



## Organizational adoption of information technologies: Case of enterprise resource planning systems

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### ABSTRACT

This paper reviews the adoption of Enterprise Resource Planning (ERP) systems which were implemented and are still being implemented in many industries today. The study defines organizational adoption of ERP systems through building a framework which has the core Technology Acceptance Model (TAM) variables (perceived ease of use of ERP system and perceived usefulness), and satisfaction; and common actors of an ERP project: technology, user, organization and project management. A survey was conducted after studying the literature and making qualitative studies. Results of the study revealed that organizational adoption can only be accomplished if the satisfaction with the ERP system is achieved by competency and flexibility of the technology along with the special efforts of project management during project implementation. This study not only handles problems of ERP from a new perspective, but also provides researchers and managers with insight about adopting the ERP software across the organization.

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### 1. Introduction

It is not so hard to understand why ERP systems gained so much importance in the market. In the very beginning of the 1990's, when the business world moved ever closer to a completely collaborative model, there was a high level of competition in the market and competitor organizations looked for ways of gaining competitive advantage against their opponents. However, it was not easy. They needed to upgrade their capabilities, improve their own business practices and procedures (Loizos, 1998). Under that pressure, to deal with this radically changing environment, many organizations had changed their Information System (IS) strategies by adopting ERP software packages rather than doing in-house development (Holland & Light, 1999; Laudon & Laudon, 1996). At that time, the organizations needed to make sound and timely business decisions and ERP systems offered this to them (Davenport, 1998). These systems provided integration and optimization of various business processes and this was what the companies looked for (Mabert, Soni, & Venkataramanan, 2003). It is not wrong to say that ERP systems gained importance as they arrived at a time when process improvement and accuracy of information became critical strategic issues (Yen & Sheu, 2004). ERP systems are being developed continuously and nowadays they can encompass all integrated information systems that can be used across any organization (Kumar, Maheshwari, & Kumar, 2003). The improvement of the internet has shown tremendous impact on every aspect of the IT sector including the ERP systems (Lawton, 2000). This environment of accessing systems resources from anywhere anytime has helped ERP vendors extend their ERP systems to integrate with newer external business modules such as Supply Chain Management (SCM), Customer Relationship Management (CRM), Sales Force Automation (SFA), Advanced Planning and Scheduling (APS), Business Intelligence (BI), and e-business capabilities (Rashid, Hossain, & Patrick, 2002). This proves that borders of ERP systems are being extended continuously.

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In spite of high expectations of the organizations purchasing ERP software, most of ERP projects become over-budget, late and even fail (Genoulaz & Millet, 2006; Griffith, Zammuto, & Aiman-Smith, 1999; Hong & Kim, 2002; Kumar et al., 2003; Seewald, 2002). Although ERP systems are functionally wealth, standardizing organizational processes with these systems is often difficult (Genoulaz & Millet, 2006).

The top three reasons for the failure of IT-related projects, as cited by IT managers, were poor planning or poor management (cited by 77%), change in business goals during the project (75%), and lack of business management support (73%) (Davis & Wilder, 1998). These are valid reasons for ERP projects, too. Davenport (1998) explained the failure occurrence by two reasons: The technical complexity of the solutions that requires a great deal of expertise, and the mismatch between technical specifications of the system and the business requirements of the company (Davenport, 1998). Furthermore, Buckhout, Frey and Nemec (1999) suggested that ERP difficulties stem from two issues: The company makes the strategic choices needed to configure the systems and processes, and the implementation process spins out of control. Umble, Half, and Umble (2003) dealt with the subject from another perspective. They claimed that given the level of investment and length of time needed to implement ERP systems, many companies have proceeded to implement ERP without making any return on investment (ROI) calculations.

The relative invisibility of the ERP implementation process is also identified as a major cause of ERP implementation failures (Griffith et al., 1999). On the one hand, such invisibility is attributed to the unpredictably complex social interaction of IT and organization (Markus & Robey, 1988), on the other hand, the critical challenge of ERP implementation is believed to be the mutual adaptation between the IT and user environment (Volkoff, 1999).

Here, what is missed is that ERP is a computer subject, however, in reality it is very much a business subject much more related with people. Despite the benefits that can be achieved from a successful ERP implementation, project managers focus on the technical and financial aspects of a project and neglect to take into account the non-technical issues like people (Genoulaz & Millet, 2006). Within the mentioned context this study is predominantly based on and prolongation of a recently completed publication (Basoglu, Daim & Kerimoglu, 2007).

## 2. Literature review

Dimensions of Information systems (IS) success is classified into six categories: System quality, information quality, use, user satisfaction, individual impact and organizational impact (Delone & McLean, 1992). These categories are valid for ERP systems success, too. According to their model, system quality and information quality jointly affect both use and user satisfaction. While use and user satisfaction have positive or negative impact on the other, use and user satisfaction are direct antecedents of individual impact. Lastly, this impact on individual performance eventually affects organizational performance.

Furthermore, up to now, lots of studies have been conducted about critical success factors of ERP systems to find out why these projects fail. Within these studies, the factors that are found to be critical are: Top management support (Al-Mashari, Al-Mudimigh, & Zairi, 2003), users' training (Somers & Nelson, 2003), project communication (Gyampah & Salam, 2004), project management (Umble et al., 2003), integration of systems (Al-Mashari et al., 2003), cultural differences (Welti, 1999), user acceptance (Amoako-Gyampah, 1999), ERP package selection (Somers & Nelson, 2004), legacy systems (Umble et al., 2003), process reengineering activities (Yusuf, Gunasekaran, & Abthorpe, 2004) and customization of ERP (Al-Mashari et al., 2003; Somers & Nelson, 2004).

Unless the organizational context and the information technology are made compatible, waiting for people to use new technologies will not be more than an expectation. There are often significant gaps between the functionality offered by ERP systems and the one required by the adopting company (Sheu, Chae, & Yang, 2004; Soh, Kien, & Tay-Yap, 2000). If firms adopt systems that do not meet their business strategies and attempt to configure these systems to meet their own needs, this tailoring greatly adds to the risks with ERP implementations. Regarding that organizational fit and adoption of ERP system is very important in implementation of modern large-scale enterprise systems (Yusuf et al., 2004). Hong and Kim (2002) proposed a model about that issue. With their model they claimed that organizational fit of ERP systems and organizational resistance plays an important role on ERP implementation success.

Kerimoglu and Basoglu (2006) extended this fit approach from a newer perspective. They suggested that fit between technology, organization and user avoid utilization problems. Alternatively Worley, Chatha, Weston, Aguirre, & Grabot (2005) focused on the integration of the human resource characteristics in business processes, which is a key issue for the ERP adoption and optimization phases. As they suggested, managing the adoption of an ERP system by its users is a difficult challenge, which requires evolving both the system through interface adaptation and the people by defining clearly their role within consistent and optimized processes. On the other hand, Somers and Nelson (2003) also claimed that ERP system and organization may become compatible through integration mechanisms consisting of business driven implementation, project management and structure, organizational adaptation and package adaptation.

Furthermore, the term "organizational memory mismatches" was described to define disparities between organizational memory contents, ERP system and related contents like in other media such as individuals' memories (Stijn and Wensley, 2003). Little attention was paid to these mismatches. However, these challenges are important cues to identify both challenges and opportunities for success.

The cores of these studies intersect at one point which is Business Process Reengineering (BPR). The incompatibility of features with the organization's information needs and business processes is a crucial problem associated with implementing any packaged software (Janson & Subramanian, 1996; Lucas, Walton, & Ginzberg, 1988; Soh et al., 2000). This problem can only be solved by

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