

Productive Implementation of Supply Chain Management with Total Quality Management

Vijay Kumar Paswan¹, Ankita Mukherjee², Bogineni Venkata Krishna³

P.G. Student, Department of Industrial Engineering and Management, GITAM University, Rushikonda, Andhra Pradesh, India¹

P.G. Student, Department of Food Processing Technology, GITAM University, Rushikonda, Andhra Pradesh, India²

P.G. Student, Department of Industrial Engineering and Management, GITAM University, Rushikonda, Andhra Pradesh, India³

ABSTRACT: Since early 1980's the trading sector became very crucial in today's world, now, one doesn't have to move around for acquiring products. Products are available at our door steps with good quality with proper supply chain channel, that is where total quality management comes into picture. This paper briefly analyzes what supply chain management is, the properties of flow of different supply chain management and various processes that are implemented in supply chain process to enhance product quality through complete quality control. Supply chain management is the secret to success for many top-rated companies through proper management and driver upgrading. The author explains the supply chain management system with Total Quality Management and various approaches that can improve supply chain channel. Total Quality Management mainly focuses on the quality assurance of the products which is to be delivered to the customers following the Quality Management System of ISO 9000. This paper also analyzes the various studies/researches done in the field of Supply Chain with Total Quality management.

KEYWORDS: Supply chain management; Total quality management, ISO9000, Quality management system, Drivers of supply chain

I. INTRODUCTION

Supply chain management plays a very important role in trading of proper delivery of products from the end stage when the product is in the form of raw material until it hits consumers at minimal cost and within a very short and limited time period. This includes numerous components needed in the distribution channel. Holding these considerations in mind supply chain often includes principles of complete quality control to produce and enhance goods that can meet consumer needs. In 1982 Keith Oliver gave the concept of the supply chain management. As time passed by, the tactics and technologies progressed so that we could get an effective supply chain system without losses. As competition increased Total Quality Management made the difference. Supply chain components are related to product quality which has been clarified by Deming cycle and given by W. Edwards Deming, but here in supply chain, Deming cycle is improved with new components. All the above mentioned tactics help to optimize the current layouts and losses. [16]

II. SCM OBJECTIVE

Supply chain management is an comprehensive trading network linking to JIT, Total Quality Management, MRP Reengineering and Optimisation.

Considering to all the aspects of supply chain management and overall quality control, we have a clear cycle view of the process with various phases. The basic cycle view is given below :

- Suppliers (Raw Materials) – Starting stage
- Manufacturers
- Wholesalers/distributors
- Retailers
- Customers – End stage

In addition to this supply chain there are different cycles in between the stages starting from customers to suppliers. The whole cycle runs on the quality and quantity of inventory according to the requirement of the customers or market demand.

Those cycles are given below on figure:1



Figure 1: Cycle view of supply chain[15]

- **Customer Order Cycle (Between customer and retailer)** : It is the first supply chain process in which the consumer collects products from the retailer according to their preferences and demands. The customer places the order and the retailer processes the request until the customer receives the product.
- **Replenishment Cycle (Between retailer and distributor)** : This cycle is in between retailer and distributor. In this Retailer replaces the inventory from the finished inventory with the help of Distributors. In this cycle Retailers acts as a customer for distributor.
- **Manufacturing Cycle (Between distributor and manufacturer)** : This is the manufacturing hub. Manufacturer's produce the inventory according to the customer demand. What customers want ? they manufacture according data and demand information that they get from distributors.
- **Procurement Cycle (Between manufacturer and supplier)** : This cycle can be referred as last cycle of the supply chain cycle view. In this procuring to raw materials from different suppliers takes place. Accumulating raw materials from different sources according to the market need and supplying it to manufacturers.

All the above mentioned stages needs quality check so that goods can reach to further stage. So, to complete the whole process of supply chain linking with total quality management is very much important .

All the stages should pass the ISO9000 prescribed standards. Due to these principles, the supply chain network can works efficiently with greater amount of output.

III. KEY COMPONENTS IN SUPPLY CHAIN MANAGEMNT

Supply Chain Management follows a procedure used in trading to ensure their supply chain is efficient and cost-effective. A supply chain is a series of steps taken in a business to turn raw materials into the finished product.[5]

W.Edwards Deming gave PDCA (plan- do – check – act) deming process. This cycle was very necessary and has been very successful. Later with respect to this process enhanced element new components were added to improve the supply chain management cycle.

Those elements are as follows :

- **Plan** : The first and most critical phase in every process is preparation. Supply Chain deals with many sectors in order to deliver products efficiently. Planning is the key to success in the trading or commercial sector. A prominent piece of strategy focuses on the preparation, forecasting, storage and effective distribution of products to customers.[9]
- **Develop (source)** : The second stage of the supply chain management is to develop relationship. The main function of this stage is to link the relationships of stages involved in supply chain management processes. From start up phase until the product hits the consumer. For example, the relationship between suppliers and producers or the relationship between manufacturers and distributors, every stage of cycle view is interconnected with each other.[9] [16]

- **Make (Production and Operations)** : This is the third stage of components. It is mostly significant in supply chain part. It deals with all physical activities, such as packaging, transport, product testing and delivery scheduling.
- **Deliver to customers (Distribution/Logistics)** : The whole supply chain is working to deliver the value to consumers efficiently. This process deals with the efficient distribution of the products. This step connects with three sections: warehouse, pick-up carriers and delivery carriers, and creates a proper forum for customers to receive a proper system of invoicing to pay.[4]
- **Return** : Last stage of the supply chain in which they will return the product they have purchased after supplying the product to the consumer if they receive faulty goods through this process. This move would allow customers to use the service easily and gain the trust of the suppliers.[5] [7]

IV. SUPPLY CHAIN DRIVERS

Drivers are the main categories that holds the supply chain management system. Some of the major drivers of Supply Chain Management are as following –

- **Facility** : These refers to the authentic locations in the supply chain management where goods are stored, assembled and manufactured. Facility provides a space to the goods to process.[19]
- **Inventory Management** : It refers to the management of inventory in the cycle of supply chain management. Inventory deals with all the raw materials, current manufacturing material which are in under process and items already produced within the supply chain. Manipulating in inventories can lead to drastic change in supply chain processes that can impact cycle efficiency and response. According to the customer demand and want they want the goods undergo through inventory management.
- **Transportation** : In whole supply chain management process transportation is responsible for the movement of goods from extreme end to customer end. It is present in all the stages of supply chain management. Transportation puts a great impact on increasing the efficiency of supply chain cycle.
- **Information** : Information is an essential component in supply chain management. We can get higher output through the proper flow of information in the supply chain cycle. There are different modes of information flow in Supply chain management that is centralized and decentralized mode of information flow.[9]

V. SUPPLY CHAIN MANAGEMENT WITH TOTAL QUALITY MANAGEMENT PRINCIPLES

Many of the above supply chain management considerations contribute to full quality control. There are so many similarities between the supply chain and total quality control that can boost both quality and production cycle together. Implementation of complete quality control at all levels, cycles and drivers can also increase the quality of the products and meet all quality standards specifications i.e. of ISO9000.

International Organisation for Standardization (ISO9000) is the most popular set of quality management protocols that has to be followed by any organization or company. This quality management protocols boosts the Supply chain management processes and Total quality management processes at all levels that satisfies the customer.[2]

As described earlier the Quality Management System (ISO9000) comprises 8 major principles of Total quality management and those are as follows :

- **Customer Need** : What is their demand ? what quality of product they want ?
- **Headship** : Quality Management is dependent on constructive leadership.
- **Involment of employees** : Teamwork and working environment of employees.
- **Process Management** : Focuses on modern quality adapting improved processes and managing it.
- **System Management** : Integeration of whole system in sub-systems and improvement of these intergerated subsets for total improved output.
- **Continuous Improvement** : Adapting modern quality researches and practises for constant improvment.
- **Proper Decision making** : On the basis of data and information making effective decisions that can work in optimized way and with minimum losses.
- **Good relations with suppliers** : Suppliers deals with the raw materials so relating suppliers with Supply chain management they come on the top of the list and the first one to manage the raw materials. Good relations can build the bridge between the suppliers and the respective firm for productive Supply chain management and Total quality management.



Similarities between Supply chain management and Total quality management

This structure shows the main factors of Supply chain management and Total quality management like meaning, duty, Aim, Approaches used, applications and Motive. These factors will build up the linking of Supply chain management and Total quality management that can lead to the main motive ie.satisfaction of customer demands.

Working on these factors efficiently results improvement in internal areas by Total quality management and improvement in external areas by Supply chain management like partnerships.[17]

**Table no.1
Similarities between Supply chain management & Total quality Management**

Subject	SUPPLY CHAIN MANAGEMENT	TOTAL QUALITY MANAGEMENT
Meaning	The method of managing the flow of products as a raw material passing through different channel until it reaches to customer in a minimum cost and short period of time	It deals with the quality assurance of the products considering all aspects of standard quality measurements and that can satisfy the customer needs
Duty	Arrangement and transportation	Quality Assurance
Aim	To increase efficiency in delivering the goods.	To increase quality for improved output
Approaches used	Material Requirement Planning(MRP), Just in Time concept (JIT), Enterprize Resource Planning (ERP)	Six Sigma, Taguchi Methods, Deming Cycle
Applications	Manufacturing services, retails, processing management with all ISO Standards	Manufacturing, Small and medium size enterprises
Motive	Customer Satisfaction	Customer Satisfaction

Profits from Supply Chain Management and Total Quality Management

After reviewing literature thoroughly, it is discovered that by adopting Supply Chain Management and Total Quality Management, we can obtain several possible benefits for any business or organization. We also had different criteria from previous research, such as decision-making, quality improvement, successful partnerships, leadership and various management structures applied in Supply Chain Management and Total Quality Management. We can extract some benefits based on these certain parameters.[6] [1]



Table no.2

Profits from Supply Chain Management and Total Quality Management	
Supply Chain Management	Total Quality Management
More precise pricing	Improved economic performance
Increased rhythm in between departments	Improvement of self confidence
Increased teamwork	Initiating continuous improvment
Risk Management process improved	Prolong relation constructing
Improved coordination with customer	Rise of customer satisfaction

VI. CRITICAL STUDY REVIEW OF RESEARCH PAPERS

This paper column describes the detailed analysis with quality control of various research in the Supply Chain sector. Past work (2003-2019) has been taken for common inference that by combining Supply Chain Management with Total Quality Management we can increase performance and quality. The reviews on different research papers form 2003-2019 are given below :

[20]The relevant area to remember is supply chain management for every corporation or organization. With proper supply channeling, theories and tactics of quality control a firm may meet customer expectations.

[13]This study explores the development of the supply chain sector with strategies of quality control that can strengthen long-term partnerships and collaborations. The company's benefits even increase through this kind of partnerships.

[3]Quality management system (ISO9000), ISO9000 requirements are designed to improve and sustain the quality assurance and management areas standard. Such standards increase the acceptability of customer products which improve the supply chain networks.

[12]Every firm wants efficient production in this rising era of competition. The implementation of new activities and technologies to increse the efficiency of the supply chain. It provides a standardized system of quality to increte the company's production and delivering system.

[10]This paper is focused on the standard nature of the items. This also accounts for the versatile supply chain structure. Model quality segments are taken seriously because this may lead to a breakdown in the supply chain processes.

[18]This paper explains briefly the differences and advantages that exist between supply chain management and total quality management. By combining these two parts, effective production can be increased.

[11]This paper is elaborating, the modern quality control mode for the supply chain which is introduced for the complex and simple environment of the supply chain networks. Through embracing new techniques for quality control of the product lifecycle, the quality sectors will change.

[14]Supply Chain and quality management are not only seen in firms and industries, but its branches can also be used in other fields. The paper describes the quality control of the supply chain in agriculture. The standard of the agricultural products is transformed according to the needs of the customers.

[8]As mentioned above, this paper also elaborates on the correct pricing methods and details on quality management, which can be obtained in a standardized and systematic manner if we apply complete quality approaches in the supply chain. For example Hunger Marketing.

VII. DISCUSSION

We have learned from the extensive studies of various research papers on how important Total Quality Control is for supply chain management. Proper flow of information from suppliers to consumers will occur within supply chain

networks. The flow of information and inventory about the need for quality-based demand provides a solid basis for efficient functioning of the supply chain. In firms and companies applying these techniques, technologies and tactics makes the companies or firm's success probability very high. With proper channeling and networking, losses will be less.

VIII. CONCLUSION

In this paper, an attempt was made to review the different research papers using quality control focused on Supply chain management. Research papers were chosen randomly and thoroughly studied the pros and cons of Supply Chain Management with Total Quality Management. The main motive of this study was to give brief information how supply chain management is linked with Total quality management.

Managing the supply chain requires team commitment for work. The fundamentals of the supply chain, cycle view and supply chain drivers were taken into consideration at all stages with respect to quality controls. We have discussed important factors when we add Total Quality Management with Supply Chain Management. Systematic implementation of these two branches i.e. Supply Chain Management and Total Quality Management minimizes the losses, uncertainty risks, wastage of inventories and can increase the profitability of any firm. Findings from this paper will also be beneficial in further researches on Supply Chain Management and Total Quality Management.

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