



Business value of B2B electronic commerce: the critical role of inter-firm collaboration

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Received 6 August 2002; received in revised form 28 October 2002; accepted 11 December 2002

Abstract

B2B (business-to-business) electronic commerce provides firms with different business value depending on how organizations use the online network. In this paper, we distinguish two different types of B2B e-commerce adoption: basic and collaborative B2B e-commerce. With “basic B2B e-commerce”, firms implement the electronic network simply to automate the exchange of commercial documents. In contrast, B2B networks are used to create new inter-firm operations with channel partners in “collaborative B2B e-commerce.” The central claim of this paper is that firms are unlikely to achieve significant benefits with Basic B2B e-commerce. B2B electronic networks offer dramatic performance improvement only when the B2B network is used to create new collaboration with channel partners. Based on the survey conducted in the grocery industry, this study suggests that the real source of performance improvement in the B2B electronic commerce is not an electronic linkage itself, but the collaboration enabled by the electronic network.

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Keywords: B2B e-commerce; Interorganizational systems; Continuous replenishment process; Inter-firm collaboration

1. Introduction

As electronic linkages between supplier and customer value-chains become an increasingly important source of competitive advantage, business-to-business (B2B) electronic commerce has been rapidly growing all over the world. It is estimated that B2B online transactions will be more than 80% of the expected US\$3 trillion EC (electronic commerce) market by 2003 (*Economist*, February 2000). Such a

dramatic growth of the B2B electronic commerce has resulted from the rapid adoption of “Internet and web” technologies. Compared to traditional VAN (value-added networks)-based B2B e-commerce, Internet-based e-commerce provides firms with cheaper and easier network infrastructures to maintain. EDI (electronic data interchange), an enabler of B2B e-commerce, is regarded as an important source of competitive advantage.

However, only 2% of the 6 million businesses in the USA (except for Fortune 1,000 firms) have implemented EDI [1]. Not all companies, that have adopted the EDI technologies, do find significant performance improvements [2,3]. While some firms

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had asserted that the economics of EDI were so compelling that EDI was rapidly becoming one of the “must do” applications, other organizations implementing EDI capabilities had indicated little or no impact of these systems on their organizational performance [4].

This research aims to investigate why organizations fail to achieve significant results from the B2B electronic commerce despite of the rapid adoption of electronic links with channel partners. Internet-based inter-firm commerce is still early in the game. Thus one possible way to achieve our research goal is to obtain significant lessons from VAN-based EDI practices. EDI has been widely used for decades and have accumulated experiences on critical business factors necessary for successful B2B commerce. If the economic principles governing the B2B commerce remain unchanged regardless of the network infrastructure (whether it is Internet or VAN), experiences in traditional EDI practices can provide organizations with useful insights for Internet-based B2B commerce as well.

When organizations develop electronic networks just to replace traditional communications means (such as postal mail or fax), the impacts of B2B exchanges on organizational performance would be limited. If firms implement the B2B commerce primarily to receive and send orders over electronic networks in an attempt to increase the speed and accuracy of order transfers between firms, they may fail to gain significant benefits from the B2B network. However, if companies establish electronic networks to create “collaborative commerce” with partner firms, the B2B commerce would offer much more significant productivity gains.

In this study we distinguish “collaborative B2B commerce” from “basic B2B commerce.” The basic B2B commerce refers to sending or receiving order information without changes in inter-firm operations. In contrast, the collaborative B2B commerce goes beyond online document exchanges, indicating that organizations adopt the B2B network to establish new collaboration mechanisms with channel partners. Our hypothesis is that the collaborative B2B commerce would provide firms with much higher productivity gains than the basic B2B commerce does.

In order to compare the effects of the “collaborative B2B commerce” with those of the “basic B2B

commerce,” we investigate CRP (continuous replenishment process) innovations that can be regarded as new collaborative B2B e-commerce [5]. In the US grocery industry, many retail firms have established B2B linkages with manufacturers to send and receive weekly orders. The B2B network for sending and receiving orders represents the basic B2B commerce. With new collaborative commerce (CRP), however, retailers no longer place orders with manufacturers. In CRP, retailers transmit information on retail sales and inventory levels at their warehouses through the B2B network. Using these data, manufacturers determine the quantity and timing of the product shipments needed to maintain adequate inventory levels at retail warehouses. CRP thus represents new collaborative B2B commerce between manufacturers and retailers since retailers effectively outsource procurement and inbound logistics decisions to manufacturers who become responsible for minimizing inventories and stockouts at their customer (retailer) warehouse.

Survey data are used to demonstrate that the collaborative B2B commerce provides firms with much higher productivity gains than the basic B2B commerce. Most survey firms had used EDI and VAN when they introduced the B2B commerce. Many of them are recently switching their B2B network infrastructure to Internet and Web for cost savings. Thus, the survey results are relevant whatever network is used for the B2B commerce. This research demonstrates that the basic B2B commerce by itself does not alter significantly the level of operational interdependence between channel partners, while the collaborative B2B commerce tightly couples business processes and greatly increases inter-firm dependency between firms. We postulate that this difference in the level of interdependency and collaboration explains the performance difference between the basic and the collaborative B2B e-commerce.

2. Literature review

2.1. From basic EDI to collaborative EDI

Although the potential for the B2B commerce and other forms of EDI to improve firm performance and to change industry structure has been extensively

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