Evaluation applying Supply Chain Management (SCM) in organizations

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Abstract: In this paper, applying Supply Chain Management (SCM) in various organizations has been studied. SCM is the management of the flow of goods and services. Effective supply chain management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains. This research conceptualizes and develops five dimensions of SCM practice (strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement) and tests the relationships between SCM practices, competitive advantage, and organizational performance. Data for the study were collected from 196 organizations and the relationships proposed in the framework were tested using structural equation modeling. The results indicate that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance.

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Introduction

SCM draws heavily from the areas of operations management, logistics, procurement, and information technology, and strives for an integrated approach. SCM has been defined to explicitly recognize the strategic nature of coordination between trading partners and to explain the dual purpose of SCM: to improve the performance of an individual organization, and to improve the performance of the whole supply chain.

The goal of SCM is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon. Council of Logistics Management defines SCM as the systemic, strategic coordination of the traditional business functions and tactics across these businesses functions within a particular organization and across businesses within the supply chain for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole.

The concept of SCM has been considered from different points of view in different bodies of literature, such as purchasing and supply management, logistics and transportation, operations management, marketing, organizational theory, and management information systems. Various theories have offered insights on specific aspects or perspectives of SCM, such as industrial organization and associated transaction cost analysis, resource-based and resource-dependency theory, competitive strategy, and social–political perspective. Eventually, these two perspectives evolved into an integrated SCM that integrates all the activities along the whole supply chain.

The concept of SCM has received increasing attention from academicians, consultants, and business managers alike. The concept of SCM has been involved from two separate paths: purchasing and supply management, and transportation and logistics management. According to purchasing and supply management perspective, SCM is synonymous with the integration of supply base that evolved from the traditional purchasing and materials functions. Organizations began to realize that it is not enough to improve efficiencies within an organization, but their whole supply chain has to be made competitive. The understanding and practicing of supply chain management (SCM) has become an essential prerequisite for staying competitive in the global race and for enhancing profitably. Many organizations have begun to recognize that SCM is the key to building sustainable competitive edge for their products and/or services in an increasingly crowded marketplace.

However, despite the increased attention paid to SCM, the literature has not been able to offer much by way of guidance to help the practice of SCM. This has been attributed to the interdisciplinary origin of SCM, the conceptual confusion, and the evolutionary nature of SCM concept. There is no generally accepted definition of SCM in the literature. In the perspective of transportation and logistics management, SCM is synonymous with integrated logistics systems, and hence focus on inventory reduction both within and across organizations in the supply chain.

Literature Review:

Topics such as supplier selection, supplier involvement, and manufacturing performance, the influence of supplier alliances on the organization, success factors in strategic supplier alliances, supplier management orientation and supplier/buyer performance, the role of relationships with suppliers in improving supplier responsiveness, and the antecedence and consequences of buyer–supplier relationship have been researched on the supplier side. Studies such as those by Clark and Lee, and Alvarado and Kotzab, focus on the downstream linkages between manufacturers and retailers. Frohlich and Westbrook investigate the effects of supplier–customer integration on organizational performance, Tan et al. study SCM and supplier evaluation practices and relates the constructs to firm performance, Min and Mentzer develop an instrument to measure the supply chain orientation and SCM at conceptual levels. Further, by offering a validated instrument to measure SCM practices, and by providing empirical evidence of the impact of SCM practices on an organization's competitive advantage and its performance, it is expected that this research will offer useful guidance for measuring and implementing SCM practices in an organization and facilitate further research in this area.A few recent studies have considered both the upstream and downstream sides of the supply chain simultaneously.

However, the absence of an integrated framework, incorporating all the activities both upstream and downstream sides of the supply chain and linking such activities to both competitive advantage and organizational performance, detracts from usefulness of the implementation of previous results on SCM. Tan et al. explore the relationships between supplier management practices, customer relations practices and organizational performance; Cigolini et al. develop a set of supply chain techniques and tools for examining SCM strategies. Extensive case studies about the implementation of SCM have been conducted by the IT service providers (such as SAP, Peoplesoft, i2 and JDEdwards) and the research firms (such as Forrester Research and AMR Research) and many case histories of successful implementations of SCM have been reported in the literature. Taken together, these studies are representative of efforts to address various diverse but interesting aspects of SCM practices.

The purpose of this study is therefore to empirically test a framework identifying the relationships among SCM practices, competitive advantage and organizational performance. The remainder of this paper is organized as follows. Presents the research framework provides the definitions and theory underlying each dimension of SCM practices, discusses the concepts of competitive advantage and organizational performance, and develops the hypothesized relationships. The research methodology and analysis of results are then presented, followed by the implications of the study.

Min and Mentzer identify the concept SCM as including agreed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and agreed supply chain leadership. Thus the literature portrays SCM practices from a variety of different perspectives with a common goal of ultimately improving organizational performance. In reviewing and consolidating the literature, five distinctive dimensions, including strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing and postponement, are selected for measuring SCM practice. SCM practices have been defined as a set of activities undertaken in an organization to promote effective management of its supply chain. Donlon describes the latest evolution of SCM practices, which include supplier partnership, outsourcing, cycle time compression, continuous process flow, and information technology sharing. Tan et al. use purchasing, quality, and customer relations to represent SCM practices, in their empirical study. Alvarado and Kotzab include in their list of SCM practices concentration on core competencies, use of inter-organizational systems such as EDI, and elimination of excess inventory levels by postponing customization toward the end of the supply chain. Tan et al. identify six aspects of SCM practice through factor analysis: supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and JIT capability. Chen and Paulraj use supplier base reduction, long-term relationship, communication, cross-functional teams and supplier involvement to measure buyer–supplier relationships. The five constructs cover upstream (strategic supplier partnership) and downstream (customer relationship) sides of a supply chain, information flow across a supply chain (level of information sharing and quality of information sharing), and internal supply chain process (postponement). It should be pointed out that even though the above dimensions capture the major aspects of SCM practice, they cannot be considered complete. Other factors, such as geographical proximity, JIT/lean capability, cross-functional teams, logistics integration, agreed vision and goals, and agreed supply chain leadership are also identified in the literature. Though these factors are of great interest, they are not included due to the concerns regarding the length of the survey and the parsimony of measurement instruments.

SCM practices are defined as the set of activities

undertaken by an organization to promote effective management of its supply chain. The practices of SCM are proposed to be a multi-dimensional concept, including the downstream and upstream sides of the supply chain. Operational measures for the constructs are developed and tested empirically, using data collected from respondents to a survey questionnaire. Structural equation modeling is used to test the hypothesized relationships. It is expected that the current research, by addressing SCM practices simultaneously from both upstream and downstream sides of a supply chain, will help researchers better understand the scope and the activities associated with SCM and allow researchers to test the antecedences and consequences of SCM practice.

It presents the SCM framework developed in this research. The framework proposes that SCM practices will have an impact on organizational performance both directly and also indirectly through competitive advantage. SCM practice is conceptualized as a five-dimensional construct. The five dimensions are strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement. A detailed description of the development of the SCM practices construct is provided in the following paragraphs. Competitive advantage and organizational performance are concepts that have been operationalized in the existing literature. Using literature support, the expected relationships among SCM practices, competitive advantage, and organizational performance are discussed, and hypotheses relating these variables are developed.

Strategic supplier partnership: Is 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. Noble and Tan et al. consider customer relationship management as an important component of SCM practices. As pointed out by Day, 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 programs. 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.

Level of information sharing: 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. Lalonde considers sharing of information as one of five building blocks that characterize a solid supply chain relationship. According to Stein and Sweat, 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 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 includes such aspects as 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 defined as the practice of moving forward one or more operations or activities (making, sourcing and delivering) to a much later point in the supply chain. 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 may be 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.

Competitive advantage

Research by Stalk, Vesey, Handfield and Pannesi, Kessler and Chakrabarti, Zhang identifies time as the next source of competitive advantage. On the basis of prior literature, 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. 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 empirical literature has 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. These dimensions are also described. 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.

Organizational performance

Any organizational initiative, including supply chain management, should ultimately lead to enhanced organizational performance. 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.

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. In line with the above literature, the same items will be adopted to measure organizational performance in this study.

Research hypotheses

Advanced design and logistic links with suppliers are related to better-performing plants. The SCM framework developed in this study proposes that SCM practice has a direct impact on the overall financial and marketing performance of an organization. SCM practice is expected to increase an organization's market share, return on investment, and improve overall competitive position. For example, strategic supplier partnership has been reported to yield organization-specific benefits in terms of financial performance. Customer relation practices have also been shown to lead to significant improvement in organizational performance. The higher level of information sharing is associated with the lower total cost, the higher-order fulfillment rate and the shorter-order cycle time.

The bottom-line impacts of SCM practices have been confirmed by real-world examples. A recent

survey finds that organizations that are best at SCM hold a 40% to 65% advantage in their cash-to-cash cycle time over average organizations and the top organizations carry 50% to 85% less inventory than their competitors. Based on the above it is hypothesized that:

Hypothesis 1. Firms with high levels of SCM practices will have high levels of organizational performance.

Information sharing and information quality contribute positively to customer satisfactionand partnership quality. Postponement strategy not only increases the flexibility in the supply chain, but also balances global efficiency and customer responsiveness. SCM practices impact not only overall organizational performance, but also competitive advantage of an organization. They are expected to improve an organization's competitive advantage through price/cost, quality, delivery dependability, time to market, and product innovation. Prior studies have indicated that the various components of SCM practices (such as strategic supplier partnership) have an impact on various aspects of competitive advantage (such as price/cost). For example, strategic supplier partnership can improve supplier performance, reduce time to market, and increase the level of customer responsiveness and satisfaction. Information sharing leads to high levels of supply chain integration by enabling organizations to make dependable delivery and introduce products to the market quickly.

Hypothesis 2. Firms with high levels of SCM practices will have high levels of competitive advantage.

An organization having a short time-to-market and rapid product innovation can be the first in the market thus enjoying a higher market share and sales volume. Having a competitive advantage generally suggests that an organization can have one or more of the following capabilities when compared to its competitors: lower prices, higher quality, higher dependability, and shorter delivery time. These capabilities will, in turn, enhance the organization's overall performance. Competitive advantage can lead to high levels of economic performance, customer satisfaction and loyalty, and relationship effectiveness. Brands with higher consumer loyalty face less competitive switching in their target segments thereby increasing sales and profitability.

An organization offering high quality products can charge premium prices and thus increase its profit margin on sales and return on investment. Therefore, a positive relationship between competitive advantage and organizational performance can be proposed.

Hypothesis 3. The higher the level of competitive advantage, the higher the level of organizational performance.

Conclusion

Supply-chain consulting is the providing of expert knowledge in order to assess the productivity of a supply-chain and, ideally, enhance the productivity. This paper provides empirical justification for a framework that identifies five key dimensions of SCM practices and describes the relationship among SCM practices, competitive advantage, and organizational performance. The instrument was tested using rigorous statistical tests including convergent validity, discriminant validity, reliability, and the validation of second-order constructs. This study provides empirical evidence to support conceptual and prescriptive statements in the literature regarding the impact of SCM practices.It examines three research questions: (1) do organizations with high levels of SCM practices have high levels of competitive advantage; (2) do organizations with high level of SCM practices have high levels of organizational performance; (3) do organizations with high levels of competitive advantage have a high level of organizational performance? For the purpose of investigating these issues a comprehensive, valid, and reliable instrument for assessing SCM practices was developed.

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