

A Study of Effectiveness Analysis of Supply Chain Management in Manufacturing Companies in India

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Abstract

Supply Chain Management (SCM) is a key strategic approach for increasing organisational effectiveness and the realisation of organizational goals. Effectively selecting and evaluating suppliers and managing their involvement in the supply chain are some of the capabilities that enable Original Equipment Manufacturers (OEMs) to achieve customer satisfaction. At the same time, the suppliers have a significant and direct impact on the performance of buyers. A sustained supplier-manufacturer relationship cannot be possible without tangible benefits accrued to both the partners. The present study, by viewing the supply chain from the perspective of the OEMs and the suppliers, identifies the critical dimensions of SCM and the measures of performance. Reliable and validated instruments are developed. Conceptual models are proposed. The effect of the moderator, such as 'selection', 'long-term relationships', etc. (OEM's perspective) and 'supply chain orientation' (supplier's perspective) on the relationship between the critical dimensions of SCM and the performance measures, are investigated. The investigations reveal that from the perspectives of the OEM and supplier, the moderator has a significant and positive effect on the relationship between the critical dimensions of SCM and the performance measures. Some issues such as inventory management, IT-enablement of supply chains, and buyer supplier relationships are at the core of supply chain research. Some other issues such as postponement, top management commitment, and disparities in trading partners' capability influence these core issues. Some hypotheses have been proposed to assess such influences. Through a questionnaire-based survey for Indian manufacturing companies, these hypotheses have been tested. It is observed from this research that information sharing and top management commitment have important roles towards the effectiveness of a supply chain. The findings also establish relationships among many important issues of supply chain management.

Keywords: *supply chain management; SCM; empirical study; India; original equipment manufacturers; OEMs; suppliers; constructs; moderators.*

1. INTRODUCTION

To compete successfully in today's marketplace, organizations concurrently need to manage effectively and efficiently the activities of design, manufacturing, distribution, service and recycling of their products and services (Sahay et al., 2003). Increasing global competition and vertical disintegration and a focus on core activities have led to the belief that firms serve as links in a networked supply chain. Serving the right customers, finding the right suppliers and fostering trust in the right partners have a great impact on today's (as well as future) business performance. For more than a decade, supply chain management (SCM) has received increased attention among the industries for achieving competitive advantage. Some of the benefits of SCM, which are predominantly discussed in the literature, include lower inventory levels and lower throughput time (Stank et al. 1999). Some issues such as IT-enablement of supply chains, buyer-supplier relationships, and inventory management are at the core of the supply chain research and have been given a lot of attention in the literature. There are, however, some other issues such as postponement, attitude of major stakeholder of the supply chain, top management commitment, disparity in trading partners' capability etc., which influence these core issues. The literature on SCM has many references about these issues but lacks in providing enough empirical evidence of these relationships. Further, it is also important to identify the relative influence of these issues on a SCM attribute. This is more relevant in the Indian context, where most

studies on SCM either consist of case studies or descriptive statistics alone. Therefore, in this article few hypotheses have been proposed to test the relationships among common SCM issues.

2. EMPIRICAL VALIDATION OF THE PROPOSED SCM CONSTRUCTS

The availability of hard evidence based on a rigorous research methodology is mandatory for the development of reliable, valid and pragmatic diagnostic instruments by researchers in order to enhance the process of theory building (Sureshchandar et al.,2001). Also, practitioners can effectively use such instruments and findings. This can only be achieved by measuring the perceptions and experiences of a range of SCM practitioners from industries. The questionnaire survey has been widely acknowledged as an efficient tool for assessing the perceptions of individuals/organisations on the chosen subject. In order to capture the aspects of SCM and empirically validate the SCM constructs, survey instruments have been developed from the perspectives of both the OEM and supplier. The instruments have been developed based on an exhaustive review of the literature (prescriptive, conceptual, empirical and practitioner). A five-point Likert scale (with 1 indicating ‘very low’ and 5 indicating ‘very high’) has been adopted. The SCM elements (or items) were initially presented to a panel of experts from both academics and practitioners from manufacturing firms in India. Based on the suggestions of the experts, modifications (in terms of the removal of redundant items and in the wordings of the items) have been appropriately done.

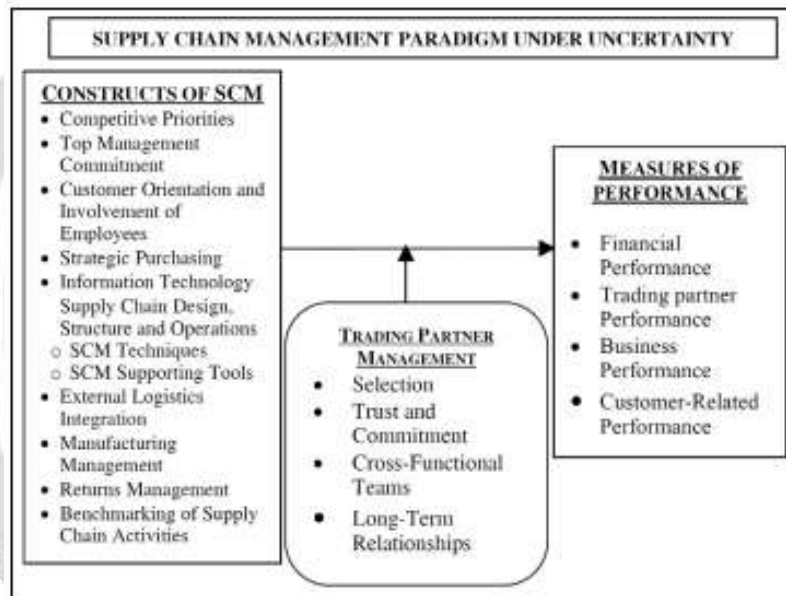


Figure 1 The conceptual model for SCM: the perspective of the OEM

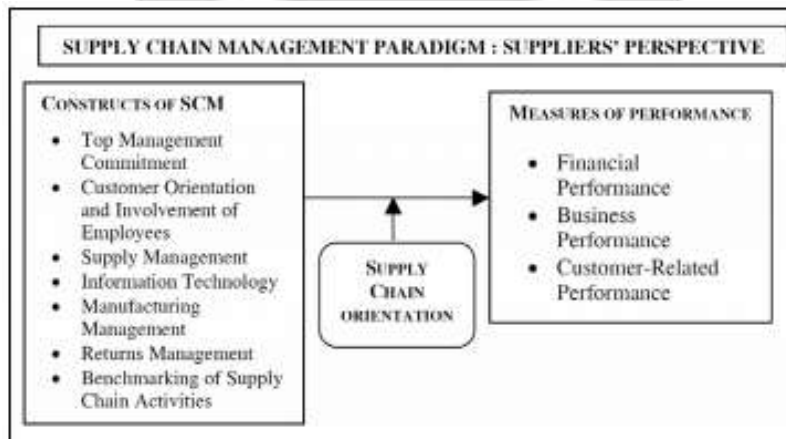


Figure 2 The conceptual model for SCM: the perspective of the supplier

3. BUYER-SUPPLIER RELATIONSHIPS

For the effective management of a supply chain, the buyer-supplier relationship has received increased attention during the past few decades. Many authors have discussed the issues, which contribute to the improved buyer-supplier relationship. For example, Daugherty et al. (1992) found that higher level of shared information and communications among the supply chain partners lead to improved collaboration and greater responsiveness in the supply chain. This observation is supported by many more researchers who observed that an information sharing mechanism among the partners of a supply chain is essential for the smooth functioning of these relationships. However, in most cases, one partner in a supply is so dominating that it may unilaterally dictate its own terms and conditions to the other partners. The major stakeholder in the supply chain may take some of the decisions at its own and forces the smaller partners to comply with these decisions. However, such dictatorial attitude can also be used in achieving cooperation among the organization. In that case, the dominant partners may help improve the cooperation in the supply chain. Top management of the supply chain organization can play an important role in developing policies, which may lead to a healthy and collaborative relationship between the buyers and the suppliers. Further, the belief and commitment of top management in SCM practices (such as improved buyer-supplier relationships, information sharing, etc.) is a key component for the successful adoption of SCM.

4. INVENTORY MANAGEMENT

Inventory reduction is one of the main objectives of SCM. It is also the most commonly shared data among the supply chain partners. Therefore, several researchers have explored the ways to reduce the inventory in a supply chain. Many researchers have noted that information sharing in the supply chain can play an important role in reducing the inventory level as it allows the companies to quickly respond to market changes thus requiring minimum inventory across the supply chain. Earlier, Loar (1992) examined the relationship between inventory levels and the information sharing in four major US industries. He observed that average inventory level had an inverse relationship with the frequency and volume of information sharing. However, besides information sharing there are some other enablers of inventory reduction in a supply chain, e.g. postponement of point of product differentiation, reduction of suppliers base in the supply chain, and reduced order fulfillment time. Regarding order fulfillment, Sahay et al. (2003) observed that it was the second most important supply chain issue in Indian companies. Companies were paying maximum time and attention to improve order fulfillment.

Postponement is emerging as an important strategy in SCM. Delaying the final labelling, assembly or packaging until the last moment is known as the principle of postponement. The objective of postponement is to minimize the risk of carrying finished product inventory at various points in the supply chain by delaying product differentiation to the latest possible moment before customer purchase. Anderson et al. (1997) and Metz (1998) also stressed the need of postponement in SCM and observed that postponement cuts down the inventory in a supply chain. Reduction of supplier's base (i.e., reducing the number of suppliers) is aimed at having few but reliable suppliers, who provide quality materials as per the schedule of the buyers. It leads to fewer uncertainties and hence reduction in the inventory level. The other benefits of reduced suppliers' base are: lower price of the product, lower administration cost and improved communications. Pagel (1999) explored the advantages of strategic supplier partnering and found inventory reduction as one of the advantages of the strategic supplier alliances. Better planning and coordination within and beyond the boundary of a manufacturing organization can achieve reduction in order fulfillment time. Technology and human resource related issues also play a role in reducing the order fulfillment time. Reduced order fulfillment time implies that inventory is not lying idle for a long time. Hence, it may be assumed that reduced order fulfillment time leads to the reduction of inventory in an organization.

5. INTEGRATION OF A SUPPLY CHAIN

Many enablers support the integration of a supply chain. Information technology is one such enabler, which has received attention in the literature. However, use of IT in a supply chain and as a result of that integration of a supply chain is subjected to some barriers such as disparity in trading partners' ability, fear of information system breakdown, and low level of supply chain integration. It is aimed here to identify the barriers that significantly

influence the supply chain integration. Compatible and integrated information systems play important roles in integrating a supply chain. These information systems enable the supply chain members to share and use the data for common goals, which ultimately lead to greater integration in a supply chain. However, at the same time the fear of information system breakdown adversely affect the process of supply chain integration. Further, there is a possibility of some disparity in the trading partners' information system capability. Sohal et al. (2001) and Kwan (1999) identified lack of compatibility of partners as a barrier in the integration of manufacturing supply chains. In the Indian context, Kadambi (2000) in his study on the manufacturing companies in India observed that weak infrastructure outside the organization and disparity in the size of the suppliers and distributors are the major inhibitors to have an integrated supply chain. Earlier, Angeles et al. (1998) and Closs et al. (1997) noted that the firms were more successful in upgrading their internal capabilities but less successful in external co-ordination due to some disparity in the capability of the trading partners.

6. CONCLUSION

The findings of the study contribute to the body of literature on SCM. The hypothesized findings not only validate some important and widely discussed aspects of SCM but also set out interrelationships among many of these aspects. In regression analysis, used for testing the hypotheses, the relative importance of each variable is obtained. From a practical perspective, the analysis reveals that placing emphasis on information sharing and improving buyer supplier relationships can benefit the firms across industries. The research results demonstrate that SCM implementation improves competitive performance by lowering inventory levels. These evidences support the concept of SCM as a comprehensive and vital manufacturing strategy that can build and sustain competitive advantage and ultimately lead to better business performance. From the supplier's perspective, as an initial contribution, through a literature review and expert opinions, a comprehensive set of constructs from the perspective of the supplier was provided. A valid and reliable instrument that captures the various dimensions of SCM was offered. Second, an investigation was made on the relationship between the constructs of SCM and the supplier's measures of performance in a moderated environment. The results indicate that the moderator, SCO, has a significant and positive contingent effect on the relationship between the IVs and the DVs. A larger sample size could have given more insights into the models. Unfortunately, the survey could not cover a larger sample due to time constraints and the operational constraints that were imposed due to limited responses from the firms. As the scope for future work, researchers can attempt to establish similar frameworks of SCM for some specific sectors such as organised retailing. Organised retailing is catching up at a very fast rate in India in various sectors. Researchers can concentrate on establishing critical factors to aid practicing managers in such sectors as well.

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