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An empirical study of EDI trading partner selection criteria in customer-supplier relationships

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Abstract

Electronic data interchange (EDI)-enabled trading partnerships are even more important now that EDI and electronic commerce-based technologies are underlying long-term strategic business partnerships. This study investigates the trading partner selection criteria used by firms in a customer-supplier dyad and their relative importance according to EDI implementation level is also established. Using the survey method implementing paired questionnaires for a dyad of customer-supplier firms, the study gathered data from 152 respondent firms. Factor analysis yielded six factors in trading partner selection: strategic commitment, trading partner flexibility, joint partnering for EDI, readiness for high-level EDI, EDI infrastructure, and communications. MANOVA and *t*-tests were used to test differences in the means of the responses of customer and supplier firms to the selection criteria. Overall, customer firms assigned higher means to all six factors than did the supplier firms. The gap between the two groups of firms were widest for the factors readiness for high-level EDI, trading partner flexibility, and communications.

Keywords: Electronic data interchange (EDI); Internet-EDI; Inter-organizational systems; Trading partnerships; Strategic alliances; Customer firms; Supplier firms

1. Introduction

The environment in which electronic data interchange (EDI) has been used has changed: we now have a 'digital nervous system' made possible by wired organizations and Internet-based technologies that allow firms to exchange information, act, and react within shorter windows of time. Traditional EDI has evolved to Internet-EDI, which means using cheaper technology to allow small- and medium-sized businesses to participate in the electronic marketplace. A far more discriminating and demanding customer base that is now accustomed to highly individualized products and services is driving companies towards strategies enhancing mass customization.

Highly integrated supply chain management (SCM) and accompanying logistics services have now become the basis of competition in the increasingly electronic and web-driven marketplace. One definition of SCM is the integrative approach that covers the flow

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of the channel from the time raw materials are sourced from the first supplier up to the time the finished products reach the last customer and beyond, including the disposal process in some systems [14]. Firms that have used EDI are now reexamining themselves so that they could move into the higher trajectory of implementing more highly integrated systems with EDI components that provide robust electronic links throughout the supply chain. New organizational forms such as the 'extended' or 'agile' enterprise have been emerging to allow for tighter links among strategic partners–customers, suppliers, or other third party service providers–that decide to dovetail their capabilities to provide a seamless and electronically enabled closed loop of unimpeded business processes.

The question, then, arises for the firm: how many strategic trading partners should it partner with under more demanding market conditions? In looking at the customer-supplier dyad, Bakos and Brynjolfsson [3] found that firms are finding it more profitable to work with a smaller number of suppliers. Use of information technology is lowering coordination costs (i.e. search costs, the cost of setting up a relationship, and transaction costs), thus, inviting a situation where a firm could deal with a potentially larger number of suppliers. However, with the movement towards more integrated and agile 'extended enterprises', hub firms (i.e. firms that initiate EDI linkages) have been forced to provide incentives to their suppliers to make non-contractible investments in information sharing, quality initiatives, and innovation to enable them to fulfill the requirements of more tightly connected and integrated information networks. It makes better sense, then, to reduce the number of suppliers one could deal with as 'partners'.

While the rationale for selecting trading partners at the least transaction cost has been suggested by transaction cost economics [4], there has been no comprehensive framework presented addressing the organizational aspects of EDI trading partnerships that directly affect the selection process. Many firms doing EDI have had previous relationships with their trading partners even before electronic linkages were established between them. In the case of these firms, the EDI connection is merely an extension of this relationship. It is also understood that most EDI networks involve the 'cluster' pattern where the hub company has sets of trading partners–customers and suppliers for particular line product lines. Their trading partners, in turn, form their own network clusters with other customers or suppliers in the marketplace. A global view of these relationships will present the image of a series of interconnected electronically linked spider-like 'webs'.

This study seeks to investigate the trading partner selection criteria used by firms in a customer-supplier dyad. The importance of these selection criteria is also investigated across the different levels of EDI implementation.

EDI is the direct computer-to-computer exchange of information stored in standard formatted business documents, such as invoices, bills of lading, purchase orders, etc., among organizations participating in a trading partnership network [10,18,21,33,40,44]. According to Sprague and McNurlin [67], EDI systems are a specific form of 'cooperative' systems–automated systems shared by two or more organizations. These are also referred to as 'Inter-organizational Information Systems (IOS)' [6,9,11, 12,46]. Certain characteristics distinguish EDI IOSs [43] from other systems:

1. The availability of a computer system that is compatible with that of one's trading partner is essential if a direct linkage between partners will be established and a third party service network such as a value-added network (VAN) is not used [16].
2. The adoption of data and communications standards is critical in implementing IOSs.
3. Education is important. Trading partner firm personnel need to be informed about the requirements and implications of such systems to ensure success.
4. The involvement of a third-party entity such as a value-added network or VAN is typical. They train IOS participants, maintain EDI standards, and connect trading partners.
5. Work activities must be synchronized among IOS participants, especially when structured data format standards need to be changed or updated.
6. Work processes need to be reevaluated and possibly, reengineered.
7. The interdependent nature of business activities and processes requires that EDI trading partners