing the chain more effectively, schedule and cost adherence, and process compatibility are the key components. In order to realise our full economic potential and satisfy the aspirations of our youth, we must align our economic systems with those of other industrialized nations. Managers may profit from the study's intriguing findings on textile supply chain management in the long run when they develop more efficient supply chain management strategies.

Keywords: Supply chain, Operational performance, Textile industry, Globalization

Introduction

One of the most important sectors contributing significantly to India's gross domestic product is the textile and garment industry. In addition to its prominence in the domestic Indian market, the Indian textile and garment industry has widespread renown and respect on a worldwide scale. Players in India's textile and apparel sector vary greatly in terms of structure, operations, and performance, and this diversity is evident across the whole supply chain. There are large, well-established companies in the sector that command a disproportionate share of the market for their name recognition and extensive infrastructure, as well as many smaller, less integrated businesses that produce goods and services in the spinning, weaving, finishing, and apparel manufacturing sectors. In the rapidly evolving landscape of global commerce, the garment industry stands as a prime example of the intricate interplay between production, distribution,

and consumption on a worldwide scale. As one of the most globalized sectors, the garment industry's supply chain and logistics have become increasingly complex, presenting both challenges and opportunities for strategic management. This analysis delves into the application of experimental approaches to supply chain and logistics management within the garment industry, exploring how innovative strategies can drive efficiency, sustainability, and competitive advantage in this dynamic field.

The Garment Industry: A Global Tapestry of Complexity

The garment industry, characterized by its labor-intensive production processes and geographically dispersed supply chains, has long been at the forefront of globalization. From the cotton fields of India to the fashion houses of Paris and the retail stores of New York, the journey of a single garment exemplifies the intricacies of modern supply chain management. As consumer demands shift rapidly and sustainability concerns gain prominence, industry leaders are compelled to reevaluate traditional approaches to supply chain and logistics management.

The Need for Experimental Approaches

In an era marked by technological disruption, changing consumer behaviors, and increasing environmental awareness, conventional wisdom in supply chain management often falls short. Experimental approaches offer a pathway to innovation, allowing companies to test novel strategies, technologies, and processes in controlled environments before full-scale implementation. These approaches can range from the application of artificial intelligence in demand forecasting to the exploration of blockchain technology for supply chain transparency.

The textile industry in India now accounts for about 14% of industrial output, 4% of GDP, and 17% of export revenues. After agriculture, it is the second biggest employer in the nation, employing about 35 million people. The mill industry was responsible for 2205 million square meters of the 59556 million square meters of fabric produced in the 2010-11 fiscal year.

Although, the Indian garment industry is among the top industries of the sector in the global market, its structure in the Indian conditions is full of diversities and it faces many infrastructural issues and differing structures of players involved at every level. These issues affect the supply chain of the companies which are already confronting the various supply chain and logistics related challenges. The basic supply chain challenges which the garment industry in India is facing are discussed later in the study. These are the challenges which are faced more or less by every company and contributing player in the industry here. Supply chain frameworks are needed to be designed as per the requirements of the particular companies in order to make them more efficient, responsive and competitive. The study first discusses the structure of the garment industry in India, which further describes its challenges based on the study of the available literatures and suggests the suitable supply chain framework with the appropriate supply chain

strategies according to the company structures and their product offerings. The study here explores many dimensions of the supply chain in the garment industry in India based on the review of the available literature which will be proved helpful and can be carried on for more descriptive study on the specific issues based on the real data in future.

STRUCTURE OF GARMENT SUPPLY CHAIN IN INDIA

The garment supply chain involves the major stages of fiber and yarn production, fabrication, garmenting, distribution and retailing (Sen, 2008; Varukolu and Poaps, 2009; Chaudhry and Hodge, 2012; Wilson, 2001; Fin, 2006). Supply chain structure of garment industry in India comes with lot of varieties of the players involved and their size and operational differences at every stage in the chain. The differences are not only based on the operational and structural variability at different stages i.e. difference among the members of two stages, but it also exists among the various counterparts competing at the same stages. Although, the stage wise difference among the players and their operations is obvious and needs the thorough consideration of the supply chain practitioners, as the chain accounts for a value addition of 300% – 400% from raw material stage to the finished garment (Verma, 2000). However, there are many small and large players at every stage of the supply chain claiming their association with either the organized or the unorganized sector (National Productivity Council, 2010; EXIM Bank, 2008), having their involvement in many supply chains at the same time which again consists of high variability among the members. The whole process together creates the complexity, which necessitates the separate study of every stage in order to understand the structure and dynamics of the complete supply chain in the Indian garment Industry

Key Areas of Experimentation

Digitalization and Industry 4.0: The integration of digital technologies such as Internet of Things (IoT), big data analytics, and artificial intelligence presents opportunities to revolutionize supply chain visibility, agility, and efficiency.

Sustainable and Circular Supply Chains: Experimental approaches to recycling, upcycling, and closed-loop production systems are gaining traction as the industry grapples with its environmental impact.

Localization and Nearshoring: In response to geopolitical uncertainties and the need for faster market responses, companies are experimenting with bringing production closer to consumption centers.

Agile and Responsive Supply Networks: The traditional linear supply chain is giving way to more flexible, network-based models that can quickly adapt to market changes and disruptions.

Advanced Analytics and Predictive Modeling: Leveraging vast amounts of data to predict trends, optimize inventory, and enhance decision-making processes is becoming a critical area of experimentation.

Stage I: Fiber Production

The first and basic stage in the garment supply chain is fiber production. Fiber is the primary material which is necessary to make any kind of garment product. Fibers can be classified in two types: natural and manmade or synthetic fibers. Natural fibers are either referred to the plant fibers which are produced in the farms such as cotton, linen, jute and bamboo, etc. (Sen and Reddy, 2011; Tanchis, 2008), or the animal fibers such as wool, fur and silk etc. (Beckwith, 2008; Sen, 2008; Wilson, 2001). Natural fibers are produced by the agricultural firms. Manmade fibers also termed as the synthetic fibers or artificial fibers are generally produced from coal, petroleum and castor oil (Tanchis, 2008) which include polyester, nylon, acrylic, Rayon and Acetate etc. (Tanchis, 2008; Wilson, 2001; Sen, 2008). Another variety of fibers are blended fibers which are the blend of both natural and synthetic fibers (Tanchis, 2008). In 2011-12 production of the manmade fibers in India is 1233.61 million kg. (India Stat)

Stage II: Yarning/Spinning

The next stage in garment supply chain consists of converting the natural and manmade fibers into yarns. Here fiber is spun in the spinning mills where in the mechanical process they are kept in the lengthwise direction and twisted together in order to convert into the yarns either single or folded (Wilson, 2001). Yarns are produced in regular and fancy varieties.

Stage III: Fabric Production

Fabric production the major stage of the garment supply chain mainly consists of weaving and knitting process as well as the non-woven process, where the woven fabrics are produced by interlacing two threads in lengthways and widthwise directions. The knitting process involves the interlacing the loops of yarns which are formed either mechanically or manually by the pair of knitting needles. The non-woven process consists of looping, fixing, knotting, plaiting or twisting the yarn in the way other than weaving and knitting, in order to produce the fabric. The Indian garment industry has variety of players involved in fabric production; however, the sector is mainly divided into two parts: The organized sector including the large scale and techno savvy composite mills; while on the other hand there is the unorganized sector which consists of the small weavers and knitters including the handlooms mainly based on the household business, powerlooms and knitting machines (Chandra, 2006). After producing the fabric, it's processing of the dyeing, printing and finishing (EXIM Bank, 2008).

Stage IV: Garment Production

Garmenting process consists of various stages including: Designing, where various designs and their different variants based on the market trends, customer needs and demand forecasting are

created. Companies either have their own designers or outsource from the various designer houses. Once the designs are selected, pieces of the fabric are cut in the specific shapes and sizes for the different variants of the specific designs. The pieces are then joined together in the predefined manner as per the requirements of the design, through the stitching process. Many Indian garment manufacturing companies do this process of cutting and stitching process themselves, whereas others source the local contract manufacturers for both the processes of cutting and stitching and provide them the designs and instructions for every step. However, some of the companies perform the cutting in-house and hire local contract manufacturers for stitching the joints in a prescribed manner. Once the garment is stitched and prepared it is sent back in case the stitching process was outsourced, and the garment products are prepared for the finishing process where it is cleaned, pressed and final preparations are done. The postponed activities decoupled in the previous processes and not finished till then, if any, are also finished at this stage. After finishing it is packed, labeled and distributed to their respective retail stores through the appropriate logistics system and network

Supply Chain Issues In Indian Garment Industry

Supply chain in Indian scenario including the garment industry is full of complexities and unlike the European countries and other parts of the developed world, a lot of work is needed to be done in India in terms of the supply chain management practices. Although a lot of economic and industrial reforms have been made in the garment industry in India and it has an improving trend in the economic and productivity terms; but when it is about supply chain of Indian garment companies it is full of challenges and issues needed to be resolved in order to gain the competitiveness globally. Indian companies are facing the wide issues of inventory management, visibility, wastes, responsiveness.

Inventory Management

Managing inventory is a major issue garment industry is facing in India. Garment products are highly volatile in nature and have the shorter life cycles especially in the case of innovative and fashion products. Their demand changes very fast as customer preference and market trends are highly variable in nature. Therefore, it requires the inventory level to be optimum i.e. neither too much nor too less. Excess of inventory causes overstocks, obsolescence and blocks the space for demanded products. Overstocks are then required to be dumped in sale resulting in markdowns; whereas, low inventory results causes out of stocks and results in lost sales. Companies in India are facing a major problem related to the inventory management which must be considered, especially in garment industry with unpredictable nature. Garment Companies in India usually confront with the challenges of overstocking of particular varieties of assortments, gradually heading towards obsolescence as well blocking the way of demanded products. Many of these companies including very renowned players have significantly very high level of inventory in their stores. Indian garment company ‘Koutons’ holds the inventory level of eight months of

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

sales claiming the highest level of inventory in the industry in India, while, the companies like 'Pantaloon' keeps the inventory of three months, 'Shoppers stop' two months and 'Trent' holds an inventory of two months of sales

Lead Time

Garment industry confronts a major issue of very high lead time despite of its short life cycle and volatile demand. Buying cycle for the garment products start generally in a year advance and the garment companies place and process their manufacturing orders for the garment products from 6 months to one year ahead of the coming seasons when the product is actually required and will be available in the stores for the sales. Higher lead time reduces the responsiveness and increases the chances of high inventory holding and therefore, problem of overstocking. Placing the order in a year advance based on the forecasting of the demand of the coming whole season or year, while the market trends and customer demands may considerably vary is an important issue the garment industry in India needs to tackle.

Suggested Supply Chain Framework

As discussed earlier garment companies in India face lots of supply chain related challenges which affects their responsiveness capabilities and their global competitiveness. A proper strategic supply chain framework is required in order to cope up with the changing market situations, customer demands and overcoming the various challenges. While making the strategic supply chain framework for the garment companies in India the first question which arises in front of the supply chain thinkers is the correct supply chain models which suit the different product offerings in different markets. The product strategy of the garment company should match with its supply chain strategy. Customer orientation and value creation in the supply chain stages is a crucial phase for any supply chain. A supply chain strategy matching with the product type will bring the efficiency while a supply chain which does not match with the product type may be disastrous for the company. It will create the problems causing the blockages in the supply chain. Only solution is to identify the problem as soon as possible and restructure the supply chain as soon as possible. Sooner the problem will be identified less will be damages and the system may be restored more easily, whereas, the delays in identifying the problems will create more delays in restoring . A supply chain must match its product type and if not then it should be redesigned soonest possible.

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

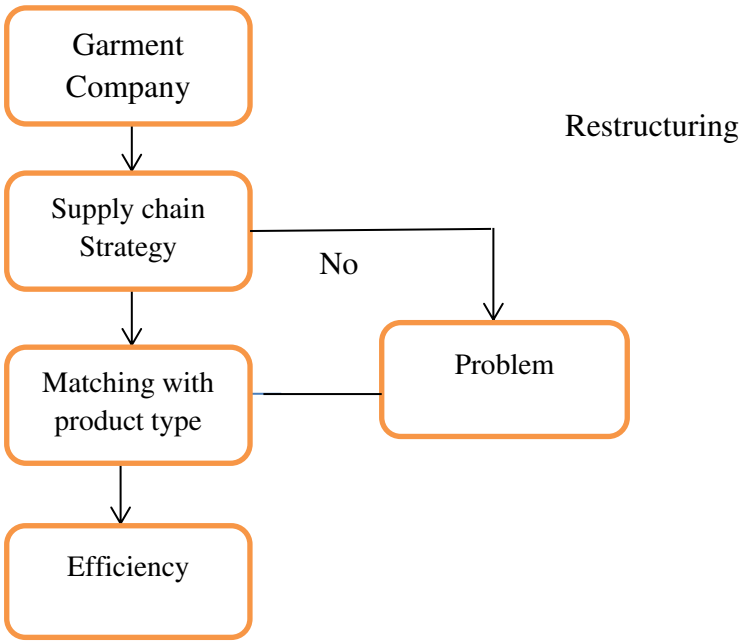

Figure 1: Strategic Supply Chain Framework

The current supply chain structure of garment companies in India faces lot of challenges as discussed earlier, which is mainly based on inventory management, lead time, collaboration, technology and logistics. A right supply chain for the right garment product will be helpful in maintaining the proper inventory flow and maintaining the optimum lead time as required by the corresponding supply chain, which will be helpful in overcoming the situations of overstocking or the stock outs and the lost sales (Fisher et al. 2000). One more practice which is widely practiced in European and American garment companies but is still about to find its way in Indian context is Quick Response (QR) will be proved revolutionary for the Indian companies and will solve many problems. QR focuses on the importance of POS data in order to make the supply chain demand driven and uses the practices such as CPFR and VMI which improves the collaborative practices among the supply chain partners, as well as maintains the flow of inventory while keeping the inventory level to the minimal and reducing the lead time. Using RFID technology widely will also be helpful for the Indian garment companies in order to maintain the real time tracing and visibility of the garment products, which is also termed as essential in QR. RFID is effective everywhere in supply chain which detects errors in manufacturing, in warehousing starting from reception area to the storage area through cross docking till the outgoing area, and at the sales floor. It makes the real time visibility of the products at all the above stages as well

Conclusion

In this research, we will look at how the garment industry's supply chain and logistics management is changing in the future, based on case studies, new technology, and strategic frameworks. We hope that by looking at the good and the bad of experimental methods, we may shed light on how businesses can innovate and expand sustainably in today's cutthroat market despite the challenges posed by global supply chains.Various small and major firms at every level of the supply chain make up India's garment sector, which is full of diversity. Their operations, client bases, and supply chain models are distinct from one another. On the other hand, logistics, transportation, inventory management, cooperation, and lead times are some of the primary obstacles that the Indian supply chain must overcome. Despite the fact that these are the most pressing problems that must be addressed if the garment industry is to remain efficient, responsive, and competitive, these problems will go away once the industry's leading suppliers tailor their strategies to each company's unique size, operational requirements, and customer focus. The goods and services offered and the people you want to sell to should inform your supply chain strategy. A company's product strategy and supply chain strategy should strive to be in a zone of strategic fit.

References

1. Ahn, S. K., Kim, H. J. and Forney, J. A. (2010), “Fashion Collaboration or Collision?” Journal of Fashion Marketing and Management, Vol. 14 No. 1, pp. 6-20.
2. Altekar, R. V. (2004), “Managing Supply Chain in Indian Manufacturing Sector: A Critical Study with Special Reference to Supplier Partnership”, South Asian Journal of Management, Vol. 11 No. 2, pp. 48-65.
3. Al-Zubaidi, H. and Tyler, D. (2004), “A Simulation Model of Quick Response Replenishment of Seasonal Clothing”, International Journal of Retail and Distribution Management, Vol. 32 No. 6, pp. 320-327.
4. Anbanandam, R., Banwet, D. K. and Shankar R. (2011), “Evaluation of supply chain collaboration: a case of apparel retail industry in India”, International Journal of Productivity and Performance Management, Vol. 60 No. 2, pp. 82-98.
5. Anbanandam, R., Banwet, D. K. and Shankar, R. (2011), “Evaluation of supply chain collaboration: a case of apparel retail industry in India”, International Journal of Productivity and Performance Management, Vol. 60 No. 2, pp. 82-98
6. Bartlett, P. A. (2007), “Improving Supply Chain Performance through Improved Visibility”, The International Journal of Logistics Management, Vol. 18 No. 2, pp. 294-313.
7. Beckwith, S. W. (2008), “Natural Fibers: Nature Providing Technology for Composites”, SAMPE Journal, Vol. 44 No. 3, pp. 64-65.

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

8. Devraja, T. S. (2011), "Indian Textile and Garment Industry- An Overview", working paper, Department of Commerce, University of Mysore, Hassan, India, May.
9. Export-Import Bank of India, (2008), Indian Textile and Clothing Industry in Global Context: Salient Features and Issues, Occasional Paper No. 127, Quest Publication, India.
10. Fin, B. (2006), "Performance implications of information technology", Supply Chain Management: An International Journal, Vol. 11 No. 4, pp. 309-316.
11. Fisher M. L. (1997), "What is the right supply chain for your product", Harvard Business Review, Vol. 75 No.4, pp. 105-116.
12. Fisher, M. L., Raman A. and McClelland, A. S. (2000), "Rocket Science Retailing is Almost HereAre You Ready?", Harvard Business Review, Vol. 78 No. 4, pp.115-124.
13. Sharma, H. L. (2012), "Indian Retail Market: Opportunities and Challenges", EXCEL International Journal of Multidisciplinary Management Studies, Vol.2 No. 3, pp. 175-189.
14. Sharma, V., Giri, S. and Rai, S. S. (2013), "Supply Chain Management of Rice in India: A Rice Processing Company's Perspective", International Journal of Managing Value and Supply Chains, Vol. 4 No. 1, pp. 25-36
15. Sultan, A. and Saurabh, (2013), "Achieving Sustainable Development through Value Chain", International Journal of Managing Value and Supply Chains, Vol. 4 No. 2, pp. 39-46.
16. Svensson, G. (2004), "Key areas, causes and contingency planning of corporate vulnerability in supply chains: A qualitative approach, International Journal of Physical Distribution & Logistics Management, Vol. 34 No. 9, pp. 728-748