

# Chapter 18

## Evolution of Supply Chain Collaboration: Implications for the Role of Knowledge

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### ABSTRACT

*Increasingly, research across many disciplines has recognized the shortcomings of the traditional “integration prescription” for inter-organizational knowledge management. This research conducts several simulation experiments to study the effects of different rates of product change, different demand environments, and different economies of scale on the level of integration between firms at different levels in the supply chain. The underlying paradigm shifts from a static, steady state view to a dynamic, complex adaptive systems and knowledge-based view of supply chain networks. Several research propositions are presented that use the role of knowledge in the supply chain to provide predictive power for how supply chain collaborations or integration should evolve. Suggestions and implications are suggested for managerial and research purposes.*

### INTRODUCTION

Recent research indicates that the era of inter-organizational collaboration and knowledge-sharing has arrived under the guise of supply chain management. Investments in supply chain

management provide a competitive advantage to business. For example, AMR’s “Supply Chain Top 25” grew revenue an average of 29% over the prior year (Hofman and Aronow, 2012). Perhaps more telling for the scholar of knowledge-based organizations are the conclusions by the World

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Economic Forum (2012) that countries could grow their GDP six times more by using policies that address the management of supply chain processes instead of relying on tariffs. Supply chain processes tend to be knowledge-intensive and depend upon international collaboration, coordination with government entities such as customs, reliable physical infrastructure for transportation and communications, and standardizing inter-organizational procedures. In a very real sense, supply chain management really represents knowledge exchange management between firms, with most pundits espousing “integration” of knowledge and processes.

Integration of inter-organizational processes has long comprised the prescription for success in supply chain management and related literature (Frohlich & Westbrook, 2001; Gustin, Daugherty, & Stank, 1995; Stock, Greis, & Kasarda, 1999). Information sharing and various levels of coordination and collaboration have traditionally found strong empirical support (c.f., Daugherty, Ellinger, & Gustin, 1996; Lee, Padmanabhan, & Whang, 1997; Lummus & Vokurka, 1999; Narasimhan & Jayaram, 1998; Stank, Keller, & Closs, 2001; Tan, Kannan, & Handfield, 1998). Notwithstanding the oft-cited works that support the “integration prescription,” one systematic review of the literature revealed the link between integration and supply chain performance as shaky (Fabbe-Costes & Jahre, 2008). One simulation study found that information sharing may have no value at all or may even increase costs, depending on demand patterns (Jonsson and Mattsson, 2013). The mixed evidence suggests an incomplete theoretical understanding of integration and inter-firm collaboration.

One issue may be the implicit assumption that all collaboration is the same. Empirical studies that distinguish among the different manners of collaborating and the different outcomes to the various supply chain members remain relatively few, with Frohlich and Westbrook’s (2001) land-

mark article representing a sort of genesis of this body of literature. More recent work has found that supply chain strategies vary but seem to become more sophisticated the closer the firm is to the market (Bourlakis, et al., 2012), despite the additional economies of scale and other benefits that firms higher up the supply chain often have. This may reflect the presence of hypercompetitive environments characterized by the rapid rise and fall of firms (McNamara, Vaaler, & Devers, 2003; Wiggins & Ruefli, 2005); retail firms that are not responsive to customer needs do not last long. Hypercompetitive environments act to “dis-integration” supply chains as firms seek higher quality, lower cost or other product characteristics desired by the market.

Another important issue has been the realization that the traditional conceptualizations of supply chain management implicitly assume a “steady-state” condition. Increasingly turbulent economic and global systems mean that supply chains must be adaptable and resilient to manage their risks—yet methods for assessing and managing inter-organizational network change remains in a nascent status (Pettit, et al., 2013). Supply chain agility comprises a well-established conceptualization of responsive and adaptable inter-organizational networks of firms; however, supply chain agility primarily focuses on descriptive or normative theories rather than predictive capability (c.f., Gligor, et al., 2012).

In the past few years, supply chain literature has begun to treat supply chains as knowledge-based constellations of organizations. Researchers have increasingly focused on the question of when, how and why supply chain integration works (or doesn’t). Recent work has evaluated with whom companies integrate (Huo, 2012), the relationship of information flows to material flows (Prajogo and Olhager, 2012), short-term knowledge sharing vs. deeper knowledge generation (Jayaram and Pathak, 2013), product and process strategies as antecedents of supply chain integration strate-

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