

Intraorganizational information and communication technology diffusion: Implications for industrial sellers and buyers

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Abstract

Information and communication technologies (ICTs) like CRM, ERP and Intranet are considered important for creating competitive advantage. Despite their rapid deployment rates, only a few studies mainly from the information technology (IT) and engineering literature have been devoted in uncovering the factors that influence the diffusion of new information technologies within an organization. Similarly, empirical studies regarding the impact of ICT diffusion on organizations are strikingly limited. In an attempt to fill this research void, the present study examines the implementation of ICT tools within marketing-related and non-marketing-related functions. By testing a number of hypotheses using structural equation modeling, the authors conclude that the antecedents and consequences of ICT diffusion in these functions vary. Their findings provide the foundation for a more thorough examination of both intraorganizational diffusion of ICT tools as well as their impact on organizations.

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1. Introduction

In today's highly competitive markets the use of information and communication technologies (ICTs) by organizations (e.g., LAN, WAN, ERP, CRM) appears to be an imperative for reducing the uncertainties surrounding production and administrative processes (Dewett & Jones, 2001) and, consequently, for sustaining competitive advantage (McKee, Varadarajan, & Pride, 1989).

Despite the importance attached to ICT, only few studies mainly from the information technology (IT) and engineering literature have been devoted in uncovering the factors that influence the implementation of such innovations *within* an

organization, once these innovations have been put in place³ (see, *inter alia*, Brancheau & Wetherbe, 1990; Cats-Baril & Jelassi, 1994; Cooper & Zmud, 1990; Grover & Goslar, 1993; Klein, Conn, & Sorra, 2001; Lai & Mahapatra, 1997; Zmud, 1982, for a meta-analysis of implementation research within the field of MIS). Surprisingly enough, in the marketing literature only two studies, one conceptual (Kim & Srivastava, 1998), and one empirical (Pae, Kim, Han, & Yip, 2002) have explored the factors affecting intraorganizational diffusion of innovations. In this respect, a thorough understanding of the effective implementation of ICT becomes a relentless necessity.

In business-to-business markets, intraorganizational ICT diffusion constitutes a very important issue, as quite often the buying organization initiates a cooperation with a seller by

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³ Innovation implementation within an organization is also called intraorganizational diffusion of innovation. It presupposes innovation adoption and refers to the process of gaining the appropriate and committed use of an innovation within the organization (Cooper & Zmud, 1990; Klein & Sorra, 1996).

purchasing an innovation in small quantities to avoid the technological risks related to the new provider's products and services (Bettman 1973). Risks like uncertainty in quality, incompatibility with current systems and vendor-related switching costs may lead to increased levels of loyalty to certain suppliers (Dick & Basu, 1994; Puto, Patton, & Kin, 1985; Weiss & Heide, 1993). In this sense, from a supplier's perspective, an innovation can only be considered a success when it is accepted and integrated into the adopting organization and the target users exhibit commitment by continuing to use the product over a period of time (Bhattacharjee, 1998). Hence, an understanding of the factors contributing to the successful intraorganizational diffusion of information and communication products is critical for the selling organization, as it can better exploit the market potential for its innovations and sustain long term customer relationships. Moreover, given the significant investment costs required for deploying new ICT tools, the adopting organization should identify the enabling conditions for enhancing diffusion, and therefore, make a full utilization of the ICT capabilities.

Equally important is the examination of the consequences of accepting or rejecting information technologies within the organization (Rogers, 1995), both because of the high investments involved (Finance CustomWire, 2005; Grover, Teng, Segars, & Fiedler, 1998; Tyson, 2005) as well as the high failure rate of ICT implementation (Street, 2004). For example, it is projected that U.S. companies will spend US\$27.8 billion in 2005 for CRM implementations (CRM News, 2001), while the failure rate of most Sales Force Automation (SFA) implementations has been reported to be as high as 55–80% (Galvin, 2002; Speier & Venkatesh, 2002). IT acceptance, which was the main dependent variable in past work, should become a predictor of a dependent variable, namely the impact of IT acceptance (Igarria and Tan, 1997). Research that investigates the impact of ICT tools (e.g., Intranet) on organizational performance may provide additional knowledge about how to maximize the potential benefits of these tools (Eder & Igarria, 2001). Paradoxically, and in spite of the provocative and sanguine speculations, which replenish the practitioner press, the relationship between ICT diffusion and organizational effectiveness remains largely unsubstantiated. One notable exception within the marketing literature is the work of Pae et al. (2002).

Furthermore, past studies have treated intraorganizational diffusion as a unidimensional construct that reflects the degree to which an innovation is used by an organization as a whole (Kim & Srivastava, 1998; Meyers, Sivakumar, & Nakata, 1999). However, innovation use may vary between individuals and between groups within an organization (Klein & Sorra, 1996). More specifically, it has been argued that the benefits of information systems- and subsequently of ICTs-are intertwined with the needs of the user (Franz & Robey, 1986). Hence, different users (e.g., marketers vs. accountants) desire distinctive benefits from computer use (Good & Stone, 2000). Similarly, Kallman and O'Neil (1993) argue that the variety of functional differences (e.g., marketing and human resources) suggests that the implementation of computer technology must

be viewed within the context of specific users, while Aydin and Rice (1991) postulate that both occupational and departmental social worlds are important predictors of individual reactions to medical information systems. Despite the acknowledged departmental differences within the same organization, the studies regarding innovation implementation, let alone ICT, are extremely limited. In particular, Kamath, Mansour-Cole, and Apana (1993) found empirical support for the different objectives that guide innovation adoption decisions between manufacturing and marketing functions. Speier and Brown (1997) have found significant differences across marketing, sales and financial operations in end-user computing support and control. More recently, Van Everdingen and Wierenga (2002) have found differences in the effects of various factors on the adoption of Euro across different departments (i.e., finance, purchasing, and sales), and thus, emphasized the very need for an intra-firm analysis of adoption and diffusion of innovations.

Based on the above arguments, the purpose of this study is to take a function-wise perspective in examining ICT diffusion by investigating the antecedents and consequences of ICT diffusion, defined as the extent of ICT use, within marketing-related and non-marketing-related functions. For the purposes of the present study, marketing-related functions include marketing, sales, customer service/support and product development (Cespedes, 1995, 1996), while non-marketing-related functions include purchasing/supplies, warehousing and finance/accounting (Ruekert & Walker, 1987).

2. Theoretical background and hypotheses development

As depicted in Fig. 1, central to our conceptual model are the constructs of marketing and non-marketing-related ICT diffusion. We define marketing-related ICT diffusion as the extent of ICT usage within the functions of marketing, sales, customer service/support and product development, while non-marketing-related ICT diffusion is defined as the extent of ICT usage within the finance, warehousing, and purchasing/supplies functions. It is important to stress out that both marketing-related and non-marketing-related ICT diffusion refer to the extent of usage of the same ICT tools, but within different functions. These variables are linked to four ICT characteristics (i.e., relative advantage, compatibility, cost and security), two organizational characteristics (i.e., formalization and commitment to change), and two market characteristics (i.e., demand uncertainty and intensity of competition). Furthermore, organizational consequences of ICT diffusion in the marketing-related and non-marketing-related function are captured in terms of marketing, financial and communication/informational effectiveness. We define effectiveness as the organization's realization of the intended benefits of a given innovation (Klein et al., 2001, p. 816). In particular, these benefits involve improvements in marketing activities (e.g., improvements in market share), financial activities (e.g., operational costs reduction) and communication/informational activities (e.g., improvements in communication with customers) (see Appendix).

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