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Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems

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Abstract

Enterprise resource planning (ERP) systems have been adopted by many organizations in the past decade. These systems have revolutionized organizational computing by facilitating integrated and real-time planning, production, and customer response. While some companies have achieved significant efficiencies through ERP, others have complained of failed implementations, budget overruns, and disappointing performance. This paper draws upon Diffusion of Innovation (DOI) theory and Information Systems Success (IS) theory to develop and test a model of ERP implementation success. Results reveal that top management support and training are positively related to user satisfaction, while perceived complexity of ERP and competitive pressure show a negative relationship. Consensus in organizational objectives and competitive pressure are positively associated with perceived organizational performance. Post hoc analysis identifies user satisfaction as a moderator between certain DOI characteristics and organizational performance. This leads to the proposal of a new model of ERP implementation for future research.

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Keywords: Enterprise resource planning; Diffusion of innovation theory; Information systems success; Organizational performance; User satisfaction; Systems implementation

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1. Introduction

Enterprise resource planning (ERP) systems have been qualified as “the most important development in the corporate use of information technology (IT) in the 1990s” (Davenport, 1998, p. 122). However, implementing enterprise systems is a costly and complex undertaking. While some companies have achieved significant efficiencies through ERP, others have complained of failed implementations, budget overruns, and disappointing performance (Fryer, 1999; O’Leary, 2000; Jenson and Johnson, 1999).

Researchers have identified several key factors that may contribute to a successful ERP implementation (Bingi et al., 1999; Motwani et al., 2002). Most of this research has been in the form of case studies of individual companies and interviews with IT professionals, both of which have provided rich accounts of the implementation process. We extend this line of research with the theoretical development and empirical testing of a model derived from two related literature streams, Diffusion of Innovation (DOI) (Rogers, 1983) and Information Systems Success (IS) (Delone and McLean, 1992). Taking an organizational level perspective, we examine the relationship between innovative, organizational, and environmental characteristics and two dimensions of ERP systems implementation success: user satisfaction and perceived organizational performance.

To test these relationships, we use regression analysis with a sample of firms that have recently implemented ERP systems and find that different sets of antecedents affect user satisfaction and organizational performance. Further analysis shows that these two outcomes are not independent but interact with each other. Based on the findings from our exploratory study and post hoc analyses of interactions, we conclude with a proposed moderated model of ERP implementation success. The proposed model simply states that user satisfaction moderates the relationships between DOI antecedents and ERP organizational performance.

2. Exploratory model and theory development

The success of IT implementations has been the focal point of a substantial amount of research over the last two decades. Two theoretical streams, DOI (Rogers, 1983) and IS implementation (Delone and McLean, 1992), have emerged, and each has been the basis for studies examining systems success. These two literature streams have numerous parallels as suggested by Premkumar et al. (1994), Fichman (2000), and others. In DOI theory, “an organizational effort directed toward diffusing appropriate IT within a user community” is analogous to IS implementation (Cooper and Zmud, 1990, p. 124).

Since its inception, DOI research has evolved from a focus on variables affecting the adoption or nonadoption of IT (Tornatzky and Klein, 1982) to its diffusion (i.e., extent of implementation) within an organization (Premkumar et al., 1994) and more recently to the organizational learning (Fichman and Kemerer, 1997) and performance (Ramamurthy and Premkumar, 1995) that may result from IT initiatives. In its current form, DOI theory

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