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Investigating the Factors for Adopting Enterprise Systems: A Cross-Cultural Study

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Abstract

Enterprise systems are gaining interests from both practitioners and researchers because of their potential linkages to organizational and individual user's productivity. However, there are few papers that investigate enterprise systems management and implementation issues based on the end users' perspective with the cross-cultural mechanisms, although currently the enterprise systems involves end-users with the different cultural backgrounds. Thus, this research-in-progress paper applies enterprise systems adoption issue to the cross-cultural end user perspectives based on the innovation diffusion theory, self-determinant theory, and Hofstede's cultural dimensions.

Keywords

Enterprise systems, innovation diffusion, personal innovativeness in IT, self determination theory, intrinsic motivation, perceived enjoyment.

1. Introduction

Enterprise systems are gaining interests from both practitioners and researchers because of their potential linkages to organizational and individual user's productivity. Although the direct influence of enterprise systems on firm performance has been debated in the Information Systems (IS) community for a long time, the importance of systems adoption by the end users is consistently emphasized for the successful implementation of enterprise systems (Davison, 2002; Al-Mudimigh et al., 2001). Enterprise systems are usually large systems involving different types of stakeholders as end users in the organization, which makes this understanding difficult and complex (Akkermans and van Helden, 2002). Furthermore, given the implementation environment of enterprise systems with globalization involving Europe (Hanseth et al., 2001) and Asia (Martinsons, 2004; Liang et al., 2004), the complexity in adoption of the system becomes important issue for both academic researchers and practitioners.

IS researchers have been investigating the implementation and adoption issues of enterprise systems based on the organizational IS management perspectives. Self determination theory (Deci and Ryan, 1985) showed that all individuals have natural, innate, and constructive tendencies to develop an ever more elaborate and unified sense of self. It focuses on how individuals develop a coherent sense of self through regulation of their behavioral actions that may be self-determined, controlled, or motivated. Self determination theory emphasizes an individual's intrinsic motivation (perceived enjoyment) as a main behavioral mechanism in the general social behavior. Rogers' (1983) innovation diffusion theory shows that diffusion is the

process by which an innovation is communicated through certain channels over time among the members of a social system. Moore and Benbasat (1991) extended the set of perceptions proposed by Rogers (1983) to include seven perceived characteristics of an innovation as predictors of IT adoption behavior. Agarwal and Prasad (1998) also provided Personal Innovativeness in IT (PIIT), the willingness of an individual to try out any new information technology, as a trait and a relatively stable predictor of individuals that is invariant across situational considerations. They provided valid measures of PIIT and showed that PIIT has an effect between perceptions about new IT (relative advantage, PEOU and compatibility) and intention to use new IT such as enterprise systems.

Specifically, this paper applies enterprise systems adoption and implementation to the intrinsic motivation and personal innovativeness in IT with the consideration of culture. Cultural consideration of enterprise systems adoption has been widely investigated with the cross-cultural setting based on Hofstede's (1980) cultural dimension or case based research. Specifically, the difference of uncertainty avoidance dimension of Hofstede's cultural construct, low in the U.S. (46) and high in Japan (92), suggests the important cultural comparison of these two country samples.

2. Research Model and Hypotheses

Based on the self determination theory and innovation diffusion theory, we propose the research model as depicted in Figure 1. The role of intrinsic motivation, such as the perceived enjoyment, for the adoption of enterprise systems is recently gaining significant interest from IS researchers based on the self determination theory. Malhotra and Galletta (2005) recently argued that a system user's intrinsic motivational development was omitted in the previous research model which investigated IS adoption. A better understanding of the nature of systems users' intrinsic motivational factors will promise to contribute to the design of more effective enterprise systems and the company's successful organizational IS implementation and management. In the enterprise systems implementation, project managers can use intrinsic motivation or values of end users to adopt the systems. Intrinsic dimension of IS use is related to self control in the organizational setting and tacit knowledge perspective (Malhotra, 2002). Sia et al. (2002) explained enterprise systems implementation with the empowerment concept that is related to self control. They argued that enterprise implementation gives users more job discretion than their functional needs, and there is the reduction in procedural formality within the modular design. This intrinsic dimension of self control in enterprise systems implementation should be investigated further.

Agarwal and Prasad (1998) also provided Personal Innovativeness in IT (PIIT), the willingness of an individual to try out any new information technology, as a trait and a relatively stable predictor of individuals that is invariant across situational considerations. They provided valid measures of PIIT and showed that PIIT has a moderating effect between perceptions about new IT (relative advantage, PEOU and compatibility) and intention to use new IT. While innovativeness has received attention as a determinant of innovation adoption behavior, marketing research noted that it is important to conceptually and operationally draw a distinction between global innovativeness and domain-specific innovativeness (Flynn and Goldsmith, 1993; Agarwal and Prasad, 1998). Lewis et al. (2003) explained that domain-specific PIIT is an

important source of "individual influence" on IT adoption, which is different from "social influences." Thus, we included the PIIT as an individual influence on adopting enterprise systems in this study.

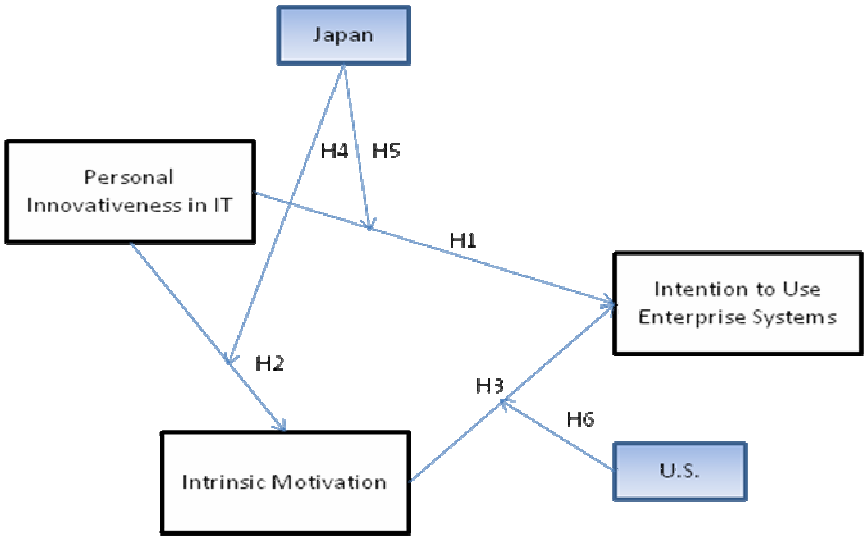

Figure 1. Proposed Research Model

Limayem et al. (2000) argued that using IS is an innovative behavior that is more likely to be adopted by innovators than non-innovators. Thus, it is important to include this construct in order to account for individual differences. Limayem et al. (2000) included personal innovativeness and social norms in the model of online consumer behavior, and found positive relationships with purchase intention ($p < .001$). In their model, personal innovativeness is a global innovativeness construct based on Rogers' (1983) innovation diffusion theory rather than a domain-specific innovativeness. Global innovativeness, such as a personal innovativeness in Limayem et al.'s (2000) study, exhibits low predictive power when applied to any specific innovation adoption decision (Goldsmith and Hofacker, 1991, Leonard-Barton and Deschamps, 1988). Domain-specific innovativeness, such as PIIT (Agarwal and Prasad, 1998), is posited to exhibit a significant effect on behaviors within a narrow domain of activity (Goldsmith and Hofacker, 1991), and it has been suggested that this trait also can be measured directly via self-report, in a manner similar to the measurement of attitudes and other personality traits (Flynn and Goldsmith, 1993). Thus, we hypothesize that;

> *H1: Personal Innovativeness in IT will have a positive effect on Intention to Use Enterprise System.*

Kegerreis et al. (1970) showed that innovative individuals tend to demonstrate higher self-confidence when performing new tasks. Thatcher and Perrewe (2002) also found a direct positive effect ($p < .01$) of PIIT on computer self-efficacy, which is an antecedent to perceived ease of use. A recent study by Lewis et al. (2003) supported the direct positive effects of PIIT, a source of individual influence in technology adoption, on perceived ease of use. However, no prior study have tested the influence of PIIT on intrinsic motivation, perceived enjoyment, while it is core construct to understand technology adoption behavior based on the self determination

theory. To investigate the relationship between an individual's influence on innovation and technology adoption, the current study relates PIIT to intrinsic motivation.

H2: Personal Innovativeness in IT will have a positive effect on Intrinsic Motivation.

Motivation to use IS has been investigated based on two lenses: intrinsic motivation and extrinsic motivation (Davis et al., 1992; Venkatesh, 2000). Recently, der Heidjen (2004) found that perceived enjoyment, intrinsic motivation, is stronger determinant of intention to use than perceived usefulness, the extrinsic motivation. Malhotra (2002) also argued that the tacit perspective of IS adoption should be managed and controlled mainly by self control or intrinsic motivation (perceived enjoyment), rather than by formal controls based on self determination theory. Perceived enjoyment refers to the extent to which the activity of using a computer system is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology (Davis et al., 1992; Yi and Hwang, 2003). Hackbarth et al. (2003) also found the strong positive relationship between computer playfulness, the intrinsic motivation, and perceived ease of use. Prior research such as theory of reasoned action proposed intrinsic motivation, such as perceived enjoyment or attitude, as a determinant of perceived ease of use and intention to use (Venkatesh, 2000; Venkatesh et al., 2002; Yi & Hwang, 2003). Thus, we hypothesize that:

H3: Intrinsic Motivation will have a positive effect on Intention to Use.

We also expect that there would be moderating effects of culture in the relationships among PIIT, intrinsic motivation, and intention to use enterprise systems. Specifically, we expect that the influences of PIIT on intrinsic motivation and intention to use are higher in Japanese end users, since the high uncertainty avoidance culture in Japan would moderate the strength of the personal innovativeness in using enterprise systems. In Japan or Eastern countries with high uncertainty avoidance, ERP systems would be considered as innovative systems since the end-users would be less risk taking. Thus, personal innovativeness on the ERP systems would be stronger factor on ERP adoption rather than the other more risk taking countries in the West. On the other hand, we expect that the influence of intrinsic motivation on intention to use is higher in U.S. end users, since enterprise systems is mature in the U.S. and the West and the influence of PIIT would be not strong comparing the Eastern countries. Self determination theory and intrinsic motivation would be the stronger factor for ERP adoption in the Western cultures. Thus, we hypothesize that;

H4: PIIT will have a stronger effect on Intrinsic Motivation in Japan.

H5: PIIT will have a stronger effect on Intention to Use in Japan.

H6: Intrinsic Motivation will have a stronger effect on Intention to Use in the U.S.

3. Methodology and Conclusion

Actual enterprise systems users in the enterprise system user group of Japan and the U.S. on the Internet are the target samples of this study. The enterprise system user group is the not-for-profit

user community of these specific enterprise system users, and the website is connected to Japan and the U.S. via the Internet. Members are typically general managers, IT consultants, project managers, training organizers, or enterprise systems end users in the customer organizations. The user group also hosts an annual Web conference to discuss enterprise system issues among customers and users. The survey website will be distributed on the discussion board of this website, and members voluntarily participated in the online survey based on their experience with the target enterprise system.

All of the constructs in the research model will be measured with the items adapted from prior research. All of the questionnaire items will use an 11-point Likert-type scale, where 1 = completely disagree, 6= neither agree nor disagree, and 11 = completely agree. This study will use three items of PIIT from Agarwal and Prasad (1998) and three items of intrinsic motivation and three items of intention to use modified version for enterprise systems by Davis et al. (1992). The survey results will be analyzed with PLS. This paper applies enterprise systems adoption and implementation to the intrinsic motivation and personal innovativeness in IT with the consideration of culture based on the integrated theory in IS fields. The findings based on the analysis of the model in the paper will be presented in the conference.

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