

Antecedents of supply chain visibility in retail supply chains: A resource-based theory perspective

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Abstract

Although visibility has become a popular buzzword in the supply chain literature it remains an ill-defined and poorly understood concept. It is assumed that if companies across supply chains have visibility of demand, inventory levels, processes, etc., that organizational performance improves. This research explores the antecedents of high levels of supply chain visibility from a resource-based theory perspective across five different external supply chain linkages. We find that the level of visibility across these linkages differs considerably based on various contributing factors which are both technology and non-technology based. Using resource-based theory, we identify those factors that can give a sustainable competitive advantage to a supply chain linkage through a “distinctive” or high level of visibility.

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1. Introduction

Industries such as the retail sector have long recognized the critical role of supply chain management (Ellram et al., 1989; Mentzer et al., 2000; Hill and Scudder, 2002) and the need to effectively manage the flow of materials, money and information across the supply chain (Lee and Billington, 1993; Gavirneni et al., 1999; Gavirneni, 2002). Recently, the retail sector, enabled by advances in technology (Sahin and Robinson, 2005) has seen a growing trend for organizations to create external linkages based on

the sharing of information (e.g. point of sale data (POS), inventory levels, forecasts, etc.) in order to gain increased visibility of their customers and/or suppliers’ operations and activities (Mabert and Venkataraman, 1998; Shore and Venkatachalam, 2003; Fiala, 2005). The purpose of achieving visibility is primarily for improving their own internal decision making and operating performance (Rungtusanatham et al., 2003; Kulp et al., 2004). It has been suggested that the capability to create improved visibility from the development of effective external linkages (Day, 1994), is critical to improving supply chain performance (Lee et al., 1997b, 2000). Whether this capability of creating improved visibility translates into sustainable competitive advantage for the firms or the supply chains is currently unclear in the extant literature (Hoyt and Huq, 2000; Eylon and Allison, 2002; Subramani, 2004).

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1.1. Research gap

Previous studies have examined the benefits, in terms of improved performance, of information sharing in supply chains, albeit mostly from a modeling/simulation perspective (Bourland et al., 1996; Chen, 1998; Aviv and Federgruen, 1998; Gavirneni et al., 1999; Gilbert and Ballou, 1999; Cachon and Fisher, 2000; Chen et al., 2000; Lee et al., 2000); although there has been some limited empirical examination of this concept (Gustin et al., 1995; Closs et al., 1997). The results of these studies are generally inconclusive and vary subject to the differing structure of the supply chains under examination (Closs et al., 1997; Cachon and Fisher, 2000; Sahin and Robinson, 2005). The missing link in many of these studies is the link between information sharing and visibility. We suggest that the concept of information sharing is not directly linked to that of improved performance. The previously studied link (between information sharing and improved performance) in fact is the result of a two stage process. When information is initially shared, it must be determined by the recipient whether the information is accurate, trusted, timely, useful, and in a readily usable format (Bailey and Pearson, 1983; Gustin et al., 1995; Closs et al., 1997; Whipple et al., 2002). In other words, does the information shared provide visibility? If the information passes this initial test it must then be incorporated into the decision making processes of the recipient who may now make a more informed decision enabled by better visibility of the sender's current situation (derived from the shared information). It is this more informed decision making that potentially leads to improved performance. This research therefore addresses an important gap in the supply chain literature in that it explores the factors that enable such visibility.

1.2. Theoretical framework

Whether organizational resources and capabilities can generate sustainable competitive advantage has been of interest to academics for many years (Wernerfelt, 1984; Barney, 1991; Grant, 1991). In this paper, we identify organizational resources and capabilities that would not only generate improved performance through improved visibility but also have the capability to potentially generate sustainable competitive advantage for a supply chain. We conceptualize not only the link between such resources and capabilities and operational performance but extend it to include the capability of such resources to generate

sustainable competitive advantage. We do so by utilizing a Resource-based theory (RBT) framework (Rungtusanatham et al., 2003). We use RBT because it explains how the rent generating potential of resources and capabilities can lead to sustainable competitive advantage (Wernerfelt, 1984; Barney, 1991; Grant, 1991); and it is particularly suitable when the resources and capabilities are intangible (Conner, 1991; Taylor-Coates and McDermott, 2002).

1.3. Conceptualization of visibility

We posit that in the context of external supply chain linkages, certain organizational resources and capabilities enable information to be shared within the linkages which leads to improved visibility and subsequently improved performance. For the resources to be capable of providing a sustainable competitive advantage, the information shared must provide what we refer to in this paper as distinctive visibility. In line with RBT, we argue that distinctive visibility as a capability has the potential of providing a supply chain linkage with a sustainable competitive advantage. How to achieve such distinctive visibility is the main objective of our research. Therefore, our research question is: what are the antecedents of distinctive or high levels of visibility in a supply chain that is characterized by different types of external linkages?

The concept of visibility has been generally understated and has sometimes been used interchangeably with information sharing within the extant literature (Swaminathan and Tayur, 2003). We posit that information sharing is an activity and visibility is a potential outcome of such activity. It is this potential visibility which in turn may lead to a more effective supply chain. We define supply chain visibility as "the extent to which actors within a supply chain have access to or share information which they consider as key or useful to their operations and which they consider will be of mutual benefit". Thus visibility has a range of levels determined by the amount of useful information that is shared across the supply chain. The importance of information sharing is not in question here, however a number of issues raised in the extant literature require further study: the extent to which the information shared is accurate, trusted, timely, useful, and in a readily usable format (Bailey and Pearson, 1983; Gustin et al., 1995; Mohr and Sohi, 1995; Closs et al., 1997; Whipple et al., 2002) It is these factors which determine the level of supply chain visibility.

We posit that a high level of visibility that is characterized by the quality of useful information

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