Adoption of Mobile ERP in Traditional-ERP Organizations: The Effect of Computer Self-Efficacy

Emergent Research Forum Paper

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Abstract

The objective of this research-in-progress paper is to investigate the employees’ intention to use mobile ERP under the effect of computer self-efficacy in regular-ERP firms. Mobile ERP, business software that integrates core business functions into a single system, has been increasingly penetrating the ERP market but to the best of our knowledge there is no study has examined its usage intention among traditional-ERP organizations. The updated DeLone and MacLean IS success model with its three quality factors is employed in this study as a theoretical framework. Conclusion and potential contribution are discussed.

Keywords

Mobile ERP, adoption, IS Success model, computer self-efficacy.

Introduction

Mobile technologies have invaded the business world with promising huge benefits. Mobile technologies can help organizations make faster and more informed decisions and allow them to capture unlimited business opportunities (Charlton, 2014). Hence, many organizations have embraced this mobility trend by adopting different mobile innovations, with the purpose of generating more profit and staying competitive. One good example is mobile ERP, which refers to the use of mobile device (e.g. a smartphone or tablet) to perform different business functions such as sales, customer relationship management and supply chain management through a single integrated system. In other words, it is a tool used to carry out business functions on-the-go. Mobile ERP promotes the concept of BYOD or “bring your own device” in today enterprise domain; hence, it has been regarded as an emerging core requirement in the contemporary business world (All, 2014). This technology shows an increasing utilization curve across industries due to the real-time access to relevant information and to diverse functions (Schneider, 2013). The market for mobile ERP is projected to continue to grow at a constant annual rate of 39% through 2017 (Trefis Team, 2014). This emerging phenomenon makes a close examination of the influential factors to its wide adoption a timely and relevant research topic.

Although mobile ERP has the capability to help organizations in streamlining workflow processes, increasing operational efficiency, deepening customer engagements and accelerating time-to-decision by top management (Charlton, 2014), it might be still in the early adoption stage of product life cycle. This stage provides an explanation of the current status of mobile ERP among traditional-ERP organizations, which being described as those organizations that have implemented desktop ERP on their platform. However, employees have become more technically savvy and their capability of handling information in different IT contexts has been augmented in the recent years. The increase of employees’ computer self-efficacy may increase the demand for organizations to adopt mobile ERP (Charlton, 2014). Our discussion leads us to conclude how crucial the study of employees’ behavioral intention towards mobile ERP is to understanding this developing market.
Research in the area of mobile ERP is very scarce but a very few studies have been found addressing different ERP topics. Kim (2013) collected data from 131 Korean manufacturing firms to determine how internal control support of mobile ERP is related to quality and organizational performance. Felix and Alain (2013) identified that adoption of mobile SCM can be predicted by technological factors and organizational factors. This research gap in mobile ERP motivated us to explore this area through the following research question: What drives usage intention towards mobile ERP considering the effect of computer self-efficacy? Given the continued reliance on DeLone and McLean’s IS success model (2003), it is adapted here to examine the postulated relationships in mobile ERP. This model has been validated by multiple IS applications across different disciplines; approximately 6,575 articles adapted it as indicated by Google Scholar. Since IS Success model focuses more on system-specific elements, computer self-efficacy, which refers to an individual self-confidence of using a computer system is integrated to the model to account for user-specific cognitive element and to reflect IT-specific individual differences.

The study contributes to theory and practice by 1) extending the ERP literature by considering a new branch: mobile ERP. To the best of our knowledge, this is the first paper attempting to explore relevant IS success factors and their impact on mobile ERP adoption among ERP-traditional organizations; 2) providing practical insights to industry for both of the vendors and organizations. Vendors could improve on the provided services by mobile ERP while organizations could gain a competitive advantage as first movers to adopt.

**Literature Review**

To the best of our knowledge, mobile ERP adoption has not been investigated yet. Therefore we borrowed literature from IS adoption research that implemented IS Success model as a theoretical lens and examined various IT innovations (i.e., online learning and shopping systems, health infomediary and mobile technologies). This research highlights the generalizability of IS Success model across different IS artifacts. Also, some of those artifacts are similar to mobile ERP by being either enterprise system or mobile system. Table 1 shows the significant predictors affecting behavioral intention in various IS contexts.

<table>
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<tr>
<th>Study</th>
<th>IS Context</th>
<th>Impacting factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Song &amp; Zahedi (2007)</td>
<td>Health infomediaries website</td>
<td>Ability, integrity, risk and benevolence</td>
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<tr>
<td>Lin (2007)</td>
<td>Online learning system</td>
<td>The three quality factors and satisfaction</td>
</tr>
<tr>
<td>Chen &amp; Cheng (2009)</td>
<td>Online shopping system</td>
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<td>Kim et al. (2009)</td>
<td>Ubiquitous computing use</td>
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<td>Chatterjee et al. (2009)</td>
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<tr>
<td>Xu et al. (2013)</td>
<td>E-commerce system</td>
<td>Usefulness and attitude</td>
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</table>

**Table 1. A summary of studies conducted using IS success model**

Few organizations generally get involved in the early adoption of a new technology. This adoption stage is embedded with a chasm that reflects a recession in the market development (Moore, 1991). Once this chasm is crossed, mobile ERP could get more exposure leading to generate a high adoption rate. We believe that mobile ERP is still being marketed and tested across industries; thus, we are particularly interested to explore the influential factors helping to cross this chasm and promoting mobile ERP to be adopted on a larger scale among regular-ERP firms.

**Research Model and Hypotheses Development**

In order to better understand mobile ERP, this phenomenon is studied through the theoretical lens of IS Success model (DeLone & McLean, 2003). This model has a primary goal of measuring success for any new IS innovation; it has been widely used in IS research due to its specificity and generalizability.
However, this paper examines usage intention of mobile ERP within regular-ERP organizations based on system quality, information quality, service quality, and computer self-efficacy.

![Research Model](image)

**System Quality**

System quality encompasses the desirable characteristics that firms need to have in any IS; it can be conceptualized in terms of ease of use, flexibility and intuitiveness (Petter et al. 2013). They suggest that perceived system quality leads to intention to use IS. This relationship is empirically supported in online learning course websites (Chang & Tung, 2008) and in online shopping (Chen & Cheng, 2009). According to Kuan et al. (2008), system quality has a positive impact on usage intention of e-commerce. Therefore, we hypothesize system quality in our research model as an independent variable:

**H1:** System quality is positively related to intention to use mobile ERP.

**Information Quality**

Information quality considers that the system outputs, such as reports, content and dashboards, are to be characterized by relevancy, accuracy, understandability and completeness (Petter et al. 2013). They posit that information quality relates positively to intention to use IS. This relationship has an empirical support in online shopping (Chen & Cheng, 2009). As proposed by Kuan et al. (2008), information quality can determine usage intention of e-commerce. Thus, we hypothesize information quality in our research model as an independent variable:

**H2:** Information quality is positively related to intention to use mobile ERP.

**Service Quality**

Service quality refers to the degree of quality and level of support that mobile ERP can provide to firms; it can be conceptualized in terms of responsiveness, reliability, technical competence, and empathy (Petter et al. 2013). They theoretically propose that there is a positive relationship between service quality and intention to use IS. This relationship is empirically corroborated in online shopping (Chen & Cheng, 2009) and as suggested by Kuan et al. (2008), service quality is an important predictor to usage intention of e-commerce. Therefore, we hypothesize service quality in our research model as an independent variable:

**H3:** Service quality is positively related to intention to use mobile ERP.

**Computer Self-Efficacy**

Bandura (1986) defines self-efficacy as: “People’s judgment of their capabilities to organize and execute courses of action required to attain designated types of performance. It is not with the skills one has but with judgments of what one can do with whatever skills one possesses (p.391).” Driven by this notion, Compeau and Higgins (1995) develop computer self-efficacy and define it as “a judgment of one’s capability to use a computer (p.192)”. Although usage intention is mostly driven by emotional and psychological factors, it can also be driven by cognitive factors like computer self-efficacy. This relationship is empirically validated by Hsia et al. (2014); they indicate that computer self-efficacy affects...
positively the employees’ intention to use e-learning system in high-tech companies. Additionally, different extensions of self-efficacy are found to be significant determinants, for example, web-specific self-efficacy in adopting e-service (Hsu & Chiu, 2004) and internet efficacy in adopting online shopping (Faqih, 2016). Thus, we conceptualize computer self-efficacy as an independent variable:

**H4:** Computer self-efficacy is positively related to intention to use mobile ERP.

Bandura (1986) suggests that self-efficacy generates a universal impact (direct and indirect effect) that can be applied to various contexts. Wang et al. (2013) find that individuals’ purchase intention is increased by ethical self-efficacy when their perceived value of online services is high. Likewise, mobile ERP usage intention among individuals would be increased by computer self-efficacy when the levels of easy-navigation, information relevancy and accuracy as well as service reliability and responsiveness are high. From a practical perspective, firms usually strive to improve current services offered to their employees. Hence, interaction variable may play a crucial role by providing valuable insights. This interaction can help firms identify whether increasing the level of computer self-efficacy is crucial to mobile ERP adoption through examining the relationship between the quality factors and usage intention across employees. Thus, we conceptualize computer self-efficacy as a moderating variable:

**H5(a):** The higher computer self-efficacy, the greater positive relationship between system quality and intention to use mobile ERP.  
**H5(b):** The higher computer self-efficacy, the greater positive relationship between information quality and intention to use mobile ERP.  
**H5(b):** The higher computer self-efficacy, the greater positive relationship between service quality and intention to use mobile ERP.

**Research Method**

Traditional-ERP organizations’ employees are considered our target population. In the process of building our sample, we will start establishing a connection with some regional organizations that have implemented regular ERP systems and then distributing the questionnaire electronically to survey their employees. Structural equation modeling (SEM) technique will be employed to analyze the hypothesized relationship between the latent variables using SmartPLS software.

The survey for this study will be developed using prior research instruments in which all factors are well-established indicators and associated with a good reliability. These factors are adapted and modified to reflect mobile ERP context. System quality, information quality and service quality are adapted from Zhou (2013). Usage intention of mobile ERP is adapted from Hsu and Chiu (2004). Computer self-efficacy is adapted from Compeau & Higgins (1995) to measure the employees’ technical capability.

**Conclusion and Potential Contribution**

Our study of mobile ERP would address a research gap found in literature and increase the understanding of mobile ERP adoption in the current market. The updated DeLone and McLean IS Success framework can be appropriately aligned with mobile ERP because it emphasizes aspects internal to the system. While computer self-efficacy can help to determine whether regular ERP firms’ employees will embrace this technology and use it.

The contribution of this study is twofold. First, it attempts to consider mobile ERP stream under the ERP literature and to complement IS Success model by the cognitive factor of computer self-efficacy. Second, the study results could identify important practical implications of mobile ERP. The results may help both software vendors and regular-ERP firms in their decisions of whether to make the initiative and adopt mobile ERP once understanding the surrounding circumstances of the current market. For software vendors, they would be able to address firms’ areas of greatest concerns related to security, usability and functionality. In addition, the vendors can increase their awareness about different regular ERP-firms by scoping out their needs of mobile ERP and then attempting to satisfy those needs to increase the adoption rate and accordingly their profit. For traditional-ERP firms, to be one of the first movers to adopt, it would help to gain a competitive advantage and accumulate sufficient market share of mobile ERP industry; this will lead to superior brand recognition and customer loyalty.
REFERENCES


