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Adoption of ERP system: An empirical study of factors influencing the usage of ERP and its impact on end user

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Abstract Complex information systems like the ERP integrate the data of all business areas within the organization. The implementation of ERP is a difficult process as it involves different types of end users. Based on literature, we proposed a conceptual framework and examined it to find the effect of some of the individual, organizational, and technological factors on the usage of ERP and its impact on the end user. The results of the analysis suggest that computer self-efficacy, organizational support, training, and compatibility have a positive influence on ERP usage which in turn has significant influence on panoptic empowerment and individual performance.

Introduction

Modern organizations are making significant investments in complex information systems such as the enterprise resource planning (ERP) systems. Despite their avowed benefits, more than two thirds of ERP system projects result in failure (Chang, Cheung, Cheng, & Yeung, 2008). A closer look at the nature of reported problems clearly suggests that the ERP implementation issues are not just technical, but encompass wider behavioural factors (Skok & Doringer, 2001). Organizations need to understand the system adoption from the user's perspective to prepare their employees to face new challenges and learn how to make good use of the technology to reap tangible benefits (Chang et al., 2008). Indian organizations have been exposed to advanced use of information technology (IT) in organizations that are made possible through joint ventures and technology transfer initiatives which in turn were facilitated by increased international trade and commerce. Indian organizations have encountered organizational and cultural problems during the adoption and implementation of new IT in general (Dasgupta, Agarawal, Ioannidis, & Gopalakrishnan, 1999). Thus, it is pertinent to understand the influence of the various factors influencing the acceptance of ERP in the Indian context. Based on the review of extant literature, we conducted this study to identify some of the factors that influence the acceptance of ERP in India and their effect on the acceptance and usage of ERP. With

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little research existing to study the impact at the individual level, this study also seeks to find the impact of usage of ERP system on the end user.

Literature review and hypotheses

ERP implementation

Enterprise resource planning systems are extensive software systems that integrate a number of business processes, such as manufacturing, supply chain, sales, finance, human resources, budgeting, and customer service activities (Weinrich & Ahmad, 2009). They result in enormous investments in software and in package customization (Doom, Milis, Poelmans, & Bloemen, 2010). The other benefits of ERP systems are its complete integration with all the business processes, reduction in the volume of data entry, upgradability of the technology, portability to other systems, adaptability, and applying best practices (Saatcioglu, 2007). However, without successful implementation of the system, the projected benefits of improved productivity and competitive advantage would not be forthcoming (Addo-Tenkorang & Helo, 2011). This requires changes not only in systems but also in processes and other social dimensions (Kwahk & Kim, 2008) and in the coordination among members of the organizations (Chang et al., 2008). The implementation of ERP systems in an organization is often accompanied by substantial changes in organizational structure and ways of working (Kallunki, Laitinen, & Silvola, 2011). Further, implementation of ERP systems in developing countries is faced with specific difficulties over and above those faced by industrialized countries (Xue, Liang, Boulton, & Snyder, 2005). This suggests that information technology and management practices need to be modified for different cultural contexts (Ananadarajan, Igbaria, & Anakwe, 2002).

While previous research has examined aspects of business process change, little research has focussed on the individual employee or studied the drivers of process adoption by employees on the factors influencing resistance, or the impacts of process change on employees of complex technology solutions like the ERP (Venkatesh, 2006). With the change in the Indian economy and consequent changes in the business environment, there is a need to understand how different factors have influenced information system (IS) deployment in Indian firms (Tarafdar & Vaidya, 2006).

Technology acceptance model

There are several theoretical models that explain user acceptance of information systems. These include the technology acceptance model (Davis, 1989), computer self-efficacy (Compeau & Higgins, 1995), task—technology fit (Goodhue and Thompson, 1995) and theory of planned behaviour (Ajzen, 1985). The technology acceptance model or TAM is a widely applied IS model to explain end user adoption of IT. It is a powerful model of user acceptance of computer technology (Igbaria, Guimaraes, & Davis, 1995). Recently, TAM has been applied to ERP systems to explain the complex implementation and adoption issues of stakeholders and end users (Amoako-Gympah and Salam, 2004).

The technology acceptance model is based on the theory of reasoned action (TRA) (Azjen & Fishbein, 1980) which proposes that an individual's behavioural intention to use a system is determined by two beliefs: perceived usefulness (PU) and perceived ease of use (PEOU) (Venkatesh & Davis, 2000). Davis (1989) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived usefulness for the individual is most likely the result of improved job performance and user motivation (Robey & Farrow, 1982). Studies have reported that perceived usefulness is positively associated with system usage (Thompson, Higgins, & Howell, 1991). Perceived ease of use is defined as "the degree to which a person believes that using the system will be free of effort" (Davis, 1989). According to TAM, perceived usefulness is also influenced by perceived ease of use because, other things being equal, the easier the system is to use, the more useful it can be. People who perceive ease of use are more likely to believe in the ease and usefulness of the system (Robey & Farrow, 1982).

According to Davis et al. (1989) usefulness was more strongly linked to usage than ease of use. In associative cultures, typically found among Africans, Asians and Arabs, perceptions and behaviour are often diffuse i.e., they utilize associations among events that may not have a logical basis (Micheal, 1997). In view of this, Anandarajan et al. (2002) reasoned that individuals in associative cultures might not connect perceptions of perceived usefulness with usage behaviour and hypothesised that perceived usefulness was not expected to influence usage, amplifying the role of perceived ease of use as an influence on both usage and perceived usefulness. But contrary to this finding, perceived usefulness was significantly related to usage (Fusilier & Durlabhji, 2005). In the Indian context, the adoption of ERP needs to be further examined.

Role of external and contextual variables on the use of ERP

The technology acceptance model predicts that external variables are expected to influence technology acceptance behaviour indirectly by affecting beliefs, attitudes, or intentions (Szajna, 1996). Orlikowski (1993) demonstrated that adopting and using specific IT is not solely dependent on the characteristics of the IT but is also dependent on other external aspects such as organizational or social context, and individual characteristics and attitudes. Based on the fundamentals of human computer interactions and socio-technical systems theory (Land & Hirschheim, 1983), Brown (2002) in his study used technological and individual user characteristics as determinants of perceived usefulness and perceived ease of use. Chang et al., (2008), in their study considered technology, organization, and user as important actors and predicted that factors relating to individual and organization will together contribute to the adoption decision of the ERP users. In studies employing TAM, the variables were considered as independent variables that would influence the usage of ERP. The variables