

Arcs of integration: an international study of supply chain strategies

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Abstract

Though there is a wide acceptance of the strategic importance of integrating operations with suppliers and customers in supply chains, many questions remain unanswered about how best to characterize supply chain strategies. Is it more important to link with suppliers, customers, or both? Similarly, we know little about the connections between supplier and customer integration and improved operations performance. This paper investigated supplier and customer integration strategies in a global sample of 322 manufacturers. Scales were developed for measuring supply chain integration and five different strategies were identified in the sample. Each of these strategies is characterized by a different “arc of integration”, representing the direction (towards suppliers and/or customers) and degree of integration activity. There was consistent evidence that the widest degree of arc of integration with both suppliers and customers had the strongest association with performance improvement. The implications for our findings on future research and practice in the new millennium are considered. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

Over the past two decades, there has been a marked shift in the focus of operations strategy. If the 1980s were about *vertically* aligning operations with business strategy (Hayes and Wheelwright, 1984), the 1990s have been about *horizontally* aligning operations across processes (Ghoshal and Bartlett, 1995). In most industries today it is not enough simply to optimize internal structures and infrastructures based upon business strategy. The most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and customers in unique supply chains. In short, for the new millennium upstream and downstream integration with

suppliers and customers has emerged as an important element of manufacturing strategy.

Though the fundamental importance of supply chains is widely accepted (Saunders, 1997; Gattorna, 1998), important questions remain open about how to characterize them (New, 1996). Our knowledge is relatively weak concerning which forms of integration manufacturers use to link up with suppliers and customers. Moreover, we know little about the connections between upstream and downstream supply chain integration and resulting performance. Which types of integration lead to the greatest overall performance improvements?

This paper empirically analyzed manufacturers' supply chain integration strategies. The paper used evidence from an international study of manufacturing strategy and tested the relationship between supply

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chain integration and performance. As Eloranta and Hameri (1991) noted, inbound and outbound logistics tend to be separated in research with an unbalanced emphasis on the supply or purchasing side. Therefore, an important goal of this paper was simultaneously considering upstream supplier and downstream customer integration during the analysis. In so doing, the paper develops a new way of characterizing the direction and degree of supply chain integration, and thus of defining different supply chain strategies. Finally, some implications of these findings for operations management strategy research and practice in the new millennium are suggested.

2. The strategic importance of supply chain integration

Over the past decade there has been a growing consensus concerning the strategic importance of integrating suppliers, manufacturers, and customers (Reck and Long, 1988; Leender and Blenkhorn, 1988; Bowersox et al., 1989; Freeman and Cavinato, 1990; Syson, 1989; McGinnis and Kohn, 1990, 1993; Morris and Calantone, 1991; Cammish and Keough, 1991; Eloranta and Hameri, 1991; Burt and Doyle, 1992; Clinton and Closs, 1997). As Carothers and Adams (1991), Langley and Holcomb (1992), and Shapiro et al. (1993) convincingly argued, the once narrow subject of logistics has become a comprehensive topic that now spans the entire value system from suppliers to customers. Reinforcing this point, Ragatz et al. (1997) noted that the “effective integration of suppliers into product value/supply chains will be a key factor for some manufacturers in achieving the improvements necessary to remain competitive”. For practitioners, the strategic importance of integration is similarly reflected in the Supply Chain Council’s popular Supply Chain Operations Reference (SCOR) model that assumes all businesses include sourcing, making, and delivering processes strategically linking suppliers and customers to manufacturers (see www.supply-chain.org).

Many of the theoretical arguments for closely integrating operations between manufacturers and suppliers and customers come from the process reengineering literature (Hammer and Champy, 1993; Hammer, 1996; Fliedner and Vokurka, 1997; Burgess,

1998). Typically the goal is to create and coordinate manufacturing processes seamlessly across the supply chain in a manner that most competitors cannot very easily match (Anderson and Katz, 1998; Lummus et al., 1998). As Birou et al. (1998) pointed out “the opportunity to use process integration across functional boundaries is now considered a key to competitive success”. Davis (1993), Dyer and Ouchi (1993), Eisenhardt and Tabrizi (1994), and Littler et al. (1995) similarly echoed the importance of integrating suppliers and customers into supply chains for developing new products and processes.

2.1. Supply chain integration tactics

At the tactical level, the literature suggests that there are two interrelated forms of integration that manufacturers regularly employ (Fig. 1). The first type of integration involves coordinating and integrating the *forward* physical flow of deliveries between suppliers, manufacturers, and customers (Saunders, 1997; Trent and Monczka, 1998). Many of these proponents of supply chain integration fall under the banner of just-in-time (Chapman and Carter, 1990; Chen and Chen, 1997; Landry et al., 1997; Grout, 1998; Narasimhan and Carter, 1998; Tan et al., 1998; Sakakibara et al., 1997; White et al., 1999). Others have pointed out the importance of delivery integration in terms of implementing product postponement and mass customization in the supply chain (Lee, 1998; Lee and Tang, 1998; Van Hoek et al., 1998; Pagh and Cooper, 1998) or for exploiting third-party logistics (Saunders, 1997; Gattorna, 1998; Marvick and White, 1998).

The other prevalent type of integration involves the *backward* coordination of information technologies and the flow of data from customers to suppliers (Martin, 1992; Trent and Monczka, 1998). Information technologies allow “multiple organizations to

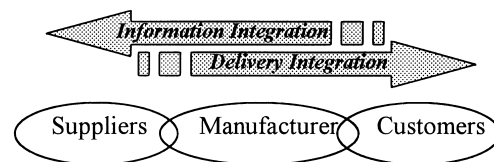


Fig. 1. Integration in the supply chain.

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