

This article was downloaded by:[Kim, Hee-Woong]  
On: 9 February 2008  
Access Details: [subscription number 790460738]  
Publisher: Taylor & Francis  
Informa Ltd Registered in England and Wales Registered Number: 1072954  
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Behaviour & Information Technology

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713736316>

### Managing readiness in enterprise systems-driven organizational change

Kee-Young Kwahk<sup>a</sup>; Hee-Woong Kim<sup>b</sup>

<sup>a</sup> School of Business IT, Kookmin University, Seoul, Korea

<sup>b</sup> Department of Information Systems, National University of Singapore, Singapore

First Published on: 24 July 2007

To cite this Article: Kwahk, Kee-Young and Kim, Hee-Woong (2007) 'Managing readiness in enterprise systems-driven organizational change', Behaviour & Information Technology, 27:1, 79 - 87

To link to this article: DOI: 10.1080/01449290701398475

URL: <http://dx.doi.org/10.1080/01449290701398475>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article maybe used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

# Managing readiness in enterprise systems-driven organizational change

KEE-YOUNG KWAHK<sup>†</sup> and HEE-WOONG KIM<sup>\*‡</sup>

<sup>†</sup>School of Business IT, Kookmin University, 861-1, Jeongneung-dong, Seongbuk-gu, Seoul, 136-702 Korea

<sup>‡</sup>Department of Information Systems, National University of Singapore, 3 Science Drive 2, Singapore 117543

The introduction of enterprise systems (ES) frequently leads to organizational change, as it involves multiple stakeholders and is associated with fundamental organizational improvements cutting across functional and organizational boundaries. Recognizing that ES implementations are overshadowed by a high failure rate because of resistance to change, this study focuses on the development of readiness for change as a way to ease an IT-driven organizational change, including ES implementations. We find that readiness for change can be enhanced by boosting the relevant individuals' attachment to the organization and their perceived personal competence regardless of the focal ES package and its technological characteristics. We also find that readiness for change positively impacts ES usage intention together with the technological characteristics of the focal ES package. Theoretical and practical implications of the study are discussed along with its limitations.

*Keywords:* Enterprise systems; Readiness for change; IS implementation

## 1. Introduction

Enterprise systems (ES) require the restructuring of an organization's portfolio of transaction-processing application systems to achieve integration of business processes, systems, and information (Markus and Tanis 2000, Markus 2004). Thus, ES implementation requires changes not only in systems but also in processes and other social dimensions. Although ES have promised major strategic benefits and process improvements from business integration and technology integration, their implementation has been plagued by a high failure rate and difficulty in realizing the promised benefits (Gattiker and Goodhue 2005, Kim and Pan 2006). Since an ES project requires enterprise-wide initiatives, brings enterprise-wide changes in the company, and requires huge resource investment, its failure would result in a big loss to the implementing company.

The failure rate in achieving the goals of an ES project (e.g. Enterprise Resource Planning project) is estimated to be between 60 and 90% (Ptak and Scharagenheim 1999).

It is widely reported that the sources of ES project failures are not limited to technical issues. Rather, there are various causes arising from the interactions among people, task, environment, and technology. Previous studies (Jiang *et al.* 2000, ITtoolbox 2004) have indicated that one of the most critical failure reasons is resistance to change. A system could be developed successfully from the technical perspective; however, if users do not use it because of their resistance to change, the project would not bring the expected benefits to the company.

Creating readiness for change has most often been explained in conjunction with prescriptions for reducing resistance. In essence, readiness for change may act to preempt the likelihood of resistance to change, increasing the potential for change efforts to be more effective (Armenakis *et al.* 1993). While many factors influence successful organizational changes, it has been argued that readiness for change contributes to the effectiveness with which such organizational changes are implemented (Armenakis *et al.* 1993).

\*Corresponding author. Email: kimhw@comp.nus.edu.sg

This study aims to examine the formation and effect of readiness for change in ES implementation projects. Specifically, this paper seeks to answer two research questions: (1) How does employees' readiness for change influence ES usage? (2) How can readiness for change be enhanced? This study offers several contributions to theory and practice. From the theoretical perspective, we examine how readiness for change is formed by identifying the antecedents, and consider what role it plays by explaining its effects on the adoption of ES by users in the context of Enterprise Resource Planning (ERP) systems. From the practical perspective, we offer managerial insights for ES practitioners on the development and effect of readiness for change in an ES project.

## 2. Theoretical background and research model

### 2.1 Readiness for change in ES adoption

Change is a fundamental theme in human life and organizational behavior that individuals generally resist (Joshi 1991). Readiness is the cognitive precursor to the behaviors of either resistance to or support for a change effort (Armenakis *et al.* 1993). Readiness for change is reflected in the attitude toward organizational change of organizational members. It refers to the extent to which organizational members hold positive views about the need for organizational change, as well as the extent to which they believe that such changes are likely to have positive implications for themselves and the organization (Armenakis *et al.* 1993). Thus, an organizational member's attitude toward change can play an important role in determining whether the individual chooses to support or resist a change (Kirton and Mulligan 1973).

Attitude toward change, in general, consists of a person's affective reactions to change, cognitions about change, and behavioral tendency toward change (Dunham *et al.* 1989). Consistent with this, and according to Elizur and Guttman (1976), individuals' or groups' responses to organizational change are classified into three types: First, affective responses are a greater or lesser feeling of being linked to, satisfied with, or anxious about change. Second, cognitive responses are the opinions one has about the advantages, disadvantages, usefulness, and necessity of the change, and about the knowledge and information required to handle it. Third, behavioral responses are the actions one has already taken or may take in the future for or against the change.

Besides the multidimensional view of responses to organizational change, resistance to change may be represented by a set of responses to change that are negative along three dimensions, and support for change may be represented by a set of responses that are positive along three dimensions (Piderit 2000). Different individuals may respond differently

to a particular organizational change. For some, an organizational change gives satisfaction but to others, it brings disadvantages (Yousef 2000).

As we have mentioned in the Introduction section, previous research has attributed many information systems (IS) failures to user propensity to resist change (Markus 1983, Joshi 1991, Robey and Boudreau 1999, Jiang *et al.* 2000). Markus (1983) explained resistance to change and implementation difficulties primarily in terms of the conflict for more power among users. Joshi (1991) posited that individuals attempt to evaluate most changes in terms of equity status, and they are likely to resist changes that are unfavorable to them. Organizational resistance to change has been identified as a top critical success factor for ES adoption (Markus and Tanis 2000, Nah *et al.* 2003, Lapointe and Rivard 2005), with user resistance blamed for many ES project failures (Laughlin 1999, ITtoolbox 2004). In addition, the absence of an adequate organizational change attitude can result in the failure of an ES initiative, regardless of how competent the organization is technically (Al-Mashari 2000).

Organizational members who have favorable perceptions of organizational transformation are likely to proactively participate in any organizational change situations such as an ES implementation project (IT-driven organizational change), and possibly look forward to changes in work patterns. If people hold a positive attitude toward change and are ready for change, they are not likely to resist change. Thus, readiness for change would reduce resistance among employees to an IT-driven organizational change, leading them to adopt the system that is being introduced (figure 1). Hence, we hypothesize:

*H<sub>1</sub>: Readiness for change has a positive impact on usage intention for a newly developed enterprise system.*

### 2.2 Developing readiness for change

Four possible antecedents of readiness for change may be identified from the extant literature: organizational commitment, perceived personal competence, performance expectancy, and effort expectancy. The first two factors are more relevant to individuals' tendency and characteristics regardless of the system introducing the organizational change, while the remaining two factors are more relevant to the characteristics of the target system to be adopted by individuals in an organization.

Organizational commitment means the relative strength of an individual's identification with and involvement in a particular organization (Mowday *et al.* 1981). Meyer and Allen (1991) posited that organizational commitment comprises three components, reflecting: (1) desire (affective commitment), (2) need (continuance commitment), and

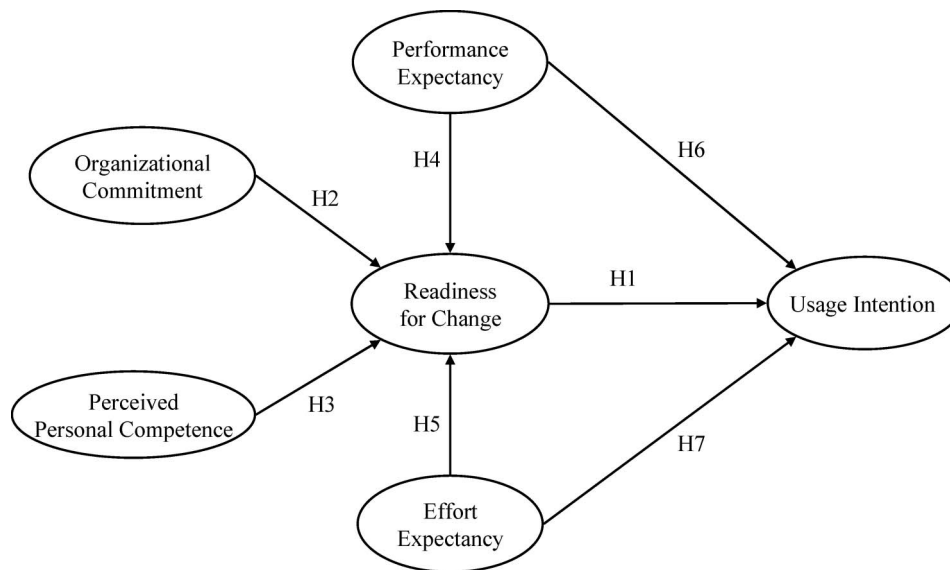


Figure 1. Research model.

(3) obligation (normative commitment) to maintaining employment in an organization. Affective commitment refers to the employee's emotional attachment to, identification with, and involvement in the organization. Continuance commitment refers to an awareness of the costs associated with leaving the organization. Normative commitment reflects a feeling of obligation to continue employment.

Previous research (Lau and Woodman 1995) has posited that an individual's commitment to an organization affects how she/he evaluates organizational change. This implies that a highly committed individual might more readily identify with and accept organizational change efforts that are perceived as beneficial. Similar to this, Guest (1992) argued that committed employees are more accepting toward organizational change than their noncommitted colleagues. Similarly, Iverson (1996) found that organizational commitment is one of the most important determinants of attitude toward organizational change. Hence, we hypothesize:

*H<sub>2</sub>: Organizational commitment has a positive impact on readiness for change.*

Perceived personal competence means the degree of the individual's feelings of competence in the work role (Allen and Meyer 1990). A high level of perceived personal competence derived from satisfactory working experiences gives employees self-confidence (Gebert *et al.* 1999). Employees with a strong sense of self-confidence tend to believe they can execute the particular job under any settings and also perform tasks that may differ from those they are used to. Thus, individuals with a higher level of personal

competence would be more confident in their work even in the face of change compared to those with a lower level of personal competence. For this reason, individuals with a high level of personal competence would have a more positive attitude toward change and be more ready for change. Similar to this, Gerbert *et al.* (1999) posited that employees with strong perceived personal competence are more likely to pursue further change initiatives because change-oriented action is known as a function of employee motivation. Hence, we hypothesize:

*H<sub>3</sub>: Perceived personal competence has a positive impact on readiness for change.*

Performance expectancy means the degree to which an individual believes that using the new system will help her/him make gains in job performance (Venkatesh *et al.* 2003). In general, ES are introduced into organizations to improve overall effectiveness of the organization, bridging the performance gap between the current state and some desired state. The need for change – that is, the discrepancy between the desired end state (which must be appropriate for the organization) and the present state – is considered one of the primary mechanisms for creating readiness for change (Armenakis *et al.* 1993). Thus, if people expect performance improvement from the use of newly developed ES, they would have more positive attitude toward change and be more ready for the change. Hence, we hypothesize:

*H<sub>4</sub>: Performance expectancy has a positive impact on readiness for change.*

Effort expectancy means the degree of ease associated with the use of a newly developed system (Venkatesh *et al.* 2003). If the newly developed system requires a lot of learning to use, it would deter people from using it. In contrast, if it is easy to use the new system, a positive attitude toward the system will be generated, and people will be more ready for the change associated with it. This is particularly relevant for the case of ES, since ES require employees across the adopting organization to learn new tasks and new technologies, and demand that the employees overcome knowledge barriers and unlearn some of what they already know (Robey *et al.* 2002). Thus, if people expect that they can easily adopt the new change, they would have a more positive attitude toward the change and be more ready for it. Hence, we hypothesize:

*H<sub>5</sub>: Effort expectancy has a positive impact on readiness for change.*

Many previous studies based on the Technology Acceptance Model (e.g. Venkatesh *et al.* 2003) have indicated that individuals' behavioral intention to use a new system is influenced by performance expectancy and effort expectancy for the system. The more useful the system is in enabling employees to accomplish their tasks, the more it will be used. While the following two hypotheses are nothing new, we propose them for completeness of the research model.

*H<sub>6</sub>: Performance expectancy has a positive impact on usage intention for a newly developed enterprise system.*

*H<sub>7</sub>: Effort expectancy has a positive impact on usage intention for a newly developed enterprise system.*

### 3. Research methodology

#### 3.1 Study context and sample characteristics

Since we are interested in examining readiness for change that leads to IS usage intention, this study considers readiness for change at the point when the new ERP system is being rolled out. Previous research has suggested that this period is the window of opportunity to improve the system (Tyre and Orlikowski 1993). At this time users' impressions are based on the features of the system. Subsequently users decide to resist the implemented system or adopt it (Lapointe and Rivard 2005).

For the data collection, we first selected an ERP vendor that is recognized as a leading company in terms of market share. One of the directors of the vendor agreed to sponsor this study. We asked the vendor to select its client companies that had finished the ERP implementation projects within less than four weeks at the point of data collection and had implemented more than two ERP modules. We then sent emails to the seven selected

companies to explain our research objective and obtain permission for the survey. After getting approval from the companies, we distributed questionnaires to the subjects who were expected to use the newly implemented ERP system in their tasks in each selected company. The survey had been conducted over two weeks. We had 446 complete and valid responses, showing a net response rate of approximately 64%.

Table 1 shows the respondent characteristics in terms of gender, age, educational background, tenure, and level in the organization. Gender distribution indicated an approximate 1.8:1 ratio in favor of male respondents. On average, the respondents were approximately 31 years old. The majority (88.9%) were between 20 and 30 years old. About 13.3% had high school education, with the remainder of respondents (86.7%) having at least a Bachelor's degree. On average, the respondents had about 6 years of work experience. Most (77.8%) had worked less than 10 years, and the largest number of respondents (44.2%) fell within the bracket of 1 and 4 years of work experience. As to work responsibility, 48.6% of the respondents held clerical level jobs, 30.1% held supervisory positions, and 21.3% of them were of middle management level.

#### 3.2 Measurement development

We developed our data collection instrument by adopting existing validated questions wherever possible.

Table 1. Respondent characteristics.

Respondent profiles	Frequency	Percent (%)	Cumulative (%)
<b>Gender</b>			
Female	151	35.0	35.0
Male	281	65.0	100.0
<b>Age (years)</b>			
20 – 29	179	49.6	49.6
30 – 39	142	39.3	88.9
≥40	40	11.1	100.0
Average age	30.8		
<b>Educational level</b>			
High school	56	13.3	13.3
University	344	81.7	95.0
Postgraduate	21	5.0	100.0
<b>Working experience (years)</b>			
≤1	27	6.4	6.4
1 – 4	185	44.2	50.6
5 – 9	114	27.2	77.8
10 – 19	87	20.8	98.6
≥20	6	1.4	100.0
Average tenure	5.9		
<b>Role</b>			
Clerical	205	48.6	48.6
Supervisory	127	30.1	78.7
Middle management	90	21.3	100.0

For performance expectancy and effort expectancy, we adopted measurement items from previous research (Davis 1989, Gefen *et al.* 2003). For usage intention, we adopted items from Rai *et al.* (2002). Readiness for change was measured with 13 items, from the instrument developed by Dunham *et al.* (1989) and modified to suit our context. For organizational commitment, we adopted items from Allen and Meyer (1990). For perceived personal competence, we adopted items from Allen and Meyer's (1990) measurement. All question items were measured with a seven-point Likert-type scale, with anchors ranging from 'strongly disagree' to 'strongly agree'. Two IS researchers reviewed the instrument and checked its face validity. The final instrument used for data collection is shown in the Appendix.

**4. Data analysis and results**

We carried out data analysis in accordance with a two-stage methodology (Anderson and Gerbing 1988) using LISREL. The first step in the data analysis was to establish the convergent and discriminant validity of the constructs. In the second step, we examined the structural model based on the cleansed measurement model.

**4.1 Confirmatory factor analysis**

To test convergent validity, we first needed to check the unidimensionality of each construct. Following recommended methodological procedures (Anderson and Gerbing 1988, Gefen *et al.* 2000), we set out to revise the measurement model by discarding, one at a time, items which shared a high degree of residual variance with other items. After discarding three questions (RFC2, RFC10 and RFC11), the measurement model had good fit.

Convergent validity was additionally assessed with three criteria. First, standardized path loadings, which are indicators of the degree of association between the underlying latent factor and each item, should be greater than 0.7 and statistically significant (Gefen *et al.* 2000). Second, the composite reliability (CR) and the Cronbach's  $\alpha$  for each construct must be larger than 0.7 (Hair *et al.* 1998). Third, the average variance extracted (AVE) for each factor should exceed 0.5 (Fornell and Larcker 1981).

As depicted in table 2, the standardized path loadings were all significant ( $t$ -value > 1.96) and greater than 0.7 except for OCM2, OCM5, and OCM6. The composite reliability and Cronbach's  $\alpha$  for all constructs exceeded 0.7. The average variance extracted for each factor was greater than 0.5. Hence, the questions in this study had convergent validity.

Next, we assessed discriminant validity by comparing the square root of AVE for each construct with the correlations between that construct and other constructs (Fornell and Larcker 1981). As shown in table 3, the square root of AVE

Table 2. Results of convergent validity testing.

Construct	Item	Factor loading	Composite reliability	Average variance extracted	Cronbach $\alpha$				
OCM	OCM1	0.788	0.872	0.535	0.870				
	OCM2	0.644							
	OCM3	0.782							
	OCM4	0.877							
	OCM5	0.604							
	OCM6	0.657							
PPC	PPC1	0.733	0.869	0.571	0.867				
	PPC2	0.730							
	PPC3	0.848							
	PPC4	0.707							
	PPC5	0.753							
RFC	RFC1	0.710	0.939	0.609	0.938				
	RFC3	0.724							
	RFC4	0.821							
	RFC5	0.810							
	RFC6	0.853							
	RFC7	0.760							
	RFC8	0.803							
	RFC9	0.834							
	RFC12	0.715							
	RFC13	0.757							
	EEP	EEP1				0.877	0.949	0.755	0.948
		EEP2				0.869			
		EEP3				0.809			
EEP4		0.861							
EEP5		0.909							
EEP6		0.886							
PEP	PEP1	0.840	0.950	0.761	0.950				
	PEP2	0.920							
	PEP3	0.881							
	PEP4	0.875							
	PEP5	0.881							
	PEP6	0.836							
UI	UI1	0.910	0.898	0.748	0.892				
	UI2	0.916							
	UI3	0.759							

Table 3. Results of discriminant validity testing.

Construct	Mean (SD)	OCM	RFC	EEP	PEP	UI	PPC
OCM	4.802 (0.991)	0.732					
RFC	5.108 (0.961)	0.537	0.780				
EEP	4.371 (1.167)	0.325	0.428	0.869			
PEP	5.085 (1.022)	0.462	0.623	0.434	0.873		
UI	5.222 (1.090)	0.469	0.615	0.503	0.753	0.865	
PPC	4.792 (0.941)	0.621	0.547	0.300	0.448	0.444	0.756

Note: Leading diagonal shows the square root of AVE of each variable.

for each construct exceeded the correlations between that construct and other constructs. Hence, discriminant validity was established.

## 4.2 Hypothesis testing

We tested the hypotheses using the structural model of LISREL. The normed  $\chi^2$  ( $\chi^2$  to degree of freedom) was 2.55, which was good, being below the maximum desired cut-off of 3.0 (Gefen *et al.* 2000). RMSEA was 0.05, indicating a good fit, being below the maximum desired cut-off of 0.06 (Gefen *et al.* 2000). Root mean square residual (RMR) was 0.046, slightly lower than the desired maximum cut-off of 0.05 (Hair *et al.* 1998). Goodness-of-fit index (GFI) was 0.84 and adjusted goodness-of-fit index (AGFI) was 0.82, both of which were above the recommended threshold of 0.8 (Hair *et al.* 1998). The other fit indices were all satisfactory: CFI=0.98, NFI=0.97, and nonnormed fit index (NNFI)=0.98. These results suggest that the structural model fitted the data adequately.

Figure 2 shows the standardized LISREL path coefficients and the overall fit indices. All four variables (organizational commitment, perceived personal competence, performance expectancy, and effort expectancy) were significantly related to readiness for change, and explained 51.4% of variance in attitude: organizational commitment (path coefficient=0.177,  $p < 0.001$ ), perceived personal competence (path coefficient=0.225,  $p < 0.001$ ), performance expectancy (path coefficient=0.380,  $p < 0.001$ ), and effort expectancy (path coefficient=0.137,  $p < 0.001$ ). Next, three variables (readiness for change, performance expectancy, and effort expectancy) were significantly related to usage intention and explained 62.8% of variance in usage intention: readiness for change (path coefficient=0.195,  $p < 0.001$ ), performance expectancy (path coefficient=0.555,  $p < 0.001$ ) and effort expectancy (path coefficient=0.179,  $p < 0.001$ ).

(path coefficient=0.179,  $p < 0.001$ ). Thus, all hypotheses were supported.

## 5. Discussion and implications

### 5.1 Discussion of findings

As a way for reducing resistance to IT-driven organizational change, developing readiness for change has often been suggested (Armenakis *et al.* 1993). Markus (1983) highlighted the importance of readiness for change (i.e. resistance to change) in IS implementation. She also pointed out that one of the major risks in IT-driven organizational change is a risk that users will not use the technology because of lack of readiness for change (Markus 2004). In terms of IS success, DeLone and McLean (1992, 2003) highlighted IS use as one of the IS success determinants, which implies that readiness for change used in this study as an antecedent of IS use (i.e. usage intention) might play an important role in explaining IS success.

Readiness for change can be applied to not only ES project but also large IT-driven organizational change project. ES implementation is a typical example of IT-driven organizational change, because ES implementation brings about technical and social changes. The new technical and social changes tend to be confronted by resistance to change from the potential users of the new IS in an organization. Manifestation of user resistance to change includes opposition, ignoring, undermining, and refraining (Bovey and Hede 2001). User resistance further adversely affects the IS implementation project and leads

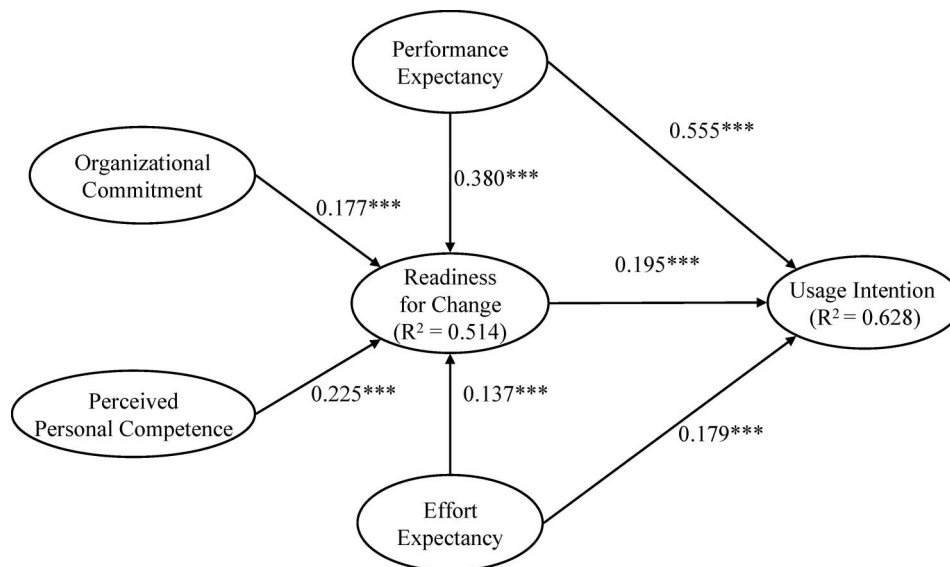


Figure 2. Standardized LISREL solution (\*\*\*)  $p < 0.001$ .  $\chi^2/df = 2.551$ , GFI = 0.844, AGFI = 0.821, CFI = 0.982, RMSEA = 0.059, Std. RMR = 0.046.

to the eventual failure (Beaudry and Pinsonneault 2005). On the basis of this background, we have examined how readiness for change is formed and how it helps users adopt the newly developed system.

We have found that readiness for change is significantly influenced by four factors across two domains. In the first domain, the factors are more relevant to individuals' tendency and characteristics in the current working context regardless of the focal system: organizational commitment and perceived personal competence. In the second domain, the factors are more relevant to the characteristics of the focal system to be adopted by individuals in the organization: performance expectancy and effort expectancy. We have also found that readiness for change together with the other two technology-related factors (performance expectancy and effort expectancy) exerts significant positive effects on ES usage intention.

Similar to our study, Orlikowski (1993) demonstrated that adopting and using a specific IT is not solely dependent on the characteristics of the IT but also on other aspects such as the organizational or social context. Readiness for change is a social antecedent, while performance expectancy and effort expectancy are technological ones. These two distinct sets of antecedent constructs are intertwined as found in this research.

### 5.2 Limitations

The implications of any study must be considered in the context of its limitations. First, we note that we have gathered the measures of all constructs at the same point in time and through the same instrument. Consequently, the potential of common method variance for some of the result exists. In addition, because of the cross-sectional nature of the study, causality can only be inferred via theory, and so a longitudinal approach needs to be considered in future research. Second, there may be limitations on how far we can generalize our findings. We have conducted our study in the context of ERP system usage, but ERP systems do not represent all kinds of ES. Consequently, it is only prudent that caution be exercised in generalizing the findings. Third, while we have regarded readiness for change as a way for reducing resistance to change based on the argument of previous research, we have not tested the relationship between them directly. Future research could consider testing the effect of readiness for change on resistance to change in the context of ES-driven or IT-driven organizational change.

### 5.3 Implications

This research offers several implications for theory and practice. From the theory perspective, first, this study

develops the theoretical model of readiness for change in the context of IS implementation. The developed theoretical research model provides a rich understanding of a broad variety of readiness for change in IS implementation. They further help explain and predict how and why readiness for change is developed and affects IS usage intention, a surrogate of IS use.

Second, this study develops and proposes a new construct, readiness for change, in the context of IS implementation (i.e. IT-driven organizational change) based on the research in management (Dunham *et al.* 1989). Since user resistance to change has been identified as one of the key reasons in IS implementation failure, measuring and managing readiness for change as a way for reducing user resistance to change is important for achieving IS implementation success.

Third, the findings of this study shed light on what factors affect user's readiness for change in IS implementation and how to enhance IS usage intention. Although previous IS research has noted the importance of readiness for change, it has been less studied regarding its antecedents and its consequence in the context of IS implementation. To the best of our knowledge, this study is the first research on examining the readiness for change in the context of IT-driven organizational change. This study further highlights how to enhance readiness for change. These results contribute toward theoretical advancements on the issue of readiness for change in IS implementation.

From the practice perspective, the results of this study indicate the circumstance under which users are ready for change in IT-driven organizational change. Since organizational change induced by ES implementation often leads to different power and resource allocations, ES introduction usually triggers a diverse group of overt and covert opponents within the organization (Hong and Kim 2002). Any ES implementation project will face a certain level of organizational resistance to change. Thus, the management should understand the critical effects of the identified four factors (performance expectancy, effort expectancy, organizational commitment, and perceived personal competence) on readiness for change.

To enhance performance expectancy and effort expectancy perceived by users, the management can attempt to put efforts on developing high quality IS (e.g. usefulness and ease of use). To enhance organizational commitment of users, the management can attempt to develop employee loyalty programs inside a company, similar to customer loyalty programs. To enhance personal competence, the management can attempt to make the users satisfied in their workings because perceived personal competence is influenced by satisfactory working experience (Gebert *et al.* 1999).



## 6. Conclusion

It has been known that more than two thirds of ES implementation projects result in failure. One of the critical failure reasons is resistance to change from employees or potential users. By recognizing that readiness for change is a way for reducing resistance to change in IT-driven organizational change such as ES implementations, we have examined the formation of readiness for change and its effect on ES usage intention. We have found that readiness for change can be enhanced with the identification of four factors across two domains: individuals' attachment to an organization and perceived competence regardless of the focal system (organizational commitment and perceived personal competence) and technological characteristics of the focal system (performance expectancy and effort expectancy). In addition, we have found that readiness for change positively impacts ES usage intention together with the technological characteristics of the focal system. Overall, this study contributes toward theoretical advancements on the issue of user readiness for change and the findings offer companies practical insights for managing user readiness for change in IS implementation.

## Acknowledgements

The authors are grateful to Prof. Matthias Rauterberg and three anonymous reviewers for their excellent suggestions. This work was supported by the research program 2007 of Kookmin University in Korea.

## References

ALLEN, N.J. and MEYER, J.P., 1990, The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, **63**, pp. 1–18.

AL-MASHARI, M., 2000, A process change-oriented model for ERP application. *International Journal of Human-Computer Interaction*, **16**, pp. 39–55.

ANDERSON, J.C. and GERBING, D.W., 1988, Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, **103**, pp. 411–423.

ARMENAKIS, A.A., HARRIS, S.G. and MOSSHOLDER, K.W., 1993, Creating readiness for change. *Human Relations*, **46**, pp. 681–703.

BEAUDRY, A. and PINSONNEAULT, A., 2005, Understanding user responses to IT: a coping model of user adaptation. *MIS Quarterly*, **29**, pp. 493–524.

BOVEY, W.H. and HEDE, A., 2001, Resistance to organizational change: the role of defense mechanisms. *Journal of Managerial Psychology*, **16**, pp. 534–548.

DAVIS, F.D., 1989, Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, **13**, pp. 319–339.

DELONE, W.H. and McLEAN, E.R., 1992, Information systems success: the quest for the dependent variable. *Information Systems Research*, **3**, pp. 60–95.

DELONE, W.H. and McLEAN, E.R., 2003, The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, **19**, pp. 9–30.

DUNHAM, R.B., GRUBE, J.A., GARDNER, D.G., CUMMINGS, L.L. and PIERCE, J.L., 1989, The development of an attitude toward change instrument. In *Proceedings of the Academy of Management Annual Meeting*, 1989, Washington, DC.

ELIZUR, D. and GUTTMAN, L., 1976, The structure of attitudes toward work and technological change within an organization. *Administrative Science Quarterly*, **21**, pp. 611–623.

FORNELL, C. and LARCKER, D.F., 1981, Evaluating structural equation models with unobservable variables and measurement error. *Management Science*, **40**, pp. 440–465.

GATTIKER, T.F. and GOODHUE, D.L., 2005, What happens after ERP implementation: understanding the impact of interdependence and differentiation on plant-level outcomes. *MIS Quarterly*, **29**, pp. 559–585.

GEBERT, D., BOERNER, S. and AGAFONOV, J.G., 1999, Attitudes toward change initiatives in corporate cultures undergoing transformation. *Eastern European Economics*, **37**, pp. 5–25.

GEFEN, D., KARAHANNA, E. and STRAUB, D.W., 2003, Trust and TAM in online shopping: an integrated model. *MIS Quarterly*, **27**, pp. 51–90.

GEFEN, D., STRAUB, D.W. and BOUDREAU, M.-C., 2000, Structural equation modeling and regression: guidelines for research practice. *Communications of the Association for Information Systems*, **4**, pp. 1–70.

GUEST, D., 1992, Employee commitment and control. In *Employment Relations*, J.F. Hartley and G.M. Stephenson (Ed.), pp. 111–135 (Oxford: Blackwell, 1992).

HAIR, J.T., ANDERSON, R.E., TATHAM, R.L. and BLACK, W.C., 1998, *Multivariate Data Analysis*, 5th ed., pp. 1–730 (Upper Saddle River, NJ: Prentice Hall).

HONG, K.-K. and KIM, Y.-G., 2002, The critical success factors for ERP implementation: an organizational fit perspective. *Information & Management*, **40**, pp. 25–40.

ITTOOLBOX, 2004, ERP implementation survey. Available online at [http://erp.ittoolbox.com/research/survey.asp?survey=corioerp\\_survey&p=1](http://erp.ittoolbox.com/research/survey.asp?survey=corioerp_survey&p=1) (accessed November 2005).

IVERSON, R.D., 1996, Employee acceptance of organizational change: the role of organizational commitment. *The International Journal of Human Resource Management*, **7**, pp. 122–149.

JIANG, J.J., MUHANNA, W.A. and KLEIN, G., 2000, User resistance and strategies for promoting acceptance across system types. *Information & Management*, **37**, pp. 25–36.

JOSHI, K., 1991, A model of users' perspective on change: the case of information systems technology implementation. *MIS Quarterly*, **15**, pp. 229–242.

KIM, H.W. and PAN, S., 2006, Towards a process model of information systems implementation: the case of customer relationship management. *The DATA BASE for Advances in Information Systems*, **37**, pp. 59–76.

KIRTON, M.J. and MULLIGAN, G., 1973, Correlates of managers' attitudes toward change. *Journal of Applied Psychology*, **58**, pp. 101–107.

LAPOINTE, L. and RIVARD, S., 2005, A multilevel model of resistance to information technology implementation. *MIS Quarterly*, **29**, pp. 461–491.

LAU, C. and WOODMAN, R.C., 1995, Understanding organizational change: a schematic perspective. *Academy of Management Journal*, **38**, pp. 537–554.

LAUGHLIN, S.P., 1999, An ERP game plan. *Journal of Business Strategy*, **20**, pp. 32–37.

MARKUS, M.L., 1983, Power, politics, and MIS implementation. *Communications of the ACM*, **26**, pp. 430–444.

MARKUS, M.L., 2004, Technochange management: using IT to drive organizational change. *Journal of Information Technology*, **19**, pp. 3–19.

MARKUS, L. and TANIS, C., 2000, The enterprise system experience – from adoption to success. In *Framing the Domain of IT Management*, R. Zmud (Ed.), pp. 173–207 (Cincinnati, Ohio: Pinnaflex Education Resources).

MEYER, J.P. and ALLEN, N.J., 1991, A three-component conceptualization of organizational commitment. *Human Resource Management Review*, **1**, pp. 61–89.

MOWDAY, R.T., PORTER, L.W. and STEERS, R.M., 1981, *Employee-Organizational Linkages: The Psychology of Employee Commitment, Absenteeism and Turnover*, pp. 1–253 (New York: Academic Press).

NAH, F.F.-H., ZUCKWEILER, K.M. and LAU, J.L.-S., 2003, ERP implementation: chief information officers' perceptions of critical success factors. *International Journal of Human-Computer Interaction*, **16**, pp. 5–22.

- ORLIKOWSKI, W.J., 1993, CASE tools as organizational change: investigating incremental and radical changes in systems development. *MIS Quarterly*, **17**, pp. 309–341.
- PIDERIT, S.K., 2000, Rethinking resistance and recognizing ambivalence: a multidimensional view of attitudes toward an organizational change. *Academy of Management Review*, **25**, pp. 783–794.
- PTAK, C.A. and SCHARAGENHEIM, E., 1999, *ERP: Tools, Techniques, and Applications for Integrating the Supply Chain*, pp. 1–456 (Los Angeles, CA: CRC Press/St Lucie Press).
- RAI, A., LANG, S.S. and WELKER, R.B., 2002, Assessing the validity of IS success models: an empirical test and theoretical analysis. *Information Systems Research*, **13**, pp. 50–69.
- ROBEY, D. and BOUDREAU, M.C., 1999, Accounting for the contradictory organizational consequences of information technology: theoretical directions and methodological implications. *Information Systems Research*, **10**, pp. 167–185.
- ROBEY, D., ROSS, J. and BOUDREAU, M.C., 2002, Learning to implement enterprise systems: an exploratory study of the dialectics of change. *Journal of Management Information Systems*, **19**, pp. 17–46.
- TYRE, M.J. and ORLIKOWSKI, W.J., 1994, Windows of opportunity: temporal patterns of technological adaptation in organizations. *Organization Science*, **5**, pp. 98–118.
- VENKATESH, V., MORRIS, M.G., DAVIS, G.B. and DAVIS, F.D., 2003, User acceptance of information technology: toward a unified view. *MIS Quarterly*, **27**, pp. 425–478.
- YOUSEF, D.A., 2000, Organizational commitment and job satisfaction as predictors of attitudes toward organizational change in a non-western setting. *Personnel Review*, **29**, pp. 567–592.

## Appendix A Measurement Instrument

### Usage intention (UI)

- UI1: I intend to use the ERP system as often as needed for performing my job.
- UI2: To the extent possible, I will frequently use the ERP system in my job.
- UI3: I would be dependent on the ERP system.

### Performance expectancy (PEP)

- PEP1: Using the ERP system enables me to have more accurate information.
- PEP2: Using the ERP system enhances my effectiveness in performing my tasks.
- PEP3: Using the ERP system is useful for performing my tasks.
- PEP4: Using the ERP system increases my productivity in performing my tasks.
- PEP5: Using the ERP system enables me to access more relevant information.
- PEP6: Using the ERP system enables me to acquire high quality information.

### Effort expectancy (EEP)

- EEP1: Learning to operate the ERP system is easy.
- EEP2: It is easy to remember how to use the ERP system.

- EEP3: I find it easy to get the ERP system to do what I want it to do.
- EEP4: My interaction with the ERP system is clear and understandable.
- EEP5: It is easy to become skillful at using the ERP system.
- EEP6: I find the ERP system easy to use.

### Readiness for change (RFC)

- RFC1: I look forward to changes at work.
- RFC2: Changes tend to stimulate me.
- RFC3: I find most changes pleasing.
- RFC4: Change usually benefits the organization.
- RFC5: Most of my coworkers benefit from change.
- RFC6: Change often helps me perform better.
- RFC7: Other people think that I support change.
- RFC8: Change usually helps improve unsatisfactory situations at work.
- RFC9: I usually benefit from change.
- RFC10: I am inclined to try new ideas.
- RFC11: I usually support new ideas.
- RFC12: I often suggest new approaches to things.
- RFC13: I intend to do whatever possible to support change.

### Organizational commitment (OCM)

- OCM1: I would be very happy to spend the rest of my career with this organization.
- OCM2: I enjoy discussing my organization with people outside it.
- OCM3: I really feel as if this organization's problems are my own.
- OCM4: This organization has a great deal of personal meaning for me.
- OCM5: It would be very difficult for me to leave my organization right now, even if I wanted to.
- OCM6: Too much in my life would be disrupted if I decided I wanted to leave my organization now.

### Perceived personal competence (PPC)

- PPC1: In general, the work I am given to do at my organization is challenging and exciting.
- PPC2: The requirements of my job are demanding.
- PPC3: In this organization, I am encouraged to feel that the work I do makes important contributions to the larger aims of the organization.
- PPC4: I am usually given feedback concerning my performance on the job.
- PPC5: In my organization, I am allowed to participate in decisions regarding my workload and performance standards.