

Supply Chain Management: An Integrated Solution to Textile Industries

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Abstract:

The Textile Industry is characterized by a complex production network which spans many businesses and usually crosses International boundaries. It has become an essential commodity in day to day life like food and water. The verities of production in Textile field has spread in all areas right from apparel to Industrial fabrics, protective Textiles, Composite Textiles, Medical textiles, Automotives, Aerospace and in so many other areas. Now- a -days the product range are not within the periphery of one area but reached at nook and corner all over the world.

Today, the sales are highly volatile and seasonal and to fulfill the requirements it needs good capacity planning, production scheduling, process control, inventory management to make the whole thing a profitable proposition. To make an integrated solution which spans stock balancing, inventory management, production planning and distribution scheduling a proper system needs to develop.

Hence to make all the systems in order, it is ideal to have a proper supply chain Management in Textile Industries.

Flow of information between business partners, producers to distributors and retailers, the inventory optimization, demand - supply is to be perfect through proper supply chain management.

This paper is going to highlight the mode of supply chain, the pros & cons of each system and to highlight the fact that how the **Supply Chain Management has become an integrated part in the Business of Textiles.**

It has described mainly on Technical and practical aspect of day to day business management and impact on profitability of the Industries.

AIM:

- The SCM is an integrated and essential part in the world of business without which the Organizations will not be able to stand in market.
- It is highly correlated with so many aspects such as Production Planning, Procurements, Logistics, Information Flow and Financial support.
- It is a matter of highly managerial related matter linked from Corporate to Floor level.
- Hence this paper is prepared to make aware our Textile Engineers the importance about the system, lacunas and solutions in this Managerial Method that how to run the Industries in smooth channel of Profitable zone.

1. Introduction:

Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies. It is said that the ultimate goal of any effective supply chain management system is to make products available when needed.

Supply chain management flows can be divided into three main flows:

- The product flow
- The information flow
- The finances flow

The product flow includes the movement of textiles from a supplier to a customer, as well as any customer returns or service needs. The information flow involves transmitting orders and updating the status of delivery. The financial flow consists of credit terms, payment schedules, and consignment arrangements.



Some SCM applications are based on open data models that support the sharing of data both inside and outside the enterprise (this includes key suppliers, manufacturers, and customers of a textile manufacturing company). By sharing this data "upstream" (with a company's suppliers) and "downstream" (with a company's clients), SCM applications have the potential to improve the time-to-market of products, reduce costs, and allow all parties in the supply chain to better manage current resources and plan for future needs.

Supply chain management is typically viewed to lie between fully vertically integrated firms such as Reliance who produce the raw material – polyester yarn and also the finished product - Vimal a single firm and those where each channel member operates independently. Coordination between the various players in the chain is key in its effective management.

2. Supply Chain Decisions:

The decisions for supply chain management can be classified into two broad categories -- strategic and operational. As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these types of

decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

There are four major decision areas in textile supply chain management: 1) location, 2) production, 3) inventory, and 4) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

2.1 Location Decision:

The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location of facilities involves a commitment of resources to a long-term plan. Once the size, number, and location of these are determined, so are the possible paths by which the product flows through to the final customer. These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service. These decisions should be determined by an optimization routine that considers production costs, taxes, duties and duty drawback, tariffs, local content, distribution costs, production limitations, etc. Although location decisions are primarily strategic, they also have implications on an operational level.

2.2 Production Decisions:

The strategic decisions include what textiles to produce, and which plants to produce them in, allocation of suppliers to plants, plants to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path through which a product flows to and from these facilities. Another critical issue is the capacity of the manufacturing facilities--and largely depends the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

2.3 Inventory Decisions:

These refer to means by which textile inventories are managed. Inventories exist at every stage of the supply chain as either raw material, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals. However, most researchers have approached the management of inventory from an operational perspective. These include deployment strategies, control policies --- the determination of the optimal levels of order quantities and reorder points, and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels.

2.4 Transportation Decisions:

The mode choice aspects of these decisions are the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading-off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. While transportation by sea or rail is cheaper, it necessitates holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus Lot-for-Lot), routing and scheduling of equipment are key in effective management of the firm's transport strategy.

3. Supply Chain Modeling Approaches:

Clearly, each of the above two levels of decisions require a different perspective. The strategic decisions are, for the most part, global or "all encompassing" in that they try to integrate various aspects of the supply chain. Consequently, the models that describe

these decisions are huge, and require a considerable amount of data. Often due to the enormity of data requirements, and the broad scope of decisions, these models provide approximate solutions to the decisions they describe. The operational decisions, meanwhile, address the day to day operation of the supply chain. Therefore the models that describe them are often very specific in nature. Due to their narrow perspective, these models often consider great detail and provide very good, if not optimal, solutions to the operational decisions.

4. Network Design Methods:

As the very name suggests, these methods determine the location of production, stocking, and sourcing facilities, and paths the product(s) take through them. Such methods tend to be large scale, and used generally at the inception of the supply chain.

Breitman and Lucas attempt to provide a framework for a comprehensive model of a production-distribution system, "PLANETS", that is used to decide what products to produce, where and how to produce it, which markets to pursue and what resources to use. This was successfully implemented at General Motors, USA.

Cohen and Lee present a normative model for resource deployment in a global manufacturing and distribution network. Global after-tax profit is maximized through the design of facility network and control of material flows within the network. The cost structure consists of variable and fixed costs for material procurement, production, distribution and transportation. They validate the model by applying it to analyze the global manufacturing strategies of a textile manufacturer.

Clearly, these network-design based methods add value to the textile firm in that they lay down the manufacturing and distribution strategies far into the future. It is imperative that firms at one time or another make such integrated decisions, encompassing production, location, inventory, and transportation, and such models are therefore indispensable. Although the above review shows considerable potential for these models as strategic determinants in the future, they are not without their shortcomings. Their very nature

forces these problems to be of a very large scale. They are often difficult to solve to optimality.

5. The Strategy:

The need of the first changing business environment in textile, apparel and in the supply of raw materials such as polyester Cotton etc., it requires proper business and planning strategy without which the supply chain management will not be successful. The following are the strategies and planning:-

- Fore sightedness of the business i.e. right idea, right supply at right time at right price.
- Proper market survey for the customers' requirements, demand and supply.
- Proper production planning at supply end and that of consumer end with help of proper information technology.
- Product supply to match the demand supply curve.
- Business expansion strategy.
- Marketing and distribution strategy.
- Strategic industry studies.
- Predicting industry trends.
- Market entry strategy
- Financial planning
- Market feasibility studies.
- Strategic Alliances.
- Mergers and acquisitions.
- Top management Recruitment/Training

6. The concept of supply chain management:

The concept should be the following for a fruitful supply chain management-

- Timely delivery at customer's end.
- Proper quantity to reach at each destination.
- Intact material.

- Reasonable cost.
- Customer must not suffer because of non-availability of raw material.
- Even the small quantity must not matter in reaching at customer end.
- With proper planning of the raw material dispatch should be in such a way that customer must not suffer because of any delay or unforeseen incidences such as road condition, traffic jam etc. which ultimately results in loss of profit.
- Although, there are frequent changes in fashion trend which leads to unpredictable market situation but with proper planning policy &, distribution system, right communication, production planning, the customer must get the required quantity of materials at its door step within stipulated time, thereby maintaining the flow of supply and thus increased profitably of both the supplier and the buyer.

7. The difficulties generally faced at supply chain:

The following difficulties are being faced in supply chain in textile industry for Yarn, cloth, apparel, garment, industrial yarn etc.

- **Distance:** - larger the distances, larger the timeframe in reaching the materials at proper time at customers end.
- **Planning.** Improper production/procurement planning at both manufacturer and consumer end. It becomes more erratic when there are fluctuations in demand of consumer products.
- **Transportation:** - larger the distance, larger is the transportation cost; some customers are not in a position to get the right raw material from the right source because of high cost of transportation and thereby the supply chain breaks.
- **Government policies one has to keep a close look at change in Government policies, like recent ban on export of Cotton Yarn.**
- **Taxation:** New Tax imposed by state Governments, like entry Tax, State levies.
- **Logistics;** In case of rise in market demand, the supply becomes more critical because of non-availabilities of trucks, man power and resource problem. At that time, the manufacturers are unable to cope -up with the growing demand of their

customers need because of their limited capacity. In such case a thorough vision in planning is must to maintain demand supply. Out sourcing are being done to meet the demand supply through proper supply chain. In such cases the transporters the concern loaders and un loaders starts demanding more wages disturbing the chain link hence long term contracts with Transporters at the beginning of Financial year pays dividend.

- **ABC Classification:** In case of increasing uncertainty in the international market, the customers starts stocking of the materials and hence, subsequent problems arises in logistics and distribution. At that time, it is necessary to see customer profile, his routine demand & accordingly distribution is made. Importances are being empathized on valuable customers for up keeping the customer's business on line.
- Sometimes any special customers need for any special product at remote place where logistic be comes difficult but to fulfill the customer need it requires to know the presence of other customers in the nearby areas, so that proper distribution can be made at a reasonable cost.
- During off season, say in heavy rain ,bad road condition ,natural calamities etc ,it becomes difficult to dispatch the material at customers end in time but to keep the supply chain on, adequate materials are being dispatched by keeping the proper information with the dealers & the customers.

8. Proper Implementation:

There should be proper implementation of the chain management to keep the production on & to minimize the cost of production. The manufacturer must have:-

- Engineering Concept.
- Machinery Evaluation.
- Architectural & Structural Details.
- Humidification, Gas & Energy Consultancy.
- Civil & Electrical & water management.
- Fire fighting & safety system.
- Improved Designing & work practices.

- Process Audit & Benchmarking.
- Process improvement & optimization.
- Complete Project management.
- Advance Analytical method of training.
- Management training & development.
- Quality assurance systems.
- Improved planning process.
- Establish performance monitoring tools through application of IT solutions.
- Establish Business Targets.

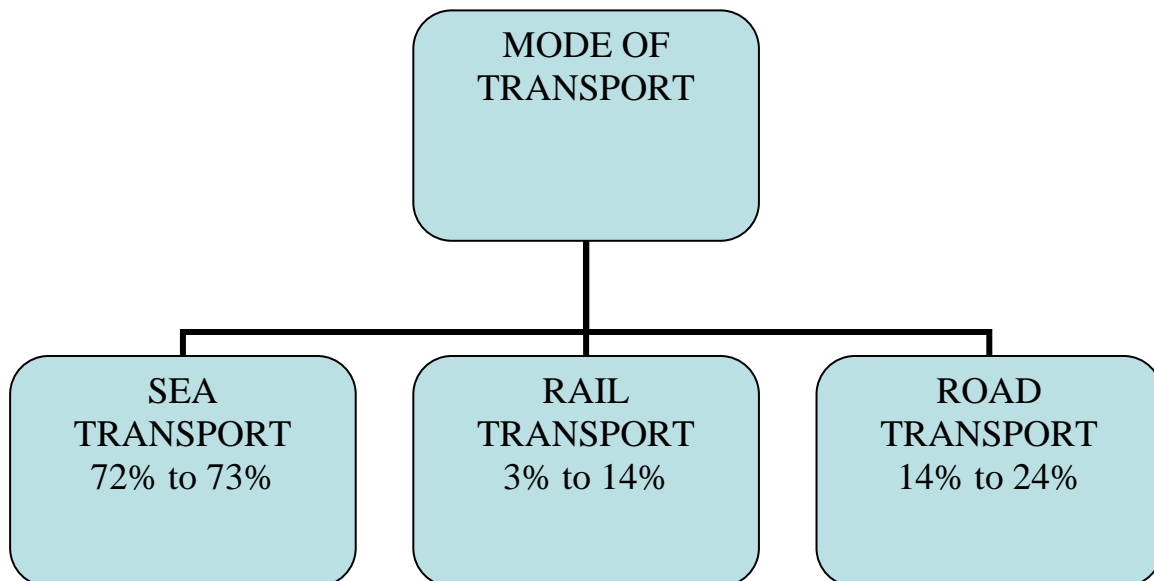
9. Mode of transportation:

For a perfect supply chain management the Mode of transportation is an essential integrated part which can be international or inter modal. It can either by ship, train, truck, Inland barge.

In the word scenario,

9.1 Difficulties faced in Transport in Supply Chain:

9.1.1 Road transport/ Surface transport :



Within India the majority of the supply chain is done through road Transport and following are difficulties faced

- Non availabilities of proper Type of Trucks to load the required quantity of the Customer. For example, in India 80% trucks are Punjab body (both sides closed) which makes difficulties in loading the trucks through Fork Lifter from all sides. It becomes time consuming, chance of material damage, less quantity loaded than the standard practices and **enhances costing**.

Because of road conditions materials get damaged even with proper packing and it creates misunderstandings among the suppliers and customers.

Rail Transport:

It is cheaper but time consuming.

- The customers need to wait for the loading / unloading operation at goods yard.
- During monsoon etc , the Textile material has got the bad impact if the proper cares are not taken in time.
- Some times it takes more time to reach the destination and customers suffer.

10. Conclusion:

1. With the growing demands of material and that of business, the Supply Chain Management has taken an important role although out the world.
2. It has taken its own shape in the Industries of Textile where large quantities are in demand with varieties of product range.
3. In the Textile Industries, there are high Market fluctuations which make the Supply Chain more critical and hence an appropriate Management is requires in this Industries.
4. The cost of Diesel and fuel price has also direct impact on this Supply chain and the Management needs to be more systematic.
5. At every stage of Demand and supply, the proper production planning is very much essential.

6. At production stage, the technical and commercial aspects are to be taken care to keep the supply Chain in tact.

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