

Total Quality Management in Supply Chain

(Effective Tool for Reducing Costs and Maximizing profits) - A Global Perspective

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Abstract

Supply Chain and Logistics sector has today grown to USD 100 billion and forms the backbone of Indian Economy. This sector contributes immensely in the growth and development of the Indian economy. Today, when country's economy is undergoing downturn, supply chain and logistics sector has a pivotal role to play in the swift bouncing back of our economy. India spends 13 percent of its Gross Domestic Product (GDP) on supply chain and logistics while other developing countries spend around 10 percent. India trails behinds China on important indices such as customs procedures, overall infrastructure quality, international shipment, logistics competence and tracking of shipments, but is ahead of the latter on the domestic logistics efficiency front. This is due to their strong logistics infrastructure that has created as ease in managing overall supply chain. But in India the Infrastructure is still to be better. Transportation by rail, rather than by road, is expected to help domestic logistics players offer more cost-effective services to their clients and this in turn is likely to boost industries use of logistics. The effective implementation of TQM in Supply Chain can reduce the costs and maximize the profits by rendering quality services. TQM is an approach to the art of management that originated in Japanese industry in the 1950's and has become steadily more popular in the West since the early 1980's. Total Quality is a description of the culture, attitude and organization of a company that aims to provide, and continue to provide, its customers with products and services that satisfy their needs. TQM refers to continuous profitability improvement. TQM is an organizational strategy with accompanying techniques that deliver quality products and / or services to customers. The Volatile international competition in the Corporate sector has forced the business houses either to shape-up or to ship out, the only promising resolution. Corporate leaders and analysts are in a lookout for new stratagems to endure. They are experimenting with various strategies like Business Process Re-engineering (BPR), managing core competencies, Benchmarking practices and Total Quality Management (TQM) with a sudden sense of urgency. Important aspects of TQM include customer-driven quality, top management leadership and commitment, continuous improvement, fast response, actions based on facts, employee participation, and a TQM culture. This involves the continuous improvement of organisation processes, resulting in high quality products and services. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. Thus there has been a desperate need of better Logistics and Supply Chain Network within the country so that the additional supply chain cost could be reduced and profits can be maximize. The Indian economy is striving for improvements in the field on supply chain management & logistics to gain a competitive edge in today's globalised economy. This need can be fulfilled with the implementation of Total Quality Management in Supply Chain Activities.

Logistics and supply chain

Logistics and supply chain has always been a central and essential feature of all economic activities. The Concept of logistics as an integrative activity in business has developed within the last twenty years. Supply Chain and Logistics sector has today grown to USD 100 billion and forms the backbone of Indian Economy. This sector contributes immensely in the growth and development of

the Indian economy. Today, when country's economy is undergoing downturn, supply chain and logistics sector has a pivotal role to play in the swift bouncing back of our economy. India spends 13 percent of its Gross Domestic Product (GDP) on supply chain and logistics while other developing countries spend around 10 percent. India trails behinds China on important indices such as customs procedures, overall infrastructure quality, international shipment, logistics competence and tracking of shipments, but is ahead of the latter on the domestic logistics efficiency front. This is due to their strong logistics infrastructure that has created as ease in

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managing overall supply chain. But in India the Infrastructure is still to be better. Logistics deals with all activity that facilitate product flow from the point of raw material acquisition to the point of final consumption as well as the information flow that set the production in motion for the purpose of providing adequate levels of customer service at a reasonable cost. Logistics is thus concerned with the management of physical distribution of material. It begins from sources of supply and ends at the points of consumption. It is therefore, much wider in its reach than simply a concern with the movement of finished goods – a commonly held view of physical distribution. Transportation by rail, rather than by road, is expected to help domestic logistics players offer more cost-effective services to their clients and this in turn is likely to boost industries use of logistics. The effective implementation of TQM in Logistics and Supply Chain can reduce the costs and maximize the profits by rendering quality services.

Total quality management

TQM is an approach to the art of management that originated in Japanese industry in the 1950's and has become steadily more popular in the West since the early 1980's. Total Quality is a description of the culture, attitude and organization of a company that aims to provide and continue to provide its customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company's operations, with things being done right first time, and defects and waste eradicated from operations.

- TQM is a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society.
- TQM refers to continuous profitability improvement. One major aim is to reduce variation from every process so that greater consistency of effort is obtained.
- TQM is an organizational strategy with accompanying techniques that deliver quality products and / or services to customers.
- TQM is an integrated organizational approach for delighting the customers (both internal and external) by meeting their expectations on a continuous basis through everyone involved with organization working on a continuous improvement in all products, services along with proper problem-solving methodology.
- TQM has a customer-first orientation. The customer, not internal activities and constraints, comes first. Customer satisfaction is seen as the company's highest priority. The company believes it will only be successful if customers are satisfied.

- The TQM Company is sensitive to customer requirements and responds rapidly to them.

Logistics and supply chain management

Logistics and SCM has become the back bone of all commercial, industrial, business activities etc. Logistics deals with all activity that facilitate product flow from the point of raw material acquisition to the point of final consumption as well as the information flow that set the production in motion for the purpose of providing adequate levels of customer service at a reasonable cost. Logistics is thus concerned with the management of physical distribution of material. It begins from sources of supply and ends at the points of consumption. It is therefore, much wider in its reach than simply a concern with the movement of finished goods – a commonly held view of physical distribution. Logistics Management is a process of strategically managing the movement and storage of materials, parts and finished inventory from supplier through the firm and on to customers. Logistic management involves two issues namely, movement of raw materials to the plant known as physical supply or material management and second, flow of finished products from the plant to the customers, known as physical distribution. Logistics management activity can be grouped as primary and secondary activities.

Supply Chain Management (SCM) is the process of planning, implementing and controlling the operations of the supply chain as efficiently as possible. Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption. Supply Chain Management is a cross-functional approach to managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and then the movement of finished goods out of the organization toward the end-consumer. As organizations strive to focus on core competencies and becoming more flexible, they have reduced their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other entities that can perform the activities better or more cost effectively.

Primary Activities:

- Transportation
- Warehousing
- Order Processing
- Inventory Maintenance

Secondary Activities:

- Product Packaging
- Product Handling
- Acquisition
- Product Scheduling

•Information Maintenance

Logistics management is that part of the supply chain which plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. The Logistics concept is based on a total system view of the material and goods flow activity from the source of supply to the final point of consumption. It recognizes the interconnections and interrelationships between the multitude of functions involved in this movement from source to final users and in doing so forces management to think in terms of an integrated system rather than managing by parts. The Logistics management task is concerned with the integrated and co-ordination of marketing activities in a way that end customers are served in the most effective way and with a profit for the organization. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing management control of daily Logistics operations. Less control and more Supply Chain partners led to the creation of Supply Chain Management concepts. The purpose of Supply Chain Management is to improve trust and collaboration among Supply Chain partners, thus improving inventory visibility and improving inventory velocity.

TQM in logistics and supply chain management

The implementation of TQM in Logistics and Supply Chain Industries can contribute to develop systems to integrating activities into key Supply Chain Processes. An example scenario: the purchasing department places orders as requirements become appropriate. Marketing, responding to Customer demand, communicates with several distributors and retailers, and attempts to satisfy this demand. Shared information between Supply Chain partners can only be fully leveraged through process integration. Supply Chain business process integration involves collaborative work between Buyers and Suppliers, joint product development, common systems and shared information.

Key Supply Chain processes:

- Customer Service Management; Procurement;
- Product development and commercialization;
- Manufacturing flow management/support;
- Physical distribution;
- Outsourcing/Partnerships;
- Performance measurement.

Customer Relationship Management concerns the relationship between the organization and its customers. Customer service provides the source of customer information. It also provides the customer with real-time

information on promising dates and product availability through interfaces with the company's production and distribution operations. Successful organizations use following steps to build customer relationships:

- Determine mutually satisfying goals between organization and customers
- Establish and maintain customer rapport
- Produce positive feelings in the organization and the customers

Strategic plans are developed with suppliers to support the manufacturing flow management process and development of new products. In firms where operations extend globally, sourcing should be managed on a global basis. The desired outcome is a win-win relationship, where both parties benefit, and reduction times in the design cycle and product development are achieved. Also, the purchasing function develops rapid communication systems, such as electronic data interchange (EDI) and Internet linkages to transfer possible requirements more rapidly. Activities related to obtaining products and materials from outside suppliers requires performing resource planning, supply sourcing, negotiation, order placement, inbound transportation, storage, handling and quality assurance, many of which include the responsibility to coordinate with suppliers in scheduling, supply continuity, hedging, and research into new sources or programmes.

Here, Customers and Suppliers must be united into the product development process, thus to reduce time to market. As product life cycles shorten, the appropriate products must be developed and successfully launched in ever shorter time-schedules to remain competitive. The Product development Managers should focus mainly for following tasks:

- 1.To Co-ordinate with customer relationship management to identify customer-articulated needs.
- 2.To Select materials and suppliers in conjunction with procurement.
- 3.To Develop production technology in manufacturing flow to manufacture and integrate into the best supply chain flow for the product/market combination.

The manufacturing process is produced and supplies products to the distribution channels based on past forecasts. Manufacturing processes must be flexible to respond to market changes, and must accommodate mass customization. Lean Supply chain management is most effective in order to reduce wastage and improve efficiency. Orders are processes operating on a just-in-time (JIT) basis in minimum lot sizes. Also, changes in the manufacturing flow process lead to shorter cycle times, meaning improved responsiveness and efficiency of demand to customers. Activities related to planning, scheduling and supporting manufacturing operations, such as work-in-process storage, handling, transportation, and time phasing of components, inventory at manufacturing sites and maximum flexibility in the

coordination of geographic and final assemblies postponement of physical distribution operations.

This concerns movement of a finished product/service to customers. In physical distribution, the customer is the final destination of a marketing channel, and the availability of the product/service is a vital part of each channel participant's marketing effort. It is also through the physical distribution process that the time and space of customer service become an integral part of marketing, thus it links a marketing channel with its customers (e.g. links manufacturers, wholesalers, retailers).

This is not just outsourcing the procurement of materials and components, but also outsourcing of services that traditionally have been provided in-house. The logic of this trend is that the company will increasingly focus on those activities in the value chain where it has a distinctive advantage and everything else it will outsource. This movement has been particularly evident in logistics where the provision of transport, warehousing and inventory control is increasingly subcontracted to specialists or logistics partners. Also, to manage and control this network of partners and suppliers requires a blend of both central and local involvement. Hence, strategic decisions need to be taken centrally with the monitoring and control of supplier performance and day-to-day liaison with logistics partners being best managed at a local level.

Experts found a strong relationship from the largest arcs of Supplier and Customer integration to market share and profitability. By taking advantage of supplier capabilities and emphasizing a long-term supply chain perspective in customer relationships can be both correlated with firm performance. As logistics competency becomes a more critical factor in creating and maintaining competitive advantage, logistics measurement becomes increasingly important because the difference between profitable and unprofitable operations becomes narrower. It is observed that the firms engaging in comprehensive performance measurement realized improvements in overall productivity.

Lean supply chain management

Effective tool for reducing wastage and improving efficiency, productivity and ultimate profitability Lean Supply Chain Management is one of the most important areas of supply chain management. Attaining lean supply chain efficiencies means addressing or rectifying many issues which create the problems of extra and unneeded time, inventory and costs.

The Company who adopt lean chain streamlines various supply chain activities to reduce and eliminate waste or non-value added activities along the supply chain flow. Various industries have a number of areas in their supply chain where waste can be identified as time, costs or inventory. Lean supply chain management is not

exclusively for those companies who manufacture products, but by businesses who want to streamline their processes by eliminating waste and non-value added activities.

Lean supply chain management requires businesses to examine every process in their supply chain and identify areas that are using unnecessary resources, which can be measured in monetary value, time or raw materials. This will improve the company's competitiveness as well as improve the company's competitiveness as well as improve the company's overall profitability. Lean management practices helps to achieve lower inventory carrying costs, reduce waste and improve responsiveness to demand fluctuations and closer integration with supply chain partners. It also helps to improve company's overall profitability. Though these benefits are significant in a slow and stagnant economy, it will continue to yield additional benefits when economy returns to growth mode. When demand accelerates, lean organizations will have superior flexibility to meet customer requirements on a timely, profitable basis. Therefore, companies should start to implement lean strategies in their supply chain in the current slow-paced economy, so that once the economy and demand revives, these organizations will be in a profitable position to scale up to meet the higher demand.

Principles of lean

The five principles of lean are:

- 1.Specify value
- 2.Identify the value stream
- 3.Flow
- 4.Pull
- 5.Perfection.

Specify value: Value is defined by the customer. The end customer defines value as does each customer in the process. If you are on a lean journey and involve suppliers, you are the customer to your tier.1 suppliers, tier 1 suppliers are customers of tier 2 Suppliers, etc. Looking at the entire value stream helps determine what creates value for each customer in the process (as well as the end customer). For manufactures whose products consist of many purchased components (or whose material cost for outweigh labour cost), understanding the entire value stream and the customers need at each point is critical. Leaning the internal operations of such an organization is good; however stopping at that point would be a mistake.

Identify the value stream: The value stream includes all of the information and material flow steps necessary to bring a product to the end customer. The obviously involves supplier. In many cases, both the information and material flows going in and out of each player in the

value stream are full of wastes that would go unseen without mapping the value stream.

Flow: Flow means moving material or information from one value-added step to the next with as little delay as possible. In many cases, it is associated with internal manufacturing only. However, it is applicable to both information and material flows within an extended value stream. Having information flow through the value stream without delays or errors can result in dramatic improvements in customer service and reductions in lead times and inventory. Better material flow within supplier plant and between plants can result in improvements as well.

Pull: This has a very obvious implication from suppliers. Most organizations do not pull from suppliers, and many of those that do have "pull" systems in place are pulling from a supplier that is operating in "mass production" mode. This means that additional costs, in the form of inventory, defects and other wastes are inside the supplier's four walls. Any customers who assume that those costs are not being passed on to them are in naïve.

Thus, it is important to setup true pull systems with supplier, who has bought in to the philosophies of lean.

Perfection: For the extended value stream, seeking perfection simple means continuing to remove wastes in the entire value stream by working closely with suppliers on programs such as product design for manufacturability, supplier associations, and other programs that aim at learning the value streams out.

Benefits of lean

- Reduces total cost of ownership by up to 15%
- Reduces inventory levels by 25%
- Reduces logistics costs by 15%
- Reduces space requirement by 40%
- Reduces lead time by 30%
- Increases fill rates by 15%
- Improves supplier performance and accountability
- Improves customers satisfaction and customer relationships
- Improves competitiveness

Conclusion

The Volatile international competition in the Corporate sector has forced the business houses either to shape-up or to ship out, the only promising resolution. Corporate leaders and analysts are in a lookout for new stratagems to endure. They are experimenting with various strategies like Business Process Re-engineering (BPR), managing

core competencies, Benchmarking practices and Total Quality Management (TQM) with a sudden sense of urgency. Important aspects of TQM include customer-driven quality, top management leadership and commitment, continuous improvement, fast response, actions based on facts, employee participation, and a TQM culture. This involves the continuous improvement of organization processes, resulting in high quality products and services. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. Thus there has been a desperate need of better Logistics and Supply Chain Network within the country so that the additional supply chain cost could be reduced and profits can be maximize. The Indian economy is striving for improvements in the field on supply chain management & logistics to gain a competitive edge in today's globalised economy. This need can be fulfilled with the implementation of Total Quality Management in Supply Chain Activities.

References

1. Supply chain journal of Council of Supply Chain Management Professionals and University of Tennessee Supply Chain Research Group. April 2004
2. Dave Nave, "How to Compare Six Sigma, Lean and Theory of Constraints," Quality Progress, March 2002.
3. Mike Rother, "What Are We Learning Since We Started Learning to See?"
4. www.lean.org.
5. www.toyota.com
6. www.toyotageorgetown.com
7. www.smartops.com
8. www.mississippiuniversity.edu
9. www.harwardbusinessonline.edu
10. www.strategosinc.com
11. www.wisegeek.com
12. www.vorne.com
13. www.va.gov
14. www.1000ventures.com
15. www.oracle.com
16. www.tcs.com
17. www.infosys.com
18. www.simpler.com
19. www.bambooweb.com