

THE MODERATING IMPACT OF TOTAL QUALITY MANAGEMENT ON SUPPLY CHAIN MANAGEMENT: IMPLICATION OF COMPETITIVE ADVANTAGE

Jack Crumbly, Jackson State University, United States

ABSTRACT

Organizations are always looking for ways to sustain competitive advantage over others. One method to gain that advantage is to have an efficient Supply Chain Management process. Despite the efforts of implementing supply chain management, organizations find themselves with an inefficient supply chain management process and search for solutions to improve their supply chain management tasks. Previous researchers have suggested Total Quality Management as a plausible process for improving supply chain management. In addition, prior research has suggested methods of implementing Total Quality Management solutions that possibly overlap the Supply Chain management process. The overlap between the two processes could either enhance or damage an organization's current supply chain management processes that have been fulfilling organization requirements. Depending on the organization's relationships with third party logistics groups (3PL) and other supply chain partners, the implementation of total quality management could have a positive or negative impact on the supply chain management process. This study provides a conceptual framework for assessing the impact of TQM implementation in supply chain processes. Testable research hypotheses are presented for future empirical study.

INTRODUCTION

Companies are continuously in search of providing optimal products and services that satisfy customer needs, and therefore recognize the ability to meet customer needs well can be a viable source of competitive advantage in a global marketplace. One way of sustaining this advantage is having an optimal Supply Chain Management (SCM) process. Although there have been ideas and technology implemented to improve the supply chain process, the performance of the supply chain has never been worse (Fisher 1997). In some instances costs have risen to unprecedented levels because of adversarial relations between supply chain partners as well as dysfunctional industry practices such as overreliance on price promotions (Fisher 1997). The proposed solution to these challenges has been to implement Total Quality Management (TQM) and its relevant components. TQM has been known to resolve issues that prevent the distribution of information and products to the final destination. The TQM process involves decision makers focusing on abstract components like relationships with customers and on continuous improvement (Curkovic et al 2000).

The theory of TQM and other solutions that focus on quality such as Six Sigma and the Business Excellence Model provide accurate solutions for organizations to resolve issues related to quality. However, the implementation of these components may not provide each organization with the best solution to sustain a competitive advantage in their supply chain. Depending on the market on which the company is focused or its current relationships with supply chain members, implementing these services may increase the process time of meeting the demands of the market. Alternatively other companies could immediately benefit from the TQM components, particularly to improve the relationships and improve on quality of the SCM process. The paper will focus on the overall impact of TQM implementation and its impact on the "market responsive" and "physically efficient" supply chains types, and the subsequent impact on the firm's sustainable competitive advantage. The remainder of this essay is organized as follows: the following section reviews both selected supply chain and TQM literature. Next a conceptual model depicting the relationship of TQM and supply chains is presented, along with testable research propositions. Last the article is concluded with future research directions.

A REVIEW OF THE LITERATURE

Total Quality Management

Based on a literature review, some management principles have been known to be useful for improving the performance of a company (Kanji and Wong, 1999). They include management principles such as process management (Kanji & Asher, 1993; Zari, 1997), customer satisfaction (Fornell, 1992; Gorst et al., 1998), teamwork (Schotes, 1992; Tjosvold, 1993), strategic leadership (Edgeman & Dahlgaard, 1998; Kanji, 1996; Tribus, 1998), systems thinking (Senge et al., 1994), continuous improvement (Imai, 1986), and scientific management as advocated by Fredric Taylor (Kanji & Wong, 1999).

The management principles mentioned above are components identified in TQM. Total quality management (TQM) has been identified as the most important input for world-class manufacturing and has become a prerequisite for success in the global

marketplace (Stundza 1990). Based on the pioneering work of Deming (1981), the term TQM emerged in the 1980's in the United States and embodied a broad scope of activities within the framework of world class manufacturing (Deming 1981, 1982, 1986). TQM itself is an integrated management philosophy and set of practices that establishes an organization-wide focus on quality, merging the development of a quality-oriented corporate culture with intensive use of management and statistical tools aimed at designing and delivering quality products to customers (Melnyk and Denzler 1996). TQM also involves benchmarking, product and service design, long-range thinking, and problem solving tools. (Curkovic et al., 2000). TQM has various definitions which could change its purpose depending on the organization implementing TQM or systems with TQM qualities. Since organizations have the ability to alter the definition of TQM, there are several methods of applying these principles to organizations. These variations could develop issues within organizations who have developed partnerships prior to the implementation of TQM standards. Ahire, Golhar, and Waller state that the level of commitment to the implementation of the TQM process can have an impact on the improvement TQM contributes to processes in an organization (Ahire, Golhar, and Waller 1996). The commitment to TQM has been observed in Japanese organizations.

However, the level of commitment by leadership to TQM in the United States seems to be different. TQM has been implemented but doesn't seem to have the same level of commitment at the leadership level (1996). Without the full commitment of leadership to TQM, the organization's commitment to improving on processes such as SCM seem to become part of the tasks needed to be performed in the organization. TQM has been embraced by organizations in the west to compete with Japanese organizations and satisfy customer demands. Although TQM activities are performed, the satisfaction with TQM has not been clearly defined in United States organizations. Even with quality standards such as Six Sigma which provide equal measurements for processes that develop defects (Dasgupta, 2003), organizations generally have their own interpretation as to satisfaction levels with the improvement of SCM by TQM components that are dictated by leadership. The satisfaction levels with SCM can change depending on the level of customer satisfaction with product delivery process and the fluctuation in profit margin. TQM has been implemented in organizations. However, TQM implemented on SCM of organizations depends on its interpretation of the SCM process. In order to determine the impact of TQM on SCM, the SCM process needs to be interpreted.

Supply Chain Management

Supply Chain Management (SCM) has similar components as TQM depending on the definition used. For this study we will use the definition of developed by Mentzer et al (2001), defined SCM as the systemic, strategic coordination of the traditional business functions and the tactics across the business functions within a particular company and across businesses within the supply chain, for the purposes of improving long-term performance of the individual companies and the supply chain as a whole. The definition involves marketing, finance, sales, research and development, forecasting, production, purchasing, logistics, information systems, and customer service. The business components are mentioned to provide an emphasis on the relationships between organizations and inside organizations.

Impact of Total Quality Management on Supply Chain Management

In examining the conceptualizations of both TQM and SCM, it is clearly evident that both definitions focus on business process improvement and business excellence. However, some scholars have determined that there is a disconnection between SCM and business processes. In particular, Kanji and Wong (1999) determined that the inadequacies of the SCM model include: 1) creation, cooperation and quality culture, 2) the way to develop a close relationship, 3) managing processes other than logistical processes, 4) leadership's role in SCM, 5) quality and cost requirements of customers, and 6) initiatives to improve continuously. The inadequacies mentioned were generated from the observation of the traditional SCM model. The SCM model focuses on long term relationships, information sharing, and integrated logistics processes. The traditional SCM model has long term relationships being essential to components having a positive long term relationship between SCM parties. Kanji and Wong observe that there isn't a measure for interorganizational relationship and operation (1999). The SCM process doesn't mention the difficulty in developing a long term relationship. Activities such as changes in organizational culture may be implemented to secure the relationships and improve the SCM process (1999). Kanji and Wong argue that SCM writers exclusively focus on the management of the material flow and related information flow as the goal of SCM (1999). Kanji and Wong claim have SCM writers focused on components such as the high customer service level. They also claim that writers don't focus on quality and cost as components of customers' needs (1999). Kanji and Wong also argue that the information being shared among supply chain members should expand to more than logistical information (1999). They argue that quality and cost information should be shared. Since sharing components such as quality and cost would develop a transparent supply chain environment, it is vital that the close relationship is developed prior to implementing these activities in order to deliver products and supply accurate information to suppliers to sustain an

advantage against competing organizations. Information being shared should be expanded to more than logistical information. The information should describe details of the design process, production process and distribution process within the supply chain in order for all organizations involved in the supply chain to be aware of their role in delivering product to consumers. The operations process of partnerships should be integrated to the extent of no gaps in the relationship between buyer and supplier to reduce disruptions in the supply chain process. Finally, continuous improvement efforts should be committed to meeting everyday needs of the ultimate consumers.

However in another vein, Fisher (1997) claims that the market targeted determines the supply chain that will be implemented within a particular firm, specifically “market responsive” and “physically efficient” supply chains. Market responsive supply chains are designed to quickly respond to unpredictable demand in order to minimize stockouts, forced markdowns, and obsolete inventory (Fisher, 1997), whereas efficient supply chains function to supply predictable demand efficiently at the lowest possible cost (1997). Fisher’s typology of supply chains raises several questions in regards to TQM and SCM: Does the TQM process improve the effectiveness of Supply Chain? If TQM does improve the effectiveness of SCM, which supply chain would TQM fit best to improve SCM?

CONCEPTUAL MODEL

In figure 1, the author presents a graphical representation of the model that describes the TQM process being implemented into Fisher’s (1997) typology of supply chains. Meaning, TQM is conceptualized to be implemented in both market responsive chains and efficient supply chains. The proposed relationships of the conceptual model are presented in the following section.

Total Quality Management

The original components of total quality management as defined by Deming consist of: Continuous improvement, increased employee improvement, process management, closer relationship with customers, and management commitment. Continuous improvement in the supply chain is used to meet the ever changing needs between partner organizations as well as customers. Increased employee improvement provides organizations and their partners with competent workers that are able to observe ways to improve the supply chain or gaps that may leave the organization vulnerable to competitors. Process management allows organizations observe and facilitate the process within supply chain functions and transactions of a supplier or a customer. A closer relationship with the customers will allow organizations to focus on functions required by customers that give organizations a competitive advantage. Management commitment is the level of involvement of leadership with suppliers, distributors (3PLs), and customers.

The components of TQM mentioned above should improve the SCM functions within corporations such as Campbell and retailers giants such as Wal-Mart and Target and the relationships they have with 3PL organizations. Therefore, the following propositions have been developed:

- P1: Continuous improvement will have a positive impact of overall supply chain management.
- P2: Increased employee improvement will have a positive impact of overall supply chain management.
- P3: Process management will have a positive impact of overall supply chain management.
- P4: Close relationship with customers will have a positive impact of overall supply chain management.
- P5: Increased commitment by management will have a positive impact of overall supply chain management.

Supply Chain Management

SCM consists of the following components as defined by the model of supply chain management in Mentzer et al., The SCM process consists of listing all parties involved in the manufacturing and delivery of the goods and services being offered to the customer. This group is listed as follows: Supplier’s Supplier, Supplier, Focal Firm, Customer, and Customer’s Customer. The functions that are involved in the delivery and management of the goods and services are coordinated with the groups involved in the SCM process. After the goods and services are distributed, the end results should be customer satisfaction, profitability, and a competitive advantage (Mentzer et al. 2001).

Physically Efficient Supply Chains. The physically efficient supply chain process exists in a company that has ties to an established market. Its primary purpose is to supply predictable demand efficiently at the lowest possible cost (Fisher, 1997). The organization has determined manufacturing focus, an inventory strategy, a lead time focus, an approach to choosing suppliers, and a product design strategy. Their focus is on having a lean supply chain process. An example used by Fisher is Campbell’s soup. Campbell’s product has not had significant changes for many years. Campbell’s also has a high customer satisfaction rate (1997). Therefore it focuses on having an efficient supply chain to reduce cost and meet customer demand.

P6: Close relationship with customers will have a positive and direct impact in both physically efficient supply chains and in market responsive supply chains.

Market Responsive Supply Chain. The market responsive supply chain exists in a company that must be able to quickly respond to unpredictable demand in order to minimize stockouts, forced markdowns, and obsolete inventory (1997). Their organization focuses on the same components as organizations involved in managing the physically efficient process. However, their focus is different from their counterparts that follow lean production operations because their focus must be to maintain their supply by having excess products and having suppliers that are flexible, fast, and produce quality products. The reason for this is most products with market responsive supply chains are innovative products. The demand of an innovative product is difficult to determine. Therefore, having excess products is important for companies with innovative products that depend on the market response.

P7: Process management will have a greater positive impact in physically efficient supply chains than in market responsive supply chains.

P8: Increased employee improvement will impede physical efficient supply and have a positive impact on market responsive supply chains.

Impact on Competitive Advantage

TQM's impact on the supply chain will affect the competitive advantage of the organization and their partners. The impact of TQM on an organization will have a competitive advantage with the right relationships with suppliers and the best strategy in delivering products and services to customers. However, if the implementation of TQM slows down the SCM process, it could damage the relationships with partners within the supply chain and with customers. Depending on the type of supply chain that an organization is utilizing for its products, the TQM process could improve the SC process or damage the SC process. In the case of Campbell's soup, the current SC process for its soup products is effective for its customers. Applying TQM could change its SC process or have no effect on the process and not having an impact on the organization.

Discussion

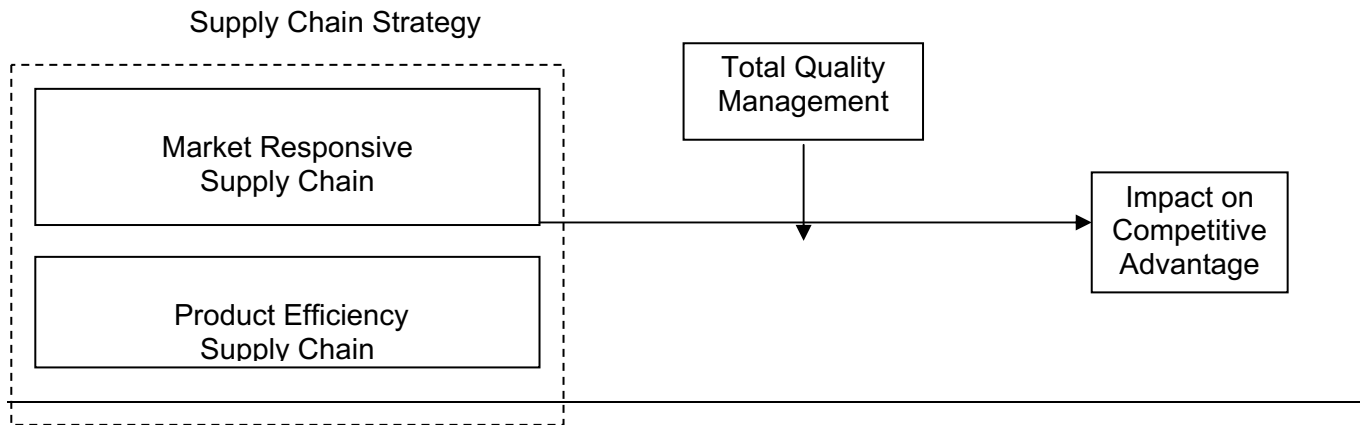
The implementation of TQM components into SCM sounds ideal in theory but has issues in the implementation. The level of transparency required for TQM to be effective between organizations may leave them feeling vulnerable reducing the level of trust and commitment, which are components of SCM. The relationship between the supplier and the partner organization could potentially become destructive and lead to organizations being ambiguous about its future relationship with the supplier. An example of this would be a foreign supplier of parts to U.S. weapons manufacturer. Depending on the location of the organization, the quality of the product and its leadership the partnership may deteriorate. The U.S. weapons manufacturer may choose to select a supplier that is in the U.S. with acceptable quality. This selection would decrease opportunity for infiltration by terrorist organizations. With these issues in mind both organization would have to create a strategy to protect both organizations from vulnerability issues in the event the partnership is dissolved. The TQM process can be utilized in the scenario above to determine that products from suppliers are being produced by suppliers in nations strongly aligned with the US. The suppliers can deliver components to US weapons manufacturers with supply chain security technology at a high quality level and significant lower costs than US suppliers.

The two established types of supply chains could or could not benefit from TQM changes. The manufacturer involved in physical efficiency would be the most reluctant in accepting TQM because the manufacturer may have its own quality measure in place which meets its margin to satisfy partners and customers. The manufacturer such as Campbell's Soup who has a 98% customer satisfaction rate (Fisher, 1997) may be satisfied with their current quality levels and determine that TQM would not significantly improve their levels of customer satisfaction nor their relationship with suppliers. Market responsive supply chain may be open to the implementation of TQM because of excess products it has to develop to sustain inventory levels. Since market responsive organizations are focused on penetrating the market with their innovative products, TQM could benefit their relationships with suppliers. If the organization has experience with penetrating the market with innovative products (i.e. Brookstone) they may have a successful supply chain strategy that satisfies their customers and suppliers. If the organization is comfortable with its partners and willing to develop transparency between the organization and suppliers, implementing TQM could benefit organizations with market responsive supply chain processes by improving the relationships and improve the prediction of consumer demand for products.

Conclusion

Although there are studies that support the implementation of TQM to improve SCM, there are overlapping functions in both concepts. To understand the full impact of TQM on SCM, the author will follow up with an empirical study that involves interviewing SCM teams that have experienced the implementation of TQM in their environment. This qualitative work should provide a foundation for further analysis

FIGURE 1 Implementation of Total Quality Management Within the Supply Chain Management Process



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