

Enhancing Collaboration in Textile e-Marketplace Supply Chains

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Abstract

Firms seldom survive and prosper solely through their individual efforts. Each firm's performance depends upon the activities and performance of others and hence upon the nature and quality of the direct and indirect relationships a firm develops with its counterparts. Textile companies have tried to improve their organizational competitiveness in order to survive in the digital age global market. The challenge in textile supply chain management is the development of collaboration network which accommodates diverse concerns of various participants while explicitly recognizing interdependencies and promoting effective relationship management. Major contents of the study are as follows. First, ideal collaboration network model from the supply chain of the textile industry is suggested. Second, utilizing the collaboration model, A framework for textile e-marketplaces supply chains is designed to improve customer services and delivery time, to promote information sharing, and shorten product life cycle time. The framework suggested is expected to promote corporate innovation and information sharing, generate infrastructure which provides appropriate communication and operations capabilities for the textile companies.

Keywords: supply chain, competitiveness of textile industry, collaboration network

1. Introduction

Networks have become a popular issues to make firms more competitive due to industrial restructuring, large-scale downsizing, vertical disaggregation and outsourcing, and the elimination of management layers. Replacing them are leaner, more flexible firms focused on core technology and processes. These firms are closely aligned in a network of strategic alliances and partnerships with customers, suppliers, distributors and competitors (Achrol, 1997).

Business networks are forming around knowledge bases such that the maximization of knowledge is obtained through network collaboration rather than through individual business units. Such knowledge-driven networks rely on external actors to acquire the desired resources for the firm to grow and survive. Knowledge has been

recognized as a strategic asset and a source of competitive advantage especially in multinational enterprises and their subsidiaries (Nonaka & Takeuchi, 1995).

The conduct and performance of firms can be more fully understood by examining the network of relationships in which they are embedded (Gulati, Nohria, and Zaheer, 2000). As networks potentially provide the firm with access to information, resources, markets, and technologies, relationship building may not only be the most important resource for the firm (Gadde, Huemer, & Hakansson, 2003) but also the source of a sustainable competitive advantage.

Firms seldom survive and prosper solely through their individual efforts. Each firm's performance depends upon the activities and performance of others and hence upon the nature and quality of the direct and indirect relationships a firm develops with its counterparts (Wilkinson & Young, 2002). Reliance on other network actors ensures that collaboration between internal and external actors requires expertise and competence to maintain a successful relationship.

The local textile companies, mainly small-medium sized companies, have focused on exporting fabric cloths based on mass production. The industry structure of heavy dependence on small-medium sized companies became an obstacle for restructuring and the mass production of simple fabrics oriented products prevented the industry from differentiating products and introducing high value-added products. Furthermore, China and South-east Asian countries which benefited from low wages made inroads into existing overseas markets.

In an effort to overcome this kind of problems, various attempts such as the development of new products and production techniques, shifting to industrial materials, restructuring of the industry, and enhancing the overseas marketing campaigns have been tried. However, the significant outcome has not yet been realized except in some large-size companies. This was due to the fact that the small-medium sized companies had to deal with lack of money and enterprise capabilities. With the rapid expansion of internet, e-business has come up as a candidate to solve the down-sloping of competitive edge of the local textile industry, especially, the supply chain management of the textile industry which constitutes very

complex supply-demand structure and value chain.

This study is designed to explore an way of enhancing collaboration network for textile e-marketplaces supply chains as an innovative solution to improve competitive power of the local textile industry. In order to accomplish the goals of the research, the desirable framework is suggested with ideal collaboration network so that the local textile companies can find a solution to handle their structural drawbacks and strategic problem in supply chain management.

2. Literature Review

2.1. Concept of Textile Supply Chains

While there is no explicit description of supply chain management or its activities(New, 1997), it can be described as the chain linking each element of the manufacturing and supply process from raw materials to the end user, encompassing several organizational boundaries (new & Payne, 1995; Scott & Westbrook, 1991). This broad definition includes the entire value chain, and addresses materials and supply chain management from the extraction of raw materials to its end of useful life.

In a supply chain world, suppliers, finished goods producers, service providers, and retailers are required to create and deliver the best products and services possible. Collaboration enables a company to do exceptionally well a few things for which it has unique advantages. Other activities are shifted to channel members that possess superior capabilities. Supply chain management is the collaborative design and management of seamless value-added processes to meet the real needs of the end customer. The development and integration of people and technological resources as well as the coordinated management of materials, information and financial flows are critical to successful supply chain integration.

Ballou, Gilbert, and Mukherjee(2000) divide supply chain activities into three main areas: (1) intrafunctional coordination(administration of the activities and processes within the logistics function of a firm); (2) coordination of interfunctional activities, such as between logistics and finance, logistics and production, and logistics and marketing, as they take place among the functional areas of the firm; and (3) coordination of interorganizational supply chain activities that take place between legally separate firms and its suppliers. This perspective reflects the concept of e-marketplace, in that supply chain activities span organizational boundary through upstream and downstream linkages, and the integration of supply chain activities extends beyond the product flow function within the same firm to external functional areas. Christopher(1998) also notes that the goal of supply chain management is to link the marketplace, the distribution

network, the manufacturing process, and the procurement activity in such a way that customers are serviced at higher levels and yet at a lower total cost.

The supply chain of the textile industry, as shown in figure 1, consists of the distribution structure which includes manufacturer, wholesaler, retailer, and consumer of raw silk, yarn, fabrics, dyeing, and apparel. The textile industry has a very complex value chain structure and requires a complex processes to supply products to consumers. Even though the structure of value chain is very complicated, the links of the value chain is independently separated and the communication among the companies are carried out as needed without any particular methods.(Motawani, 2000)

It was found that the textile companies are not actively utilizing the information sharing and therefore management of the generation, storage and distribution of information, is not systematically done. Furthermore, due to the short life cycle of the textile products, it is very difficult to standardize the products except some categories such as raw materials, yarn, gray fabrics, and therefore the level of innovation is also extremely low.

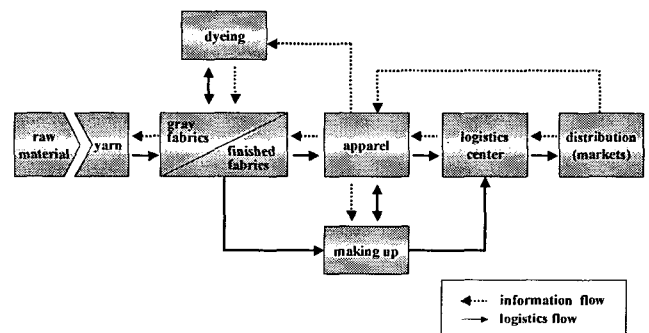


Figure 1. Supply chain of textile industry

2.2. Critical Success Factors of Textile SCM

SCM requires not only a practical change in the organization level but also a substantial change in the attitude and the corporate culture. The overall process of SCM comprises many critical factors to ensure its successful operation. Various researches have been conducted to identify the characteristics of the critical success factors of SCM.

Kim suggested that CEO's recognition and support, level of information sharing, information technology, level of communication, trust level of integration and strategy of supply chain, cooperation and collaboration, value-added products/services, and organizational bottleneck are critical.(Overby, 2001; Faweet,2004)

According to Park, CSFs of SCM can be classified into 4 categories such as environmental factors, organizational, information systems, and partnership factors. The

environmental factor includes the effort for the expansion of SCM and change in recognition of SCM while organizational factor consists of CEO's recognition and support, change in employee's attitude for SCM and education. The information system factor includes the level of development of the internal information systems and standardization while the partnership factor identifies that among supply chain members as critical.

Lee and Keencade identified six dimensions of SCM processes such as partnership, information technology, management flexibility, performance measurement, management practice, understanding characteristics of demands, Lee et al. evaluated SCM activities based on three categories of management factor, information technology factor, and relationship factor.(Yu, et al, 2001)

Ross emphasized the importance of vision and objectives of supply chain and also pointed out building collaborative partnership, maximizing the capacity through interactions among partners, and utilizing the information technology to achieve successful SCM. Hong et al. suggested four categories to measure the performance of SCM in fashion apparel industry. These include organizational factor, management factor, information technology factor, and relationship factor. In this study, critical success factors of textile SCM are identified as shown in table1. The factors are classified into four categories such as environmental, management, information technology, and collaborative relationship factor.

Table 1. Critical Success Factors of Textile SCM

Environmental Factor	Management Factor
<ul style="list-style-type: none"> Education level for SCM Continuous investment CEO's recognition and support Enhancing production and distribution system Empowerment level 	<ul style="list-style-type: none"> Integrated inventory and cost control Integrated quality control Exploration of new approach for integration of SCM activities. Purchasing of raw materials based on demands Production cycle and capacity based on demands Small lot production, order and distribution
Information Technology	Collaborative Relationship
<ul style="list-style-type: none"> Building efficient logistics networks Material requirement planning and JIT system Standardized bar code system Technology for rapid response to customer requests Knowledge management systems Group decision support systems 	<ul style="list-style-type: none"> Efficient and frequent interaction among members in supply chain Listening to customers for their strategic requests Information sharing for production, sales, demands forecasts Collaborative planning Sharing the business strategy Sharing the technology

2.3. Collaboration Network of Textile Industry

Collaboration networks can be described by the density, multiplexity, and reciprocity of ties, and a shared value system that define membership roles and responsibilities. If the overall collaborative efforts of the network are well directed, the network may become more of a network

organization than a network of linkages. Examples can be derived from technology networks where R&D organizations, products, and distributors closely coordinate their activities to provide new products to the market in a timely manner.

Networks have both economic and social dimensions that are important for the optimal operation of the network. This implies that many aspects of business relationships cannot be formalized or based on legal contracts.(Hakaasson, 2002) Collaboration involves both aligning the economic goals and aims of the network and the development of the social dimensions - in particular, mutual trust and commitment.

In an increasingly dynamic and turbulent textile industry market, a firm's ability to develop and successfully manage its relationships with other firms is emerging as a key competence and source of sustainable competitive advantage. Ritter, Wilkinson, and Johnston recognize that firms are embedded in a network of ongoing business and nonbusiness relationships that both enable and constrain the firm's performance. While many business managers may perceive that they are in total control of these relationships, most inevitably discover that they themselves are subject to the control and influence of others.

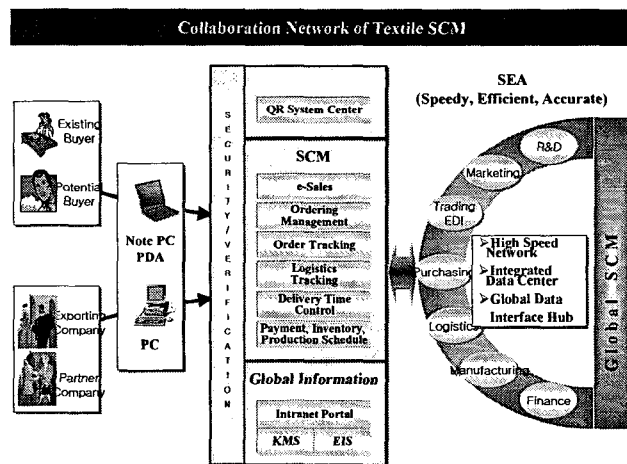


Figure 2. Collaboration network of textile supply chain

Figure 2 illustrates desirable collaboration networks in the textile supply chain. A variety of collaboration model can be derived from the whole supply chain. As a network is a set of connected relationships between firms, effects will flow through the various relationships that the focal firm has established with other connected actors. Two connected relationships can be directly or indirectly connected to many other relationships that may have some bearing on each firm as part of a larger business network. Thus, collaboration within one relationship will affect relationships with other closely connected actors, making

the collaboration process and its outcomes contingent upon the goals of the network rather than the dyad.

Network structure and network position affect how network collaboration will occur and between which network actors' collaboration will take place. Developing an understanding of network structure will enable firms to consider with whom they may be directly or indirectly affected and affected by. However, a business network does not have a natural centre or clean borders making network structure a fluid concept that invariably changes over time.

3. Framework for Textile e-Marketplaces Supply Chains

Many believe the concept of e-marketplace is a hypothetical system that can't be put into practice. However, many companies have been successful with the e-marketplaces based on strategic alliances and partnership development. The main concern here should be to convince the practitioners about the benefits of e-marketplaces. This requires education and training, perhaps re-searchers can contribute to this effort. Companies need to assess their business process and IT environment and the e-marketplaces, so that a suitable framework can be developed based on the overall support available from the company. Researchers can develop conceptual frameworks to understand the role of IT and structure of e-marketplaces and hence to develop both analytical and simulation models for selecting suppliers/partners.

The impact of e-marketplace on SCM is much larger as it facilitates inter-organizational communication and in turn reduces cycle times and develops collaborative work. E-marketplaces provide opportunities for an organization to expand their markets worldwide. Once a company places its products/services, it can expect an increase in demand. This requires a SCM system, which effectively meet the growing demand. Also, the supply chain should be agile in meeting customized online requirements. E-marketplaces opens up the communication and enlarges the networking opportunities. E-marketplaces support seamless integration of partnering firms. This facilitates an increase in agility and a reduction in cost. Enhanced teamwork and supply chain management for designing new products and receiving feedback from customers and being proactive on responding to changing market requirements. More and more companies are attempting to sell their products/services in e-marketplaces.

Although the functions of an e-marketplace may vary depending on individual market makers, common functions of e-marketplaces could be described as follows (Emiliani, 2002):

1. Core commerce transactions that automate and streamline the entire requisition-to-payment process online, including procurement, customer management, and selling;

2. A collaborative network for product design, supply chain planning, optimization, and fulfillment processes;
3. Industry-wide product information that is aggregated into a common classification and catalogue structure;
4. An environment where sourcing, negotiations, and other trading processes such as auctions can take place online and in real time; and
5. An online community for publishing and exchanging industry news, information, and events.

These capabilities seem to change traditional supply chain management processes by lowering costs and increasing speed to respond to supply and demand needs. Specifically, buyers can reduce purchasing costs and achieve higher volume contract terms with preferred supplier by aggregating purchasing across divisions and companies. It provides a single point of contact and minimizes off-contract buying and lowering selection costs through access to multiple suppliers.

Conceptually, the e-marketplace concept offers many advantages compared to traditional supply chain processes with real-time access to data, and reaches global markets. The sel-reliant model of maximizing one's ownership of supply chain activities is becoming increasingly untenable, not only because faster decisions and information can be made available, but also because firms are increasingly embedded in networks of relationships in a global business environment.

The function of e-marketplaces based on the Internet has the advantage over the traditional systems on the communication links across geographical boundaries and with external enterprises. An e-marketplace is usually sponsored by a third party with nonproprietary software enabling every business to use and share data. This creates a more level playing field as small and large firms are able to participate in electronic markets. A framework for textile e-marketplace supply chains is depicted in figure 3.

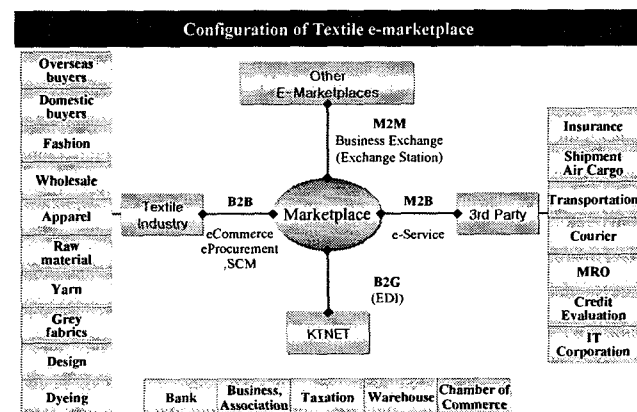


Figure 3. Framework for Textile e-Marketplace Supply Chains

Many previous researches noted that internet usage in supply chains is mainly confined to internal supply chain processes such as ordering, processing of customer, and tracking of shipments, which contribute to cost reductions. While the impact on profitability is not guaranteed (Emiliani & Stec, 2002b), the application of internet to supply chain activities enables firms to exploit opportunities beyond traditional ownership of supply chains and maintains a constant flow of corporate and customer information. In this respect, the concept of e-marketplace could facilitate the collaboration with external firms to reach new markets and synchronize product planning and promotional activities. Also, costs and revenues of business-to-business transaction could appear in different time periods.

The primary benefits that could be derived from a transaction-based type of supply chain services concentrate on automation of processing orders, payments and deliveries, reverse auctions, inventory clearance, scheduling, online catalogues, negotiations, and 24-hours availability. The main components of strategic services focus on collaborative planning, forecasting, and replenishment for efficient consumer response. Recent studies revealed that benefits of e-marketplaces include improved relationship with trading partners, increased service levels reduces stock outages, increased sales, decreased inventory, forecast accuracy, improved internal communications, and better asset utilization (Eng, 2004). These benefits that relate to the function of an e-marketplace set the agenda for the future research with an empirical survey.

4. Conclusions

Top management should encourage the empowered implementation team to cut across the functional barriers and provide with necessary technical and financial support to achieve a productive supply chain with suitable e-marketplace systems. Suitable performance measures and metrics should be developed to monitor the implementation of e-marketplaces over a time period. Implementation of e-marketplaces to achieve agility in a supply chain requires a strong team that can include key and IT knowledgeable managers from all functional areas. A well-documented implementation plan is required to develop an effective supply chain. Moreover, the top management support and involvement are essential for the successful implementation of textile e-marketplaces supply chains.

Many companies have turned to supply chain management to leverage the resources and build more collaborative business relationships. It is evident that textile industry facing reverse competition and losing competitive power needs to develop an effective strategy which delivers innovative, high quality, low-cost products

on time with shorter product life cycle time and better customer services.

As organizations continuously seek to provide their products and services to customers faster, cheaper and better than the competition, managers have come to realize that they cannot do it alone; rather, they must work on a cooperative basis with the best organizations in their supply chains in order to succeed. Members of a supply chain network in a virtual environment use technology and management collaboratively to improve business operations in terms of speed, agility, real-time control, and customer response. Once partners enter into a business relationship mutual success will depend on trust, information and knowledge sharing, communication, and co-owned product service design and performance measures.

The proposed model suggests a textile supply chain collaboration network where the necessary modules are designed to guide partners of a collaboration network to achieve strategic and tactical capabilities. Based on the collaboration network model for the textile supply chain, a framework for textile e-marketplace supply chains is designed to provide textile companies which participate in the network with appropriate communication and operations capabilities through IT based infrastructure.

The framework allows companies to build relationships quickly and efficiently as appropriate, and measure channel performances to improve profitability and deliver transactions and customer satisfaction. As companies in a supply chain shift their business models to work in collaboration networks, the form of relationships becomes critical to success. A network's success will strongly depend on its relationships with its business partners and on its customer/partner knowledge assets.

Implementation of e-marketplaces for achieving an effective supply chain warrants suitable framework that is based on theoretical analysis and past experiences. More case studies and benchmarking studies would be useful. Strategic alliances and benchmarking studies on implementing e-marketplaces for textile supply chains would be helpful.

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