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An Efficient Supply Chain in Apparel Industry

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Abstract

A supply chain is a sequences of processes and flows that take place within and between different stages and combine to fill a customer need for a product. The apparel industry has, like most other industries quickly started using the Internet to gain improvemeoments in the efficiency and effectiveness of operations and marketing. In this paper, a proposed supply chain model has been developed which can save most unnecessary cost of the apparel supply chain over the traditional supply chain. In this paper, it has moreover been analyzed that 35% efficiency improved after implementation of proposed model in apparel supply chain.

Keywords: *supply chain, network, efficiency, apparel industry.*

1. Introduction

One of the main challenges of today's apparel manufacturing industry is to be efficient and contribute to high effectiveness, i.e. customer satisfaction .In the competitive market, Information is ever more available through e-business, customer relationship management (CRM) and supply- chain management (SCM) solutions, making it possible to serve buyers individually with customized goods [1].

Operation manager is strictly monitored to achieve factory plan efficiency in order to match the shipment date as well as the company profit goal in garments industry. Practically, there is a gap generated between plan and actual efficiency in account of some inappropriate processing, which will be discussed in the next chapter echelon wise of the supply chain in a typical garment's manufacturing industry. The main reason is to magnify the inefficiency level; involving uneducated people for long times in garments manufacturing industry. Some of the people are leading mid- level management among unqualified manpower. Garments industry now a days looking for establishing industrial engineering section for finding out the actual reasons and take possible action to overtake such as kind of issues, which greatly bring an effect in efficiency. The efficiency is therein described as a compound evaluation of quality, delivery, cost, and overall capability that is not only planned and reviewed in the relationship but also a measure of the relationship. Thus, in this research, an initiative has been taken to improve efficiency of garments manufacturing organization. Textile and apparel supply chain in the U.S. consists of about 22,000 companies and employs about 675,000 people analyzed by U.S. Census Bureau (2004a). U.S. apparel industry has been in a transition over the last 20 years. Imports from lower wage countries and retail consolidation forced U.S. manufacturers to look for other ways to remain competitive: quality and flexibility. Physical proximity and advances in information and manufacturing technologies enabled U.S. manufacturers to accept retailer orders closer to the season and replenish their stocks frequently during the season. However, retailers continue to source more and more of their merchandise from overseas with the cost of having to make risky inventory decisions. However, buyers are looking to buy the high quality garments with low or competitive cost with the delivery status must be on time. That is meant, the buyer is demanding to

follow QQD in their manufacturer. It can be illustrated that Q for "Quantity"; Q for Quality and finally D for just time "Delivery". As efficiency can be defined that it is quantity matrix. So, in this context, buyers will place order to the manufacturer who can meet the QQD and who can show proof that his supply chain is efficient in order to deliver their products to the buyer on time. Only considering co-efficient supply chain buyers are placing the orders to the low cost countries rather than US market. In this research, an apparel supply chain model as well as smooth supply chain network has been developed to retain in the competitive market.

1.1 Objective of the research

- To identify the actual cause of lower efficiency in apparel manufacturing organization.
- To improve efficiency of the selected garments manufacturing organization by implementing the proposed chain model.

2. Literature review

"Supply Chain Management" was revealed in the late 1980s, and then it was exposed to all in 1990s [2]. Before of that time „Supply Chain Management was used as different terms like- "logistics" and "operations management" in the business fields. Once up on a time, supply chain management was considered just like a concept. Implementation of this concept was very difficult as there were some necessary components in the total chain to connect with each other. The focal part of the barrier to full supply chain management was the cost of communication and coordination among the many independent suppliers in each supply chain. An entire supply chain covers the area from the creation of raw materials to the delivery of the finished consumer goods. So, many supply chains are involved in the entire supply chain of a product up to the ultimate delivery stage. This is why; it was difficult to link up actively all the supply chain points considered [3]. But day by day companies are being interested to implement the supply chain concept in their business for three environmental changes. First, development of the communication technology has made easier the process to communicate between members of the supply chain. Second, new management models have been developed that are being used by the supply chain members to simplify the coordination of tasks. Third, for the development of highly trained work-force, it has become easier to assume the responsibility, make decisions quickly and take required actions to coordinate the supply chain. These three changes are encouraging the companies to take the challenges in the competitive market through the utilization of supply chain management concept. In this paper, developed a proposed supply chain model for apparel manufacturing industry which can save the time and cost of the communication through whole apparel supply chain.

Time-based management and the relationship between speed of operations and efficiency has been one of the key issues in operations management literature during the 1980s and 1990s and he has also described how time has become one of the most important sources of competitive advantage in manufacturing industries [4].The background for "Japan's secret weapon" or "lean thinking" by illustrating how the competitive advantage of Japanese manufacturing industry evolved from low labor costs—through scale-based strategy, focused factory and flexible manufacturing—to time-based competitive advantage in order to expedite the supply chain efficiency premeditated [5] . Uncertainty and the nature of the forecasting problem have a considerable impact on the supply chain structure. The first step in devising an effective supply chain is to consider the nature of the demand for the products. If products are classified on the basis of their demand patterns, Many recent texts emphasize that the product, manufacturing process and supply chain structure need to be considered together to create a capability for mass customization; different industries require different approaches for customization considered [7].

3. Industrial Practice

Garments manufacturing organization is looking for enhancing efficiency in their internal supply chain echelon i.e. cutting, sewing and finishing. The inefficiency of apparel supply chain is started from cutting section. This is the key echelon of apparel supply chain. Cutting department receive input from store, they keep it on the cutting floor for "Relax". After keeping on relax the fabric about 6 hours, cutting people keep it on the cutting table and ready for cutting. The cutting departments have the capacity of supplying input into sewing section, but

maximum time they cannot feed input due to improper flow of material which is caused by the in-efficiency. Consequently, sewing department fall on pressure, they have to complete the 5 days production within 3 days because of the delay of the cutting section. In this case, shipment date become sturdy to meet and the company cannot keep the buyers commitments. It greatly hampers the company's reputation. For example :

Order confirming date on 30th June
Shipment date on 15th august
Total lead time :47 days
Order quantity :9800 pieces
Required fabric : 2814 kgs
Embellishment status: Embroidery
Production target : 100 pcs /hour
Working hours : 8
Allocated line : 02

For meeting this shipment sewing should complete 4000 pieces per day. But if the cutting department delays at least 6 hours to send input into sewing department, the shipment cannot be met. If the working hour is 8 hours, then the production manager takes decision about overtime for production and meeting the shipment date. It enhances the product cost whereas the amount of profit is being reduced in order to pay for overtime of workers. After receiving the input from cutting department, input has to be re-cut and the shipment date cannot be met. Before entering the input into sewing line quality was not checked. So, after the production of a major quantity, quality related problem of cutting department is occurred. At that time sewing department is bound to discontinue production of that particular line and send information into cutting department. The cutting department ensures inputs quality again and send it to sewing department for starting the production process. It takes time that obstructs the production and shipment being tight. Also when operator and quality section of the line make defective product check it out and resend the defective item to the respective operator. The operator takes time to make the correction of this product. For this reason in this process the bottleneck may be happened which limits the total production and target of line and also to make the shipment delayed.

For delay of production from the sewing and cutting departments, finishing department hindrance delay by default. So, shipment cannot be done on time. Inventory is created in the finishing section in spite of having the capacity to make finishing on time they cannot complete timely because of problem faced by predecessor department. In the finishing section, they receive finished goods from sewing section and they also do not check it out on the account of hammering on them to meet shipment on time. So after finishing they make packaging the finished goods where some product remains unchecked. When the buyer checks the lot and unfortunately if the unchecked product is being disqualified then full lot can be re-checked. This news is very pedantic for company. The above mentioned reason can cause for decreasing efficiency in apparel chain.

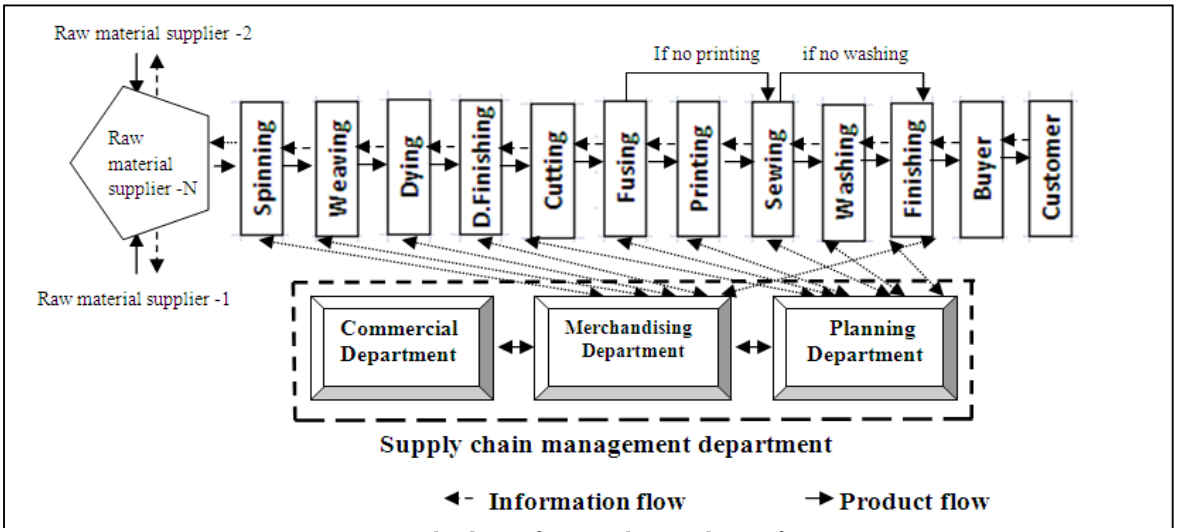
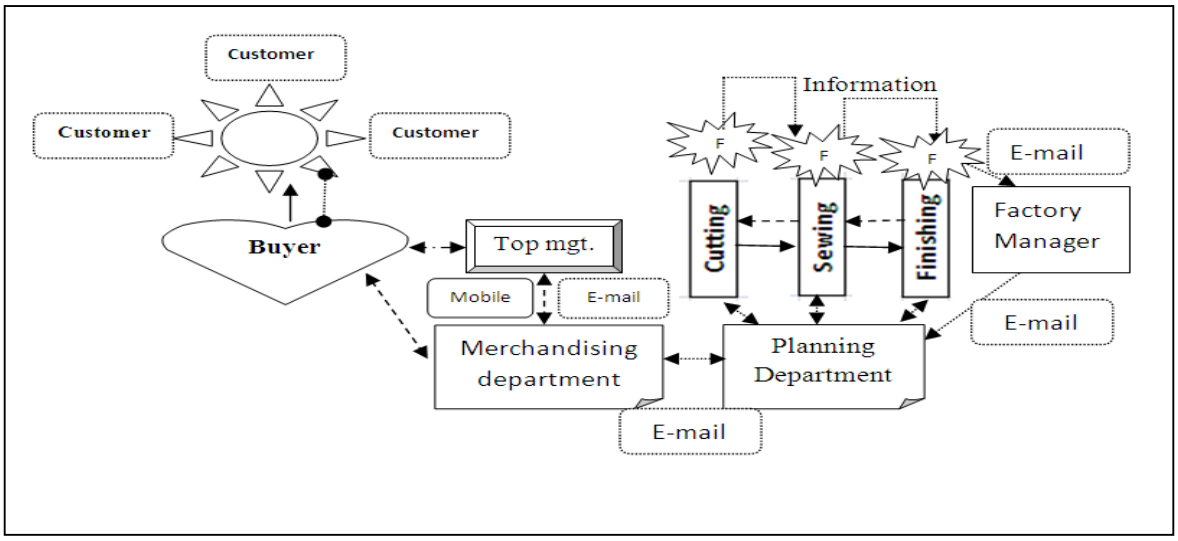


Fig.1 Supply chain of a typical apparel manufacturer



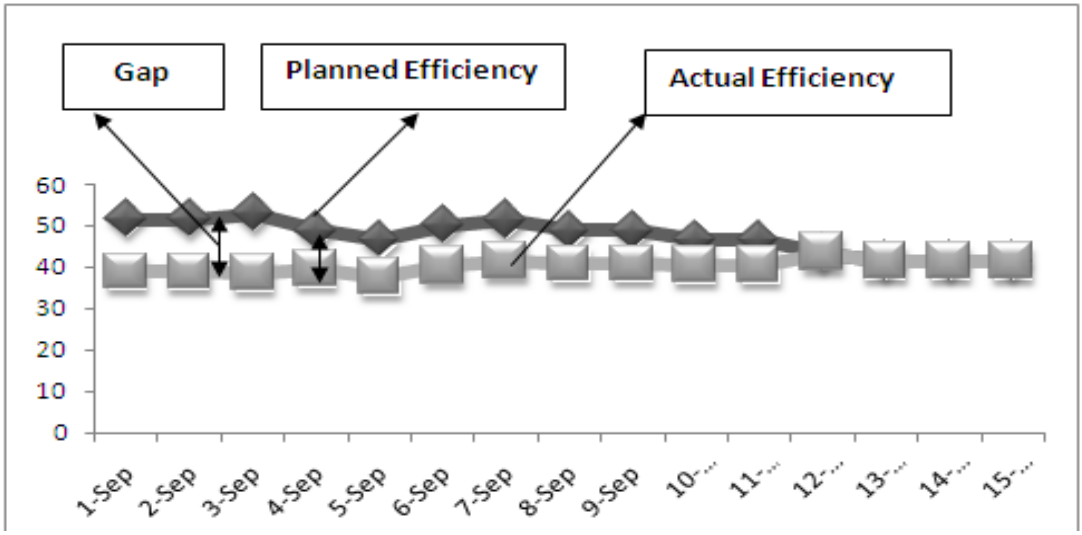


Fig. 3: Date vs. Efficiency in Cutting

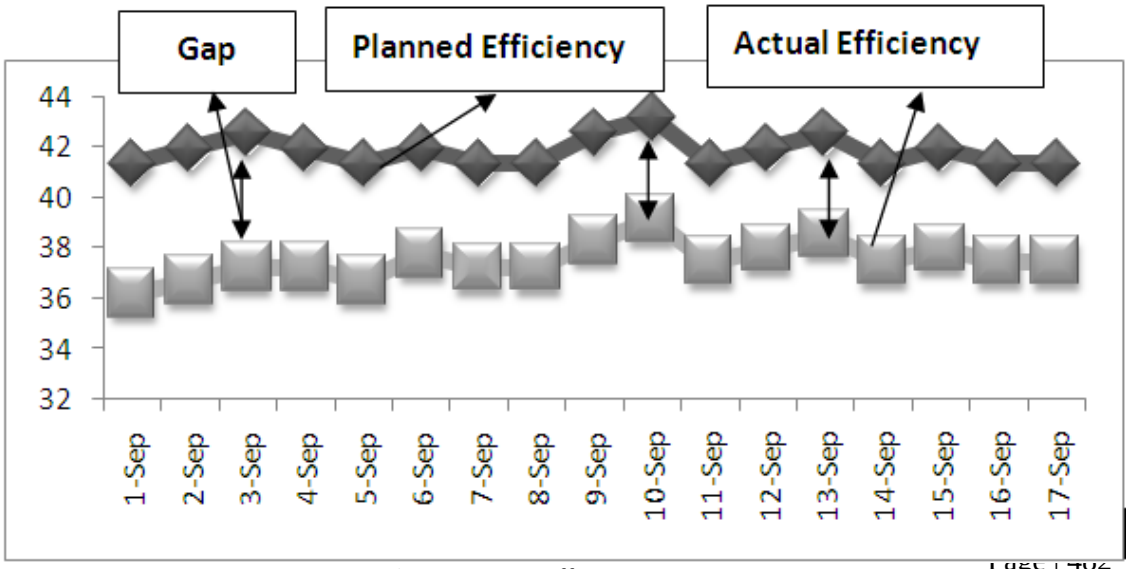


Fig.4 : Date vs. Efficiency-Sewing

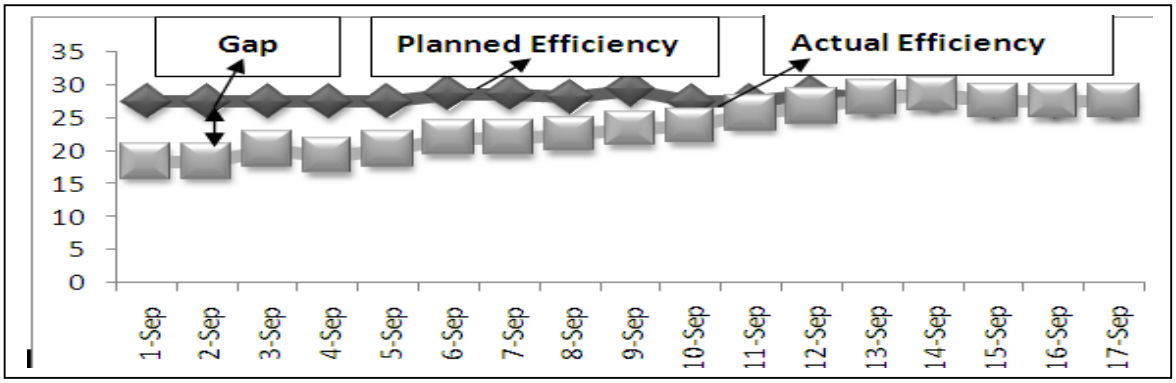


Fig. 5 : Date vs. Efficiency-Sewing

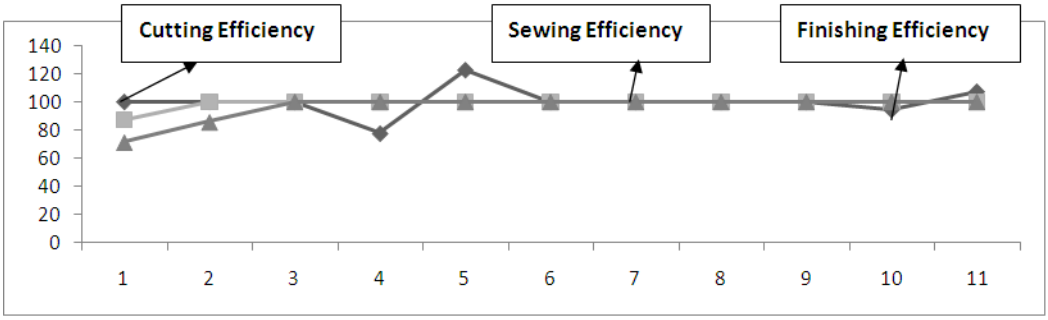


Fig. 6: Improved Efficiency of Apparel Supply chain

4. Results & Discussions

Apparel manufacturing organization is harassed to make the downy supply chain in order to deliver garments to the buyer on time as well as gain the profit margin by reducing unnecessary waste or from the chain. Pragmatically, we have shown from the figure 3, 4 & 5, supply chain department cannot reach their goals. Figure 4 depicted that there was a huge gap formed between plan and actual efficiency of cutting section. The fallout of efficiency of the cutting department alarming to the supply- chain department that shipment will not be met on time whereas sewing line was waited for the inputs which also ensured that plan productivity target was nil as input was not available on time. It was the colossal waste in the apparel supply chain which greatly an impact on efficiency. Figure 4&5 has further depicted the scenario of the efficacy gap for sewing and finishing section. It was clear that owner of the apparel manufacturing organization in a dilemma to take a decision, whether can be met delivery date; they have to decide for the air shipment. Resulting in, this leads to massive cost for managing the supply chain. However, this practice eventually affected on overall chain profitability, which is the core objectives of the supply chain. It was too sturdy to analyze the whole supply chain inefficiency and strived to mitigate the delivery cost as well as improving the efficiency level of apparel supply chain and co-ordinate with all the chain members. In this research, we have developed a supply- chain model shown in figure 2 in order to overcome the inefficiency. This model has described that the decision making system while the proficient supply chain was being impeded, and it will ensure about the saving of air cost because of information visibility among the chain partners. The anticipated chain model has been developed in order to make the smooth supply chain. The outcome has shown moreover, in table 1 and figure 6. The efficacy level was very near to the acknowledged plan efficiency in the three echelons in the apparel supply chains. The result was illustrated in table 1 that shipment date for a typical style was October 9, where the order quantity

was 9600 pieces for a specific buyer. It has shown that 98% work completed on October 8. The supply -chain department can take a decision without any troubles to inform shipping line to confirm the delivery for sending garments to the buyer on time.

5. Conclusions

Efficiency is the major points in any manufacturing organization in order to stay alive in competitive market. In this research, to make the efficient supply chain in apparel manufacturing industry was giant challenge. The study has been analyzed the real conditions of apparel supply chain while inefficient supply chain. Implementing the proposed apparel supply chain model was more challenging job in the typical apparel manufacturing organization as the middle management put down antique idea regarding the efficiency of the organization. It apparently seemed that the gap between the plan and actual efficiency was vast but from the figure 6 it was clarified that due to make efficient supply chain in a typical apparel manufacturing organization ultimately there were no adverse effect on efficiency in the three key tier of the chain gradually. After implementation of proposed supply chain model in the reputed apparel industry in Bangladesh, the revenue figure has been increased and objective of the chain was being achieved. An essence of the philosophy has been implemented between three branches of the chain and has received immense success. This paper showed vital model for making smooth apparel supply chain which improves efficiency of the company, maximize overall profitability for overall value chain in apparel manufacturer, reduces cost of manufacturing and finally helps to meet the on time delivery of products to the respected customer. See appendix A, B and C for analysis of the effect of efficiency for cutting, sewing and finishing respectably. The top management must be sympathetic before implementing such kind of proposed supply chain model in apparel manufacturing organization. Future work can be done by making efficient entire apparel supply chain shown in figure 2 in the textile and apparel industries.

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