Interorganizational Information Systems Adoption in Supply Chains: A Context Specific Framework

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ABSTRACT

Supply chain management (SCM) enabled by advances in technology, aims to develop a technical infrastructure linking technology and people, in an effort to align the technology with the capabilities of the organization and among its trading partners. This has led to the importance of the interorganizational information system (IOS) which has been increasingly recognized by organizations. There are several IOS types, including B2B electronic commerce (EC), customer-oriented strategic systems, EDI and electronic markets. The factors influencing the adoption of these systems are presented in the literature, but the IOS adoption in supply chains with supply chain context specific antecedents is very limited. To fill the gap in the literature, in this study a comprehensive model is built on the foundations of technology adoption at the organizational levels and by examining the supply chain context specific antecedents behind the motivations of adoption of technology in supply chains. The developed TOESCM research framework considers the TOE (technological-organizational-environmental) framework and SCM context specific antecedents such as information sharing, interorganizational relationships, and collaboration among trading partners to determine the adoption of IOS in supply chains.

Keywords: Interorganizational Information Systems, Supply Chain Management, System Adoption, Technological-Organizational-Environmental (TOE) Framework, Technology Adoption

INTRODUCTION

The desire to share information and promote collaborative management and coordination of supply chains (SC) causes firms to turn to interorganizational information systems (IOS) for SCM (van Hoek, 2001). During the last decade or so there has been a considerable infusion of information technology (IT) into SCM, such as electronic data interchange (EDI) networks, extranets, B2B, electronic commerce and electronic markets. They enable integration between trading partners through faster, more efficient and more accurate data exchange, thus offering ample benefits for trading partners (Rahim & Kurnia, 2004).
operational and strategic benefits of IOS adoption and use include strengthening buyer–seller relationships, improving bargaining power over customer/suppliers, shortening lead time, fitting products to customer requirements, facilitating transactions, reducing errors and returns, lowering the organization’s inventory levels, and improving transportation practices (Grover & Saeed, 2007).

Hill and Scudder (2002) contended that using IOS can facilitate frequent and automatic bidirectional information flows between SC partners, thus enhancing degree of coordination between them. In order to gain process efficiencies through collaborative or partnership-like relationships, organizations need to expand information flows in the SC by instituting IOS that are integrated and facilitate exchange of a comprehensive set of information. The factors influencing the adoption of IOS systems are presented in the literature, but the IOS adoption in SCs with SC context specific antecedents is very limited. So, the purpose of this study is to investigate the factors which influence the IOS adoption in SCs, and to clarify to what extent these aforementioned factors play a role in the IOS adoption, if any. In accordance with our research objective, the choice of IOS is based on the following two concerns: first, there are trends in the adoption of IOS by SC partners because of both the strategic and operational importance and second, network based information systems (IS) have been the focus of technology adoption research and practice in recent years. In this research work, a model is built on the foundation of earlier work dealing with technology adoption at the organizational levels and by examining the SC context specific antecedents behind the motivations of adoption of technology in SCs.

The remainder of this paper is structured as follows: the literature review appears in the first section, the theoretical background of the model is addressed afterwards, the framework of the conceptual model is covered in the following section, and the conclusions are finally presented.

**LITERATURE REVIEW**

The review of literature identifies many models and frameworks that have been developed and used as a basis to investigate the adoption of IOS and the specific constructs of SCM, which leads to the development of the proposed framework. The theoretical approaches used to examine IOS adoption and use can be segmented into four different streams (Grover & Saeed, 2007). First, research that builds on the innovation diffusion approach predominantly focuses on the perceptions regarding the attributes of the technology such as complexity, compatibility, and relative advantage in examining diffusion of technology (Premkumar et al., 1994). A second stream expands on this idea by including factors such as top management support, organizational slack, organizational readiness to accept new technology, and IT capability of the firm to be important determinants (Chwelos et al., 2001). The third stream tackles the issue from an industry perspective, arguing that environmental uncertainty, industry pressure, competitive pressures, and institutional factors play a significant role (Grover & Saeed, 2007). Finally, relational approaches offer researchers emphasize the importance of the nature of the relationship between firms and its likely impact on IOS adoption (Grover & Saeed, 2007). Kumar and Crook (1999) propose a multi-disciplinary framework that highlights collaboration, organization and technology issues for effective IOS. Kumar & van Dissel (1996) provide a framework for an IOS based on interorganizational interdependence including information resources, value and SCs, and networks. Further, the empirically based IOS adoption and diffusion models includes the following: first, IOS solutions that vary along the lines of their business intent, technology and willingness to participate with external organizations; second, the most common set of constructs which are the organizational - technological - environmental framework; and third, the most frequently found determinants namely competitive pressure, top management
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