

Chapter 8

Developing Angles of Integration: On the Alignment of Internet- Based Information Technology and Supply Chain Integration¹

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ABSTRACT

This chapter discusses the relationship between the focus and degree of internet-based Information Technology (IT) applications and the scope and orientation of process-oriented integration in supply chains. In particular, the degree of supplier and customer integration and its match with the implemented IT instruments supporting inter-organizational collaboration are investigated. Different types of integration are differentiated from each other. For the measurement of the focus and degree of IT integration and supply chain integration, an approach is introduced which allows the analysis of the alignment of both aspects. This approach is referred to as the angles of integration. With respect to supply chain integration and IT implementation, the analysis of different integration strategies are possible. The chapter helps companies to evaluate the alignment of their use of IT techniques with their supply chain management emphases. Furthermore, it refines an existing framework for the comparison of different supply chain integration strategies and applies it with IT. Based on the angles of integration, the match of supply chain integration and IT can be investigated.

INTRODUCTION

In the past decades, supply chain management has evolved as one major discipline in Operations Management, and today it plays a significant role in the competitiveness of industrial companies (e.g. Flynn et al. in press; Swink et al. 2007; Frohlich

& Westbrook 2002). Great potential, including benefits like lower stocks and shorter cycle times, can be realized by implementing supply chain management practices (Fisher 1997; Lee et al. 1997). In the production and operations management literature, IT is often mentioned as a key enabler of successful supply chain management implementation (e.g. Sanders 2007; Frohlich &

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Westbrook 2002; Devaraj et al. 2007; Bowersox et al. 2005, Cachon & Fisher 2000).

In a dynamic environment, many companies struggle with uncertainty. Often, companies respond with high inventories to buffer themselves against demand volatility. Furthermore, they try to cope with uncertainty by improving the accuracy of their forecasts. The critical point is that inventories raise costs and forecasts are almost always wrong (Suri 1998; Stalk & Hout 1990). Cooperation of companies can be regarded as one reasonable approach in order to cope with the challenges of a dynamic and complex environment acting conjointly on the consequences of intensive competitiveness. One way to realize cooperation is through supply chain integration. With supply chain integration companies strive for improving the competitive performance of the underlying supply chain structure by coordinating mutual processes. Accordingly, supply chain integration can be defined as the process leading to better cross-company collaboration for improving the flow of material and information. This process perspective is also supported by Swink et al. (2007), who state that integration should be seen as a process, rather than an outcome. It can be interpreted as a possible way towards effective supply chain management, since it helps companies to create strategic and sound supply chain relationships. By engaging in supply chain integration, companies will benefit from coordinated processes, due to strategic alignment of the upstream and downstream partners being integrated, i.e. customers or suppliers.

One key aspect of successful supply chain integration is information transfer within a supply chain. Information can be regarded as an effective remedy, for example against the bullwhip effect (Lee et al. 1997), since it makes supply chains more responsive and efficient by getting uncertainty under control. One way to realize supply chain integration is through implementation of mutual IT systems.

IT helps to cope with uncertainty by transferring information quickly through the supply chain improving the availability and accuracy of information for better decision-making. The development of Internet-based applications allows a higher degree of inter-organizational communication, thus improving the flow of information creating a seamless integration of entities in a supply chain (Devaraj et al 2007; Sanders 2007). Internet-based applications foster supply chain integration by enhancing the efficiency of information transfer, the timeliness of information availability, and the openness and transparency of relevant business information (Cagliano et al. 2003). In turn, Handfield and Nichols (1999) point out that, without a foundation of effective supply chain relationships, any efforts to manage the flow of information across the supply chain are likely to be unsuccessful.

Yet, despite the fact that supply chain management and IT are commonly accepted as critical enablers of successful production and operations management, there is still a lack of research concerning the use of IT in supply chains, especially in terms of the adoption of Internet-based applications in a strategic context (Cagliano et al. 2003). It seems that, with the importance of IT to supply chain relationships, the alignment of supply chain strategy and IT strategy is a critical issue for successful supply chain development.

The purpose of this chapter is to create a framework for the mutual analysis of supply chain strategy and IT. After discussing supply chain integration and the role of IT in supply chains, we develop an approach called the angles of integration, which can be regarded as a refinement of the arcs of integration framework introduced by Frohlich and Westbrook (2001). Based on this approach, the alignment of supply chain integration and IT integration can be analyzed, whereby the degree of IT integration is measured with respect to e-business in terms of internet technologies.

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