

CSR as a key element for integrating knowledge production into supply chain management.

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Abstract:

Sustainable supply chain management calls for an in-depth analysis of the interactions between stakeholders and the firm. Through the assessment of a firm's knowledge lifecycle, it is possible to achieve a higher understanding of the company's value chain, delivering products with higher value added and achieving greater customer satisfaction.

Key words: Supply Chain Management, Knowledge Production Lifecycle, Corporate Social Responsibility, Stakeholders

Introduction

During late 20th century, there was a higher increase of studies regarding the way in which production was conducted. Furthermore, in-depth analysis was conducted regarding the interrelationships between diverse areas of the firm, as well as different companies who interacted throughout this process. In defining the concept of supply-chain management (SCM), academia and practice have greater agreement upon the concept of “supply-chain” (SC) rather than “SCM” (Cooper and Ellram 1993; La Londe and Masters 1994; Lambert, Stock, and Ellram 1998).

La Londe and Masters (1994) define a supply-chain as a set of companies that transfer materials forward in a production process line. In today's globalized world, several independent firms commonly are involved in producing a certain good and delivering it to the final consumer and this is the process to which the authors refer to as SC. Among the many agents involved in this procedure there are commonly found raw material and component producers, assemblers, wholesalers, retailers and transportation/distribution companies. Complementary to this definition, Lambert, Stock, and Ellram (1998) state SC involves the alignment of enterprises collaborating during the production-process all through the delivery of the product to the final consumer.

The collaboration between firms should be deemed the key factor for effective and successful SCM. This cooperation involves not only contributing to the production process but also sharing information and knowledge which will result in an enhanced final product. Due to this fact, knowledge transfer becomes essential in order to achieve true sharing of elements which will contribute to better SCM. However, it is difficult to achieve this goal unless the agents participating in SCM trust each other.

There is therefore a need to establish a true relationship between parties participating in SCM. Based on the large number of agents that contribute to SCM, it is essential to evaluate the degree of influence each of them has on the remaining firms. Furthermore, not only companies participating in SCM are relevant, but also it is indispensable to assess other agents that can influence SCM. Among the most significantly influential ones are employees, governments and stockholders. These stakeholders can contribute to the generation of knowledge, as well as the distribution and integration into SCM. Additionally, through the integration of groups of interests, the group of corporations included in a single SCM could benefit from learning in-depth the needs, wants and demands from consumers. This is due to the fact that in some cases, firms do not get hold of customer's perception directly but through market research and stakeholder's knowledge can complement any study from first-hand information.

Consequently, it is herein proposed to evaluate SCM and knowledge management (KM) from the Stakeholder Theory perspective as a way of enhancing trust between agents and successfully achieving higher performance in SC. The paper first analyzes the evolution of SCM and the relations between firms. Secondly, it will be detailed the relevance of KM in SCM. Thirdly, it will be explained why it is considered important to evaluate SCM and KM from the Stakeholder Theory perspective and how taking stakeholder's into consideration through corporate social responsibility could result not only in an overall corporate benefit but also in a SCM enhancement.

Literature Review

Supply-chain

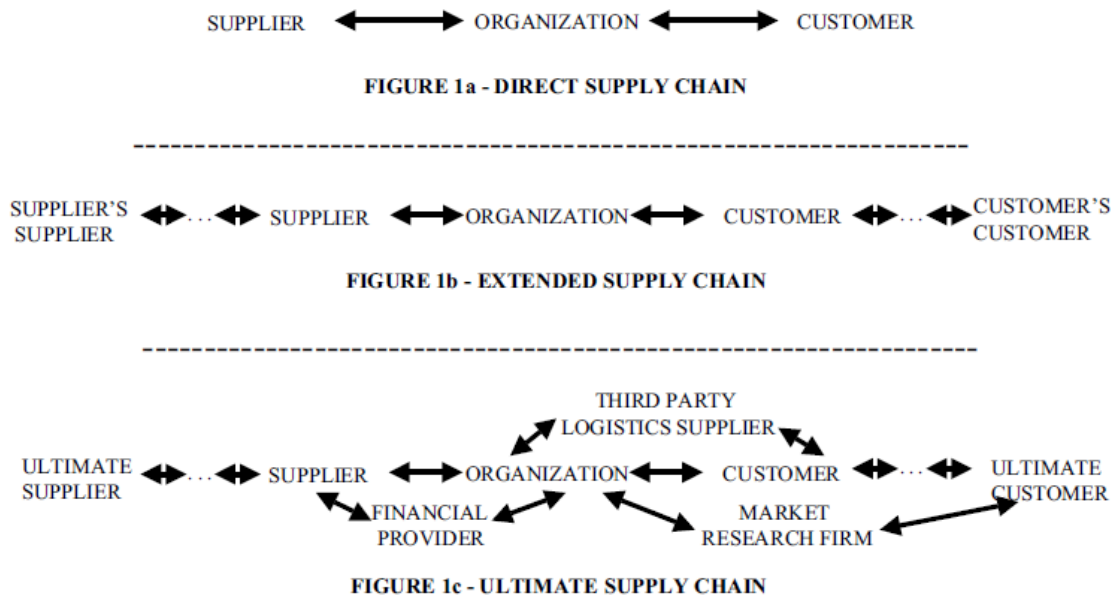
In studying SC, it should be first stated the degree of interrelationship between firms and its nature. Christopher (1992) determined the links between these corporations could be upstream or downstream; depending on the processes and activities they conducted through the incorporation of value to the product or service delivered to the final consumer. In the case of the first linkage, these are firms in charge of supply; while in the case of downstream, these enterprises operate in the field of distribution, to reach the ultimate consumer. Mentzer et al. (2001) proposed an integral definition of SC, which will be the basis for the present study. The authors define the concept as a "set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer. Encompassed within this definition, we can identify three degrees of supply chain complexity: a 'direct supply chain,' an 'extended supply chain,' and an 'ultimate supply chain'" (Mentzer et al.; 2001; pp. 4).

The three degrees of SC complexity included by Mentzer et al. (2001) are key elements to comprehend the interrelationships of firms and the level of interdependence. In the case of 'direct supply chain', it consists of a process involving a firm, a supplier and a customer. These three

elements are interrelated whether upstream and/or downstream, and through this flow circulate goods/services, finances and/or information, as shown in Figure 1a. With regards to the ‘extended supply chain’, this concept is based on the ‘direct supply chain’ but it incorporates not only the immediate supplier but also this firm’s supplier; and the same applies to consumer, it incorporates also the consumer’s consumer, as shown on Figure 1b. In this case, the level of complexity is expanded to include in the analysis a wider range of interrelationships.

Finally, Mentzer et al. (2001) define the concept of ‘ultimate supply chain’, which starts off with the previous concept (‘extended supply chain’) and incorporates all firms involved in every upstream or downstream flow of products/services, finances and information, from the ultimate supplier up until the ultimate consumer. The complexity of this supply chain revolves around the multiple interrelations between all the corporations involved in the production of goods or services and how they are delivered to the final customer, illustrated in Figure 1c. In the example provided by Mentzer et al. (2001), the authors depict a third party financial provider who assumes part of the risk related to providing loans and finances one or more of the organizations involved in the supply chain while offering advice. Continuing with the example portrayed in Figure 1c., there is also a third party logistics provider as well as a market research firm supporting supply chain with investigations related to firm’s consumer choices and evolution of the market in general.

Figure 1: Types of Channel Relationships



Source: Mentzer et al (2001; pp. 5)

Supply-chain Management Philosophy

The illustration herein included comprises the diverse relationships involved in SC. The way in which those connections are organized is the managerial approach to the flow of materials and products. The term SCM has become popular in recent years yet there is no consensus among academia and practice as to its meaning. One of the approaches used by many authors is defining SCM in operational terms involves the flow of materials and products; while others associate its meaning with a philosophy based on processes (Tyndall et al., 1988).

For the purpose of the present research, SCM will be defined according to the philosophical approach. In this framework, SCM is an integrated system conformed out of several parts that perform its own function but without which the whole system could not work (Ellram and Cooper, 1990; Houlihan, 1988; Tyndall et al., 1998). The philosophy of SCM involves a partnership between corporations, through which the total flow of goods and services needed from the ultimate supplier to deliver the product/service to the final consumer are managed (Ellram, 1990; Jones and Riley, 1985). Hence, each firm involved in SC directly or indirectly affects the performance of others (Cooper et al., 1997). This results in a need for synchronization and convergence on an intrafirm and interfirm capabilities (both strategic and operational), to create an integrated compelling marketplace force (Ross, 1998).

Apart from requiring a multi-firm coordination for SC operations, SCM as an integrative philosophy focuses on other benefits derived from the multi-corporate collaboration, such as joint-value creation. In this sense, Langley and Holcomb (1992) suggest the final objective of SCM should be to synchronize all activities related to SC in order to develop innovative solutions to create unique individualized customer value. Consequently, firms can all benefit from the joint-SCM efforts. However, in order to achieve this it is essential to understand customer's values and requirements (Ellram and Cooper 1990; Tyndall et al. 1998), thus giving SCM a customer or market-pull orientation.

SCM as a philosophy is characterized by approaching SC as an integrated system and joint management of the total flow of goods inventory from the first supplier to the ultimate consumer. Furthermore, SCM understands there should be a strategic orientation to achieve cooperation, synchronization and convergence between and within firms. This leads to a unification of efforts, derived in the development of strategic capabilities and unique as well as individualized sources of customer value (Mentzer et. al, 2001) and customer satisfaction. However, in order to implement SCM management philosophy it is necessary to implement a set of activities which will allow the aforementioned benefits and characteristics to take place. These activities are: (1) integrated behavior, (2) mutually sharing information, (3) mutually sharing risks and rewards, (4) cooperation, (5) having the same goal and same focus on serving customers, (6) integration of processes and (7) counting on partners to build and maintain long-term relationships.

The first activity is based on Bowersox and Closs (1996), who stated there was a need to expand an integrated behavior to incorporate suppliers and customers if firms wish to be competitive in the market. Additionally, the coordinated effort between SC partners (suppliers, distributors, manufacturers, etc.) leads to a dynamic response to consumers' needs (Greene, 1991). Regarding the second activity, SC associates can only achieve an efficient and effective SCM if they share information with each other (Cooper et al. 1997; Cooper, Lambert, and Pagh 1997; Ellram and Cooper 1990; Novack, Langley, and Rinehart 1995; Tyndall et al. 1998); which implies,

according to the Global Logistics Research Team at Michigan State University (1995) making strategic and tactical information available for other firms participating in SC. By sharing sensible data, such as inventory levels, forecasts, etc., the uncertainty between SC partners is reduced while each corporation's performance is increased (Andel 1997; Lewis and Talalayevsky 1997; Lusch and Brown 1996; Salcedo and Grackin 2000).

Apart from an integrated behavior and mutually sharing information, collaboration in SCM also implies sharing risks and rewards by planning jointly planning, organizing and controlling strategies and processes. This also involves cooperation, as there is a need for SC members to work together in order to conduct the four activities herein mentioned and create new product developments and make joint-decisions on product portfolio. In doing so, the integration of SC processes are achieved and there is a minimization of costs (especially inventory) and a maximization of opportunities (Drozdowski, 1986; Spekman, 1988; Heide and John, 1990; Ellram and Cooper, 1990; Novack, Langley and Rinehart, 1995; Cooper et al., 1997; Lambert and Pagh, 1997; Tyndall et al., 1998).

The last activity needed to implement SCM management philosophy is building and maintaining long-term relationships with SC partners. La Londe and Masters (1994) proposed that a supply chain succeeds when members of SC share a goal and focus on serving consumers. Consequently, it is essential to integrate processes within SC with the SCM policy and processes, namely sourcing, manufacturing and distribution (Cooper et al. 1997; Cooper, Lambert, and Pagh 1997; Ellram and Cooper 1990; Novack, Langley, and Rinehart 1995; Tyndall et al. 1998). Nonetheless, an integrative policy can only be achieved if the corporate culture and management techniques of each firm participating in SC are shared (Mentzer et al., 2001).

Knowledge Production and Integration

Academia and Practice have thoroughly studied the knowledge production phenomena yet it was in the past three decades that major developments broke through. Firstly, three concepts were identified according to their usefulness: data, information and knowledge. On the one hand, data makes reference to raw stimuli, which lacks any organization, application or utility; while information is the organization of data according to a determined criteria yet this too lacks a specific application or utility. Knowledge, on the other hand, is the use and application of information, serving for decision-making purposes and undertaking actions. It can be classified in two main categories: codified and tacit knowledge; being the first one a standardized use of information which can be transferred and easily-shared with others, while the second one makes reference to a way of applying and using information which is not categorized or standardized and relies in a person or group of people.

Tacit knowledge, also referred to as 'know-how', is therefore one of the most valuable assets in a firm as it contributes in complex, intractable or problem-solving, especially in case of uncertainty environments. At the same time, it is one of the hardest to transmit, codify or transfer due to the implicit complexity and ambiguity of the logic underlying information organization (Bock et al., 2005). Contrary to this, explicit knowledge can be transmitted and systematically shared between individuals and between firms; such as for instance customer's database, inventory, how to operate specific machinery or equipment, among many others. Therefore, the obtaining and

processing information becomes easier and simpler; while in the case of tacit knowledge it involves a higher level of abstraction and relies on specific people.

The influence of knowledge management (KM) and its relevance in corporate management is increasing exponentially with globalization. The internationalization of firms, outsourcing and insourcing, spin offs, and constant interaction of firms through out the production process involves constant exposure to new data and information. Hence, there is a need for each firm to understand the potential use of such material and how to derive both explicit and tacit knowledge from it. In terms of SC, it has been noted that accurate KM can drive higher flexibility in SCM, which would result in higher adaptability to market changes (Wadhwa and Saxena, 2007). In practice, when organizing KM, technical culture creates a bias towards the knowledge mindset as the vast diversity in manager's backgrounds drives each of them to introduce a different approach in decision-making. Consequently, choice-making, knowledge sharing and KM will depend on SCM's approach, based on their previous experience and exposure.

Bangens and Araujo (2002) envisioned, improve performance through providing learning through practice. Along these lines, Mason and Leek (2008) determined it is essential to know what is needed to develop a shared-framework between firms. Once this is established, it is also relevant to know who should be in charge of evaluating the improvement of the decision-making process. Through their study, the authors found out corporations identify and link key actors, providing each of them with appropriate knowledge types and knowledge transfer mechanisms for each of the actor's specific needs. In this sense, knowledge sharing provides a higher contribution to efficient and effective decision making compared to information sharing yet the challenge relies on establishing a true trusting relationship between sharing parties (Chang and Wong, 2010). Partnership quality, significantly influences performance (Vijayasarathy, 2010). As shown in Table 1, there is a significant difference between information sharing and knowledge sharing.

Table 1: Comparison of Information and Knowledge sharing.

	Upstream	Downstream
Primary activities	Inbound logistics, operations, outbound logistic	Marketing and Sales, Service
Transaction costs	Menu costs, customer-demand data collection outlays, marketing expenses, inventory control costs	Existence of imperfect and costly information, price-related, resource expenditures for transactions
Sources of uncertainties	Availability, quality, delivery time, transportation times, machine breakdown, human performance, inventory hedging, allocation inventory control, stocking control, queuing delay	Arrival time, batch sizes, type, fill rate/delivery lead time, after-sale services
Decision-making	Transactional information Structures/routines/schedule Information nodes prepared for latter decision Influential information for downstream decisions	Communities of practice Collaborative decision knowledge sharing

Source: Shih et al. (2012)

According to Chang and Wong (2010), the mechanisms through which knowledge can be transferred is through the development of communities of practice. When analyzing SCM, decision knowledge sharing can be downstream through SC, resulting in the first firm in SC identifying the most relevant knowledge (according to the context) and transmitting it to decision-makers in the downstream. The process is finished when all firms' members of this SCM process consider the solution suitable. In this context, it is essential to establish communities of practice (Shih et al., 2012).

Knowledge production from a stakeholder perspective

It was herein stated a need to integrate KM between diverse firms participating in a SCM. Complementary to this, there is a need for firms to focus especially on knowledge sharing other than on cost reduction in order to improve SC performance. Shih et al. (2012) conducted a study through which they identified a firm's e-business system for web-centric extended enterprise knowledge sharing (WEEKS). Through this system, the authors identified this element as a good tool to enhance SC performance by allowing electronic KM. However, this is not the sole element which will enhance the performance of the entire SC. Building relationships based in trust along the SC is one of the key elements in achieving the maximum potential of SCM.

There is a need to establish a true relationship between parties participating in SCM. Based on the large number of agents that contribute to SCM, it is essential to evaluate the degree of influence each of them has on the remaining firms. Furthermore, not only companies participating in SCM are relevant, but also it is indispensable to assess other agents that can influence SCM. Among the most significantly influential ones are employees, governments and stockholders; with which the communities of practice suggested by Chang and Wong (2010) could be created. Consequently, it is herein proposed to evaluate SCM and KM from the Stakeholder Theory perspective as a way of enhancing trust between agents and successfully achieving higher performance in SC.

The framework of Stakeholder Theory is based on the social contract. This element is described as a set of social responsibilities companies have towards society, including all of its stakeholders (employees, government, stockholders, etc.). Through this implicit agreement, enterprises should take into account these agents when creating management strategies. In this sense, creating corporate social responsibility (CSR) actions related to stakeholder's interests is an action which could significantly influence corporate management and in particular SCM and KM. By incorporating stakeholder's perspective into SCM, there should be a higher bonding and trust relationship between firms involved in the SC. This is due to the fact that, per the basis of Stakeholder Theory, each company shall take into consideration its stakeholders in order to create and enhance a solid sustainable competitive advantage.

If firms shared not only knowledge but also the stakeholder's needs they each need to cover, several benefits are expected to be derived. First, more than one firm can face the challenge of fulfilling the same stakeholder's requirements, hence synergies can be created. Secondly, by sharing knowledge not only on SC but also on matters related to stakeholders, companies can enlarge the information they hold to create, design and modify the products they create. In this sense, by allowing stakeholders to collaborate in the knowledge production and innovation process, the improvement of SCM should be directly aimed at consumer's needs.

Thirdly, integrating stakeholders into the knowledge creation and diffusion process, it can be evaluated whether firms can partner with a specific stakeholder to tackle the needs of others. This cannot be achieved unless there is shared knowledge. In fourth place, stakeholders take a fundamental role in determining firm's positioning and reputation, which could be enhanced by incorporating them to the decision-making. Additionally, this could be used as a marketing element when promoting the product. Last, it is stated through the evolution of the herein stated

theory that by taking into consideration socio-environmental matters that concern stakeholders, firms are honoring the social contract. This leads to a response from society who will value those companies and reward them economically by acquiring their products/services and collaborating in the creation of innovations.

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