

## DEVELOPMENT OF A THEORETICAL FRAMEWORK OF SUPPLY CHAIN QUALITY MANAGEMENT

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### Abstract

*Objective/Purpose:* The present work attempts to define the concept of Supply Chain Quality Management (SCQM) and develop a conceptual framework of SCQM after identifying the constructs of Supply Chain Management (SCM) and Quality Management (QM) practices through literature review.

*Design/Methodology:* The framework proposes that the impacts of both SCM practices and QM practices would be evaluated in terms of competitive advantage and organizational performance. Further the competitive advantage would be measured on the parameters of price/cost, quality, delivery dependability, product innovation and time to market while organizational performance will be measured in terms of marketing, operations and finance.

*Findings:* The framework will help the decision makers in making a comparison among three broad categories of organizations with regard to their competitive advantage and organizational performance which are pursuing only SCM practices, only QM practices and SCM & QM practices both.

*Limitation:* The main limitation of this research paper is the absence of empirical data.

*Keywords:* Supply chain quality management, Supply chain management, Quality management, Competitive advantage, Organizational performance

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### 1. INTRODUCTION

Even though much attention has been focused on supply chain management (SCM) concepts in recent years, its interlinking with the quality management perspective is often limited and tangential in nature. While the

importance of quality management is universally recognized, academic researchers need a more focused approach in evaluating quality management issues within the internal and external supply chain contexts. As global markets evolve, supply chain managers are faced with many new

challenges, as traditional approaches to managing supply chains prove increasingly ineffective. The integration of quality management principles offers potential for broadening the perspective of supply chain management from its traditional narrow focus on costs and competitive relationships to a focus on cooperative relationships between members of the supply chain and the strategic importance of supply chain management to the achievement of competitive advantage.

In the past decade however, companies have begun to recognize not only the need for continual quality improvement and meeting the needs of their immediate customers, but also the necessity of competing quickly and efficiently in ever-changing global markets. As a result, SCM has come to the forefront as a philosophy by which firms can operate inter-organizationally, and merge both strategic initiatives and upstream and downstream processes in order to achieve business excellence. Traditional quality programs focusing on approaches such as TQM, and ISO 9001, must now transform to a supply chain perspective in order to simultaneously make use of supply chain partner relationships and quality improvement gains essential to market- place satisfaction.

To understand the field of supply chain quality management (SCQM), we must first define the term by deconstructing it. As per the definition of Supply Chain Council (2002), the supply chain encompasses every effort involved in producing and delivering a final product from the supplier's supplier to the customer's customer. This includes partnering with other firms in chains of relationships that result in down- stream benefits to customers. Similarly, the quality management perspective has traditionally

considered interacting aspects of systems such as processes, inputs, machines, people, procedures, plant, and equipment as means of creating excellence in products and services (Deming, 2000). This systems-based view of quality also applies to supply chains as well. According to Fawcett et al. (2006), competition now is not only found at the firm level. Business competition now exists as supply chains seek to gain advantage over competing supply chains. This level of competition requires a much greater level of coordination among chains or networks of suppliers, distributors, producers, and customers.' Moreover, the relevance of the impact of the quality movement in the international marketplace for the last 30 years is well established and documented by the loss of manufacturing jobs to those competitors who successfully understand and translate customer requirements to final products and services. In the reality of intense global competition, SCM principles and technologies are taking center stage as a means to achieve business excellence. This SCM movement embraces quality management initiatives, further supporting the notion that product quality is only one aspect of quality oriented continual improvement programs leading to competitive advantage and organizational performance. Satisfying final customers can only be achieved when the whole chain commits, integrates, and coordinates to pursue coherent and innovative practices (Simchi-Levi et al., 2000).

The present work is an attempt to define Supply Chain Quality Management (SCQM) and develop a conceptual framework of SCQM through integrating and synergizing the concept and philosophy of SCM and QM practices across the whole supply chain with a view to delivering value to the end

customers involving all stakeholders of the supply chain. In order to further examine the role of quality in a supply chain framework, our focus in this paper is to analyze prior work that integrates quality management principles within the supply chain. Subsequently, we identify dominant constructs, themes and gaps within the literature base, and use it to define future research opportunities and agendas in this area.

The following section provides a brief review of literature pertaining to SCM and QM constructs and the findings of different researchers in respect of SCQM. Section 3 presents a conceptual framework of SCQM based on the early works of the researchers. The concluding section highlights the potential contribution of the work, its limitations and future research directions.

## 2. REVIEW OF LITERATURE

The essence of SCM is the co-ordination and integration of different processes throughout the supply chain both upstream and downstream. The SCM concept has been advanced mainly from two bodies of knowledge: (1) purchasing and supply management and (2) transportation and logistics management (Tan et al., 1998). According to purchasing and supply management perspective, SCM is synonymous with rationalization of supply base and integration of suppliers into product development and manufacturing activities (Lamming, 1993; Krause, 1997). Further according to transportation and logistics management perspective, the focus of SCM is on reduction of inventories both within and across the organizations in the supply chain and improvement of service level

(Van, 1998; Bechtel & Jayaram, 1997; Romano & Vinelli, 2001; Alvarado & Kotzab, 2001).

As global markets evolve, supply chain managers are faced with continuously changing market dynamics, new global markets and stressful competitive environments (Mehra & Agrawal, 2003; Mehra & Inman 2004). Organizations operating beyond their national boundaries can no longer depend on previously proven domestic quality practices (Mehra & Agrawal, 2003). Dealing with traditional tradeoffs is no longer an option, and firms are finding the need to optimize their supply chain strategies over a much broader base (Meredith & Roth, 1998). Because supply chains extend across several functions and many organizations, each has its own priorities and goals (Narayanan & Raman, 2004). Additional challenges are presented by the availability of electronic links for improving supply chain performance (Poulymenakou & Tsironis, 2003), which makes it much more difficult for organizations to observe other firms' actions (Narayanan & Raman, 2004) and causes an increased focus on cost cutting and efficiency (Lee, 2004; Liker & Choi, 2004). Thus, serious threats from competition and declines in markets have forced a change in supply chain management. Initiatives such as quality management offer the potential for dealing with these challenge (Levy et al. , 1995; Carter & Narasimhan, 1996; Carter et al., 2000; Mehra & Inman, 2004). Traditional supply chain management, where suppliers are selected based on price (Chen & Yang, 2002), may lead to results that deter an organization from competing in global markets. Suppliers are pitted against each other to obtain the lowest price, buyers believe that their position is enhanced by

having a large number of competing suppliers, and Internet-based technologies have led companies to the conclusion that the immediate benefits of low cost global suppliers outweigh the long-term benefits of investing in relationships (Liker & Choi, 2004). Supplier development practices are traditionally perceived as uneconomical (Forker et al., 1999), exemplified by the existence of large supplier bases and arms-length relationships. Low cost, efficient supply chains are often unable to respond to unexpected changes in demand or supply, due to their scale economies (Lee, 2004). In an effective supply chain network, members maintain and sustain a customer-driven culture, offering the right product in the right place, at the right time and at the right price (Kuei et al., 2001). Although customers may blame the final producer for quality problems, they are often part of a broader problem related to how the supply chain is managed (Trent & Monczka, 1999). Thus, customers are the drivers of supply chain management, just as they are the drivers of quality management. Ascertaining customer requirements completely and accurately are of the utmost importance (Crosby & LeMay, 1998), and establishment of a close communication loop is critical in establishment of what Ferdows et al. (2004) refer to as a super- responsive supply chain. In fact, this is a two-way relationship: in addition to helping a buyer compete on speed, the best suppliers can also provide quality and design insights to the buyer. Quality management practices reduce process variance, which has a direct impact on supply chain performance measures, including inventory and time measures, such as cycle time and delivery dependability (Flynn et al., 1995). As process variance is reduced, there is less need for safety stock

and cycle stock inventory. Quality management practices, such as design for manufacturability, facilitate setup time reduction, allowing the use of smaller lots, which reduces cycle stock. Pipeline inventory, which is held as a function of manufacturing, supply and delivery cycle times, is also improved through variance reduction. Cycle times are shortened through the improved flows resulting from quality management practices, correspondingly less pipeline inventory is needed. As quality management practices reduce the number of items requiring rework, cycle times are shortened by speeding product throughput (Mefford, 1989; Flynn et al., 1995), allowing improved schedule attainment and correspondingly faster response to market demands. This allows a greater extent of synchronization across the entire supply chain (Ferdows et al., 2004). The use of certified suppliers and long-term supplier relationships based on quality criteria reduces pre-processing cycle time delays for incoming inspection (Heiko, 1990). In the processing and post-processing phases, quality at the source, feedback, statistical process control and effective product designs reduce or eliminate time delays for rework and process inspection of in-process and finished goods, respectively, and transportation times.

Researchers have identified a number of constructs pertaining to SCM, which is shown in Table1.

The quality management construct is complex, with many different formulations (Westphal, 1997). Several authors have noted that quality management has a set of core characteristics (Dean & Snell, 1991; Anderson et al., 1994), for instance, it is 'characterized by a few basic principles—doing things right the first time, striving for

*Table 1. SCM constructs identified by the researchers*

SCM constructs	Researchers
<b>Strategic supplier partnership</b>	Gunasekaran et al., 2001; Tan et al., 2002; Li et al., 2005; 2006
<b>Customer relationship</b>	Aggarwal, 1997; Tan et al., 2002; Li et al., 2005; 2006
<b>Level of information sharing</b>	Li & Lin, 2006; Li et al., 2005; 2006
<b>Quality of information sharing</b>	Li & Lin, 2006; Li et al., 2005; 2006
<b>Postponement</b>	Zografos & Giannouli, 2001; Li et al., 2005; 2006
<b>Internal lean practices</b>	Handfield & Nichols, 1999; Mason-Jones & Towill, 1997

continuous improvement, and fulfilling customer needs—as well as a number of associated practices’ (Dean & Snell, 1991). Quality management calls for developing and implementing a corporate culture emphasizing customer focus, continuous improvement, employee empowerment and data driven decision making. Research works carried out in the field of quality management have covered a number of QM constructs, which are displayed in Table 2.

SCM constructs and QM constructs shown in Table 1 and 2 respectively reveal

that Supplier quality management and Customer relationship/ Customer focus are in the domain of both SCM and QM. Researchers have also attempted to integrate the concept of SCM with QM with a view to deriving the synergistic benefits of both (Flynn & Flynn, 2005; Lin et al., 2005; Robinson & Malhotra, 2004; Lo & Yeung, 2004; Stanley & Wisner, 2001; Romano & Vinelli, 2001; Kannan & Tan, 2005; Kaynak & Hartley, 2007). The Table 3, presents the summarized findings of different researchers pertaining to SCQM/QM in supply chain.

*Table 2. QM constructs identified by the researchers*

QM constructs	Researchers
<b>Top management leadership</b>	Crosby, 1984; Deming, 1986; Anderson et al., 1995; Ahire et al., 1996; Black & Porter, 1996; Adam et al., 1997; Kaynak, 2003; Wong, 2003
<b>Supplier quality management</b>	Ahire et al., 1996; Black & Porter, 1996; Crosby, 1984; Deming, 1986
<b>Customer focus</b>	Ahire et al., 1996; Black & Porter, 1996; Adam et al., 1997; Deming, 1986
<b>Product and services design</b>	Ahire et al., 1996; Black & Porter, 1996; Adam et al., 1997; Ahire & Dreyfus, 2000; Kaynak, 2003
<b>Process management</b>	Ahire et al., 1996; Black & Porter, 1996; Anderson et al., 1995; Crosby, 1984; Deming, 1986
<b>Employee training and human relations</b>	Ahire et al., 1996; Black & Porter, 1996; Adam et al., 1997; Crosby, 1984; Deming, 1986
<b>Quality data and reporting</b>	Ahire et al., 1996; Black & Porter, 1996; Crosby, 1984; Deming, 1986; Kaynak, 2003

*Table 3. Research findings relating to SCQM/QM practices along the supply chain*

Authors	Main Findings
<b>Flynn &amp; Flynn, 2005</b>	Organizations pursuing sound quality management practices are likely to achieve better supply chain performance due to the reduced variances associated with the use of quality management practices. Further integrating quality goals with supply chain management goals enhances the capability of the organization for achieving other strategic goals.
<b>Lin et al., 2005</b>	QM practices are significantly correlated with supplier participation, which, in turn, influences organizational performance. Further QM practices are significantly correlated with supplier selection, but it does not influence organizational performance.
<b>Stanley &amp; Wisner, 2001</b>	Implementation of co-operative purchasing/supplier relationship has a strong positive relationship with internal service quality and the service and product quality provided to external customers.
<b>Romano &amp; Vinelli, 2001</b>	QM practices in traditional customer-supplier approach and the same along the whole supply network were compared. Findings reveal that QM practices along the whole supply chain improve the ability of the organization to meet the expectation of final customers in terms of quality through the joint definition and co-management of quality practices.
<b>Kuei &amp; Madu, 2001</b>	High-quality tendency organizations tend to perform better than low-quality tendency organizations on cost savings. High-quality tendency firms can be differentiated from medium-quality firms in respect of productivity, sales growth and earnings growth and medium-quality firms are differentiated from low-quality firms on indicators like employee satisfaction, productivity and sales growth.
<b>Romano, 2002</b>	ISO 9001 certified suppliers are characterized by better level of quality system, greater top-management involvement in formulating, supporting and communicating quality strategy, and larger diffusion and use of quality management procedures (e.g. more advanced internal quality system).
<b>Tan et al, 2002</b>	Link business practices to performance. SCM factors, JIT capability and supply chain characteristics have positive relationship with overall product quality. Delivery and communications improve overall customer service levels' six constructs of SCM practices.
<b>Benito et al., 2003</b>	Supplier quality assurance practices are positively related to technological complexity, purchase value, company internationalization, product essentiality and suppliers' specialization.
<b>Wong &amp; Fung, 1999</b>	Collaborative and structured relationships with suppliers in meeting quality objectives.
<b>Levy et al., 1995</b>	There is scope for extending the organizational forms, processes, tools and techniques of internal total quality into the supply chain. Total quality relationship will need to reach beyond the customer-relationship into the whole supply chain.
<b>Forker et al., 1997</b>	QM practices, for instance, supplier QM, role of the quality dept., training, quality data and reporting etc. are positively related to the performance of the firm. Research findings encourage manufacturers to continue promoting TQM practices throughout the whole supply chain.
<b>Wong, 2003</b>	Application of the supply chain excellence model applying TQM principles which provides insights into success factors managing supply partners.
<b>Rodriguez &amp; Hemsworth, 2005</b>	Implementation of quality management practices in purchasing has a direct positive effect on purchasing performance and an indirect effect on business performance.
<b>Kannan &amp; Tan, 2005</b>	Linkages exist between JIT, TQM and SCM at both strategic and operational level. Findings reveal that TQM and SCM related factors have greater influence on business performance, while JIT-related factors have very little influence on the same.
<b>Lo &amp; Yeung, 2004</b>	Manufacturing companies developing strategic alliances with their critical suppliers by adopting total quality approach enable them to reduce production cost, improve quality performance and competitiveness.
<b>Robinson &amp; Malhotra, 2005</b>	Defined the concept of SCQM by exploring quality management issues within the external and internal supply chain contexts.
<b>Fynes et al., 2005</b>	Supply chain relationship quality has positive impact on design quality but not on conformance quality. Suppliers can become much more pro-active in the design of new product development process by engaging in true partnership with them.
<b>Casadesus &amp; Castro, 2005</b>	Implementation of QM practices in the organization reveals that there are some indicators of QM which reinforce the improvement in SCM strategies.
<b>Sila et al., 2006</b>	SCQM has a positive impact on product quality. Further findings reveal that price, quality and trust are all important attributes in a company's relationship with its suppliers and customers. However, quality was rated more important than trust and price in the company's relationship with its suppliers and customers.
<b>Kaynak &amp; Hartley, 2007</b>	The inclusion of two supply chain management-related quality practices namely supplier quality management and customer focus in the QM model suggests that the integration of processes both upstream and downstream influences quality performance.
<b>Krause et al., 2007</b>	Understanding of buyer-supplier relationship and the relationship of social capital accumulation with buying firms' performance.
<b>Foster, 2007</b>	Identified the key variables of SCQM through literature review and classified the variables according to their commonality and uniqueness.



### 3. A CONCEPTUAL FRAMEWORK OF SCQM

SCM and QM constructs identified in the previous section will be utilized in developing the conceptual framework of SCQM. For the purpose of this paper we provide the definition of SCQM as below:

“Supply chain quality management is a set of approaches utilized to efficiently and responsively integrate all channel partners through applying quality management practices across the whole supply chain, in order to enhance trust between channel partners and deliver maximum value to customers”.

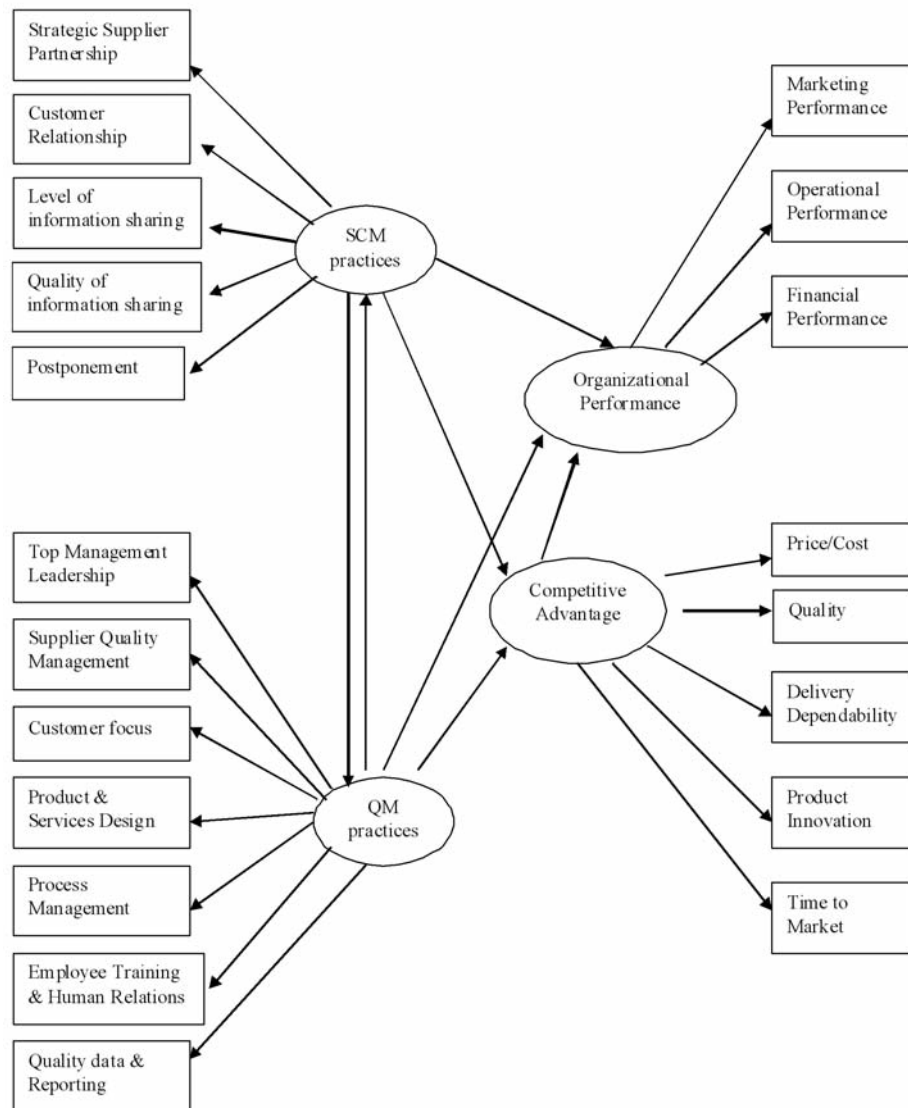
Most of the early researches are confined to finding out the impact of QM practices and SCM practices on organizational performance separately. Current research trends indicate some works on SCQM pertaining to investigating the synergy between SCM and QM (Flynn & Flynn, 2005; Romano & Vinelli, 2001; Sila et al., 2006) or defining the concept of SCQM (Robinson & Malhotra, 2005) etc. Very few works have attempted to find out the influence of SCQM on overall organizational performance by comprehensively utilizing the constructs of SCM and QM.

The present work will attempt to make use of SCM and QM constructs with a view to developing a framework which will enable the researchers to find out the impact of SCQM on competitive advantage and organizational performance of the firm. Competitive advantage of the firm will be evaluated through price/cost, quality, delivery dependability, product innovation and time to market while organizational performance of the firm will be evaluated through marketing, operational and financial performance (Li et al, 2006). The Figure 1

demonstrates the conceptual framework of SCQM.

The Figure1, suggests that SCM practices of a firm will be measured by the five SCM constructs such as Strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, postponement and internal lean practices. Strategic supplier partnership defined as the long term relationship between the organization and its suppliers. It is designed to leverage the strategic and operational capabilities of individual participating organizations to help them achieve significant ongoing benefits. A strategic partnership emphasizes direct, long-term association and encourages mutual planning and problem solving efforts. Such strategic partnerships are entered into to promote shared benefits among the parties and ongoing participation in one or more key strategic areas such as technology, products, and markets. Strategic partnerships with suppliers enable organizations to work more effectively with a few important suppliers who are willing to share responsibility for the success of the products. Suppliers participating early in the product-design process can offer more cost effective design choices, help select the best components and technologies, and help in design assessment. Strategically aligned organizations can work closely together and eliminate wasteful time and effort.

An effective supplier partnership can be a critical component of a leading edge supply chain. Customer relationship comprises the entire array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers, and improving customer satisfaction. Tan et al. consider customer relationship management as an important



**Figure 1: Conceptual framework of SCQM**

*Figure 1. Conceptual framework of SCQM*

component of SCM practices. The committed relationships are the most sustainable advantage because of their inherent barriers to competition. The growth of mass customization and personalized service is leading to an era in which relationship management with customers is becoming crucial for corporate survival.

Good relationships with supply chain members, including customers, are needed for successful implementation of SCM program. Level of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. Information sharing has two aspects: quantity and quality. Both aspects



are important for the practices of SCM and have been treated as independent constructs in the past SCM studies. Level (quantity aspect) of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. Shared information can vary from strategic to tactical in nature and from information about logistics activities to general market and customer information. Many researchers have suggested that the key to the seamless supply chain is making available undistorted and up-to-date marketing data at every node within the supply chain. By taking the data available and sharing it with other parties within the supply chain, information can be used as a source of competitive advantage. We consider sharing of information as one of five building blocks that characterize a solid supply chain relationship. Supply chain partners who exchange information regularly are able to work as a single entity. Together, they can understand the needs of the end customer better and hence can respond to market change quicker. Moreover, Tompkins and Ang (1999) consider the effective use of relevant and timely information by all functional elements within the supply chain as a key competitive and distinguishing factor. The empirical findings of Childhouse and Towill reveal that simplified material flow, including streamlining and making highly visible all information flow throughout the chain, is the key to an integrated and effective supply chain. Quality of information sharing refers to the accuracy, timeliness, adequacy, and credibility of information exchanged. While information sharing is important, the significance of its impact on SCM depends on what information is shared, when and how it is shared, and with whom. Literature

is replete with example of the dysfunctional effects of inaccurate/delayed information, as information moves along the supply chain. Divergent interests and opportunistic behavior of supply chain partners, and informational asymmetries across supply chain affect the quality of information. It has been suggested that organizations will deliberately distort information that can potentially reach not only their competitors, but also their own suppliers and customers. It appears that there is a built-in reluctance within organizations to give away more than minimal information. Since information disclosure is perceived as a loss of power. Given these predispositions, ensuring the quality of the shared information becomes a critical aspect of effective SCM. Organizations need to view their information as a strategic asset and ensure that it flows with minimum delay and distortion. Postponement is the practice of moving forward one or more operations or activities (making, sourcing and delivering) to a much later point in the supply chain. Close customer relationship allows an organization to differentiate its product from competitors, sustain customer loyalty, and dramatically extend the value it provides to its customers. Two primary considerations in developing a postponement strategy are: (1) determining how many steps to postpone, and (2) determining which steps to postpone. Postponement allows an organization to be flexible in developing different versions of the product in order to meet changing customer needs, and to differentiate a product or to modify a demand function. Keeping materials undifferentiated for as long as possible will increase an organization's flexibility in responding to changes in customer demand. In addition, an organization can reduce supply chain cost by

keeping undifferentiated inventories. Postponement needs to match the type of products, market demands of a company, and structure or constraints within the manufacturing and logistics system. In general, the adoption of postponement maybe appropriate in the following conditions: innovative products, products with high monetary density, high specialization and wide range, markets characterized by long delivery time, low delivery frequency and high demand uncertainty; and manufacturing or logistics systems with small economies of scales and no need for special knowledge. QM practices will be measured by the seven QM constructs; Top management leadership, supplier quality management, process management, customer focus, quality data & reporting, product and service design, employee training and human relation. Through top mgt. leadership top management provides the necessary leadership in enabling conditions for total quality. Process Management is the application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes with the goal to meet customer requirements profitably. Process improvement methods are used to ensure stable and capable processes. Through employee training programmes companies should emphasized on Job-related skills and total quality control concepts. Employee relations empower employees and reliance on awareness and efforts of all employees. Supplier quality emphasis is on quality, not on management of price. Use joint problem solving approach. Quality-oriented Suppliers are selected based on their capacity to meet the needs of the enterprise. Suppliers are selected based on the selection cost

components. Quality data reporting records about cost of quality, and other indicators are kept for analysis. The figure further reveals that few constructs like customer focus/customer relationship, strategic quality management/strategic supplier partnership are common to both SCM and QM practices. The impact of SCM practices will be evaluated in terms of organizational performance and competitive advantage. Further the impact of QM practices will also be evaluated on the same measures. These are shown by arrows in appropriate directions in figure 1. Further as mentioned earlier, organizational performance will be measured on the dimensions of marketing, operations and finance. Organizational performance refers to how well an organization achieves its market-oriented goals as well as its financial goals. The short-term objectives of SCM are primarily to increase productivity and reduce inventory and cycle time, while long-term objectives are to increase market share and profits for all members of the supply chain. Financial metrics have served as a tool for comparing organizations and evaluating an organization's behavior over time. Any organizational initiative, including supply chain management, should ultimately lead to enhanced organizational performance. A number of prior studies have measured organizational performance using both financial and market criteria, including return on investment (ROI), market share, profit margin on sales, the growth of ROI, the growth of sales, the growth of market share, and overall competitive position. Competitive advantage is the extent to which an organization is able to create a defensible position over its competitors. It comprises capabilities that allow an organization to differentiate itself from its competitors and is

an outcome of critical management decisions. The literatures have been quite consistent in identifying price/cost, quality, delivery, and flexibility as important competitive capabilities. In addition, recent studies have included time-based competition as an important competitive priority. Some researchers identify time as the next source of competitive advantage. Koufteros et al. describe a research framework for competitive capabilities and define the following five dimensions: competitive pricing, premium pricing, value-to-customer quality, dependable delivery, and production innovation. Based on the above, the dimensions of the competitive advantage constructs used in this study are price/cost, quality, delivery dependability, product innovation, and time to market which are clearly revealed in Figure 1. Competitive advantage of a firm indicates that the said firm possesses better capability in respect of price, quality, delivery dependability etc. compared to its competitors, which, in turn, enhances its overall performance. Thus competitive advantage leads to high level of economic performance, customer satisfaction and loyalty, less brand switchover thereby increasing sales and profitability. Therefore, a positive relationship between competitive advantage and organizational performance is proposed. Research studies disclose that the components of SCM practices like strategic supplier partnership improves supplier performance, reduces time to market (Ragatz, 1997) and increase the level of customer responsiveness and satisfaction (Power et al., 2001). Integration of QM practices with the SCM practices enhances the capability of an organization for achieving its strategic goals (Flynn & Flynn, 2005). Further since QM and SCM practices

appear to be positively correlated, implementation of QM practices along the whole supply network increases the ability of the firm to meet the needs of its customers (Romano & Vinelli, 2001). Organizations pursuing strategic alliances with their critical suppliers by adopting total quality approach enable them to reduce production cost, improve quality performance and competitiveness (Lo and Yeung, 2004). The figure suggests that the organizational performance of a firm is directly influenced by SCM and QM practices and indirectly influenced by the same practices mediated through competitive advantage. Further SCM and QM practices are supportive of each other which are shown by the bi-directional arrows between SCM practices and QM practices.

#### 4. CONCLUSION

SCQM is an emerging area of research in the field of operations management which has attracted the attention of the researchers for the last few years. The present work has attempted to define and develop a simple conceptual framework of SCQM after identifying the constructs of SCM and QM practices through literature review across diverse disciplines. Most of the prominent works pertaining to SCQM/QM in supply chain have been reviewed with a view to identifying the types and nature of researches carried out by the researchers. We argue that SCQM possesses greater potential than either SCM or QM in isolation in improving the performance and competitive advantage of a firm. Accordingly we have mentioned several propositions based on our observations in literature. The framework developed in this paper will provide an

insight to the decision maker in respect of making a comparison among three categories of firms with regard to their competitive advantage and organizational performance which are practicing only SCM (category 1), only QM (category 2) and SCM and QM both (category 3).

## 5. LIMITATION

The main limitation of this work is the absence of empirical research. The validity and the theoretical soundness of the conceptual framework of SCQM can only be tested by collecting empirical data from real-life cases and testing the propositions of the framework subsequently. This will be taken up as the future scope of the present work.

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