



Examining the adoption of KMS in organizations from an integrated perspective of technology, individual, and organization



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ABSTRACT

Knowledge management systems (KMS) have been implemented by many organizations to aid in the management of the intellectual property and the development of sustainable competitive advantages. However, despite the efforts of academics and practitioners with regard to promoting the use of KMS, the rate of adoption remains relatively low. Based on the DeLone and McLean's information system success model, self-efficacy theory, and institutional theory, this study develops a multi-dimensional model to better understand KMS adoption among employees from an integrated perspective of technology, individual, and organization. Survey data collected from 295 employees of a petroleum corporation and its business partners were examined using structural equation modeling to verify the proposed research model. The results indicate that system quality factors, top management support, and organizational rewards are the key determinants of employee adoption of KMS, while KMS self-efficacy is far less important. The theoretical and practical implications are discussed.

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1. Introduction

Organizations need to effectively manage the knowledge they have access to, and this can be done by implementing knowledge management systems (KMS) in order to obtain competitive advantages, and thus better deal with the challenges of rapidly changing and competitive business environment (Wu & Wang, 2006). However, while the implementation of KMS is usually resource intensive, the results are often unsatisfactory. A significant number of studies have investigated the factors which facilitate and inhibit the adoption of KMS in organizations. Most of these base their investigations on the technical dimension of such systems, along with issues that are related to some of the non-technical dimensions, including cost-effectiveness, social/environmental, and personal psychological dimensions (e.g., Boh, 2008; Hung, Huang, Lin, & Tsai, 2005; Kankanhalli, Lee, & Lim, 2011; Kuo & Lee, 2009; Kuo & Lee, 2011; Lai, 2009; Lai, Wang, & Chou, 2009; Lin & Huang, 2008; Lu, Kuo, & Lee, 2010; Nevo & Chan, 2007a; Ong & Lai, 2007; Quaddus & Xu, 2005; Thatcher, McKnight, Baker, Aarsal, & Roberts, 2011; Wu & Wang, 2006). However, the literature is still

rather limited in terms of presenting a comprehensive picture of the issues related to KMS adoption in organizations.

A few notable studies do adopt rather more comprehensive approaches to examining KMS adoption (Benbya & Belbaly, 2005; Chen, Chuang, & Chen, 2012; Lin & Huang, 2009; Nevo & Chan, 2007b). However, these works tend to devote limited attention to the multi-faceted forces that contribute to individuals' internalization of the use of KMS. Institutional theory indicates that organizations must not only deal with pressures from their constantly changing institutional environments, but also make sense of, manipulate, and partially construct these in order to allow organizational actors to perceive a specific organizational practice as legitimate and valuable, thereby increasing its probability of successful diffusion and acceptance (Kostova, Roth, & Dacin, 2008; Scott, 2008). Many information systems (IS) researchers have thus recommended using this theory to investigate how organizations/institutions affect the design, implementation, use, and outcomes of large-scale information systems (e.g., Chen et al., 2012; Currie, 2009; Orlikowski & Barley, 2001). To build upon and extend the achievements of KMS studies that take a multi-dimensional approach, this study aims to take into consideration the system/technology, individual, and organizational dimensions of KMS adoption, and to integrate theories in all three fields to develop a holistic understanding of the related issues.

With regard to the technical dimension of KMS adoption, DeLone and McLean's (1992), DeLone and McLean's (2003)

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information system success model (D&M ISS model) is one of the most widely used methods for evaluating the success or failure of IS implementations. The model's popularity is a result of its comprehensiveness, which enables IS researchers to fully integrate their findings. Consequently, we adopt this model as the theoretical basis to assess the effects of system/technology-related factors on KMS adoption. Additionally, the adoption of IS, as a type of innovation, is dependent on the institutional intervention enabled by the influence and regulatory powers of the institutions (King et al., 1994). We thus adopt institutional theory to help identify the key institutional factors that have a significant influence on KMS adoption. Finally, previous studies point out the significance of personal cognitive factors with regard to predicting and interpreting individuals' knowledge sharing behaviors, and find that self-efficacy plays the most important role in explaining these behaviors in various contexts (e.g., Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Lin & Huang, 2008; Lin & Huang, 2009). We thus adopt self-efficacy theory to help investigate the key issues related to the personal dimension of KMS adoption.

In summary, we find a lack of studies in the KMS literature that simultaneously investigate factors from multiple key dimensions of KMS adoption. This study thus aims to address this research gap and to provide organizations with practical recommendations with regard to improving their KMS adoption. The D&M ISS model, institutional theory, and self-efficacy theory are integrated in this study because of their relevance and significance in explaining the behaviors of individuals with regard to using KMS. Consequently, based on these three perspectives, we propose and empirically validate an integrated research model to find the key factors that influence KMS adoption from an integrated system/technology, personal, and organizational perspective.

The rest of this paper is organized as follows. We begin with a review of the prior literature on the D&M ISS model, institutional theory, and self-efficacy theory, and their use in investigating KMS adoption. Based on the results of this review, we then develop a research model that depicts the relationships among the system, personal, and organizational factors of KMS adoption and individuals' behavioral intentions to use such systems. We then describe our research method, and present the results of the data analysis. We subsequently discuss the research results in terms of their theoretical and practical contributions. Finally, we conclude this paper by specifying the limitations of this work and making suggestions for future research.

2. Theoretical background

2.1. D&M ISS model

The D&M ISS model is one of the most widely used theoretical models for evaluating the success or failure of the implementation of information systems (IS), due to its comprehensiveness, which enables IS researchers to integrate their findings. This model includes six key factors, namely system quality, information quality, user satisfaction, system use, individual impact, and organizational impact. In order to meet the changing needs of IS managers and users in this context, particularly with regard to studies of e-commerce systems, DeLone and McLean (2003) proposed an updated D&M ISS model. This new model is different from the original one in three ways. First, it includes a new dimension of *service quality* alongside the original items of system quality and information quality. Second, it now includes the dimension of *intention to use* in order to better consider contexts of non-mandatory system use finally, the new model groups all the measures of the impacts of system use (i.e. individual and organizational impacts) into a single impact/benefit dimension, called *net benefit*.

Despite the challenges and difficulties of using both versions of the D&M ISS model, as noted in the literature (e.g., Seddon, 1997; Wang, 2008), both continue to be popular with IS researchers when investigating user behaviors in relation to various IS (Petter, DeLone, & McLean, 2012; Petter & McLean, 2009; Urbach, Smolnik, & Riempp, 2009), particularly online/web-based learning systems (e.g., Adeyinka & Mutula, 2010; Roca, Chiu, & Martinez, 2006; Wang & Wang, 2009) and e-commerce systems, technologies, and services (e.g., DeLone & McLean, 2004; Hsieh, Kuo, Yang, & Lin, 2010; Jin, Cheung, Lee, & Chen, 2009; McKinney, Yoon, & Zahedi, 2002; Schaupp, Belanger, & Fan, 2009). However, relatively few studies have adopted the new D&M ISS model to investigate behaviors of KMS users in organizations (e.g., Kulkarni, Ravindran, & Freeze, 2006; Nantapanuwat, Ractham, & Kaewkittipong, 2010; Wu & Wang, 2006).

In both the original and updated D&M ISS models, system quality, which measures technical success, and information quality, which measures semantic success, have been widely used as important quality dimensions of various kinds of IS (Lin, 2008). In the current study, we transform the term information quality into knowledge quality to better fit the research context. The construct of service quality in the updated D&M ISS model, which measures the effectiveness of the support provided to IS users, is a critical factor influencing users' overall evaluation of an IS, particularly when system use is not mandatory, and thus it should be considered alongside system quality and information quality as one of the key factors of IS success (Wang, 2008).

In line with the proposition of the updated D&M ISS model, prior research finds that system quality, information/knowledge quality, and service quality have a positive influence on user satisfaction and the intention to use an IS, such as a KMS (e.g., Benbya & Belbaly, 2005; Kulkarni et al., 2006; Nantapanuwat et al., 2010; Wu & Wang, 2006) or an e-commerce systems/websites (e.g., DeLone & McLean, 2004; Wang, 2008). For example, Jahng, Jain, and Ramamurthy (2000) highlight the importance of the fit of system-quality characteristics, information-quality characteristics, and service-quality characteristics with regard to customer satisfaction in e-commerce environments, with satisfaction being based on the value created by such systems in terms of efficiency, effectiveness, and strategy. A better fit among these IS-quality related characteristics with the business model of an e-commerce website will positively affect consumer intentions to use the website. Roca et al. (2006) state that information quality refers to the quality of system output in terms of timeliness, relevance, and accuracy, while system quality refers to the functional reliability of the system in terms of user interface consistency, ease of use, and documentation quality. In contrast, service quality is concerned with the effectiveness of the system-related services in terms of empathy and reliability. These three constructs thus represent users' overall evaluations of a system, and have positive effects on user satisfaction. Nevo and Chan (2007a), Nevo and Chan (2007b) find that system-related attributes and quality, such as useful system functions (i.e., system quality), high quality content and appropriate formats of system outputs (i.e., information quality), and quick responses to the queries regarding system use (i.e., service quality), are positively associated with employee intentions to use a KMS.

Based on the above discussion, the following hypotheses are proposed:

H1a. Knowledge quality has a positive effect on the intention to reuse a KMS.

H1b. Knowledge quality has a positive effect on user satisfaction with regard to a KMS.

H2a. System quality has a positive effect on the intention to reuse a KMS.

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