AN OVERVIEW OF SUPPLY CHAIN MANAGEMENT ON APPAREL ORDER PROCESS IN GARMENT INDUSTRIES, BANGALORE

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Abstract

Indian Garment Industry improvement is desired in reducing the Supply time required to produce and fulfill the orders placed by foreign companies. One way to decrease the supply time required for producing RMG is to increase domestic linkage expansion way. we can have deep level improvements in the RMGI too. Supply time refers to the time required for supplying ordered garment products after the export order has received. Using modern fast and effective machinery can reduce time taken to deliver the order. The implementation of SCM had been beneficial as this helped in improving the communication channels, production and services of the companies. Considering the important role of apparel manufacturers within the global chain, we conducted a research on the Bangalore garment industries and focus on several important supply chain operational issues. The objectives are to analyze apparel supply chain matters such as new orders, raw materials supply, production processes and logistics related to finished goods delivery. We collect data for trade statistics, conducted structured interviews and send survey questionnaires to garment manufacturers. Analysis shows apparel manufacturers are striving for sustainable business growth. We identify related supply chain practices influencing the industry, set guidelines for improvement and offer recommendations for sustainability. Anyway Several Big scale industries are in Bangalore region. Still some Industries did not do this SCM techniques .We have taken the research only for top and middle level producer.

Keywords: *RMG- Reade Made Garment, SCM: Supply Chain Management, RMGI- Ready Made Garment Industry,*

Introduction

The garment industry is an important business sector in India. For this reason, companies operating within this industry must then be able to apply business strategies that would help sustain the growth of the clothing sector. This means that by modifying some of the existing business procedures of the apparel companies, such as their supply chain management systems, continuous progress and development in the industry may be observed. By means of identifying the current supply chain management practices of some Bangalore garment companies, business areas for improvement can be identified. This in turn may enable the formulation of better supply chain management practices that would contribute to the continuous progress of the apparel industry. The development of the supply chain management in this Bangalore business sector can also likely strengthen its connection with the international market. Supply chain management, the information between business partners are optimized and collaborated; most importantly, supply chain management systems help in reducing inventories, which in turn can lessen operational costs, compress order cycle time, enhance asset productivity as well as increase the companies' responsiveness to the market (BTMA).

Aside from these benefits, the apparel industry is able to achieve quick response through efficient supply chain management practices (2005). Quick response is a concept pertaining to the collaboration and sharing or information among manufacturers, suppliers and distributors, allowing them to respond more rapidly to the needs of the customers. Previous studies have noted that QR concept brought about by supply chain management is advantageous to the apparel industry as well as to fashion-oriented businesses.

Another factor that relates the apparel industry to SCM is the companies' connection with the retailers. While some apparel companies distribute their products directly to consumers, most manufacturers utilize the services of the retailers. The application of an SCM system on the other hand helps in strengthening the relationship between both parties as well as in achieving positive business outcomes. Considering that the apparel sector encounters the problem of demand uncertainty, SCM allows the companies to communicate with their retailers; this feature of the SCM enables them to forecast product demand jointly. The participation of the retailers with the SCM system of the company helps the apparel companies to obtain valuable consumer data such as end-customer demand levels; this will then help in reducing the manufacturer's errors in determining raw material and production volume.

Order time management is one of the big issues for Bangalore readymade garment industry. Foreign buyer is likely to need short leading time for manufacturer the apparel. Because of apparels is seasonal demand. Buyers give the orders for their customer demands. If the production make delay buyer cannot caught up the season.

In the beginning of 1990s, the lead-time was 120-150 days (2005) but in 2007, it was reduced to 30-50 days, i.e. at present it is 90-100 days (BTMA). India requires only 30 days due to their textile and other backward linkage facilities as well as export friendly management and Supporting, policy. It is 45-60 days in India and Pakistan (2005). Therefore, it appears that in the present situation Bangalore RMG industry will not be able to compete successfully in the international market for the existence of unusually long lead-time. This is specifically the main problem area of present research.

Objective of Study

The study on Bangalore garment industry is one of the main source for economic development of Bangalore demands examination and evaluation of multidimensional aspect of garment sector and its impact on the economic condition of Bangalore.

In such a context, the main objective of the study is to examine, evaluate and analyze Business process and buyers order time, supply chain management garment industry and identify the techniques used by some apparel business operators in Bangalore.

Aim of the Research

The overall aim of the research is to consider the Bangalore garment management approaches used in the textiles and apparel sector. This is addressed through case studies of companies at different points of the apparel chain, ranging from fiber producers downstream in the chain to manufacturers and foreigners.

Research Methodology

The data have been collected on primary as well as on secondary basis. The secondary data were used in the study. Those were collected from various publications, books, Bangalore Economic review and the annual reports, audit reports , Interview of key person of the garments factory , foreign buyers. In this research, qualitative method has been used. In the qualitative method, we can find out how people feel or what they think about a particular problem, which are very relevant in this research. Mainly the descriptive research approach has been used. But in the exploratory phase of the research, in-depth interviews have been conducted with the suppliers /manufacturers (Owners) and the relevant bodies and association.

Literature Review

The apparel industry stands out as one of the most globalized industries in the world and it is a supply driven commodity chain led by a combination of retailers, contractors, subcontractors, merchandisers, buyers, and suppliers; each plays an important role in a network of supply chains which spans from fibers to yarn, to fabrics, to accessories, to garments, to trading and to marketing. The peculiar characteristics of apparel supply chain are short product life cycle, high volatility, low predictability and high impulsive purchasing. These factors bring high pressure to apparel retailers to manage their supply chains.

Moreover, in today's competitive environment, markets are becoming more international, dynamic, and customer-driven and customers are demanding more variety, better quality and service, including both reliability and faster delivery.

In the apparel sector, all the Bangalore garment companies are subcontractor and producing at the low end of the market. They are performing cutting, making and trimming (CMT) activities (The Times of India) The RMG industry is highly dependent on imported raw material. About 90% of woven fabrics and 60% of knit fabrics are imported to make garments for export. That's why this sector needs to maintain a long supply chain (backward and forward). Besides rudimentary application of ICT and inefficient port management limits its ability to respond quickly to market change, which is very essential in the fashion market . Therefore, this industry takes maximum lead-time to process an order (BMA). In BD the lead-time for apparel export varies between 90-120 days, whereas the time for Sri Lanka is about 19-45 days, China 40-50 days and for India 50-70 days for similar products (Textile Journal).

Asian researchers (2006) have reviewed the concept of supply chain management in textile and apparel supply chain management in Bangalore. They discussed the strengths and problems faced by the Bangalore textile apparel supply chains. They argued that Bangalore apparel industry is generally not aware of the concept of supply chain management and industrial benchmark for both manufacturing and retailing industries in Bangalore and the supply chain performance is below the world average.

Due to the growing intensity of competition in both local and global business sectors, several companies and service providers have realized the need to develop more strategic approaches for managing supply chains. These affective factors and realization then led to the development of tradition SCM systems up to the advanced systems companies apply at present. The evolution of supply chain management occurred during the 1990s; at this time, collaboration between manufacturers and suppliers had been established in order to enhance traditional approaches in supply management functions. At the same time, retailers as well as wholesalers had integrated their logistics operations as well so as to achieve greater competitive advantages (2006).

In general there are five major elements in the apparels supply chain comprised of the processing raw materials into fiber , shipping thread and weaving fabric assembling finished products (often far away from point of sales) to goods to destination (often through in the traders and retail sales (in departments stores chains shops or boutique). Raj Guptha's state that there are six processes in the simple apparels supplying Bangalore, design, raw materials, purchases, and manufacturing distribution retails sales.

Many world-class apparel companies emphasize lead-time reduction. Short lead-time are the major enabler in achieving a responsive and flexible apparel supply chain as the time reduction contribution greatly to the improvement of demand forecast accuracy . There are

Three critical times in the fashion and apparel industry: Time –to Market, Time –to – Serve and Time –to- React.

Overview of Bangalore Garment Industry

1.1 Multi-fiber Agreement (MFA)

Starting in the late 80's as a negligible non-traditional sector with narrow export base, the readymade garment (RMG) sector, by the year 1983, emerged as a promising export-earning sector of the country. Within a short period of time, it has attained high importance in terms of its contribution to GDP. South Indian Garment Manufacturers and Exporters Association, Bangalore (SIGMEA) is the apex trade body of 200 apparel-manufacturing companies of Bangalore. Since the inception, the association has been working to promote and protect the greater interest of RMG sector of Bangalore. SIGA also acts as a pressure group to protect the higher interest of the sector and as a promoter of trade negotiation in international market, global trade bodies like WTO, concerned UN agencies like ILO, UNCTAD etc.

The conclusion of the Uruguay Round of General Agreement for Trade and Tariff (GATT), on April 15, 1994 delivered the most significant decisions in the recent history of the international, pervasive regime. The scope of multinational trade was expanded to cover three major areas that were previously not under the jurisdiction of GATT, namely the General Agreement on Trade in Services (GATS), Trade-Related Intellectual Property Rights (TRIPS) and Trade-Related Investment Measures (TRIMS). GATT also addressed the other two major sectors outside of its control, IT and textiles. The other significant event at the Uruguay Round was the advent of the World Trade Organization (WTO).

The WTO promised to provide a framework for the conduct of trade between its members on matters related to the Uruguay Round Agreements. The WTO pushes "liberalization" of trade in goods, services and related areas. This has had a big impact upon the economies of both "developed" and "developing" nations.

Although it was only supposed to be a temporary agreement, the MFA was extended four times, the last time being in 1986. Then the WTO wants textiles to be under its control, the abolition of the MFA over a ten-year period commenced from January 1, 1995. As a result, the quota system that has provided some security (albeit with associated difficulties) for those in the industry in Bangalore may be abolished by the beginning of 2006.

The abolition of quotas has come about as a result of decisions made by the WTO, of which Bangalore is a member. The decision affects not only Bangalore but also some other countries in South Asia, such as China and Sri Lanka, and the entire textile industry that has been enjoying the quota facility since 1974 until the end of the Uruguay Round were governed by the Multi-fiber Agreement.

1.2 Impact of Imposition of GSP & Quota

1.2.1 Short term impact: The first stages of the withdrawal of MFA benefits were completed in January 1995. The steps taken by the USA, the biggest importing country of readymade garments from Bangalore, did not affect any fixed quota or category. Despite the concern and fear of negative impact on in the aftermath of quota removal, the whole scenario of RMG sector in Bangalore appears with positive trends. Bangalore mainly exports garment, knit and woven goods including shorts, trousers, shirts, sweaters, blouses, skirts, tea-shirts, jackets, sports attire and many more casual and fashion items with the changing times. Despite removing privileged quota system, the number of RMG industries rose up over the periods (AT, 2006). As per the statistics of KGMEA (Karnataka Garment Manufacturers and Exporters Association), an apex trade body of the country, that the RMG export was 10.57 million US$ in 1983-84 and goes up to 1347.77 million US$ in 2008-09. RMG export of Bangalore was 3.89% of total export in 1983-84 while in 2008-09 it was about 80%. After quota removal in 2004 average more than 16% growth were observed from 2004-05 to 2008-09 and during this period total export growth rate be also more than 15%.

1.2.2 Long Term Impact: The success of readymade garments industry of Bangalore after 2005 depends on how fast she can prepare herself for producing fabrics and yam at home to meet the demand. Bangalore produces 8% and 45% of the total demand of woven fabrics and knit fabrics respectively. Bangalore is expected to be self-sufficient in production of fabrics by 2005. But even at the end of MFA, interim period readymade garments sectors will continue to be dependent on import of cotton cloths.

1.2.3 Role of Preferential Treatment under MFA and GSP: Multi-Fiber Agreement (MFA) and Generalized System of Preference (GSP) mostly facilitated the rapid growth and expansion of the industry. Bangalore entrepreneurs took advantage of MFA and GSP facilities to successfully enter into the US, Canada, and EU market. The World Bank country study show that during 1980s ,US importers actively pursued import from Bangalore (world bank 1995) while quota restriction on giant competition provided a guaranteed market for Bangalore garments in USA and UK , preferential treatment under GSP allowed Bangalore apparels a zero tariff access to markets of the European community. Quota and GSP therefore played a significant role in rapid growth and development of RMG industry in Bangalore.

Theoretical Analysis of Bangalore Garment Industry

2.1 RMG Business Structure

Readymade garment is a labor-intensive industry and relatively simple technology compared to other high-tech industries. The RMG manufacturing units are like tailor's shop; getting order from the foreign buyers and then import raw materials specially fabrics from the foreign suppliers or sometimes buy from the local market as per order, then manufacture garments and supply those to the buyers (2005).

Bangalore garment manufacturer need more time is getting higher due to import of fabrics mainly from China, Indonesia and India, The total average time to import fabrics from abroad is 50-65 days and this is the main reason for long lead-time (BGMEA research cell).

In the process of import of fabrics from the foreign suppliers lies the main reason for long lead-time. The process is visualized in fig.-2 below.
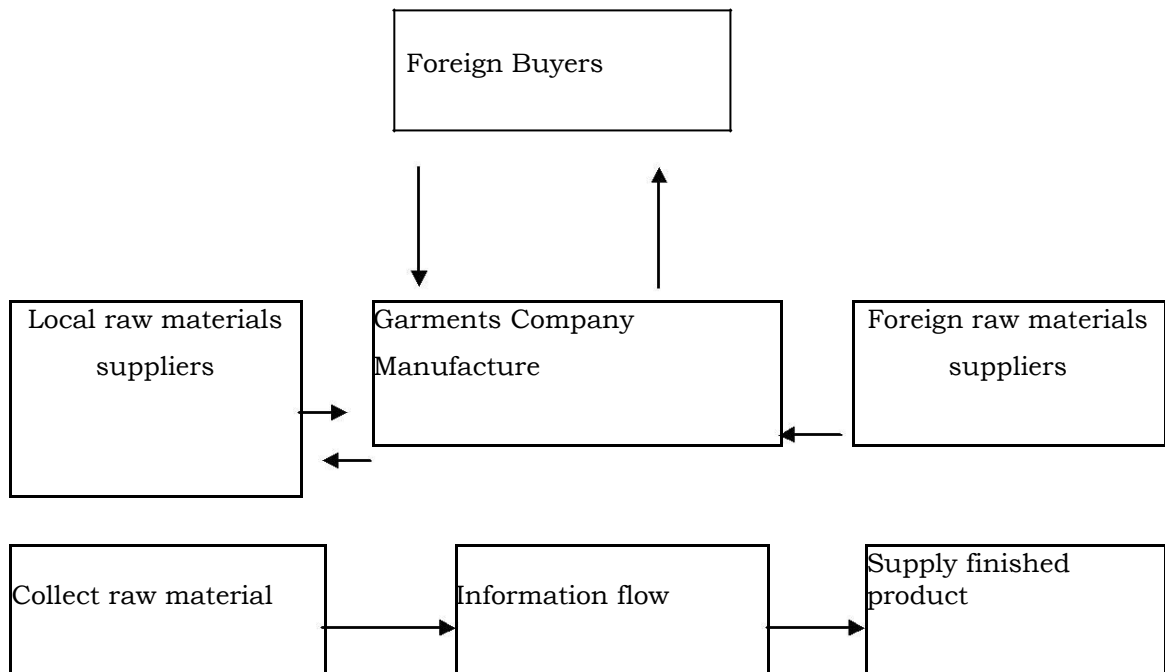
Source: BTMA

Figure 1: Business Structure and raw material supplier

In the RMG sector, the Manufacturer - Raw materials Supplier relationship is different. In this Industry the main raw materials are fabrics (Cloths) and few accessories are like button, collar etc. About 80% of the suppliers of accessories are local and accessories suppliers are not responsible to Increase l time
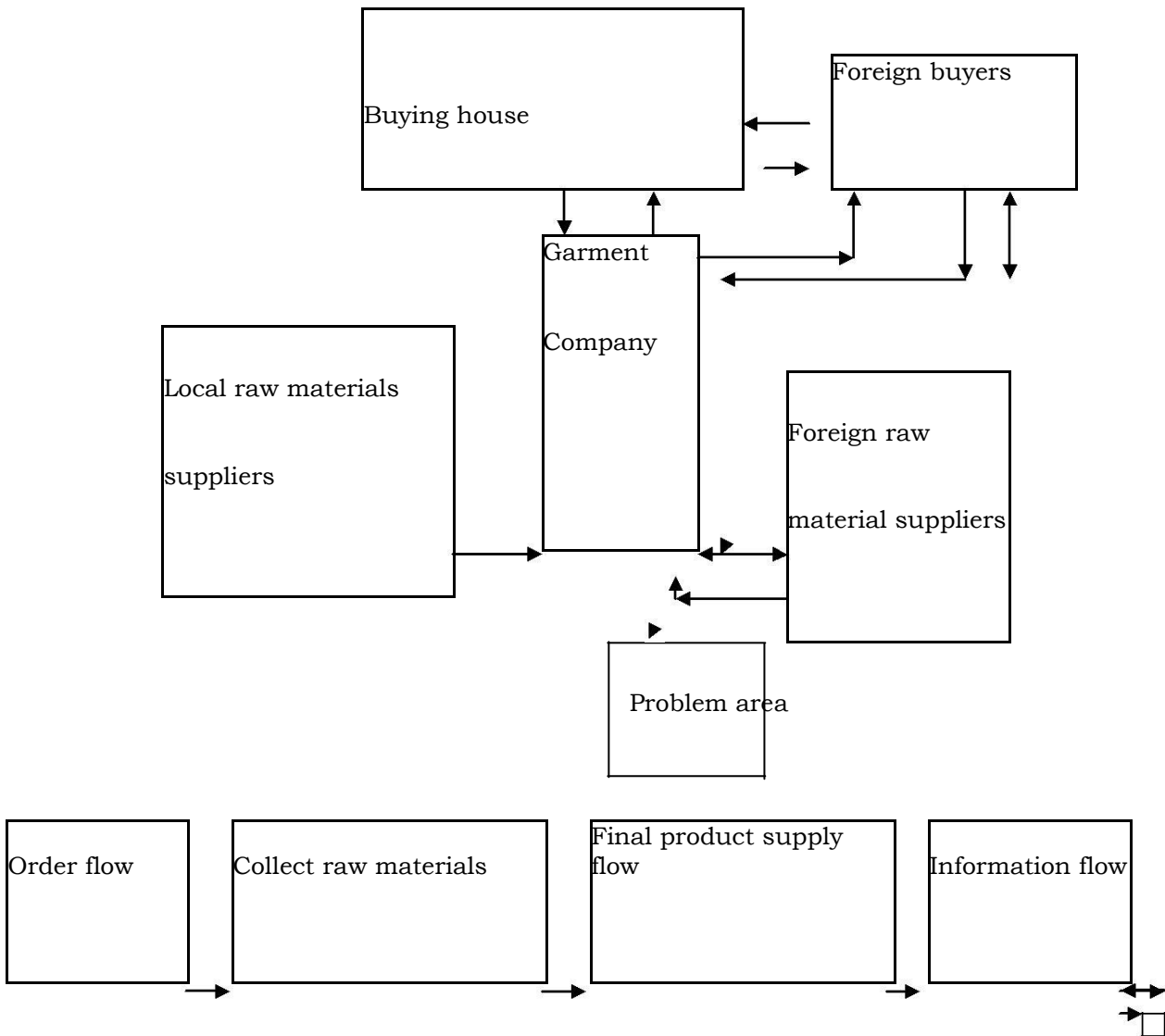
Source: BTMA

Figure2: Business structure and raw materials collection process

2.2 Analysis of Supply Management of Apparel Orders

Apparel buyers around the globe demand product, as they want it, when they want it, and the best possible price. In today's highly competitive global marketplace, they are placing greater value on quality and delivery time. Manufacturers similarly have begun to place more value on quality and delivery time and companies are trying to gain a competitive edge and improve profitability through cutting cost, increasing quality and improving delivery. However it is safe to say that the more competitive the industry, the more shortened lead-times will help. In competitive industries, short lead-time will differentiate a company from its competitors, leading to increase sales (Charles K, BGEMA).Lead-time is one of the main competitive factors among companies. The ability to deliver quickly influences export, sales and thereby revenue. The definition of lead-time can vary, depending on what part of the company is focused upon. It normally includes all activities from start to end. Lead-time begins with the first receipt of a customer order and ends with customer receipt of the product or service. Everything in between is the lead-time (2005). Lead-time refers to the time lag between placing an order and receiving it (2005). In this study lead-time is defined as the time it takes from getting order from a customer and received the delivered product by that customer (AJ, 2014).

At present, Bangalore the average lead-time is 60-120 days. It is sometimes 80-130 days. Total lead-time is made up of time devoted to processing orders, to procuring and manufacturing items,

and to transporting items between the various stages of the supply chain. However, lead-times can often be reduced if items are transported immediately after they are manufactured or arrive from Suppliers (2005). Lead-time typically includes two components: ***Information lead-times*** (i.e., the time it takes to process an order) and ***Order lead-times*** (i.e., the time it takes to produce and ship the item). ***Information lead-time*** can be reduced by using very sophisticated and modern communication system while ***Order lead-time*** can be reduced through efficient supply chain management (BTMA)

A researcher named Marc Smith explained lead-time in two ways (www.elsmar.com, 2004). First, ***Customer lead-time***, which refers to the time span between customer ordering and customer receipt? Second, ***manufacturing lead-time***, which refers to the time span from material availability at the first processing operation to completion at the last operation? In his paper, Marc Smith developed theories for the reduction of lead-time in the equipment manufacturing company especially in vehicle manufacturing company. It is also applicable to the RMG sector. In the lead-time reduction process, Lead-time Management in the Garment Sector of Bangalore: An Avenues for Survival and Growth. Identifying the beginning of the process and walking through the process is very important. In the RMG sector after order confirmation, the process begins by sending information to the suppliers for Raw materials (fabrics + accessories) and the process run through shipment of final product Received by the buyers. The whole of this process is comprised of the following steps – order Submission, scheduling & sequencing, manufacturing and distribution. A manufacturer may be able to reduce lead-time by taking some strategic measures in all of these four stages.

From the above theory, it is clear that the total lead-time is customer lead-time. Therefore we can Write that; **Customer Supply time** = [{Information supply time} + {Order lead-time}] **Total supply time** = [{Information lead-time} + {(manufacturing lead-time) + (shipping time for import fabrics) + (Shipping time for export final product)}

(**Note** that, shipping time for import includes shipping time, unloading time and transport time from port to manufacturing point. Shipping time for export includes manufacturing time for final products and shipping time for export) the leading time on delivery issues matters most important in RMG export trade. In the beginning, the leading time was 120-150 days, but now in 2008 this time has been reduced to 40 to 60 days, thanks to the timely intervention of the join forces. China requires only 30 days due to their textile and others backward linkage facilities as well export friendly policy. Bangalore need set-up a central bonded warehouse for woven and grey fabrics in order to help the manufactures collect the fabrics within seven days from the issuances of L/C and thus reduce the lead-time.

3.1 Discussion and Result

The RMG industry of Bangalore still plays the role of tailor in the garments business. The required fabrics and limited accessories till now come from abroad. The industry is heavily dependent on imports and had to spend about 55-75 days to import fabrics from abroad (2005). This backdrop is the main reason for long lead-time. Bangalore garment export in volume is increasing @ 15-20 percent for the last 20 years, whereas Bangalore RMG is depending only on Chennai and Mumbai port (CMP). The facilities of Chennai port have not increased at the same rate. The containers kept stuck up in the port, findings and analysis

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"Unfortunately we are spending 15-20 days to receive our fabrics from sea port to our factory and it is playing the main role to increase lead-time". Again, to find out the probable causes of long lead-time and for the empirical analysis 50 firms including 5 leading garments units have been chosen to collect primary data. They mentioned many causes behind this problem when interviews were taken but in the interview 100% i.e. of the 36 number respondents (Though 50 firms were chosen but 36 firms were interviewed successfully) put their comment on import dependency as a most important cause for increased lead-time .Then 91.66% i.e.33 respondents on CBW, 75% i.e. 27 respondents on inefficient port management, 69.44% i.e. 25 respondents on poor infrastructure and 41.66% i.e. 15 respondents on communication system respectively. The same causes were identified in our analysis based on secondary data. This fact enhances the credibility of our findings. At the time of interview, the Managing Director of Gokaldas Exports limited divided the lead-time into three stages as it is illustrated in fig. -3. First stage, from P-Q (Fabrics suppliers – Sea port) the approximate lead-time for the first stage is 40-55 days including the manufacturing time of fabrics, then from Q-R (Sea port - Manufacturer) the approximate lead-time for the second stage is 15-20 days and at last from RMG (Manufacturer - Buyer) the approximate lead-time for the last stage is 35-45 days.
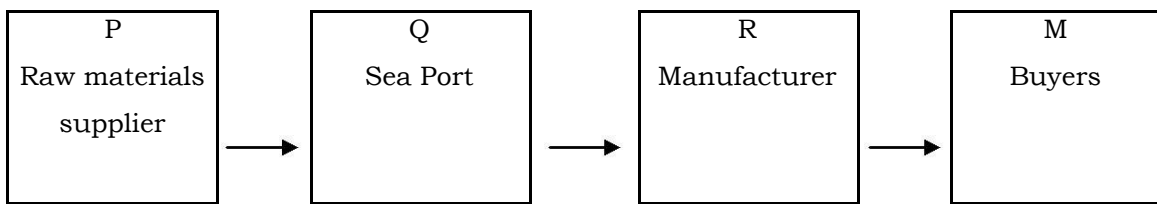
P Raw materials supplier	→	Q Sea Port	→	R Manufacturer	→	M Buyers

Figure: 3 Basic Supply chains of Bangalore RMG Industries

The present estimated time from point Q to point R is unnecessary. Here the main task is unloading the container and carry it to the manufacturing point. The total procedure can be done by only 2 or 3 days through efficient management in port and good transportation system. But due to inefficiency of port management and poor transportation system it takes 15 to 20. From the above observation, it is clear to us that, just for import of raw materials Bangalore manufacturers are forced to spend 55-75 days more. Therefore, import dependency for fabrics is the main reason of longer lead-time. From the above discussion, it appears that the manufacturers of RMG sector mainly face "order lead-time" problem and this problem occurred in the supply chain due to inefficient management. Time consumed in the first four steps in the supply chain is the basic reasons for increasing lead-time. It is possible to reduce a major portion of order lead-time by improving the other three areas namely, communication, port management and transport management in the supply chain. We can get a clear idea about lead-time in the supply chain by considering the equation of lead-time and put average estimated time collected from the interviews for each step.

3.2 Manufacturer Lead-time

Total supply time = [{Information lead-time} + {(Order lead-time)}] Or, = [{Information lead-time} + {(time to manufacturing fabrics) + (time to shipment of fabrics)+(time to unloading fabrics and customs formalities at port) + (time to take fabrics from port to manufacturing point) + (time to sample approval and production of final product)+ Time to shipment or export of final products)}] Or, 120 = [{7} + {(15)+ (25)+(14)+(6) + (23)+(30)}] From the above equation, we can say that through the first four stages a manufacturer received fabrics from the suppliers after 60 days on average. Out of this the shipping time of 25 days is constant. There is no chance to reduce this shipping time but we can reduce the rest 35 days. There are two parties and various activities involved between suppliers and manufacturers in the supply chain. It can be seen in the fig.-4 broadly. The activities and time consumption area have been illustrated here through four boxes (A-D) or stages.
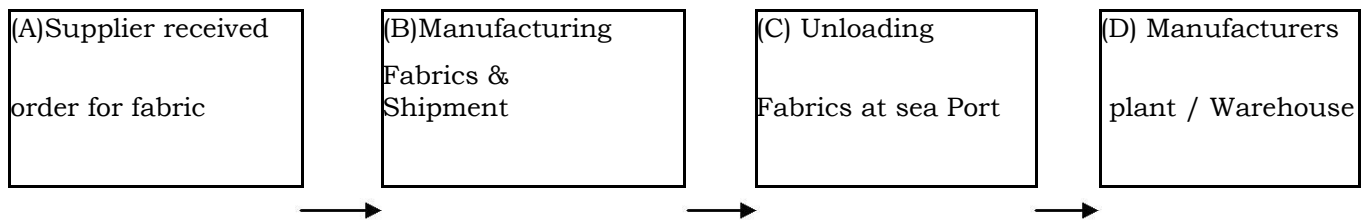
(A)Supplier received order for fabric	(B)Manufacturing Fabrics & Shipment	(C) Unloading Fabrics at sea Port	(D) Manufacturers plant / Warehouse

Figure 4: *Lead-time and fabrics importing process*

Manufacturing time ⟶ Shipping time ___ Unloading & transportation time

After final contract with the buyers, manufacturers first place order to the foreign fabrics supplier (A). Then the supplier manufactures fabrics (B) and sends fabrics by shipment. After a certain time the ship reaches at the port (C). Here after unloading and completing, some custom formalities fabrics are sent through train or road transport to the manufacturers production-plant/warehouse (D). For this total process from A-D manufacturers need 55-75 days. At the time of import a proper management in the supply chain can reduce 30-35 days. The rest of the time of 25-35 days is needed only for shipment. Management in the supply chain can reduce 30-35 days. The rest of the time of 25-35 days is needed only for shipment. It is known from the interview that most of the buyers have no regional offices in Bangalore. These are either in Chennai or Mumbai. One of the largest European garment sub-contractors based in Bangalore is Marks & Spencers (M & S) from London (Asia invest, p-11, Sector 4.). The regional offices and the buyer's resident in Bangalore can build a stock of the required quality of fabrics in advance before making final contract with the manufacturers. It will definitely reduce the manufacturing time. Again the proper and efficient management at port and good transportation system can reduce time to receive raw materials from port to manufacturing plants. But if we avoid fabric import altogether then we can reduce 55-75 days from the total lead-time and we will be able to assure export of RMG products by 45-60 days regularly.

4.1 Interview

The interview was taken very closely with Mr.Ashish Dikshit, Madura F&L CEO of Group. At the time of interview he was found scared for the possible awful situation in the post MFA period. He stated, "We have all but just for want of fabrics we are going to face stiff competition". What he said about the business operations of the company could be summarized as follows. After getting the final order, the company communicates with the suppliers through e-mail and over telephone. For this task, the company spends few days. Mr. Dikshit said that they were not worried about the information lead-time. They generally take 5-7 days for this process. He said, "In the garment business suppliers are not permanent, we had to communicate with one or more suppliers for fabrics in time after getting final order. A good numbers of accessories are procured from the local market. So e-mail and telephonic communication are sufficient for the RMG companies." At the time of interview, it was gathered that the company was facing problem mainly in the supply chain i.e. order lead-time for importing fabrics. The company, Madura group also faces problem in the sample approval process. In the supply chain, the company had to spend 45 days on a Lead-time Management in the Garment Sector of Bangalore: An Avenues for Survival and Growth 624 average which is not negligible. Again, the sample approval process is also cumbersome. It takes enough time and thus contributes to increase lead-time problem. Mr. Ashish Dikshit expressed that the company could reduce a certain portion of lead-time by taking some appropriate measures but 60% of lead-time can be reduced by avoiding import dependency and by considering alternative source of fabrics supply. In Fig.-2 of appendix-1, the estimated time can be seen at different stages of the manufacturing process of Madura group. The estimated time was shown according to the information delivered by the Managing Director of Madura Group. Most of the buyers follow in this process to purchase garments from this company. At the time of our discussion on the present situation the RMG business, Managing Director of this company told us that he was afraid for the post MFA period. The company was certainly going to lose its business due to long lead-time in the post MFA period. He urged that immediately we should take some proper measures to reduce lead-time.

At the time of interview, it has been informed that the company was doing business successfully with a European company where lead-time was in between 45 to 60 days. It is the competitive lead-time in the RMG sector of Bangalore. In the figure-2 of Appendix-1, total business process of Arvind group has been visualized through A-F stages. From this figure, we can get clear information about the estimated time in six different stages like, A-B, B-C, C-D, D-E, E-F and from F to Buyers. The total lead-time in this process for Arvind group is 120-140. There is a buyer named 'BMB Apparels' doing business with Arvind. It strictly follows 100% of the sample approval flow chart & the RMG business process like the figure-1&2 (see appendix-1). Therefore, its average lead-time is 130 days. But the other buyers like JC Penny, American eagle do not maintain the sample approval flow chart of fig.-1(Appendix-1). They approve sample in a normal procedure and spend 5-10 days for approval. In this case, they take help from local office or local agent. Therefore, their average lead-time is in between 90-120 days. At present, the company is doing business successfully with "Corona" maintaining a minimum lead-time.

In this regard, Mr. Dikshit urged, "We have to consider this success story with the buyer like Corona and find ways and means to deliver garments product to the buyer by 45-60 days". When asked for the reasons for the success in the business to the Managing Director, opined his success is mainly due to the procurement of fabrics from the local market. The buyer Corona at first makes their fabrics ready then contact with the manufacturer for order placement. The buyer takes just one or two days for sample approval. As a result, the company is able to cut down the lead-time by about 60-70 days. According to the figure-2 (Appendix-1), the average information lead-time is 6 days and the average order lead-time is 129 days for the Madura group. So reduction of order lead-time is the crux of lead-time problem. Out of 129 days, in the supply chain, total average lead-time is 52 days. By taking some proper measures like making fabrics available in advance, developing inland transportation system, improving management efficiency at port etc., it is possible to reduce about 23 days in B, C, D and E stages of supply chain. In the supply chain, the rest of the time is for shipment. The company can cut down this time only by avoiding import. It is also possible to reduce 30 days in sample approval process by adopting normal sample approval process performed by other buyers or by encouraging the buyers to open a local office in Bangalore. Considering the equation of lead-time and putting value in that equation three types of buyer of this company can be analyzed.

A manufacturer, K.Mohan Exports Ltd., expressed his opinion in a more logical way and stated,

"To reduce lead-time effectively we have to reduce import dependency as soon as possible. Immediately we can reduce 30-40% lead-time only by proper and efficient management in the supply chain."

At the time of interview the largest RMG manufacturer 'Karle group' responded, "Just after January, 2005 Bangalore RMG sector is facing tough competition due to long lead-time. For the woven garments export, our lead-time generally 90-120 days. However, immediately we can reduce 30% of lead-time through proper management in supply chain during import of fabrics and 15% would be possible by only developing port facilities. If we develop our textile sector and procure fabrics from the local market we can reduce 60% of total lead-time. For the knitwear garments, we procure all raw materials from the local market so there is no lead-time problem in the Knitwear garments sector." In this study

4.2 First Result

Considering BMB apparels from UK. We know that; Total lead-time = [{Information lead-time} + {(Order lead-time)}] Or, = [{Information lead-time} + {(fabrics manufacturing time) + (fabrics shipment time)+ (unloading and transportation time) + (sample approval and production time of garments product)+ (shipment time for export of final products)}]= [{6}+ {(11) + (24) +(12)+(35+12)+(30)}] So, total average lead-time = 130 days In this study for the BMB buyer, manufacturer's order lead-time is 124 days. In the supply chain the company spends totally (11+24+12) = 47 days for import of fabrics where 20 days can be saved. (BMEA) Time for the last two stages is common for all manufacturers. Here manufacturer spends (47+30) = 67 days where maximum time is consumed by sample approval. The company spends about 35 days for sample approval process for this buyer. It is unusual. So here sample approval process is the main reason for increasing lead-time.

4.3 First Result

The buyer JC Penny from USA has been considered. For this buyer, Total lead-time = [{Information lead-time}+ {(Order lead-time)}] Or, = [{Information lead-time} + {(time to manufacturing fabrics) + (time to shipment of fabrics)+(time to unloading fabrics and customs formalities at port) + (time to take fabrics from port to manufacturing point) + (time to sample approval and production of final product)+ shipment time to export of final products)}] = [{6} + {(12)+ (25)+(14)+(6) + (23)+(30)}] So, total average lead-time = 116 days

4.4 Second Result

Now form the above calculation it is clear that doing business with the buyer JC Penny, USA, manufacturer's order lead-time is 110 days. In the supply chain the company spends totally (12+25+14+6) = 56 days for importing fabrics where about 24 days can be reduced. Times for the last two stages are common to all manufacturers. Here manufacturer spends (23+30) = 53 days. Where maximum 10 days are is spent for sample approval. It is a normal process. Therefore, in the above calculations it has been observed that the four values as underlined above are the principal reasons for the increase of lead-time.

4.5 Third Result

It has been considered the buyer of 'Corona' from Italy. For this buyer, Total lead-time = [{Information lead-time}+ {(Order lead-time)}] Or, = [{Information lead-time} + {(time to sample approval and production of final product)+ (shipment time to export of final products)}] = [{1}+ (17)+(30)}] So, total average lead-time = 48 days. Here in this case the manufacturer does not have to import fabrics for Corona. The buyer himself supplies fabrics from their own textile mill located in Bangalore. For this reason, the order lead-time is only 47 days. After getting order, the company spends totally 48 days in the supply chain to export final products to the buyer. In this case as there is no need to import of fabrics the RMG company does not face any manufacturing lead-time, transportation related problem and unloading related problem at port. Therefore, the manufacturer does not have any problem in the supply chain. We know time required for the last two stages are common to all manufacturers. So there is no scope to reduce this time. Here buyer (Corona) communicates with the prospective manufacturer over telephone and takes the sample to the manufacturer physically and approves the sample within two/three days. For that reason information lead-time and sample approval time are very minimal in the total lead-time. From the above discussion and analysis of some buyer's success and other failure in reducing lead-time, one can draw a conclusion that if Madura group could avoid import and collect fabrics from the local market, the lead-time would be between 45-60 days. It will be more competitive if the buyer would open a local office in Bangalore. This will minimize sample approval process.

Table-1: Lead-time to Bangalore Selected Garment

Garments	Import Fabric	Accessories	Lead-time
Gokaldas Export	100%	80% locally and 20% imported	120-140 days
Arvind Mills	100%	90% Locally	116 days
Gokaldas Images	20% Local Fabric	100% Imported	48 days
Karle Exports	100%	80% Imported	125 days
Texport Syndicate	100% Local Fabric	50% Locally	45-60 days
Madura Garments	100%	50% Locally, 50% Imported	60 days

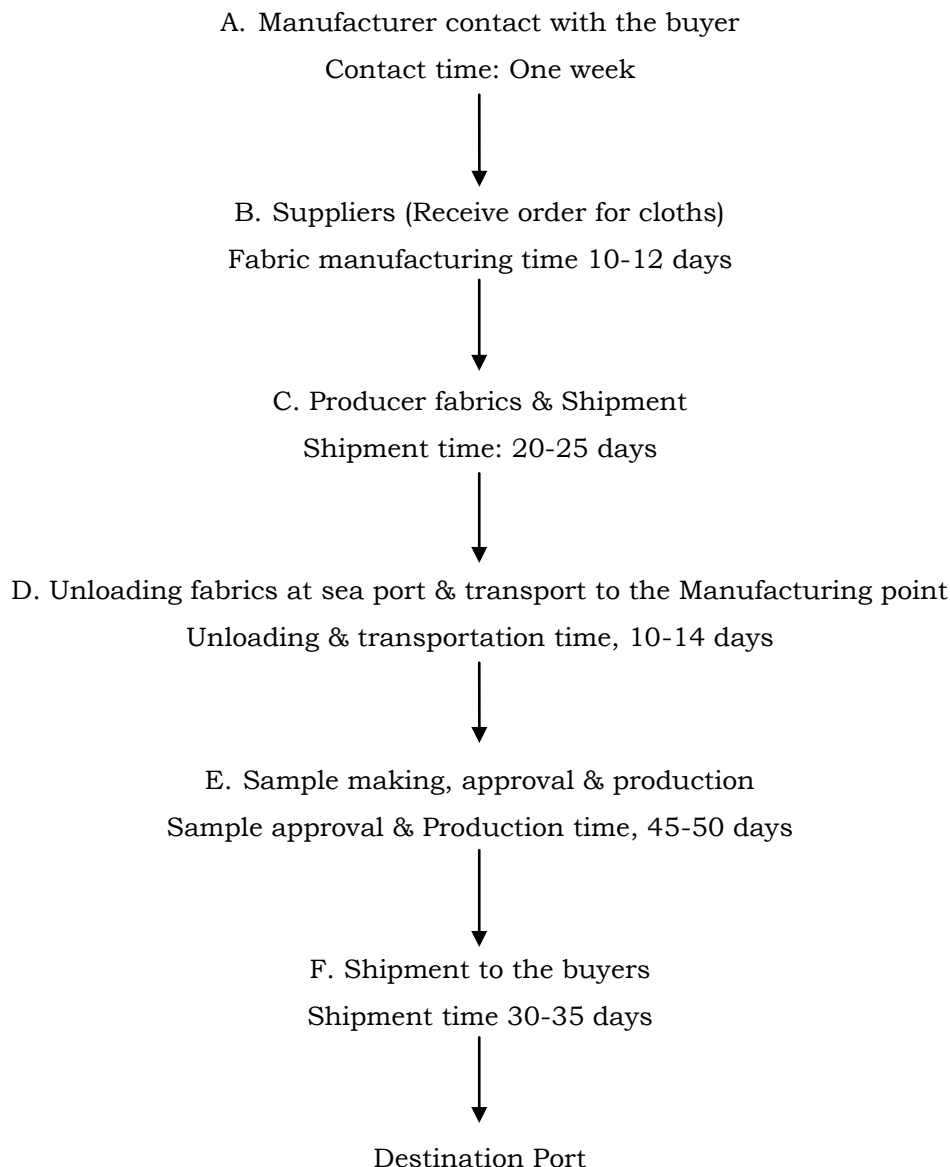***Source:*** *Result find out from own research questioner and survey*

Conclusion

Bangalore has entered in the quota free market after 2005.After enter the free market Bangalore apparels face competition from others competitor .Analysis has been found that import dependency on backward linked industry is the main factor for long lead-time. More than 80% imported. Absence of sufficient backward linkage industry and for this reason a total additional 55-75 days are spent in the import process of fabrics by RMG sector of Bangalore.

As a result, this sector is facing long lead-time, which is 90 to 130 days on the average. From the analysis, it is clear that the impact of information lead-time is very negligible on total lead-time. It contributes only 6%. In conclusion, considering the above analysis it has been found that import dependency is contributing 50% or more in the problem of long lead-time and it is the main factor for the problem of long lead-time in the RMG sector it is the standard lead-time to compete with the other manufacturer and exporter of the world. It becomes possible only for avoiding import of fabrics. When the RMG sector ensure the availability of fabric from the local market by developing backward linkages industries especially in the oven sector and by establishing textile mills by the buyer for their own consumption.

The Garment and Export industry process is mentioning below only for Bangalore region. This is based on the no unit or pcs of Apparel. If they have more branches, it will change according to the capacity. I mention the Process above

Appendix: 1

A. Manufacturer contact with the buyer

Contact time: One week

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B. Suppliers (Receive order for cloths)

Fabric manufacturing time 10-12 days

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C. Producer fabrics & Shipment

Shipment time: 20-25 days

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D. Unloading fabrics at sea port & transport to the Manufacturing point

Unloading & transportation time, 10-14 days

↓

E. Sample making, approval & production

Sample approval & Production time, 45-50 days

↓

F. Shipment to the buyers

Shipment time 30-35 days

↓

Destination Port

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