



An extension of the technology acceptance model in an ERP implementation environment

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Abstract

This paper presents an extension to the technology acceptance model (TAM) and empirically examines it in an enterprise resource planning (ERP) implementation environment. The study evaluated the impact of one belief construct (shared beliefs in the benefits of a technology) and two widely recognized technology implementation success factors (training and communication) on the perceived usefulness and perceived ease of use during technology implementation. Shared beliefs refer to the beliefs that organizational participants share with their peers and superiors on the benefits of the ERP system.

Using data gathered from the implementation of an ERP system, we showed that both training and project communication influence the shared beliefs that users form about the benefits of the technology and that the shared beliefs influence the perceived usefulness and ease of use of the technology. Thus, we provided empirical and theoretical support for the use of managerial interventions, such as training and communication, to influence the acceptance of technology, since perceived usefulness and ease of use contribute to behavioral intention to use the technology.

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1. Introduction

There is a growing body of academic research examining the determinants of information technology acceptance and utilization among users [16,71]. The theoretical foundation primarily originates from a theory on the adoption and diffusion of innovation, where individuals' perceptions about using it are posited to influence adoption behaviors [57,64]. Also, there are

theoretical models that attempt to explain the relationship between user attitudes, perceptions, beliefs, and eventual system use. These include the theory of reasoned action (TRA) [4], the theory of planned behavior (TPB) [5], and the technology acceptance model (TAM) [20]. Among these, TAM seems to be the most widely used by IS researchers, perhaps because of its parsimony and the wealth of recent empirical support [3].

TAM posits that perceived usefulness and perceived ease of use of IT are major determinants of its usage. Davis [21] argued that research on technology acceptance needs to address how other variables affect core TAM variables, such as usefulness, ease

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of use, attitude and user acceptance. In a similar vein, Karahanna and Straub [40] observed that little attention had been paid to understanding factors that influenced the belief constructs of perceived usefulness and ease of use. They argued in favor of investigating antecedent variables that can explain the core TAM variables and extend TAM in a way that enhances our ability to better understand the acceptance and usage of existing and new IT. Factors contributing to the acceptance of an IT are likely to vary with the technology, target users, and context [56].

Most of the prior studies have been carried out in traditional and relatively simple but important environments, such as personal computing, e-mail systems, word processing and spreadsheet software [34]. But with the advent and adoption of complex IT systems that cut across functional and organizational boundaries requiring business process reengineering during implementation, it was clear that there is an increased need for studies that examine and extend TAM in a complex IT setting [37,50].

In their conclusion to a meta analysis of TAM research, Legris et al. [48] found that most TAM studies examined the introduction of office automation software or systems development applications. They concluded that TAM research would benefit from examining the introduction of business process applications and pointed out that it would be better if it was performed in a business environment. Here, we provide specific contributions along these lines. We examine TAM within a real business environment and extended TAM by considering it in the implementation of an enterprise resource planning (ERP) system. Given its complexity, we believe an investigation of the extended TAM in this context furthers our understanding of the acceptance of complex IT.

ERP systems are programs that aim to provide integrated software to handle multiple corporate functions including finance, human resources, manufacturing, materials management, and sales and distribution [19]. The adoption of these systems by the business world has been touted as one of the most important developments in the corporate use of IT in the 1990s [18]. They require significant organizational resources and their implementation is inherently risky due to large investments required. Thus, ERP systems represent a completely different class of

IT application compared with traditional and simple IT systems.

This study examined how shared beliefs in the benefits of the ERP system along with two IT implementation success factors, project communication and training, impact the core TAM variables in the context of an ERP implementation [49,60,74].

2. Literature review

2.1. ERP implementation research

Factors that have been identified for achieving ERP implementation success include top management support [14,24,76]; a strong business justification for the project [47]; training of employees [6,65]; project communication; properly defined roles for all employees including chief information officers and functional managers [77]; user involvement [8]. A good review of the above factors has been provided by Nah et al. [58].

ERP implementations almost always require business process reengineering, because of the need to adapt the organizational processes to match the capabilities of the software. This means there is the need to go beyond traditional project management principles [35]. In addition, ERP systems are organizational-wide systems and their implementation involves multiple stakeholders, often in geographically dispersed locations. It requires data standardization, integration of the system with other IS and the need to manage several consultants and vendors [67]. Traditional project management challenges are magnified in such environments, making the implementation more difficult, expensive and failure-prone [53]. This complexity suggests that we should not assume that the results obtained in other simpler technology implementation environments readily apply to ERP environments.

2.2. Technology acceptance model (TAM)

One of the key measures of implementation success is achieving the intended level of usage of the IT. System usage is a reflection of the acceptance of the technology by users [73]. The TAM has served as a basis for past research in IS dealing with behavioral intentions and usage of IT [1,22,30,38,39,54,70].

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