Chapter 2-Literature Survey

The earliest shifts of textile and apparel sector were associated with a search for lower costs (Tewari, 2005). This manifested in three ways throughout the 1970s, 1980s and 1990s:

i. Extensive outsourcing (of apparel assembly) first locally, and then to suppliers in lower wage sites across the world.

ii. The rising power of large retailers and corporate buyers based in industrial countries, who played a key role in organizing and coordinating these emerging global networks and clothing supply chains.

iii. In the 1990s the rise of information technologies and the deepening power of retailers demanding timely supplies of apparel led to the rise of lean retailing, or production relations associated with rapid replenishment of fast-moving stocks.

The traditional fashion markets, characterised by two fixed seasons per year, have also been affected by the need for more rapid refreshing of ranges, styles and colours (McCarthey and Jayaratnae, 2009). Demanding consumers and competitive retailing have generated pressures to respond with multiple refreshes per season. The focus is on quick replenishment of the specific styles, designs and colours that are selling well, whilst reducing, changing or abandoning those that turn out to be less popular than forecast. This trend, when taken to the extreme of compressing design times, multiple refreshes, coupled with very quick response from the supply base, and all done at low cost, describes the so-called ‘Fast Fashion’ market.

2.1 The Apparel Supply Chain

Irrespective of the category, clothing products can take a circuitous route from fabric production, through garment production and distribution, ultimately to an individual retail customer (Johnson, 2002).

The textile producers supply the clothing plants, which in turn feed into distribution and logistics systems to enable garments produced in dispersed global networks to meet anticipated demand in specific retail chains and stores. Much of the material flow complexity occurs around clothing plants and the distribution parts of the system. In reality, any specific clothing supply configuration will resemble more a supply network than a ‘linear’ supply chain. Describing just the physical configuration and the
material flow is insufficient to understand and analyse the operation and performance of a specific clothing supply network. A global supply network comprises of diverse entities including retailers, designers and merchandisers, fabric producers, garment manufacturing plants, as well as distribution, logistics and warehousing companies (Dickerson, 1999).

Even simple garments like T-shirts are often touched by hands in several countries before ending up in the target markets of Europe or the US. A more complex product, like a winter parka, often sports components from all over the world: snaps from Germany, zippers from Japan, insulation from China and Thailand, and the outer shell from Taiwan. Getting the right information to the right people at the right time is the biggest challenge. (Banomyong, 2010).

Equally important is visibility to the entire product and sourcing team with a documented history of product changes. All too often, a change made by one member of the design team would be unseen by others creating confusion and finger pointing. Off-spec products arriving at a brand distribution center would be turned back by inspectors only to find out later that a single manager in the chain verbally approved the changes.

Key issues that need to be understood include the different participants within the network; the nature of their relationships; ownership, power and control structures; how the network is managed, coordinated and controlled and how information flows in the network.

As per Nordas (2004), textiles and clothing sectors can be seen as a supply chain consisting of a number of discrete activities. Increasingly the supply chain from sourcing of raw materials via design and production to distribution and marketing is being organized as an integrated production network where the production is sliced into specialized activities and each activity is located where it can contribute the most to the value of the end product. When the location decision of each activity is being made, costs, quality, reliability of delivery, access to quality inputs and transport and transaction costs are important variables.

Hines (2001) sees Supply Chain Management as a critical factor in managing contemporary fashion businesses.
Traditional supply chains view flow of goods/services from upstream raw material suppliers through manufacturing processes and on to the customers. In contrast the modern supply chain concepts begin and end with customer.

Modern supply chains are described as flexible, responsive, agile, lean, value adding networks and value streams. Supply chains are more than the term suggests. They are value creation mechanisms for customers. They are not simply ‘supply’ focussed nor are they necessarily ‘chains’. Supply chains are dynamic, efficient, effective response networks delivering customer requirements flexibly and on time. These high performance networks consist of customers, suppliers and information travelling through organisational ‘arterial systems’. These arterial systems cut across functional, organisations and geographical boundaries. Two management skills in particular marked out winners in today’s marketplace: managing the product cost and speed to market. In the apparel industry, speed and flexibility are required to satisfy customers who expect increasingly good value and more fashion content (Chandra and Kumar, 2000).

There are a number of critical issues management needs to address when it comes to applying the marketing concepts towards fashion:

i. Fragmented markets hence difficulty in targeting and segmentation

ii. Increasingly more demanding customers make it difficult to spot a sustainable winning formula

iii. Individualism is breaking down traditional fashion trend prediction influences

iv. Fashion cycles are shorter, leading to a more volatile marketplace, making forecasting difficult

2.2 Apparel Supply Chain Entities

Apart from the final customer the three main entities of the apparel supply chain are:

The Apparel Importer/Buyer - The apparel export industry is a buyer driven industry, hence comprehending the expectations of the buyers is of utmost importance. The buyer could be a retailer, a brand owner or a wholesaler based in the country of selling.

The Buying House - The buying house is a mediator between the buyer and the seller, buying house plays a vital role in offering the kind of service levels which their principal(s) expect and ensuring that they upgrade the vendors.
The Apparel Manufacturer/Exporter- Also referred to as vendor/seller/exporter, the apparel manufacturer/exporter is the most important link in the supply chain. The merchandiser here is the pointer which balances tasks between buyer/buying house on one side and the factory on the other.

Figure 2.1 - The Structure of Apparel Supply Chain

A global supply network comprises of diverse entities including retailers, designers and merchandisers, fabric producers, garment manufacturing plants, as well as distribution, logistics and warehousing companies. Key issues that need to be understood include the different participants within the network; the nature of their
relationships; ownership, power and control structures; how the network is managed, coordinated and controlled and how information flows in the network (MacCarthy and Jayrathnae, 2009).

Lead Example of Apparel Intermediary (Fung and Chen, 2010)

Li and Fung Ltd- Founded in Guangzhou, China in 1906 and with headquarters in Hong Kong, Li and Fung is an international company for high-volume, time-sensitive consumer goods that include soft goods (garments) and hard goods (fashion accessories, gifts, toys, handcrafts, etc.) Throughout the years, Li and Fung has successfully transformed itself from a regional sourcing agent to a worldwide supply chain management enabler. It now coordinates supply chains for their customers through a network of 65 buying offices in 38 countries across the globe. The supply chain coordination tasks of Li and Fung can be illustrated as follows:

Li and Fung receive orders from individual European clothing retailers who need a few thousand garments within six months. Using its expertise, the yarn which is made in South Korea is dyed and weaved in Taiwan. The zipper in each product is made in a factory in China owned by a Japanese firm. Since China’s textile quota has already been used up under some country’s import rules, all work-in-progress is shipped to Thailand for final assembly. As no single factory can handle all work-in-progress for this single order, several factories in Thailand share this order. What Li and Fung does is to assure the quality of the whole garment and manage the whole process starting from supplier selection, sourcing, manufacturing selection and assessment, logistics and documentation arrangement etc. Six months later, that European retailer would receive the whole order at the specified time, specified place with conformance to specified quality and specified quantity. Manufacturers simply must have an optimal value-adding supply chain.

The company, in general, can provide tailor-made service to customers in sourcing, logistics and financing. In short, the value chain integration between Li and Fung with its customers is flexible but effective (Lam and Postle 2006).

Suppliers of the company have a wide geographical spread. Rather than taking complete control over about 7500 suppliers in more than 26 countries, Li and Fung leaves the management challenge to its contractors in order to gain flexibility in coordination and quality control.
Furthermore, it takes up between 30% - 70% of the production of each factory to make certain it gets substantial leverage and induces suppliers’ dependence on them. The company provides regular feedback to suppliers to improve their performance. It rewards performing suppliers with more substantial and steady business. As a back-office hub of Li and Fung, an Operations Support Group (OSG) is backed by an IT system that keeps a database of 6000 factories around the world. It contains not just the profiles of each factory in terms of products and capacity; it is also a hub where customers can easily check the progress of their orders, from production to shipping. Aside from IT, the group also acts as an in-house human resource provider, offering recruitment services, internal matching of staff and training. All divisions of Li and Fung could take loans from the OSG as all divisional revenues finally go to the OSG. Intermediary (like Li and Fung), must provide customer value based on its supply chain management capabilities. The capabilities serve to perform complex coordinated tasks that meet customers’ changing needs, utilizing company-based and supplier-based resources for the results. In order to qualify as sources of sustainable competitive advantages, resources and capabilities have to be distinctive, costly and time-consuming to replicate by competitors or new entrants (Adam & Tisdell, 2008). For this reason, intermediaries must protect these capabilities and stay ahead by endlessly improving their performance.

**Lead Example of Apparel Manufacturer (Kahn, 2001)**

Record of the sales at *JC Penney* stores is downloaded by factory in Hong Kong. In about two days time, the factory packs an identical replacement shirt into a bundle to be shipped back to the *JC Penney* store where the sales is made. This speedy process, part of a streamlined supply chain and production system for dress shirts that was years in the making, has put Penny stores now hold almost no extra inventory of house-brand dress shirts. Less than decade ago, Penny would have had thousands of them warehoused across the U.S., tying up capital and slowly going out of style. The new process is one from which Penney is conspicuously absent. The entire program is designed and operated by TAL Apparel Ltd., a closely held Hong-Kong company then decides how many shirts to make and in what styles, colors and sizes.
The manufacturer sends the shirts directly to each Penny store, bypassing the retailer’s warehouses and corporate decision makers.

TAL is the maker of one in eight, dress shirts sold in the U. S. Its close relationship with U.S. retailers is part of a power shift-taking place in global manufacturing. As retailers strive to cut costs and deep pace with consumer tastes, they are coming to depend more on suppliers that can respond swiftly to their changing needs. This opens opportunity of savvy manufacturers, as retailers tend to depend more on suppliers that can respond swiftly to their changing needs. TAL has rushed in even starting to take over critical areas such as sales forecasting and inventory management.

The retailers have been willing to cede some functions once seen as central, because some suppliers can do them better and more cheaply. But Penney now has let TAL take the arrangement a step further designing new shirt styles and handling their market testing.

TAL’s design terms in New York and Dallas come up with a new style, and within a month its factories churn out 100,000 new shirts. For a test, these are offered for sale at 50 Penney stores. Not nearly all will sell, but offering a wide array of colors and sizes helps to provide a true test of consumer sentiments. After analyzing sales data for a month, TAL—not Penney – decided how many of the new shirts to make and in what colors.

Because TAL manages the entire process, from design to ordering yarn, it can bring a new style from the testing stage to full retail rollout in four months, much faster than Penney could on its own.

**2.3 Apparel Sourcing Criteria**

In a research on UK apparel retailers’ supplier selection criteria (Gibbon, 2001), most UK apparel retailers considered cost as the most important criteria in formulation of company sourcing strategy. The next important criterion was lead time/flexibility. The others which followed in Gibbon’s research were- availability of capacity, service capacity, production expertise and ethics.

List of expectations from their core suppliers were articulated as- conformance to their current price, technical/product quality, communications, capacity and delivery reliability requirements.
Ninety percent of responding companies said ‘partnership’, with core suppliers is of prime importance. Exchange of sales information is a pre-condition for suppliers to be able to manage retailers’ inventories, mutual transparency, bargaining volume for reductions in price, joint planning of new capacity, degree of differentiation in product offers, openness and honesty (Oxborrow, 2000).

Cesca (2006) found that the top three criteria when selecting a vendor were quality, on-time delivery, and cost. Primary research supported in that all U.S. retailers feel that on-time delivery is more important than costs. Retailers feel that if the product is not on their shelf when it is supposed to be, no money will be made and costs will no longer matter.

With U.S. and global manufacturers, quality, on-time delivery, and cost were the most frequently used when selecting a vendor. When looking beyond the top three criteria, the global manufacturers were found to be using more common criteria with the U.S. retailers than the U.S. manufacturers. The major metrics used by U.S. retailers to measure the performance of their vendors was again on-time delivery, quality, and costs. The costs measured may be first costs, distribution costs, or the margins that they receive from a certain vendor’s product. The U.S. and global manufacturers from both markets were also measuring their own on-time delivery and quality. However, only the global United States retailers were also using flexibility as a metric to measure the performance of their vendors (Sauls, 2007).

Six criteria—namely cost, quality, delivery, flexibility, innovation and trust are identified as the supplier selection criteria in apparel industry (Koprulu and Albayrakoglu, 2007).

Even high-end fashion-driven segment wants to lower production costs and ability to work within cost structures is dictated by market (Birnbaum, 2005).

Most apparel buyers look for-

i. Reliable supply of low-cost labor

ii. Ability to meet quality standards, labor treatment standards, benefits, facilities standards, and environmental standards specified by key market regulators and customers

iii. Access to raw materials

iv. Ability to meet deadlines

v. Flexibility for smaller production lots
vi. Unit capacities to meet peak demand
vii. Design and merchandising skills
viii. Ability to interact with buyers to implement design changes, complex items, etc
ix. Cultural understanding of customers
x. Educational infrastructure to provide regular supply of designing and management skills

The ability to ship a decent garment, on time every time and in a competitive price, is no longer an asset. It has become an entry-level requirement.

2.4 Buyer-Supplier Relationship

Buyer-supplier relationships in the supply chain are one of the most important elements of supply chain integration. Establishing and managing effective relationships at every link in the supply chain is becoming the prerequisite of business success. Two kinds of supply chain relationships have been identified to exist- Strategic and Operational partnerships (Mentzer et al, 2000).

Strategic partnerships are long term, on going partnerships which deliver value to customers and profitability to partners. Operational partnerships on the other hand are short term, as and when needed to keep parity with competitors. Partners in a strategic partnership recognise each other as an extension of their own firm.

An operational partnering orientation seeks to improve the efficiency and effectiveness of business operations. Efficiency minimises use of resources to accomplish specific outcomes and effectiveness is the ability of channels to deliver products and services as required by the end customers.

High volatility in the retail industry reflects rapid fluctuations in customer demand and unpredictable market trends. In addition, environmental diversity reveals uncertainty in the global business environment (Hsaio et al, 2003). Facing market volatility and diversity, retailers are encouraged to develop relatively flexible relationships with multiple channel partners to deal with unexpected market demands and thus reduce the dependence on the vendor.

Mentzer et al, (2000) further said that, firms engaged in long-term relationship with their customers achieve higher profitability and ROI than firms using a transactional approach. Strong buyer-supplier relationships have a significant positive effect on
manufacturer performance, supplier performance, and performance of the entire supply chain.

Five prominent dimensions of the buyer-supplier relationship as shown in Hsaio et al. (2003) research are- trust, communication, interpersonal relationship, cooperation, and power-dependence. Each of these dimensions has been discussed briefly as follows:

A. Trust- Trust leads retail buyers and sellers to the focus on long-term benefits of the relationship, and eventually enhance the performance outcomes in buyer-supplier relationships, including firm competitiveness and transaction costs reduction. Trust influences long-term relationships, and has the strongest effect on achieving cooperation in relationship. It is the key to maintaining continuity and financial performance.

B. Interpersonal Relationship- Interpersonal relationship is the concept of drawing on connections or networks, and it involves reciprocal obligations and favours between two parties in personal or business relations. Personal relationships play a significant role in Asian business and are a critical precondition for effective business. Many Western companies lacking the understanding of cultural differences in relationships and networks were not able to manage long-term business relationships in Asia successfully. Building and maintaining personal relationship network is key to achieving long-term success in business markets.

C. Communication- Owing to the risk of seasonal and short product life, small firms are naturally inclined to reduce inventory carrying costs and maximize profits from the products provided by the suppliers. Effective communication plays a critical role in social and business relationships. Communication is defined as ‘the formal as well as informal sharing of meaningful and timely information between firms.’ More open sharing of information is indicated by the willingness of both parties to share important information. However, lack of trust can be translated to unwillingness to share information, and can make it difficult to share sensitive information such as financial data. Difficulties in cross-cultural communication and information sharing can be a significant obstacle to business.
Effective communication in channel relationships can enhance levels of channel member coordination, satisfaction, commitment levels, and performance. In fashion apparel industry, frequent communication between retailers and suppliers can expedite quick and accurate response to volatile market, and reduce the costs and impact of inaccurate forecasts. Effective communication is crucial to maintain a long-term buyer-relationship and achieve high performance.

D. Cooperation—Cooperation is defined as ‘similar or complementary coordinated actions taken by firms in an interdependent relationship to achieve mutual or singular outcomes with expected reciprocation over time’. Cooperation between the exchange parties reflects the expectations of working together to achieve mutual and individual goals jointly. The cooperative inter-business relationship is primarily based upon personal trust between business parties. Without close relationship, the suppliers or buyers are not willing to share information and have less intention to cooperate. Active cooperation plays a role in export sales growth. Research on channel distribution has suggested that there is a positive relationship between cooperation and satisfaction.

E. Power-Dependence—The issue of power is closely associated with the nature of dependency in business relationships. Channel member dependence and sources of power in marketing channels are conceptually inseparable, and dependence is a component or dimension of these power sources rather than a separate phenomenon. Marketing channel power is the ability of one channel member (e.g. supplier) to control the decision variable in the marketing strategy of another member at a different level of distribution (e.g. retailer). Power plays a significant role in the supply chain, and the different sources of power have differing impact on inter-firm relationships and the performance of the entire supply chain.

2.4.1 Relationship Adhesives
In a report by JE Austin Associates (2007), on Supporting Buyer-Supplier Relationships after the first transaction, the supplier continually faces the challenge of keeping up with the buyer and its end-market. The ability of the supplier to stay on top of the shifting needs of the buyer is largely determined by relationship adhesives. Relationship adhesives essentially provide glue of the relationship to increase the probability that the supplier is aligned with, and can adapt to, the needs of the buyer.
over time. When considering the buyer-supplier, it is important to note the positioning of the business environment. In most models and frameworks of private sector and enterprise development, the issues that define the business environment are generally considered as encompassing the relationships or transactions. In this case, the business environment is positioned directly in the middle of the transaction. The rationale being that a positive environment can directly enable a successful and sustained relationship while a negative environment can directly get in the way of the relationship.

There are two aspects of their buyers’ model: margin and scale. Big box retailers such as Walmart, Target, and Marshalls are large scale, low margin businesses. Their product offer is driven by their ability to attract low-value customers on a large scale. Their operating model and product/market standards are ultimately tied to this model.

On the other end of the spectrum a low volume, high margin business, focused on delivering unique value at a premium price (Wuyts, 2007). The different business models of the international buyers will have differing demands on their supplier’s product specifications, delivery and operating standards. For instance, volume and standardization of product is critical for Target. It needs enough products to stock its shelves, all with standard specifications. As a retailer, product brand is de-emphasized in favour of volume, price and time to market. It has limited incentive to invest in the capabilities of its suppliers (Humphreys et. al, 2001).

For Nike, the brand equity is a key driver of the market value. In the soccer ball market, once product specifications are met, there is limited additional product differentiation. The supplier’s value to Nike is determined by its ability to balance low-cost production while still upholding the brand equity. By contrast, speciality, high priced buyers are driven by the quality of their ingredients and communicating a sense of uniqueness to the market (Romano and Vinelli, 2001). A higher quality input from a unique location translates into a higher priced product. The ability of the supplier to understand and deliver the intrinsic value of their products to the buyer and the end market is a key determinant of the long-run sustainability of a buyer-supplier relationship. The way in which the buyers will behave in a given relationship will be largely driven by the shape of their business model. The strategies that they use for enabling the relationship will differ.
Figure 2.2 - Buyer-Supplier Relationships

(Source-Adapted from Mentzer et al,2000)
Some of the strategies that buyers are using to enable the relationship are:
- Third party verification
- Sponsoring in-house training
- Community development
- Market feedback
- Aligning the interests of the supplier to the brand, not just the product
- Joint ventures

2.4.2 Partnering Implementation
As pointed out by, Mentzer et al. (2000), no matter what kind of partnerships exist between firms, the partnerships are implemented by information sharing, technology utilisation, strategic interface teams, organisational issues, joint programs, asset specificity and establishing joint performance measures.

2.5 Apparel Supply Chain Competitiveness
As defined by Nowell (2005) in the research on ‘Market Competitiveness in the Global Textile Supply Chain: Examination of Supply Chain Configurations’, competitiveness could be defined as:

*Economic Competitiveness*:
It would refer to the ability to sustain and grow a business within the global textile and apparel environment, through optimization of products, processes, and strategies to gain a competitive advantage.

*Market Competitiveness*:
It refers to having a position of superiority over competitors in satisfying the aggregate demand for certain products or services.

Research studies have identified the top three major reasons for global sourcing as cost reduction, quality, and availability in the textile and apparel industry. Therefore, improvements in these areas are a must to be competitive in a global market.

The main reason for the surge of apparel imports is due to the cost advantage of foreign manufacturers (Yusuf et al, 2004). The apparel industry especially is very labor intensive and wages make up a large portion of production costs, which has led to a decrease in domestic apparel production. Customers today are more quality conscious and are willing to pay higher prices for it. However, to be competitive a firm
must offer high quality products at competitive prices, for many foreign manufacturers that used to compete on price alone are now producing better quality goods. The availability of goods is a major motivator of offshore sourcing because many desired products are not available in the large apparel retailing countries. In order to compete, suppliers must not only be able to have high quality goods available at competitive prices, but also be able to deliver those goods to the customer on time. In order to gain a competitive advantage in a global supply chain a company must carefully manage lead times, quality, costs, inbound and outbound logistics, and the supporting technical service. It is essential for companies to invest in information systems to organize the entire supply chain. Overall, a company involved in a global supply chain must have flexible and responsive networks, which can only be obtained if all viable information is made available to all supply chain locations. Yusuf et al. (2004) suggested that in order to compete in the areas of timely deliveries and supply chain flexibility, companies should adopt the lean supply chain approach.

According to Gelei (2004), firm competitiveness is the basic capability of perceiving changes in both the external and internal environment and the capability of adapting to these changes in a way that the profit flow generated guarantees the long term operation of the firm. This definition - in accordance with the contingency approach and the evolutionary theory of firms – interprets competitiveness as an ongoing struggle for survival. This capability of survival is one of the most complex phenomena of company’s operation.

Firm competitiveness is basically a function of two factors. First, it is determined by the extent a company can identify those value dimensions that are important for their customers. These are the main characteristics of the firm’s complex product and service package a customer expects. In the long run a company can be competitive only when it is able to create value for their customers’ and as a consequence contribute to their competitiveness as well. These value dimensions are the aspects of supplier selection. The second factor of firm competitiveness is the sum of resources and capabilities that makes a firm able (capable) to create and deliver the identified important value dimensions for the customer. A company can possess a very wide range of resources and capabilities. Those subsets of resources and capabilities have the biggest
importance which is fundamental to the firm’s performance are called core competencies.

A company is competitive when it is able to create and deliver value for its customers. Value is created for the customer when the revenue received from a supplier exceeds the total ownership costs of the product and service package of the given supplier.

![Diagram of firm competitiveness](source)

Figure 2.3 The two basic components of firm competitiveness
(Source: Andrea Gelei (2003), ‘Competitiveness: A match between value drivers and competencies in the Hungarian automotive supply chain’, www.iimm.org/knowledge_bank/IFPSM/Andrea%20Gelei.pdf)

The essence of supply chain management focuses on delivering the right product at the right time at each level within the supply chain. This requirement has quality, dependability, flexibility, agility, and efficiency as necessary capabilities for achieving this goal (Vokurka, 2002). The priorities should not be considered as trade-offs for each other, but rather as complimentary and cumulative. All of these capabilities are necessary for value to be delivered to each customer at each level in the supply chain. Quality, as the foundation, allows for future ongoing developments in dependability, flexibility, agility, and efficiency. As this capability development continues, customers receive the right product at the right time, with the right price.

Supply chains can improve their performance by developing competitive priorities in a specified sequence: quality, reliability, flexibility, agility, and finally, cost efficiency.
Market competitiveness

In the textile and apparel industries, being competitive in the market means that companies must also be competitive economically (Nowell, 2005). Factors to consider in order to gain a competitive advantage include:

a) Customer-supplier relationships
b) Quality orientation
c) Cost competitive
d) Product availability
e) Service/Delivery
f) Logistics
g) Innovative products
h) Value-added services
i) Flexible supply chain

Market Characteristics

Key Sourcing Objectives

i. Cost- Cost is not the number one factor in sourcing decisions. Nowell’s (2005), research showed that more and more retailers are looking at the importance of on-time delivery. If you cannot get the product on the shelf on-time then you will never make any money.

ii. Full Package sourcing- Retailers want to communicate with as few people as possible. They are moving more and more towards full package sourcing in which they go to one person, usually the garment manufacturer, who takes full responsibility of the entire supply chain. This takes the responsibility off of the retailer and makes business a lot easier.

iii. Minimal Inventory- Many retailers want to source from companies that are willing to keep their inventory for them so that they do not have to acquire those costs. The retailer wants to simply call out goods as they need them without actually keeping a large amount of inventory themselves (Gargeya et. al, 2005).

2.6 Benefits and Challenges of Apparel Sourcing from India

U.S. buyers enjoy the benefits of sourcing from India, including higher mark-ups from high quality apparel products produced at low costs (Singh, 2008). Despite the benefits, there are several challenges faced by U.S. buyers sourcing globally. These
challenges have been categorised into three main groups: logistic support, cultural differences, and regulations. International logistics involves longer distances, requiring longer lead times, higher inventories and increased chances of inaccuracy. India’s poor transport connections make it difficult to meet the just-in-time requirements of the apparel industry. Due to a relatively poor infrastructure, it is more expensive for India to ship a single container of garments to the U.S. when compared to other Asian countries. India also faces transit time delays due to a scarcity of direct sailing vessels, as well as delays caused by general inefficiencies in Indian ports when compared to other Asian countries. Its inventory management is therefore much less flexible.

Marked cultural differences between the U.S. and India can often lead to problems, most notably arising out of miscommunications in supplier evaluation, contracting, inspections, and even in maintaining relationships, due to differences in factors like attitudes, manners, customs, religion, and language. Although India’s official language is English, most Indians speak Hindi to each other. English is used when dealing with the U.S. customer. To achieve success, Indians must understand the cultural and time differences, the buyer’s mindset, and prevailing trends within the U.S. market so as to adapt their working style to the needs of their customers. This is important because they are producing goods for customers who are culturally very different from themselves.

To improve supply chain efficiency, Indian suppliers must develop collaborative links with buyers working together as partners during the buying-supplying process.

Participants in Singh’s (2008) research describe the benefits of working with Indian suppliers as stemming from their ability to produce novel products with innovative approaches and at comparatively low cost. Apparel buyers who are looking for innovative products think of India as a sourcing destination. India is one of the few countries that offer so much innovation and product development right then and there, vendors have their own design teams, their own sample rooms, and that can do ordering mock ups, etc. India happens to be the home of innovative vendors compared to Asia. Yet innovation is not the only benefit. Buyers work with Indian suppliers because of category expertise, a high level of convenience, functional capabilities, effective pricing structures, and good service. India is always known for the technological advances and especially, the IT industry but these advancements are not seen in the apparel industry.
The buyers found it lacking when they compared to the technology of their Chinese suppliers in particular. Most buyers linked quality products with good equipment and the latest technology.

Few areas of policy weakness stand out (Chandra, 2006) – labour reforms (which is hindering movement towards higher scale of operations by Indian firms), power availability and its quality, customs clearance and shipment operations from ports, credit for large scale investments that are needed for up-gradation of technology, and development of manpower for the industry.

2.7 Competitiveness of Indian Apparel Export Industry

A study by Verma (2002) on buyers’ perception of India as a source country showed that while India was perceived satisfactorily on price, quality, technology, flexibility, small order quantity etc., it was perceived unfavourably on lead times, responsiveness, communication, trust, meeting contractual obligations, ethical standards etc.

A research by CRISIL on Indian textile and Garment Industry done by Anand (2003), highlight the demand-side issues faced by the industry as:

a) Understanding the change in buyer preferences markets, especially USA and EU Keeping up with fashion trends
b) Competing on non-price factors, and
c) Upgrading technology to improve quality and productivity

On the supply side, the concerns include:

a) The availability of quality raw material
b) Low labour productivity
c) Infrastructural bottleneck

Each firm's performance and survival is dictated by a combination of external and internal factors (Anand, 2003). But a firm cannot compete externally if its internal operations are not geared to deliver. The firm level initiatives suggested to improve competitiveness are

Core competencies: Each firm needs to identify its core strengths benefits and build on them to create its own niche in the marketplace through an extensive benchmarking and hence draw up a business plan to reach its goal.
**Market responsiveness:** Given their small operational scale, most Indian textile firms are unable to respond to market challenges.

Market responsiveness is a combination of various factors such as communication, transparency, delivery timeliness, social and employment and environmental aspects. All these have a bearing on the sourcing decisions of international buyers.

**Organisational restructuring:** Most textile companies are caught in meeting a chasm between their market and operations. A thorough analysis of their operations, market, finances and human resources will help them to improve each of these areas. Most garment units are family run businesses. The infusion of professional management at senior level would enable them to access experienced and talented pool of manpower. Investments in IT and communications could help reduce response time.

To improve supply chain efficiency, Indian suppliers must develop collaborative links with buyers working together as partners during the buying-supplying process (Singh, 2008). Trust, communication, commitment, follow up, knowledge and continuance - participants weighed each attribute’s value differently based on their own experiences. Singh’s work points to all attributes as important for building, maintaining, and strengthening working relationships with their suppliers.

The Indian textile and clothing industries have one of the longest and most complex supply chains in the world, with as many as 15 intermediaries between the farmer and the final consumer. Each contributes not only to lengthening of lead times, but also adding to costs.

**Ramachandran (2001)** further points out that the supply chain in India is extremely fragmented chiefly due to the government policies and lack of coordination between industry and relevant trade bodies. The countries that are globally competitive are the ones who have a significantly consolidated supply chain. Manufacturing management is a key link between technology adoption and competitiveness of firms. Productivity gains are indeed achieved through better managerial practices on the existing technology.

Of all the parameters used in the framework, India appears to score over China only in the breadth of home market, quality of managerial workforce, and managerial practices. In all other components, India compares unfavourably with China. Perhaps
here lies some explanation for higher competitiveness of China compared to India in the textile industry.

According to Verma’s (2002) study, poor ‘organisation of functions and tasks’ (OFT) was the most important contributor to poor productivity in Indian apparel sector.

Continuously shrinking lead-time will leave SCM implementation not a choice but a mandate for apparel exporters in future (Gupta et.al, 2002 and Jana and Bheda, 2003). Pre production activities vary from manufacturer to manufacturer as well between orders for a one manufacturer. While some start at pre-production stage others start with product development stage, some orders even may start from pre-production stage but later involve development activities. Due to this hybrid nature of product development activity supply chain rationalisation poses a real challenge. Based on the research on Supply Chain Dynamics in Indian Apparel Export Manufacturing (Jana and Bheda, 2003), the following were the conclusions -

i. Only 31% of respondents were aware of SCM or had heard about Supply Chain Management.

ii. Majority of respondents felt priority is productivity and quality improvement and not SCM implementation.

iii. Though product development was identified as most time consuming activity and needed improvement, the subsequent operational measures were all focused around cost reduction and control and time did not get enough importance.

iv. Intra and inter-enterprise communication was a weak area resulting rework and delay in approval.

v. Management is busy addressing day-to-day petty operational issues, finding no time to think about strategic issues.

2.8 Apparel Merchandising

2.8.1 Evolution of Merchandising in the Apparel Industry

Historical Perspective-USA

During the first half of the twentieth century, the US apparel industry had very little foreign competition. Domestically produced apparel products dominated the market (Rosenau and Wilson, 2006). After World War II, the United States transferred many of it’s manufacturing technologies to the private sector to support the war effort. The
Dramatic Growth in the Apparel Industry

During the period immediately following World War II, the apparel industry had two seasons per year: spring/summer and fall/winter (Kunz, 2010). There were minimal changes in style. Raw materials consisted primarily of natural fiber fabrics such as cotton, wool, linen, silk etc. Product development evolved over a number of seasons, thereby allowing stock to be carried over from year to year without the risk of obsolescence. Most companies maintained large warehouse inventories. They produced to stock and sold from stock. Companies struggled internally as the manufacturing divisions tried to keep the warehouses full, and the sales forces tried to empty them. The period between 1960’s and early 2000’s saw dramatic changes in the structure, focus and content of US apparel companies.

Kunz (2010) further states that many of the emerging apparel companies of the 1950s started fighting for market share in 1960s, a decade of change. In 1962, the largest publicly owned apparel firms still produced mostly basic apparel products. The top five apparel companies represented net sales of only USD 635 million. The US apparel industry was still a large fraternity of small and medium sized companies.

The 1970s brought a dramatic growth spurt to the apparel industry, which continued through 1980, 1990 and created large billion dollar corporations as industry leaders. This increase was generated largely by consolidation and mergers and by emergence of American mega-designers such as Liz Claiborne.

The extraordinary growth of the apparel industry during the last half of the twentieth century brought with it a heightened level of professional management. The industry shifted from an entrepreneurial generalist structure in which company owners made the critical marketing, product development and manufacturing decisions to a professional specialist structure with marketing specialists, product development specialists and manufacturing specialists. The larger more complex businesses require highly trained executive specialists to manage the intricacies of the sophisticated apparel supply chain.
Advent of Style

The customers of the 1950s bought what the manufacturers produced (Burns & Bryant, 2002). Style changes were subtle and slow to evolve until baby boomers became the flower children in the early 1960s. Whatever was lacking in the clothing was filled in by feathers, beads, tie and dye clothing.

Teenage fashion became a new, rapidly growing category in the 1960s as Americans focused on ‘doing their own thing’. The 1960s had a dramatic effect on the apparel industry by transforming it into a consumer-driven market. Bertrand Frank of Bertrand Frank Associates, Inc., a management consultant, stressed the role of styled wear in focusing apparel companies on shortening product development cycles in an April 1969 article for Bobbin magazine.

The key to profits today is market acceptance. You have to produce what people will buy now, today and do so in a way that at least brings you your proper profit margin, regularly….What do people buy today? They buy fewer staple or unchanging garments and more and more styled wear…..Styled wear invited the relative uniqueness of product that minimizes competition and outflanks foreign production.

<table>
<thead>
<tr>
<th>1960s</th>
<th>Oleg Cassini, Anne Klein, Halston, Bill Blass, Calvin Klein, Ralph Lauren, Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td>Diane Von Furstenberg, Geoffery Beene, Liz Claiborne, Kmart, Target, Wal-Mart</td>
</tr>
<tr>
<td>1980-90</td>
<td>Donna Karan, Nicole Miller, Perry Ellis, Tommy Hilfiger, Ann Taylor</td>
</tr>
</tbody>
</table>

Table 2.1- Emergence of Designers/Retail Stores


The growth of shopping centres and sub urban malls as well as the revolutionalisation of urban shopping districts that started in the 1970s was an enormous boon to fashion retail outlets. This in turn increased the demand for more fashion products. The tail end of the millennium refined the product category ‘active sportswear’ or ‘active-wear’, which is functional as well as stylish clothing designed to improve the performance or comfort of the wearer while participating in sport or activity.
In the late 1990s, this new market raised the bar another notch with a fashion category for ‘extreme sports’. Specialized gear for rock climbing, mountain biking, snowboarding etc, adding a new dimension to design criteria: protection from extreme conditions of climate and terrain.

The beginnings of the 21st Century also brought consumer dissatisfaction with the sameness of merchandise from one store to another. When consumers can find value priced merchandise in discount stores, thy need added incentive to buy apparel in department and specialty stores. These incentives are fashion and assortment.

### 2.8.2 Structural Changes in the Apparel Merchandising

Societal changes, such as more women in the workplace and an expanding middle class, brought about an increased demand in people’s clothing needs, which in turn created a consumer driven market place. The apparel industry experienced dramatic growth and new technologies provided manufacturers with the ability to respond quickly to change (Rosenau and Wilson, 2006).

Apparel manufacturing went global as it searched for cheaper labour. The two seasons per year of early 1960s became ‘season less’ years with new styles being presented to retailers almost monthly. All these changes created turmoil in the fashion business. Fashion trends changed very quickly. Gone were the days of manufacturing departments tweaking every penny to achieve profits.

Today’s successful apparel companies must determine what the consumers want and to see it they get it when they want it and at a competitive price that still allows them a profit. Overproduction of a particular style can result in markdowns and too little of a particular style also results in lower sales and reduction of profits.

The complex job of developing, executing and delivering product line based on the needs of a target market is the responsibility of the apparel merchandiser. The task must be performed with a focus of meeting the overall objectives of the merchandiser’s firm. The individual with the responsibility for this function may be given different titles: merchandiser, product development manager, design manager, merchandising director etc. In many of today’s larger companies this function may be broken down into more specialized areas such as general merchandising, creative design, technical design, sourcing and quality management. In every company someone must make the decisions concerning design direction and which garment
styles will get adopted in the product line. This same someone must ensure that the garments are manufactured in time and meet the customer demand. Thus, the process of apparel merchandising may be defined as the development, execution and delivery of a product line based upon the needs of the target market.

The position, responsibilities and authority of the apparel merchandiser evolved as apparel companies made the transition from traditional focus on production efficiency to the more recent focus on changing consumer needs. This evolution took place over 50 years and involved five distinct structural changes in the typical apparel organization.

The current initiative of companies within the apparel supply chain is to strive to reduce cycle time, to develop and bring products to the selling from an average 12 months to an average 6 months.

The direction in larger companies is frequently towards higher levels of management specialization, utilizing a team approach for critical decision making. Even under the more specialized structure, the functions of development, execution and delivery of the product line based upon the needs of the target market remain central to the success of an apparel company.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Structure</th>
</tr>
</thead>
</table>
| Stage I | • Immediate post world war II  
          • Sales representatives took orders and manufacturing division of a company maintained stock positions.  
          • Profitability of the company depended on efficient manufacturing  
          • Manufacturing executives wielded tremendous power within the organization and industry. |
| Stage II | • Early 1960’s, brand recognition was very important  
          • Concept of marketing embraced to gauge consumer needs and strengthen image of company through advertising and promotion.  
          • Marketing function added to company structures.  
          • Rapid growth of apparel companies created focus on finance and cost containment. |
| Stage III | • Late 1960’s, marketing executives took on increased responsibilities and authority in the organization  
          • To fulfill consumer demands, product development departments were established with creative design capabilities.  
          • To bridge the gap between rigid business structure and creativity, a new function emerged: merchandising.  
          • Early merchandisers focused on overseeing the design function to ensure |
that market data was interpreted into desirable product lines in a timely manner.

Stage IV

- The companies which could interpret rapidly changing consumer needs prospered in 1970s and 80s.
- This prosperity depended on talents of new breed on professional apparel merchandisers.
- Large companies at this time were looking to global sourcing (contracting production in factories worldwide).
- This function fell under the purview of merchandiser.
- Merchandiser rose to the level equal to marketing in the management hierarchy.
- Product Development became vital to the success of apparel companies and merchandiser was the key to that success.

Stage V

- Due to increasing complexities of product development and global sourcing as well as extraordinary amount of time required to set up and monitor the sourcing process, some companies established sourcing as a separate function, which is handled by the merchandiser.

<table>
<thead>
<tr>
<th>Table-2.2- Evolution of Fashion Industry Structure</th>
</tr>
</thead>
</table>

2.8.3 Modern Merchandising

Merchandising Defined

Fashion requires talented executives with a keen sense of the marketplace and finely honed management skills that enable them to make the critical decisions needed to keep a company profitable. The driving and central force in today’s apparel business is merchandising (Rosenau and Wilson, 2006).

The term merchandising means simply to buy and sell commodities for a profit. In the fashion business, the role of merchandising may vary based on whether it is performed in the retail or manufacturing context. In the retail environment, retail fashion merchandising is the buying of apparel and selling them to the ultimate consumer for a profit. In the manufacturing environment, involves conceptualization, development, procurement of materials, sourcing (the process of deciding where and how to manufacture the product) of production and delivery of apparel products to retailers. Major retailers develop and have their own private label apparel (products that are
developed and produced exclusively for their store) and some manufacturers have opened their own retail stores.

Merchandising is defined as activities undertaken to ensure that the right product reaches at the right price in right quantity and at the right time to the final destination. (Gowrek, 2004).

Despite the confusion around the term sourcing in the literature, global sourcing activities are considered one of the most important firm strategies in achieving competitive advantages (Muhammad and Brookshire, 2011). Researchers found that successful global sourcing could be achieved via specific business activities, such as planning, logistics, operation, time management, communication, research, networking, and negotiation in the global marketplace. Thus, sourcing personnel are not only expected to have relevant job qualifications, including knowledge of global culture, economics, policies, environment, research, networking, communication, and foreign language, they are also required to have the skills necessary to make decisions that are intricate, multidimensional, and potentially firm altering, including the ability to become specialized in the art of negotiations.

For apparel firms, the merchandising constituency plays an integrative role by focusing on planning, development, and presentation of product lines for target markets. However, as firms get larger and the economy becomes globalized, the responsibilities of merchandisers tend to be separated into several different functions. Additionally, production managers who used to be in charge of domestic manufacturing operations, such as plant management, product engineering, pattern making, costing, quality management, and sewing machine operation, are now working with and/or for sourcing/merchandising personnel whose main responsibility is to determine how and where manufactured goods or components will be produced and obtained in the global supply chain.

For today’s apparel firms that are operating in the global supply chain, quick response is a challenging task. For effective QR, employees must make intricate decisions while considering multi-dimensional and multi-departmental impacts as well as the firm’s overall goals. QR requires teamed environments, encompassing not only those within the firm but also constant communication with outside relationships.
2.8.4 Profile of Today’s Merchandiser

Societal changes, work ethics, leisure time activities, music, movies, the arts, physical fitness, vacation choices, eating trends, attitudes, philosophies of life, geopolitics, reading habits, language, global economy and climatic changes all have an effect on fashion preferences (Rosenau and Wilson, 2006). Today’s merchandiser must be constantly aware of subtle changes occurring in their target market and be acutely sensitive to the market environment.

To achieve control while developing, executing and delivering a product line that meets the rapidly changing needs of the target market, requires a very special management professional. Today’s apparel merchandiser must be a blend of logical, analytical thinker, and an intuitive, expressive, creative individual. The merchandiser must be able to rigoursly plan and control the functions involved in developing product, sourcing it and getting it to the customer on time, as well as have a keen understanding and appreciation for creative design. It is this balance of solid and analytical thinking that makes the ideal merchandiser such a unique individual.

2.8.5 Traits of a Merchandiser

In today’s high-tech, competitive global apparel industry, a merchandiser must possess a rare blend of traits, skills and experience. In addition to experience, a merchandiser should be (Rosenau and Wilson, 2006):

i. An independent thinker with ability to maintain a steady course toward the long term company objectives while under pressure from sales, marketing, and manufacturing requirements.

ii. An entrepreneur by being assertive in leading the company in new directions while taking risks based upon an innate feel for the market

iii. Flexible with the ability to change with the changing demands and timetable of the marketplace.

iv. A leader, demonstrating the ability to gain the respect and cooperation of other members of the management team while making the critical decisions needed to keep the company ahead of competition.
v. A communicator with the ability to express new ideas and concepts clearly and persuasively and also being capable of convincing the design team to translate subtle styling indicators into firm style trends.

vi. Dedicated with a focused commitment on maintaining a clear vision of the company’s target market and styling direction.

vii. Organised, exhibiting the ability to maintain a disciplined business atmosphere while managing many functions simultaneously and meeting critical deadlines.

A fashion merchandiser needs to be (Gowrek, 2004)

a) Versatile and flexible as the buying schedule may include many tasks.

b) Enthusiastic, self motivated, creative, imaginative

c) Conscientious, professional, decisive and numerate.

d) Foresighted and people’s person

The required skill sets of personnel who source in various apparel firms essentially are (Muhammad and Brookshire, 2011):

*Organizational and multi-tasking skills*- Due to the complex global supply chain, fast-paced environment, and multifaceted cultural relationships found in the global T&A industry, a great deal of organizational and multi-tasking skills are required for merchandisers.

Merchandisers must be able to detect and pay attention to minute details in order to organize a great amount of complex information. Moreover, even if one is extremely organized with great attention to detail, being able to perform multiple tasks at once to meet various deadlines in an organized way seemed an important skill that merchandisers must have.

*Computer skills*- Basic computer skills are the most required.

*Communication skills*- Employers seek exceptional communication skills in merchandisers who are extensively involved in managing relations and business operations with foreign business partners as well as domestic co-workers, implying different communication skills may be necessary for different communication parties. Communication skills include excellence in both oral and written communication skills.
2.8.6 Responsibilities of the Merchandiser

Muhammad and Brookshire’s (2011) study results revealed daily duties of merchandiser as:

i. **Vendor management**- Vendor relationship building and maintenance are considered one of the most important firm activities because vendors or suppliers are a critical element of a firm’s profitability.

ii. **Product development** - The knowledge of product development and its role in global sourcing seemed to be important for merchandisers. The responsibility could be as small as acquiring materials for product development, extending to dynamic work relationships with product developers. Merchandisers must understand the product development process and international sourcing. Also a time and action calendar, to communicate the significance of timely follow-ups in sourcing is a prerequisite.

iii. **Production management** - The study data showed that merchandisers are responsible for managing entire production or manufacturing processes. The responsibility could start with managing order fulfilment and tracking order status to keen supervision of products being manufactured. In overseeing production, it was not surprising to find that merchandisers seemed to be responsible for three major production factors – cost, on-time delivery and quality. To achieve the objectives of cost, delivery, and quality, merchandisers are responsible for resolving production issues and problems with vendors. Sourcing personnel must know different objectives of costing and quality assurance. Other responsibilities, such as scheduling, vendor performance tracking, and quality evaluation may help achieve cost, delivery, and quality objectives.

iv. **Internal collaboration** - Collaboration helps to foster internal relationships between colleagues with whom individuals can consult about work related matters that internal interactions among different constituencies to negotiate and resolve various conflicts may occur during planning, managing, and executing processes. Apparel firm employers sought merchandisers to coordinate meetings, interface between departments, and play a liaison role within all levels of the firm. Merchandisers work closely with the quality assurance, importing, logistics and legal departments, suggesting a wide range of responsibilities directly related to various departments. Well-orchestrated
sourcing activities require the interactions between merchandisers and other department in order to actively resolve discrepancies that may occur

Ali and Ali (2010) have described merchandising as
i. Merchandising can be termed as heart of making a product fail or pass
ii. Merchandising can be a difference between winning or losing a project/customer.
iii. Merchandising means finding new customers and markets.
iv. Merchandising means retaining the customers and extracting more orders from them
v. Merchandising means making the customers delighted/satisfied on one hand and bringing profits for the company on other.
vi. Merchandising means bridging communication gap between the company and its customers.
vii. Merchandising means completion of project/order placed by the buyer as per its requirements in right time, quality and quantity.

The role of merchandiser in textile industry has been vital since the beginning of the trade, the only thing that has changed is the shape of the supply chain in modern world which is clearly in a process of shifting from supply chain concept to value chain, or in other words, from brand oriented to customer oriented.

The responsibilities of merchandiser are changes from company to company, according to structure they adopt. The traditional merchandising role is integrated with the buying, which merchandising team has responsible for both the planning and stock allocation

There has been an increase in the responsibilities of merchandisers along the whole supply chain, both at the supplier end and the retailer end. The major problem still faced at both ends of the supply chain is the lack of coordination and communication.

To co ordinate various activities of the buyer, buying house and apparel exporter, each one of them has merchandisers. A merchandiser in each organization then ensures that the succeeding /preceding supply chain entity is linked with all other functions/departments in their organization through them.
### The Roles of Merchandisers of Various Levels of Supply Chain

<table>
<thead>
<tr>
<th>Planning and Control</th>
<th>Merchandiser of Buyer</th>
<th>Merchandiser of Agent/Buying House/Liaison Office</th>
<th>Merchandiser of Factory/Manufacturing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and control</td>
<td>Plans entire season- new trends, colours, design, analyse the inventory, forecast the consumption or target sales by analysing the previous sales. Distributes the orders for production to the suppliers with respect to the lead time, quantity and the budget.</td>
<td>Identifies the manufacturing resources for a particular order on the basis of financial soundness and reputation of the firm and also on the basis of the product and the price of the product. Plans follow ups and coordination schedules</td>
<td>- Production planning and control by coordinating with managers of various departments. - Plans about procurement of raw materials, fabric, consumption, sewing, trims for the required order. - Determines cost for the complete order. Coordinates with the major operations and departments required for completing the order. - Coordinates and helps in product development and sample making.</td>
</tr>
<tr>
<td>Procurement methods</td>
<td>The buyer’s merchandiser might have nominated raw material suppliers, testing agencies and logistics and freight forwarders. If they do, this information is passed on to agents or suppliers. If not agents/ suppliers have to identify appropriate suppliers on their own</td>
<td>Coordinates with the merchandiser of the factory and gives details of the raw materials required. It is then job of the merchandiser of the factory to do the procurement.</td>
<td>Has to coordinate with the supplier of a particular raw material for e.g., yarn or trims etc and then deciding the purchase by matching it with the cost sheet which is planned before the purchase.</td>
</tr>
<tr>
<td>Information flow</td>
<td>Buyers’ Merchandiser</td>
<td>Agent/Liaison Office Merchandiser</td>
<td>Factory’s Merchandiser</td>
</tr>
</tbody>
</table>

Table 2.3 – Role of Merchandisers in Supply Chain
(Source- Adapted from- The role of merchandiser in managing the supply chain, Ali and Ali, 2010, http://hdl.handle.net/2320/6708)
Jobs of a Merchandiser in an apparel manufacturing company can be seen as follows in the table

<table>
<thead>
<tr>
<th>Pre-production</th>
<th>Production</th>
<th>Post- production</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Product Development and Sampling</td>
<td>-Production and Line Planning</td>
<td>-Shipment Status</td>
</tr>
<tr>
<td>-Costing and Negotiation</td>
<td>-Fabric and Trim Sourcing</td>
<td>-Vessel / Flight Planning</td>
</tr>
<tr>
<td>-Fits and Pre-Production Approvals</td>
<td>-Maintaining Records</td>
<td>-Documentation</td>
</tr>
<tr>
<td>-Color / Fabric approval</td>
<td>-Fabric Booking</td>
<td>-Payment Follow up</td>
</tr>
<tr>
<td>-Fit approval</td>
<td>-Trim Confirmations</td>
<td></td>
</tr>
<tr>
<td>-Plan Factory Capacity and Allocations</td>
<td>-Testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Product Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Production follow up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Quality Audits</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.4 - Jobs of a Merchandiser in an apparel manufacturing company
(Source: Paper Presentation by the author at International Conference on Apparel and Home Textiles, New Delhi, Sept 2008)

As discussed by various authors, the key responsibilities of a merchandiser are:

a) Market Knowledge-A merchandiser must have an intimate and comprehensive knowledge of his or her company’s target market (Rosenau and Wilson, 2006).

b) Planning and Control-These actions encompass all departments of an apparel company (Stone, 2008).

c) Product Development-Many apparel and retail companies offer new styles every month. The number of increased offerings creates an almost continuous styling mode in most design departments. Merchandising must provide rigorous controls of the product development process (Myers-McDevitt, 2010).

d) Costing-Developing accurate cost estimates for new products is a critical merchandising function. This cannot be done without a thorough understanding of manufacturing process and a command over math (Stone, 2008).

e) Interfacing with Sales and Marketing-Line planning, style selection and line presentation require a close working relationship among merchandising, sales
and marketing. Throughout the product development process, merchandising should be obtaining valuable inputs from sales and marketing as to how current styles are selling at retail and trend projections for retail buyers (Stone, 2008).

f) *Production Authorization*- Many apparel companies commit to production before meaningful sales have been generated. In many companies merchandiser is directly responsible for production authorization with the help of tools like past sales histories, current market research, advance sales advice and sales forecasting models (Stone, 2008).

g) *Interfacing with Manufacturing*- Since in many companies the merchandiser authorizes production, it is important for the merchandiser to maintain close links with manufacturing (Kunz, 2010).

h) *Materials Management*- Raw materials including fabrics, trims etc can represent from one third to one half the total cost of a garment. The purchasing and scheduling of these raw materials must be programmed for delivery as close to their required usage as possible. In many organizations, merchandisers select all raw materials. The planning, ordering, and follow up of delivery and utilization of material enables merchandisers to gain valuable knowledge of the operations of merchandising department (Kunz, 2010).

i) *Sourcing*- Depending upon the size and departmentalized structure of the organization, sourcing may be the sole responsibility of merchandising; it may be an independent, senior level management function; or it may be a shared responsibility. Whichever the case, the merchandiser must understand the complexities of domestic and international sourcing (Donellan, 2007).

### 2.8.7 Market Knowledge

Market knowledge is the comprehensive understanding of a company’s markets and products (Rosenau and Wilson, 2006). This knowledge is the foundation upon which a successful merchandising effort is built. In order to obtain market knowledge, a merchandiser and product manager must master the available technologies, research techniques and management principles that can monitor changes in the market. This requires a combination of technical knowledge and practical experience.

To obtain and update their market knowledge, merchandisers and product managers utilise the following resources:

i. Shopping the market-visiting retail stores
ii. Meeting with retail buyers and store managers
iii. Researching the consumer marker by utilizing focus groups, consumer panels, mall intercepts, surveys and point of sale data capture
iv. Shopping fabric and trim markets
v. Reading trade and business journals and periodicals
vi. Observing lifestyles and tastes within the market community
vii. Utilizing services of styling consultants and forecasting services
viii. Using Internet for research
ix. Industry associations
x. Attend national and international trade shows

2.8.8 Planning and control of merchandising function

Effective planning and control are vital to the success of today’s apparel companies (Stone, 2008). The function of development, execution, and delivery of apparel product lines is becoming increasingly complex and time critical. To be consistently successful season after season, apparel merchandisers must utilize powerful planning and control tools.

The production relationships in apparel industry move from country to country and factory to factory in search of best tax deals and lowest labor costs and to be successful in this global market place, the following must be overcome (Bae and Plumlee, 2005):

i. Communication: because of differences in language
ii. Differences in cultural and business paradigms
iii. Long distances and hence time to travel to various countries for product development and price negotiations
iv. Scheduling problems: due to varying production lead times, logistic capacities and shipping schedule
v. Stability: due to varying economic conditions in each country, human rights issues

Changing Consumer Demands

Retailers and consumers demand more frequent offerings of more and more styles (Stone, 2008). Merchandisers are confronted with ‘seasonless’ seasons. The spring, summer, fall and winter offerings have evolved into product lines that for many
companies change on a monthly basis. Retailers want a constant offering of fresh new products to draw customers into their stores and consumer await next fashion change. All this can only be done by very strong planning tools

With today’s rigorous consumer demands, merchandisers must establish clearly defined operating plans and utilize precise methods of control. Without careful planning merchandisers would ‘by failing to plan, plan to fail’. With greater competition and less time to develop that meet rapidly changing consumer demands, merchandisers must perform their responsibilities with greater precision. This requires well defined planning and disciplined execution of all merchandising functions.

**Marketing Calendar**

The merchandising calendar is the basis of all merchandising planning in apparel companies (Stone, 2008). The calendar is the central mechanism from which all marketing schedules, merchandising and manufacturing plans evolve. This planning tool is a clock that drives all functions of a season. The key elements of marketing calendar are:

i. Line preview dates by season

ii. Line release dates by season

iii. Start Ship date(first date when a season’s orders can be shipped to retailers)

iv. End Ship date(Last date when season’s orders can be shipped to retailers without incurring penalties)

v. Weekly sales plans

vi. Weekly shipping plans

Line preview date is the merchandiser’s deadline for having all prototypes and pricing for a new product line completed. Merchandiser work backwards from this date to create their product development plans. The line preview date is often the date the seasonal sales meetings where the merchandising teams present the line to the sales force. The final line adoption committee meets prior to the line preview date to select those styles that will be included in the final seasonal line.

The merchandiser has to ensure sales samples from prospective factories are ready for this meeting.
2.8.9 Merchandising Calendar

The primary control tool when developing a seasonal line in an apparel company is the merchandising calendar or line plan calendar (Lee and Kunz, 2001). This is a very critical instrument designed to control key events, needed to get the right apparel products, in the right mix, at the right prices, to the customer at the right time. The other names for this tool are-critical path calendar, critical task calendar, or line calendar. The basic ingredients of a successful apparel season are:

i. Manufacture what the consumer wants relating to style, quality and cost.

ii. Deliver the proper product mix on timely basis

iii. Maintain low raw material, work-in-process, and finished goods inventories. This increases inventory turns, which reduces the amount of operating capital needed to run the company. Inventory turns equal to the annual value of total inventory created divided by average value of inventory throughout the year.

iv. Accommodate changes with split second timing

2.8.10 Line Development Principles

Line development is the creation of a line, also referred to as collection (group of garment styles that is presented to consumers for sale and delivery during a specific time period). Large companies may have a number of different lines, each targeted to specific customer categories such as evening wear, sportswear, outerwear, active sportswear or even petite size lines. Some of these companies have men’s, women’s and children’s divisions, each offering a number of different lines (Rosenau and Wilson, 2006).

Apparel merchandisers play a pivotal role in controlling the process. The key to better control of the line development process, the merchandiser must:

i. Understand: acquire and maintain thorough sense of the market and target consumer

ii. Conceptualise: Quickly and effectively visualize new styling ideas and communicate the concepts

iii. Create: the ability to develop finished garment styles that meet the expectations set forth in the conceptualization stage through an efficient design process.
The Creative Process
The driving force behind effective line development is creativity (Rosenau and Wilson, 2006). This ability to visualize a concept that will capture the essence of consumer’s buying urge almost a year in advance is not easily quantifiable. Creativity is affected by the design environment and corporate product development philosophy, which is often established, interpreted, and controlled by the merchandiser. Merchandiser is the facilitator of the design process. Good merchandisers must be able to understand the creative abilities of their designers and provide a healthy environment that enables the designers to achieve the most effective styling results. In order to function as a facilitator, a merchandiser must possess a thorough understanding of the creative elements of design and also have good foundation of business principles. It is this unique blend of right and left brain abilities that allows merchandiser to maintain the necessary balance between business management controls and creativity.

The Process of Line Development
The process of line development consists of many complex interrelated functions that build on one another and that must be carefully monitored and controlled (Kwak, 2004).

Response Time- It is the time taken from beginning the line development process through shipment of the styles in that line to the retailers. Leading apparel companies and retailers have focused on the line development process in their quest to shorten lead times. This initiative, which brings Quick Response (QR) philosophy to line development, has been effective because of advances in computer aided design and graphic systems, Internet Web based research capabilities, PLM systems and improved communications through Email and video conferencing.
Web based product information systems allow merchandisers, designers, and manufacturing sourcing facilities to have access to important information, 24 hours a day. Applying Quick Response strategies to the line development process has allowed companies to cut 26 to 40 week cycles to as few as 2 weeks.
Zara is the flagship brand for the Spanish retail group, Inditex SA. The company believes, this business is all about reducing response time and in fashion stock is like food, it goes bad quick (Tokatli, 2007).

Zara contributes 80% of the group’s sales, and follows a three pronged approach to freshly baked fashion:

a) Shorter lead time leads to More Fashionable clothes
b) Lower quantities means Scarce supply
c) More styles means More Choice, the chances of hitting right are higher.

Design Environment – A critical role of merchandising in the line development process is to establish and effective, creative environment (Rosenau and Wilson, 2006). This involved developing design spaces where all creative personnel can interact and share inspiration and ideas. Merchandisers must establish this environment of free expression but still maintain control of the line development process in order to meet deadlines and line plan objectives.

Research- Successful companies are those that have the best understanding of their target markets (Rosenau and Wilson, 2006). This intimate knowledge of a company’s target market and ability to predict that market’s apparel requirements is achieved through extensive market research, trend analysis and data collection. Merchandising has the responsibility of translating marketing strategies into salable product lines and deliver them to their customers at the right price at the right time.

Market Research-In the preliminary stages of line development, merchandiser can determine the characteristics of a market through market segmentation studies or by collecting data directly from a company’s target market.

Fashion Trend Research-Merchandisers must keep a constant eye on the fashion marketplace (Gowrek, 2004). Keeping abreast of the developing trends can be achieved through:

i. Reading trade publications
ii. Reading international fashion magazine
iii. Using predictive services
iv. Shopping the competition
v. Researching fashion websites
vi. Attending international fashion shows

*Color Research*- Color trends play a key role in the line development process. The color palettes that evolve for a specific season can have direct influence on fabric choices and silhouette development. Color forecasts are provided by fibre and textile companies as well as various fashion forecasting companies.

*Fabric and Trim Research*- The sources for fabric/trim research could be fibre companies, international fabric/trim shows, trade publications, fabric/trim manufacturers.

*Styling Direction*- This involves creating styling concepts that meet the needs of the target market and that will stimulate the creative efforts of the design team *(Donellan, 2007)*. The primary factors considered in this process are colors, fabrics, silhouettes.

*Product Development*- It is the process of creating individual style within the line. After the research phase of line development is completed, silhouettes are developed, fabrics and trims selected, prototypes made and specifications created. The resulting styles are analysed to determine manufacturing costs.

*Fabric Selection*- Donellan,(2007) says the following factors are taken into consideration while selecting fabrics:

  i. Fiber Content
  ii. Fabric construction(basic structure)
  iii. Prints
  iv. Color Range
  v. Performance Characteristics(wear factors, care requirements, sewing compatibility and drape)
  vi. Versatility for use in multiple styles
  vii. Price and terms
  viii. Availability
  ix. Minimum Order Quantities
Silhouettes- Silhouettes determine the exact shape of the garment and hence are very important to determine technical details like types and seams and stitches and trims to be used. Silhouette development involves transforming garment ideas into final garment sketches or technical drawings, which are hand or CAD renderings.

Line Sheets- As designers select fabrics and develop silhouettes, they are focusing on filling the requirements of the line plan (Myers-McDevitt, 2010). Line sheets are created for each style group in the line plan with space allocated for number of styles planned for the group. The designers provide sketches for style in the group along with corresponding fabric swatches and pertinent prototype information. These line sheets are constantly review by the merchandiser to keep the product development process on schedule.

Prototyping- It is also called first sample. This is the first critical opportunity for the product development team to see an actual garment and try it on a fit model.

Pre Costing- The prototype process provides an opportunity for the development of data that will determine the estimated manufacturing cost for each new style. Merchandisers should have comprehensive databases of product costs and effective cost accounting or cost engineering support. These data along with feedback from prototype production can provide information for estimating the manufacturing cost of a new style. This process of preparing a cost estimate is called pre costing or quick costing by some companies.

Specifications- For the styles that are estimated to meet acceptable price points and are approved by the review committee, preliminary manufacturing specifications are prepared.

Final Costing- This process is a detailed calculation of the costs required to manufacture a style based upon available data.

Adoption- The culmination of the line development process is final line adoption. Throughout the process there are frequent executive line reviews. These are performed
by the merchandiser and members of the design team and sometimes include input from sales, marketing, and key retail buyers.

2.8.11 Merchandisers’ Responsibility for Quality Assurance
Merchandisers are expected to research and analyse quality demands of their target markets as the first stage of product development (Kunz, 2010). Based upon the end use of the garment, the merchandiser needs to understand the various quality attributes that determine consumer satisfaction. This may be difficult to determine because the consumer may not always be able to name or to describe these product attributes. There are times when a consumer’s perception of quality is different from the inherent quality (actual quality of materials, components and construction). The merchandiser must be aware that in these situations the perceived quality becomes real quality (Bye and LeBath, 2005).

Figure 2.4—Quality Factors to be considered by Merchandiser in Product Development (Source: Author)

2.8.12 Quick Response (QR); the time competitiveness of apparel supply chain
One of the most important elements in establishing and maintaining a successful apparel company is time. In the product development process, merchandisers are constantly faced with determining what consumer will want to purchase at some time in the future. The longer the time frame between developing a styling concept and
delivering the completed style to the retail stores, the greater the risk of error and associated markdowns.

The concept of QR was developed as a business strategy for textile, and retail sectors to reduce inventories, shorten cycle times and respond rapidly to changing consumer demands. In essence, one of the primary objectives of QR is risk reduction. The QR strategy involves using developing technologies in data processing and communications, evolving software applications and effective collaboration among business partners in the integrated textile complex supply chain.

The three Cs of QR are:

i. Control
ii. Communication
iii. Collaboration

*Control*-In order to respond quickly to the rapidly changing complex fashion marketplace, well defined, effective control systems must be in place throughout all areas of an apparel company especially in merchandising. Merchandising calendars, product data management, merchandising planning, forecasting and adoption, line management analysis, materials management, product sourcing, manufacturing systems, inventory management and point of sale product performance must all be carefully controlled with accurate and responsive systems (Dhanpal and Anita, 2006).

In a QR environment, the product development process must be capable of reacting to subtle and rapid changes in the marketplace, so that style that are in the pipeline can be adjusted and new concepts can be injected into the process in time to meet production deadlines. Manufacturing and sourcing likewise must be able to perform with low work-in-process inventories to respond quickly to change and provide consistent flow of merchandise to retail consumers. Precise timetables must be established, integrated, and maintained for success. For all these processes costs must be captured, allocated and analysed.

*Communication*-Effective communication within an apparel company and with that of company’s supply chain partners is critical to attaining QR benefits. Research has shown that wait time in apparel industry is caused by raw material or finished goods inventory remaining idle until decisions are made to concerning which styles to produce or which SKUs to ship to retailers. Fast digital communications through
the use of bar codes for product and shipping container identification and electronic data interchange for fast, accurate transfer of data and exchange of business documents are necessary elements for QR communication (Doeringer and Crean, 2004).

Collaboration- Each participant in a QR partnership must be dedicated to sharing information and establishing decision making models that function within the supply chain management system. With this collaboration comes the need for trust and confidence. Since any chain is as strong as its weakest link, even if one partner is not effective at collaboration, QR partnership fails.

Collaborative Planning, Forecasting and Replenishment (CPFR) – QR strategies took the apparel industry from a reactionary mode of design, forecast, manufacture and sell to a collaborative mode of partnerships, visionary planning and control systems, consumer driven product development, and more effective electronic communications. This created a more technology driven merchandising function. Vendor Managed inventories focus on the unilateral response by apparel manufacturers to retail data relative to their product lines. The manufacturer makes all replenishment decisions without input from retailer. This one sided approach to supplier responsibility for maintaining retail inventories misses many factors that could affect ultimate sell through for a retailer (Simester et. al,1999). CPFR establishes a shared action and responsibility model for apparel manufacturers and their retail QR partners. The partners collaborate on critical decisions that will result in reduced inventories and increased sales. Some areas of this proactive collaboration are:

i. Shared business plans
ii. Joint development of evaluation criteria
iii. Information sharing
iv. Collaborative forecasts
v. Real Time Data Sharing
vi. Collaborative analysis and adjustments of forecasts
vii. Evaluation of results
viii. Adjustment of business plans
2.8.13 Training requirements of Merchandising Managers of Apparel Manufacturing Companies

A survey conducted by the Methods Apparel Consultancy (2007) covered 10 factories in which 300 people were assessed for managerial characteristics.

The survey found that –

i. Communication skills were lacking among managers.

ii. The discipline to manage a to-do list can be a vital asset in organizing one’s work.

iii. There’s a need to train managers in effective planning strategies by utilizing the data available through various management techniques. The most talented people in the organisation are mostly busy with fire fighting and shipment delivery.

iv. To further increase the level of technical expertise managers should be encouraged to continuously upgrade themselves by training and attending seminars on various new products and procedures.

v. SOPs were not present in many factories and even if they were present, they were only for decorative purposes for the buyers.

Graph 2.1 - Training requirements of Managers of Apparel Manufacturing Companies
(Source- Status of Apparel manufacturing SMES in the NCR Region-Surveys conducted by Methods Apparel Consultancy – Managers and Supervisors, 2007)
### Table 2.5- Suggested Training Areas for Apparel Industry Managers

<table>
<thead>
<tr>
<th>Suggested Course</th>
<th>Statistical Analysis</th>
<th>Urgency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>61 managers evaluated</td>
<td>HIGH</td>
</tr>
<tr>
<td>Conflict Management</td>
<td>96% were unable to achieve the required level of communication skills</td>
<td></td>
</tr>
<tr>
<td>Team Building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Management Techniques</td>
<td>92% need to acquire this knowledge</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Work Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garment Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Knowledge</td>
<td>Basic computer knowledge present</td>
<td>LOW</td>
</tr>
</tbody>
</table>

The paper by National Skill Development Corporation on Human Resource and Skill Requirements in the Textile Industry (2010) points out the following skills gaps that exists in merchandisers of Indian Textile industry:

i. Lack of soft skills for interacting with buyers in the international market.

ii. Knowledge of foreign languages is limited to English – this might prove to be an issue with India becoming a sourcing hub for garments and knitwear.

iii. Understanding of various factors affecting costing.

iv. Inadequate understanding of various production activities. The person employed picks up the requisite skills with experience.

v. Inadequate understanding of quality requirements.

### 2.9 Supply Chain Competitiveness and Performance Measurement

#### 2.9.1 Competitiveness

Firm competitiveness is the basic capability of perceiving changes in both the external and internal environment and the capability of adapting to these changes in a way that the profit flow generated guarantees the long term operation of the firm (Gelei, 2004). This definition - in accordance with the contingency approach and the evolutionary theory of firms – interprets competitiveness as an ongoing struggle for survival. This capability of survival is one of the most complex phenomena of company’s operation.
Firm competitiveness is basically a function of two factors. First, it is determined by the extent a company can identify those value dimensions that are important for their customers. These are the main characteristics of the firm’s complex product and service package a customer expects (Bitran et.al, 2006).

In the long run a company can be competitive only when it is able to create value for their customers and as a consequence contribute to their competitiveness as well. These value dimensions are the aspects of supplier selection. The second factor of firm competitiveness is the sum of resources and capabilities that makes a firm able (capable) to create and deliver the identified important value dimensions for the customer. A company can possess a very wide range of resources and capabilities. Those subsets of resources and capabilities have the biggest importance which is fundamental to the firm’s performance are called core competencies.

A company is competitive when it is able to create and deliver value for its customers. Value is created for the customer when the revenue received from a supplier exceeds the total ownership costs of the product and service package of the given supplier.

2.9.2 Competitiveness and Supply Chain Strategies

A company’s competitive strategy defines the set of customer demands that it seeks to satisfy through its products and services. A supply-chain strategy determines the nature of procurement of raw materials, transportation of materials to and from the company, manufacture of the product or operation to provide the service and distribution of the product to the customer, along with any follow-up service. The ultimate objective of SCM is to achieve a ‘strategic fit’ between the company’s competitive strategy and supply-chain strategy. This strategic fit can be achieved by understanding the customer demand, which helps the company to define costs and service requirements and understanding the supply chain that helps the company to design and manage its supply chain in accordance with the customer’s demand. If any mismatch exists between what the supply chain is capable of doing with respect to customer demands, the company can either alter the structure of the supply-chain design or alter its strategies (Kale, 2007).

The essence of supply chain management focuses on delivering the right product at the right time at each level within the supply chain. This requirement has quality, dependability, flexibility, agility, and efficiency as necessary capabilities for achieving
this goal (Vokurka, 2002). The priorities should not be considered as trade-offs for each other, but rather as complimentary and cumulative. All of these capabilities are necessary for value to be delivered to each customer at each level in the supply chain. Quality, as the foundation, allows for future ongoing developments in dependability, flexibility, agility, and efficiency. As this capability development continues, customers receive the right product at the right time, with the right price.

As firms look to competitive advantages in areas such as delivery, flexibility, and innovation, firms are increasingly managing the entire supply chain. Supply chains can improve their performance by developing competitive priorities in a specified sequence: quality, reliability, flexibility, agility, and finally, cost efficiency. Improvements realized in this sequence will yield lasting benefits that will provide a strong competitive foundation as further improvement initiatives are initiated and the supply chain is better positioned to meet future competitive challenges.

A company’s success or failure is thus closely linked to the following keys:

i. The competitive strategy and all functional strategies must fit together to form a coordinated overall strategy. Each functional strategy must support other functional strategies and help a firm reach its competitive strategy goal.

ii. The different functions in a company must appropriately structure their processes and resources to be able to execute these strategies carefully.

iii. The design of the overall supply chain and role of each stage must be aligned to support the supply chain strategy (Hoek, 1998).

Market Characteristics

In a research undertaken by Yusuf et al. (2004) on ‘agile supply chain capabilities’: the companies were asked questions related to manufacturing objectives and business performance measures. The manufacturing objectives of companies are low cost, quality, dependability, speed, volume flexibility, product customisation, and leadership in new technology products. The measures of business performance -sales turnover, net profit, market share, percentage of sales from new products, customer loyalty based on the ratio of repeat orders to total sales turnover, and overall performance against competitors
Performance Measurement

The difference between organisational success and failure is often in performance measurement and benchmarking practices (Cooper et al, 2005). Performance measures are vital to assess the health of an organisation, support managers in their decision making processes, and provide focused direction for operations. They allow an organisation to express its strategic intent and demonstrate how that strategy connects with everyday operations, and thus enabling organisational systems to create essential feedback and learning mechanism to support overall organisational goals and sustainable growth in the face of current business pressures of globalisation and profitability.

As noted in Beamon (1999), cost was the basis of performance measures in many supply chain models from the mid-1980 to the mid-1990. According to a KSA report, performance measurement in SMEs was focused on benchmarks of financial measures. Though cost is an important measure in determining performance, it should not be the sole performance measure.

Researchers have acknowledged problems with purely financial performance measurement and developed measurement systems that account for non-financial measures, such as time and capacity utilization, in addition to incorporating qualitative measures, such as customer satisfaction, information flow, supplier performance, and risk management (Lichiello and Turnock, 1999).

Performance measurement systems involve the methods used to gauge the performance of a supply chain. Characteristics of performance measurement systems are inclusiveness (all relevant information is measured), universality (differing conditions can be compared), measurability (data can be measured), and consistency (measures are consistent with organizational goals). These characteristics can be used as a starting point for analyzing performance measurement systems. Research in performance measurement systems involves identifying performance measures, grouping these measures, and developing frameworks for performance measurement systems (Shaw, 1999).

In certain developing countries, such as India, performance improvement efforts are being concentrated on improving productivity (Bheda, 2002). Also, the Joint Apparel Association Forum (JAAF), an industrial association in Sri Lanka, has undertaken a productivity improvement program to increase process efficiency (Joint Apparel
Association Forum, 2007). However, instead of simply improving productivity, companies should understand the basis of performance measurement in their supply chain and improve their operations to meet the terms of performance of their suppliers and customers (Kapuge et. al 2007). This idea is illustrated by the Triple P-model wherein performance is constructed of profitability and productivity, and includes attributes of quality, delivery, speed, flexibility, and price recovery.

In a study undertaken on ‘Performance Management Systems in Manufacturing Companies in New Zealand by Carr and Hasan (2008) , the most frequently used performance measure was production followed by human resource measure and lastly financial measure. 73% of the respondents of this study felt that their organisation’s performance and annual cost savings had improved as a result of performance measurement systems.

2.9.3 Supply Chain Performance Measurement Systems

1. Benchmarking

Benchmarking is a systematic management process which helps managers to search and monitor the best practices and/or processes (Lapide, 2000). The search for the best practices may not be limited to direct competitors. The goal is to emulate and exceed the ‘best in class’.

Benchmarking study generates a comprehensive set of fact-based performance measures that can be used to accurately describe a world-class supply chain of plan, source, make and deliver activities. The aim of benchmarking is to help companies take a broad supply chain process perspective by quantifying performance improvement opportunities across the entire supply chain. The comprehensive benchmarking study may cover four areas, which are identified as the ‘keys’ to unlocking supply chain excellence:

   a) Delivery performance;
   b) Flexibility and responsiveness;
   c) Logistics cost
   d) Asset management

The metrics for these key areas are as below:

   i. Delivery performance including: delivery-to-request date; delivery-to-commit Date; order fill lead time.
ii. Flexibility and responsiveness including: production flexibility; re-plan cycle; cumulative source/make cycle time.

iii. Logistics cost including: total logistics cost; order management costs.

iv. Asset management including: inventory days of supply; days of sale

v. Outstanding

2. Supply Chain Council’s SCOR Model

The Supply Chain Council’s SCOR Model provides guidance on the types of metrics one might use to get a balanced approach towards measuring the performance of one’s overall supply chain (Supply Chain Council, 2000)

The SCOR Model approach advocates a set of supply chain performance measures comprised of a combination of:

i. **Cycle time metrics** (e.g., production cycle time and cash-to-cash cycle)

ii. **Cost metrics** (e.g., cost per shipment and cost per warehouse pick)

iii. **Service/quality metrics** (on-time shipments and defective products)

iv. **Asset metrics** (e.g., inventory level, inventory turnover)

SCOR Model approach directly addresses the needs of supply chain management with balanced measurements. Figure 2.6 depicts an illustrative set of supply chain measures balanced among the SCOR Model’s top-level processes

![SCOR Model Diagram](image-url)
3. The Logistics Scoreboard

Another approach to measuring supply chain performance recommends the use of an integrated set of performance measures falling into the following general categories (Lapide, 2000):

a. Logistics financial performance measures (e.g., expenses and return on assets)
b. Logistics productivity measures (e.g., orders shipped per hour and transport container utilization)
c. Logistics quality measures (e.g., inventory accuracy and shipment damage)
d. Logistics cycle time measures (e.g., in-transit time and order entry time)

Contrast to the other approaches discussed, The Logistics Scoreboard is prescriptive and actually recommends the use of a specific set of supply chain performance measures. These measures, however, are skewed toward logistics, having limited focus on measuring the production and procurement activities within a supply chain.

4. Activity Based Costing

The Activity-Based Costing (ABC) approach was developed to overcome some of the shortcomings of traditional accounting methods in tying financial measures to operational performance (Lapide, 2000). The method involves breaking down activities into individual tasks or cost drivers, while estimating the resources (i.e., time and costs) needed for each one. Costs are then allocated based on these cost drivers rather than on traditional cost-accounting methods, such as allocating overhead either equally or based on less-relevant cost drivers. This approach allows one to better assess the true productivity and costs of a supply chain process. For example, use of the ABC method can allow companies to more accurately assess the total cost of servicing a specific customer or the cost of marketing a specific product. ABC analysis does not replace traditional financial accounting, but provides a better understanding of supply chain performance by looking at the same numbers in a different way.

ABC methods are useful in conjunction with the measurement approaches already discussed as their use allows one to more accurately measure supply chain process/task productivity and costs by aligning the metrics closer to actual labor, material, and equipment usage.
5. Economic Value-Addition (EVA)

One of the criticisms of traditional accounting is that it focuses on short-term financial results like profits and revenues, providing little insight into the success of an enterprise towards generating long term value to its shareholders – thus, relatively unrelated to the long-term prosperity of a company (Lapide, 2000). For example, a company can report many profitable quarters, while simultaneously disenfranchising its customer base by not applying adequate resources towards product quality or new product innovation.

To correct this deficiency in traditional methods, some financial analysts advocate estimating a company’s return on capital or economic value-added. These are based on the premise that shareholder value is increased when a company earns more than its cost of capital. One such measure, EVA, developed by Stern, Stewart and Co., attempts to quantify value created by an enterprise, basing it on operating profits in excess of capital employed (through debt and equity financing). Some companies are starting to use measures like EVA within their executive evaluations.

Similarly, these types of metrics can be used to measure an enterprise’s value added contributions within a supply chain. However, while useful for assessing higher level executive contributions and long term shareholder value, economic-value added metrics are less useful for measuring detailed supply chain performance.

6. Balanced Score Card (BSC)

The BSC was introduced by Kaplan and Norton (1992). Traditional business performance metrics are only financial; examples are return on investment (ROI) and price/earnings. The BSC, however, distinguishes the following four different types (dimensions) of performance metrics (Kleijnen and Smits, 2003).

(i) Customers: SCM examples are the fill rate in case of mass products, and conformance to specification in case of ‘built to order’ products.

(ii) Internal processes: Examples are Work-in-Process (WIP) inventory, resource utilization and throughput.

(iii) Innovation: The division discussed above calculates the ‘best in class’ and the ‘best improver’ among its business units we might add the amount of new IT investments for SCM.

(iv) Finance: WIP may be expressed in value added instead of physical units; SCM should increase profit, market share, and other financial metrics.
If firms take action by linking their performance measurement systems to their supply chain practices, they will be better positioned to succeed in their supply chain initiatives (Brewer and Speh, 2001). Balanced scorecard is designed to help firms that have historically over emphasised short term financial performance. BSC provides a mechanism to achieve a balance between financial and non financial results across short term and long term horizons.

2.9.4 Supply Chain and Performance Measurement

In order to assess the overall performance of a supply chain, performance measurement is needed (Nowell, 2005). Companies are not only competing product to product but also in the area of logistics processes to achieve maximum asset utilization and operational efficiency.

As more products are becoming a commodity, companies also have to compete on the service with which a product is delivered. Companies have to use logistics to differentiate themselves. Globalization has led to very long supply chains, which must be flexible, lean, and agile with minimum inventory levels. As the market becomes more complex, performance measures will have to be a priority in order to meet customer demands (Saini, 2007).

In order to be successful in performance measurements companies must make sure that the performance measures are in synch with the company strategy, and also understand customer expectations and the cost of providing logistics services.

Studies have found that when on-time delivery is measured, the supplier and customer rarely defined the term jointly. Satisfying customer expectations can be very difficult when performance metric terms have not been defined and agreed upon by all parties involved. By measuring performance a company can prove to customers that they are meeting goals, and they may prove that suppliers are not meeting goals. Either way, areas for improvement are identified.

Performance measuring also helps a company to better understand how well they are meeting the expectations of their customers and how to correct problems before they occur. Research has found that a company can benefit from a structured measurement program in three areas:

Reducing operating costs, improved customer service and new growth opportunities.
Companies’ measures to evaluate performance include:

a. On-time delivery,
b. Order fill rate,
c. Invoice accuracy,
d. Performance to request date,
e. Order cycle time,
f. Customer service,
g. Stock-outs/back orders,
h. Over/short/damaged, performance to commit date,
i. Line item fill.

Effective performance measures can help to understand which suppliers offer the lowest costs, what customers are the most profitable, and which services are adding the most value.

Researchers have recognized the main integrated supply chain performance measures as time and customer satisfaction. Customer satisfaction could be found by measuring

a) Perfect order fulfilment,
b) Product quality,
c) Delivery-to-commit date,
d) Warranty costs,
e) Returns,
f) Customer-inquiry response time.

Time can be measured through

a) Order fulfilment lead time,
b) Source/make cycle time,
c) Supply chain response time,
d) Production plan achievement.

Beamon (1999) presented an evaluation of performance measures used in supply chain models and supplied a framework for performance measurement selection. She suggested that the performance measures chosen must be inclusive, universal, measurable, and consistent. The performance measures used in supply chain models to date are

a) Cost,
b) Customer responsiveness,
c) Activity time,
d) Flexibility,
e) Customer satisfaction,
f) Information flow,
g) Supplier performance,
h) Risk management.

Performance measures can be used singly or jointly. Using a single measure exhibits simplicity, but it must describe all aspects of the supply chain in order to be accurate. Beamon’s framework suggests that a measurement system should include one measurement from three identified types: resources, output, and flexibility. Resources are meant to measure efficiency, output measures customer service, and flexibility measures a company’s ability to respond to a changing environment.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Output</th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Total Cost</td>
<td>-Number of items produced</td>
<td>-Volume Flexibility</td>
</tr>
<tr>
<td>-Distribution Costs: Total cost of distribution, including transportation and handling costs.</td>
<td>-Time required to produce a particular item or set of items</td>
<td>-Delivery Flexibility</td>
</tr>
<tr>
<td>-Manufacturing Cost: Total cost of manufacturing, including labor, maintenance, and rework costs</td>
<td>-Number of on-time deliveries (orders)</td>
<td>-Mix Flexibility</td>
</tr>
<tr>
<td></td>
<td>-Customer Satisfaction</td>
<td>-New Product Flexibility</td>
</tr>
<tr>
<td></td>
<td>-Product quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Sales: Total revenue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Profit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Fill Rate: of items</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-On-Time Deliveries</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Back Order/Stock-out</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Customer Response Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Manufacturing Lead Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Shipping Errors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Customer Complaints</td>
<td></td>
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</tbody>
</table>

Table 2.6- Framework of Supply Chain Performance Measurement

Gunasekaran et al. (2004) suggested that process control along a supply chain is imperative to improving performance and can be achieved through measurement. Individual companies will succeed faster at maximizing their supply chain potential by developing the performance measures and metrics needed to fully integrate the entire
chain. The measurements used should be understood by all members of the supply chain, and all members should be performing to achieve the same organizational goals. 

Gunasekaran et al. (2004) discussed supply chain metrics and measures in the context of the activities: plan, source, make/assemble, and delivery/customer. The most important metrics for order planning are the order entry method, order lead time, and the customer order path. The order entry method illustrates how customer requirements are converted into information that is distributed along the supply chain. Measuring order lead time is important because a reduction in lead time leads to a reduction in response time. The customer order path is an important measure in that the time spent in different channels can be determined and non-value adding processes can be acknowledged.

Measuring a supplier’s performance performs measuring sourced goods. Measuring a supplier’s performance is important to ensure that they are performing up to customer expectations and to ensure that they are working towards the same goals as the rest of the supply chain. Supplier performance measurements include

i. Lead time
ii. Quality
iii. Cost savings initiatives
iv. Pricing against the market
v. Purchase order cycle time
vi. Capacity flexibility
vii. Technical expertise
viii. Customer service
ix. Defect rate
x. Production
   a) product range
   b) capacity utilization
   c) scheduling

Product range affects supply chain performance in that company with a wide range of products usually add less value per employee and lack in speed and delivery reliability. Capacity utilization is important because it directly affects the response time to satisfy the customer demand. Scheduling determines how goods will flow in operation, which directly impacts production and performance.

Delivery is the link in the supply chain that directly affects the customer.
i. time delivery, 
ii. faultless invoices, 
iii. flexibility, 
iv. total distribution costs.

The results of Gunasekaran et al. (2004) survey provided the measures that are deemed as the most beneficial in the four concentrated areas. The performance metric rated as ‘highly important’ for planning was customer query time, while the most important for supplier metrics was supplier delivery performance. The defect percentage, cost per operation hour, and capacity utilization were rated as highly important for production metrics, and quality, on-time delivery, and flexibility were the most important for delivery metrics.

Globalization has led to very long supply chains, which must be flexible, lean, and agile with minimum inventory levels. As the market becomes more complex, performance measures will have to be a priority in order to meet customer demands.

The information required for performance measurement could be: products and services offered, sales, market share, cost, quality, delivery, cycle times, assets utilized, responsiveness and customer service (Handfield, 1999). In order to be successful in performance measurements one must make sure that the performance measures are in synch with the company strategy, and one must also understand customer expectations (Cooke, 2001).

In a study of 350 companies by Cooke (2001), majority surveyed said that they had metrics in place to measure performance, but few were measuring performance with both suppliers and customers. The study also found that when on-time delivery was measured, the supplier and customer rarely defined the term jointly. Satisfying customer expectations can be very difficult when performance metric terms have not been defined and agreed upon by all parties involved. By measuring performance, a company can prove to customers that they are meeting goals, and they may prove that suppliers are not meeting goals. Either way, areas for improvement are identified.

Performance measuring also helps a company to better understand how well they are meeting the expectations of their customers and how to correct problems before they occur (Durtsche et al., 1999). The research found that a company can benefit from a structured measurement program in three areas: reducing operating costs, improved customer service, and new growth opportunities.
<table>
<thead>
<tr>
<th>Supply chain activity/ process</th>
<th>Strategic</th>
<th>Tactical</th>
<th>Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Level of customer perceived value of product, Variances against budget, Order lead time, Information processing cost, Net profit Vs productivity ratio, Total cycle time, Total cash flow time, Product development cycle time</td>
<td>Customer query time, Product development cycle time, Accuracy of forecasting techniques, Planning process cycle time, Order entry methods, Human resource productivity</td>
<td>Order entry methods, Human resource productivity</td>
</tr>
<tr>
<td>Source</td>
<td>Supplier delivery performance, Supplier lead-time against industry norm, supplier pricing against market, Efficiency of purchase order cycle time, Efficiency of cash flow method, Supplier booking in procedures</td>
<td>Efficiency of purchase order cycle time, Supplier pricing against market</td>
<td>Efficiency of purchase order cycle time, Supplier pricing against market</td>
</tr>
<tr>
<td>Make</td>
<td>Range of products and services</td>
<td>Percentage of defects, Cost per operation hour, Capacity utilization, Utilization of economic order quantity</td>
<td>Percentage of Defects, Cost per operation hour, Human resource productivity index</td>
</tr>
<tr>
<td>Deliver</td>
<td>Flexibility of service system to meet customer needs, Effectiveness of enterprise distribution planning schedule</td>
<td>Flexibility of service system to meet customer needs, Effectiveness of enterprise distribution planning schedule, Effectiveness of delivery invoice methods, Percentage of finished goods in transit, Delivery reliability performance</td>
<td>Quality of delivered goods, On time delivery of goods, Effectiveness of delivery invoice methods, Number of faultless delivery notes invoiced, Percentage of urgent deliveries, Information richness in carrying out delivery, Delivery reliability performance</td>
</tr>
</tbody>
</table>

Table 2.7 - Supply Chain Performance Metrics Frame Work


According to **Handfield (1999)**, the main integrated supply chain performance measures as time and customer satisfaction. He found that customer satisfaction could be found by measuring perfect order fulfilment, product quality, delivery-to-commit date, warranty costs, returns, and customer-inquiry response time. Time can be measured through order fulfilment lead time, source/make cycle time, supply chain response time and production plan achievement.

**Beamon (1999)** presented an evaluation of performance measures used in supply chain models and supplied a framework for performance measurement selection. She
suggested that the performance measures chosen must be *inclusive, universal, measurable, and consistent*. The performance measures used in supply chain models are cost, customer responsiveness, activity time, flexibility, and combinations of these. Other measures that have been used include: customer satisfaction, information flow, supplier performance, and risk management. Performance measures can be used singly or jointly.

Using a single measure exhibits simplicity, but it must describe all aspects of the supply chain in order to be accurate suggested that process control along a supply chain is imperative to improving performance and can be achieved through measurement (Gunasekaran et al, 2004).

Their research further shows that, production is one of the most important entities of the supply chain and should therefore be measured for improvement purposes. Production measurements include product range, capacity utilization, and scheduling techniques. Product range affects supply chain performance in that companies with a wide range of products usually add less value per employee and lack in speed and delivery reliability. Capacity utilization is important because it directly affects the response time to satisfy the customer demand. Scheduling determines how goods will flow in operation, which directly impacts production and performance. Delivery is the link in the supply chain that directly affects the customer.

Important delivery measures include on-time delivery, faultless invoices, flexibility, and total distribution costs. On-time delivery measures the percentage of perfect deliveries and is an appropriate measure of customer service as well. Perfect deliveries can also be measured by comparing invoices to a previously made agreement. Flexibility is an important measure in that it measures a firm’s ability to provide a product that meets customers’ demands when needed.

The results of Gunasekaran et al. (2004) survey provided the measures that are deemed as the most beneficial in the four concentrated areas. The performance metric rated as ‘highly important’ for planning was customer query time, while the most important for supplier metrics was supplier delivery performance. The defect percentage, cost per operation hour, and capacity utilization were rated as highly important for production metrics, and quality, on-time delivery, and flexibility were the most important for delivery metrics.

Allen (2008) in his research says that one of the ways that and apparel companies increase economic competitiveness is through supply chain management. In order to
gauge the effectiveness of supply chain management efforts, companies utilize performance measurement systems. When looking at the textile and apparel supply chain, more of the upstream portion (closer to raw materials) is located in developing countries. Efforts to improve supply chain performance by these upstream companies should be based on the expectations of their downstream supply chain members – apparel marketers and retailers.

While the most important metrics used to measure the performance of a vendor or supply chain are cost and customer service. However, on-time delivery, lead time, damages, flexibility, and capacity are becoming increasingly important to measure especially as supply chain structures are becoming longer due to global sourcing (Salam, 2010).

Meaningful and effective performance measurement begins with strategic planning, linked to the periodic planning process of performance reviews and best practice (benchmark) implementation. This concept is well appreciated in larger organisations, unlike in SMEs, particularly those in the textile and clothing manufacturing sector. A number of factors must be responsible for the limited or lack of uptake of performance measurement and benchmarking for positioning for competitive advantage gain in this sector.

In a study conducted on Performance Measurement in UK textile and clothing manufacturing SMEs (Cooper et al., 2005) - 10 apparel firms were studied to explore the extent to which performance measurement / benchmarking practices were incorporated as integral part of achieving business performance within the companies operational activities.

Cooper et al. (2005) study showed clear relationships between strategic direction of the organisation and the main products offered; staff empowerment and the level of performance measurement and the criteria of production facility layout and production capacity planning; level of performance measurement and the logistics of the production facilities layout; turnover and the level of operating capital available as well as the level of skills. Other results includes; the relationships between business growth rate and awareness of appropriate manufacturing strategy and production capacity planning; awareness manufacturing strategy and production process utilised and that production process and production capacity planning.
The study showed the following areas where effort needs to be concentrated in order to regain the competitive initiative (listed in order of importance):

i. Performance Management Factor  
ii. Experience Factor  
iii. Resource Utilisation Factor  
iv. Management Capability and Strategy Factor  
v. Capital Availability Factor  

Performance management which incorporates criteria such as staff empowerment, implementation of appropriate strategies, capacity and production process planning and the measurement of performance and benchmarking of best practices.

There is the need to widen the areas to be encompass factors like - leadership, people management, investment level, available organisation capability to effectively and efficiently define business processes and performance measures, i.e. the capability that ensures the selection, alignment and integration (application and implementation) of such measures to operational processes (Chen et al, 2007).

Performance measures should be implemented as a means of articulating strategy and monitoring business results. Ideally the measures will evolve from the organisations’s strategy, be developed to support business objectives, be collected and reported at various levels in the organization and be linked cross functionally. It appears that a good performance measurement system will have an appropriate balance of internal measures with external benchmarks, cost and non-cost measures, results measures and process measures. An organization with an effective performance measurement system that incorporates all these things will be able to promote continuous improvement through corrective actions when results and processes are seen to be drifting away from the organisation’s strategic plans and objectives. Performance measures should be used to enhance a continuous improvement environment in an organization and stimulate employee involvement.

2.10 Apparel Supply Chain and Performance Measurement  
Though there has been much research in terms of performance measures for supply chains, textile and apparel specific research in the area is lacking (Allen, 2008). There have been a limited number of studies related to textiles and apparel. A study
performed by McMullen (1996) examined supply chain management processes in the Asia Pacific region. The survey methodology included respondents from a variety of industries performing various supply chain functions (manufacture, service, resource, and retail). The sample included two apparel firms. Results indicate that 85% of those companies surveyed used financial performance measures, among them budget to actual, savings, return on investment (ROI), return on equity (ROE), and other measures. In addition to financial performance measures, companies were utilizing customer service performance measures such as on-time deliveries, customer complaints, back orders, stock-outs, inventory accuracy, ship errors, total order cycle time, and fill rates (Lee and Kincade, 2003).

Ten percent of those surveyed had no customer service performance measures in place. In terms of warehousing and transportation performance measures, costs calculated by 49% of the respondents include standard order processing, stock-outs, order expediting, back orders, or other costs. Fifty-one percent of those surveyed did not calculate any of the costs specified by the researcher. When looking at warehouse performance, twelve percent of respondents had no measures in place. The performance measures utilized by the remaining 88% included inventory accuracy, on-time shipments, shipping errors, customer complaints, back orders, warehouse cycle time, number of kilos/units shipped, number of dollars shipped, or other measures.

Kurt Salmon Associates conducted a study on sourcing of textiles and apparel. The respondents for the study were apparel retailers (35%); apparel manufacturers, brand marketers and contractors (58%); and ‘other’ firms, including home furnishing manufacturers and sporting good retailers (7%). One area of the study focused on vendor selection criteria. The top four criteria are 1) cost, 2) quality program, 3) product development/execution capabilities, and 4) lead time.

A study conducted by Lohman et al. (2004) focused on performance measurement at Nike’s European operations center in Belgium. This center serves Europe, the Middle East, and Africa. It is important to note that the study did not cover the entirety of the Nike supply chain; rather, only the European market was investigated and only in terms of operations (transportation, warehousing, and customer service). The researchers developed a scorecard, based on the work of Kaplan and Norton, for performance measurement, and also developed a list of performance measures for each category of the balanced scorecard. It is similar to the scorecard proposed by Kaplan and Norton with the addition of a sustainability section (relating to environmental
standards) and people (relating to organizational health and employee satisfaction). This highlights the fact ‘that the format is a fluid element for the development and implementation of performance measurement systems’. That is, performance measurement systems should evolve as business dynamics and requirements shift.

In a research by Uluskan (2010) on Improving the Competitiveness of the Haitian Apparel Supply Chain, service level was an important parameter to improve competitiveness. Service refers to response rates and communication levels in case of a problem, suggestions for the solution to that problem, the sample preparation and delivery time, being proactive in helping buyer companies to run their business, watching the marketplace for the type of products that they produce and bringing new ideas to buyer companies, and offering full package.

Respondents of the research also stated that if the prices of suppliers are the same or close, the differentiator is service which is quality, delivery time and being proactive – to have the knowledge and experience to prevent problems and unwanted situations from reoccurring.

The other considerably important factors in Uluskan (2010) study were training for improvement, skills enhancement-training of existing and new employees and staff - operators, mechanics, floor leaders, and middle management - is critical to build production efficiency.

Undertaking cross-training of existing and new employees can result in increased quality levels, decreased rework, and production flexibility.

In order to have trainings, it is also necessary to have deep understanding of structured training. Therefore, participating in ‘training center’ activities to get technical assistance in terms of operator training, proper cross-training, industrial engineering, lean manufacturing, quality assurance, information management, and logistics will definitely help the manufacturing companies to have better training for their employees and the staff and ultimately, help to reduce waste and increase their productivity.

In a study of Business Performance through Key Performance Indicators (KPIs) in Thai Garment Industry (Suanmali et al. 2009) identified KPIs based on SCOR model and Balanced Score Model for the Thai apparel industry.
The KPIs identified were:

**Level 1-Based on SCOR model**

*Reliability* - this metric category contains value chain metrics focused on quality of product and service. In the case of service, it could pertain to delivery, post sales service, or warranty.

*Responsiveness* - this metric category focuses on speed or velocity in responding to demand events such as a customer order, new product introduction, service order, etc.

*Flexibility* - this category of metrics attempt to measure the adaptive-ness of a value chain to meet demand variation both in the near and long terms.

*Cost* - this metric category attempts to measure the process performance of both direct and indirect aspects of the value chain including customer chain, supply chain, design chain, and aggregate measures.

*Asset management* - this category of metrics focuses on measuring the efficient use of assets including both fixed and working capital.

*Satisfaction* - this category of metrics focuses on satisfaction of the supply chain partners.

**Level 2-Based on Balanced Score Card (BSC)-KPIs level II are associated with supply chain processes (Plan, Source, Make, Deliver, Return). Each process may be in different department of a firm, such as, marketing, purchasing, production planning, production, inventory, and distribution.**

These KPIs are adapted from BSC concept and associated with business process of garment manufacturing.


b. *Source*- Sourcing Time, Inventory Turnover

c. *Make*- Approved Sample Product, Sample Cycle time, production Cycle Time, Rework Production

d. *Deliver*- Packaging Cycle Time, Delivery Cycle Time, Cost of Delivery, Amount of Dead Stock

e. *Return*- Return of Defective Product
2.10.1 Vendor Selection Criteria - Measure of supply chain performance

As per Nowell’s (2004), research the top three criteria found to be used when selecting a vendor was quality, on-time delivery, and cost.

U.S. retailers feel that on-time delivery is more important than costs. Retailers feel that if the product is not on their shelf when it is supposed to be, no money will be made and costs will no longer matter.

The major metrics used by U.S. retailers to measure the performance of their vendors was on-time delivery, quality, and costs. The costs measured may be first costs, distribution costs, or the margins that they receive from a certain vendor’s product.

United States retailers were also using flexibility as a metric to measure the performance of their vendors.

The only three performance measures that were seen among all sectors were quality, cost, and on-time delivery, and these performance measures were the ones with the highest frequency.

The additional common performance measures used when selecting a vendor include speed, compliance, flexibility, and product innovation.

The research undertaken by Ronald Allen in 2008, in the textile and apparel industry of Sri Lanka takes into account metrics to gauge the performance of supply chains.

The most important metrics were

i. Cost
ii. On-time delivery
iii. Quality,
iv. Lead time
v. Capacity

The least important metrics were product innovation, financial health, product development / design capabilities, damages, in-stock rates / stock-outs, and, lastly, product / service variety.

The top competitiveness improvement strategies used by developed countries were

i. addition of value-added services,
ii. decreases in lead time, and
iii. increases in flexibility.
Graph 2.2- Important Supply Chain Performance Metrics
(Source- Performance Measurement of Textile and Apparel Supply Chains in Developing Countries, Ronal Allen, 2008, http://repository.lib.ncsu.edu/ir/bitstream/1840.16/6200/1/etd.pdf)

The two key supply chain challenges pointed out by the respondents of the Allen’s survey were- Competitiveness and Managing Supply and Production.
And it was felt that these challenges could be overcome by better quality, quicker delivery, and pricing and using a time action plan for each order.