

Supply Chain Integration, Collaboration, and Coordination

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INTRODUCTION

The term supply chain management (SCM) was first coined by Keith Oliver in 1982. After that, SCM has been evolved as the art and science of integrating the flows of products, information, and financials through the entire supply pipeline from the supplier's supplier to the customer's customer (Coyle et al., 2009). Supply chain management is also a concept required for strategic (re-)organization of all stages of production and logistics processes among involved companies (Cigolini et al., 2004). Supply chains are complex and may be nonlinear or have many participants. In addition, many companies can be part of several supply chains.

The primary purpose of any supply chain is to satisfy customer needs in the process of generating the profit for itself. Supply chain activities begin with a customer order and end with a satisfied customer. Uncoordinated decision making in a supply chain can result in significant impacts on the supply chain efficiency, and as a result, on customer satisfaction. For example, the bullwhip effect occurs when the demand order variability in the supply chain is amplified as it moves up the supply chain. Distorted information from one end of a supply chain to the other can lead to tremendous inefficiencies (Lee et al., 1997). This effect has been observed in other supply chains of business and is evidence that highlights the importance of an easy access for coordination,

collaboration and integration among the suppliers for effective SCM.

Today there exist many opportunities for supply chain development, with notable avenues of growth existing in environmental orientations and technological advances. Currently there also exist many challenges for supply chain management, such as threats posed by globalization, the misuse of technology and the rigidity of traditional chains. This paper examines the current literature on theory of supply chain integration, collaboration, and cooperation and practice in the industries. It starts with an introduction to supply chain integration, collaboration, and coordination, and illustrates the significances of these SCM components, as well as the impact of the practice in industries. We then will discuss the issues of supply chain integration, collaboration, and coordination and propose some future research directions.

BACKGROUND

Supply chain function is based on three fundamental pillars: integration, collaboration, and coordination. Fawcett and Magnan (2002) indicated that better words to describe integration are cooperation and collaboration. Chen et al. (2009) stated that integration is often equal to coordination and collaboration. Thus, integration, collaboration, and coordination are closely related.

Integration

Supply chain integration is a process of redefining and connecting by integrating internal functions within a company and effectively connecting them with the external processes of suppliers, customers and other channel participants, seeking to enhance performance. In traditional supply chain integration, the definitions of parts are usually limited by the boundary of the enterprises: the integration emphasizes connecting each enterprise with logistics and information communications.

In order to successfully implement supply chain management practices with the goal of achieving superior supply chain performance, via flexibility, cost, quality or time performance for example, internal cross-functional integration must exist within the firm and external integration must also be present amongst suppliers and customers (Kim, 2009). Integration, or integrated logistics management within firms, was introduced as a concept during the 1980's and encompasses all aspects from the inbound logistics to the outbound logistics of physical distribution within a single organization (Coyle et al., 2009). Internal integration contributes to cost reductions, the reduction of stock-outs and lead time, as well as competitive advantage (Chen et al., 2009). The academia have not reached an agreement on the order of integration, if internal facilitates external integration, or if external integration constitutes internal integration, or if the two can coincide and exist and evolve independent of one another. The integration evolution showed movement from functional to internal to external integration (Toivo, 2009). Chen et al. (2009) concluded that true supply chain integration is to complete alignment of objectives and shared resources as well as share benefits and risks among supply chain partners. If a company can be part of several supply chains, the company should focus on both internal and external integration.

The role of integration is a key factor in achieving improvements (Romano, 2003). Integrative practices and a high level of integration have

been shown to have positive impacts on corporate and supply chain performance. Several studies provided convincing empirical evidence for the relationship between integration and performance (Childerhouse & Towill, 2003). The degree and effectiveness of supply chain integration can influence the level of success firms achieve regarding the intended results of the supply chain. It is commonly agreed that both internal and external integration of functions is required to increase performance. Attainment of greater logistics performance involves concurrent integration of internal and external operations; thus, neither should stand-alone (Kim, 2009). For example, Bowersox and Closs (1996) showed that Supply chain integration improves overall logistical performance and minimizes variance.

Collaboration

Collaboration is recognized as a significant process that holds the value creation opportunity which can drive effective SCM (Bauknight, 2000). As pointed out by Sabath and Fontanella (2002), is "...supply chain collaboration is at the same time the most used, the most frequently misunderstood, the most popular — and the most disappointing — strategy that has come along to date." The typical collaboration in supply chains involves demand-side, supply-side, and overall collaboration. The collaboration varies from the basic execution through operational planning to cooperative optimization of supply chains (Roche, 1999).

Collaboration refers to the business practice that encourages individual organizations to share information and resources with each other for the benefit of all (Coyle et al., 2009). Collaboration is also defined as two or more companies sharing the responsibility of exchanging common planning, management, execution, and performance measurement information (Min et al., 2005). It is difficult for supply chain improvements to only involve one firm, thus the need for effective relationships emerges. Collaboration also includes joint decision making and responsibilities sharing

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