Asia Pacific Journal of Information Systems
Vol. 21, No. 1, March 2011

The Impacts of Social Networks on Individual Adaptation to Technochanges

Kee-Young Kwahk*

Despite the growing attention to the effective utilization of ICT system in workplace, there is an accumulation of evidence from the literature indicating that organizations do not utilize newly introduced ICT systems to their full functional potential and an amount of new implementations continue to fail. We explore the reasons for the underutilization of new ICT by focusing on the individuals' social networks. This paper investigates how the social networks influence individual adaptation to the new ICT and its related performance. Based on the coping theory, we establish a research model that explains the coping mechanism. Collected data are analyzed to test the proposed model and its hypotheses using PLS and UCINET. The results show that the coping effort mechanism of individuals can be explained in terms of their positions within social networks. We conclude the paper by discussing theoretical and practical implications for the research findings and by proposing future studies.

Keywords : IS Management, Coping Theory, Social Network, Adaptation, Self-Efficacy, Absorptive Capacity

* School of Management Information Systems, College of Business Administration, Kookmin University

Ⅰ. Introduction

Most of today's organizations have used information and communication technology (ICT) to achieve their competitive advantage as well as to operate daily work practices, which makes the effective use of ICT by organization members a necessary condition for successful business. As a consequence, a primary challenge facing organizations with the intent of introducing a new ICT for the business purposes is how to adapt organization members to the major technological changes that have an impact on their business operations and strategy. Given the rapidly changing ICT trend and the pervasiveness of ICT-induced organizational change embedded in workplace, the extent to which organization members adapt to a new ICT system can directly influence the effectiveness of their work operations and eventually the overall organizational performance.

Despite the growing attention to the effective utilization of ICT system in workplace, however, there is an accumulation of evidence from the literature indicating that organizations do not utilize newly introduced ICT systems to their full functional potential and an amount of new implementations continue to fail [Davis and Venkatesh, 2004; Jasperson *et al.*, 2005]. We explore the reasons for the underutilization of new ICT by focusing on the two barriers related to individual's coping process for adapting to ICT-induced changes. On the one hand from the technical perspective, today's ICT is complex and raises significant challenges for organization members, particularly by overwhelming them with numerous features and the accompanying learning requirements [Kanter, 2000]. Users thus face knowledge barriers to system adaptation even after a formal introduction of the system [Fichman and Kemerer, 1999]. On the other hand from the organizational and social perspective, the introduction of new ICT tends to bring a disruptive workplace change, for example, a new way of order fulfillment process induced by a new ERP system, which might lead to a sense of anxiety and uncertainty about the future among organization members. Users thus face emotion barriers to system adaptation even though they are knowledgeable about the system. Therefore, understanding the effective use of ICT with a focus on an individual's coping mechanism towards knowledge and emotion barriers will help us in devising ways to manage individual adaptation processes and thereby achieve the enhanced performance.

Cognizant of the fact that interpersonal communications play an important role in an individual's coping process to organizational changes [Orlikowski and Gash, 1994], we believe that analyzing the structure of organization member's social networks may shed some light on the individual's adaptation mechanism to ICT-induced changes and its effect on performance. Social networks help individuals acquire and accumulate knowledge through informal knowledge share and transfer among colleagues. The role of social networks as a source of knowledge acquisition has organization members overcome the knowledge barriers to the adaptation of new ICT system. Social networks also help reduce uncertainty and anxiety through communicating with colleagues and friends. Given the unsettling nature of ICT-induced changes, organization members need to understand their new organizational context and to regain psychological bal-

ance [Griffith, 1999]. Social networks have organization members restore their mental equilibrium so that they can defeat emotion barriers to the adaptation of new ICT system.

With this motivation and background, this paper has the following research objectives. First, this study develops a research model of system adaptation with its effect on performance that reflects an individual's coping effort mechanism. Second, this paper introduces key social network constructs into the research model and thereby extends the applicability of the social network research to the IS field. Third, the proposed research model shows a role of social network perspective in explaining system adaptation by combining traditional psychometric constructs with social network ones and empirically validating the model.

Ⅱ. Theoretical Background: Coping Theory

Lazarus and Folkman [1984, p. 141] defined coping as "the cognitive and behavioral efforts exerted to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person." It deals with the adaptation acts that an individual performs in response to stimulation or disruptive events, and circumstance in his/her environment. Individuals apply two kinds of coping efforts to cope with the disruptive events: problem-focused coping efforts and emotion-focused coping efforts [Lazarus and Folkman, 1984]. Problem-focused coping aims at the problem solving by changing environmental pressures, barriers, resources or changing oneself (e.g., learning new skills or procedures). Emotion-focused coping aims at reducing or managing the negative emotional distress. It doesn't change the situation itself, but changes one's perception of the situation [Lazarus and Folkman, 1984].

In an IS research drawing on the coping theory, Beaudry and Pinnsoneault [2005] introduced adaptation as a similar concept with coping and defined it as the cognitive and behavioral efforts exerted by users to manage specific consequences associated with a significant ICT event that occurs in their work environment. When ICT-induced changes occur, individuals make problem-focused and emotion-focused coping efforts in order to adapt to the changes. In this context, problem-focused adaptation mechanism aims at dealing with the issues of ICT changes directly by adapting oneself, work, and technology. Self-adaptation involves adjusting one's habits [Orlikowski, 1996; Tyre and Orlikowski, 1994], learning new skills [Tyre and Orlikowski, 1994] and adjusting commitment to the work [Majchrzak and Cotton, 1988] to meet the requirements of the technology. Therefore, this kind of coping mechanism helps individuals overcome the knowledge barriers to the adaptation of the new ICT. Emotion-focused adaptation mechanism provides another, distinct type of coping process to ICT-induced changes. In contrast with problem-focused adaptation mechanism, emotion-focused adaptation mechanism aims at changing one's perception of the consequences of the newly introduced ICT or reducing emotional distress. Emotion-focused adaptation is oriented towards avoiding reality though self-deception [Zuboff, 1988] or psychologically minimizing negative consequences, selective attention, and positive comparison to other users [Lazarus and Folkman, 1984]. As a con-

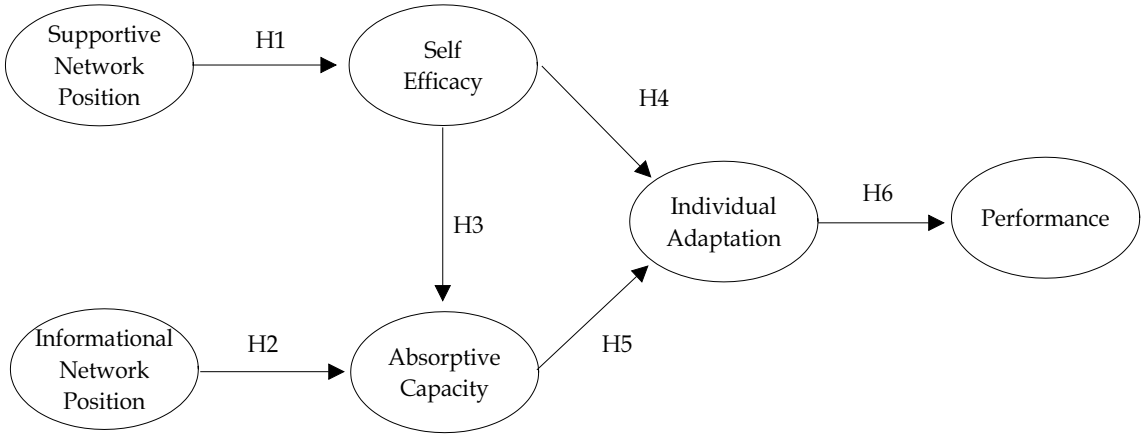
sequence, individuals use this kind of coping mechanism to mitigate the emotion barriers so that they can easily adapt to the new ICT.

Ⅲ. Research Model and Hypothesis Development

We develop a research model to explain the coping mechanism towards ICT-induced changes based on the perspective of coping theory. <Figure 1> presents the proposed research model.

Supportive network position represents how an individual actor has affective relationships carrying either positive or negative emotions that are not necessarily task related [Bruque *et al.*, 2008-9]. Organization members usually experience a higher level of stress, anxiety, and job dissatisfaction during ICT-induced changes because those changes lead to a heightened sense of uncertainty about the future work environment. Those kinds of dysfunctional results eventually have an impact on the system adaptation of organization members. Organization members who have rich supportive relationships are likely to gain the required emotional support towards the uncertainty and thereby restore the psychological equilibrium.

Coping is a complex process that is sensitive to the environment and resources [Lazarus and Folkman, 1984]. A newly introduced ICT can also be mentally fatiguing and frustrating [Mumford *et al.*, 1987]. So coping is strongly related to the regulation of emotion, particularly distress and anxiety, all through the stress process [Folkman and Moskowitz, 2004]. Self-efficacy refers to one's belief in one's capability to perform a specific task [Bandura, 1977]. It arises from the gradual acquisition of complex cognitive, social, linguistic, and physical skills through experience [Bandura, 1986]. Emotional resources enhance individual's perceived self-efficacy through encouragement, coaching, mentoring, and recognition. Exchange of psychological support and guidance are also related to the personal skill development, which might lead to enhanced one's self-efficacy [Lankau and Scandura, 2002]. Individuals who perceive themselves as having more emotional resources are likely to cope with distress and anxiety involved in ICT-induced changes and have a heightened sense of con-



<Figure 1> Research Model

fidence, leading to a higher level of self-efficacy [Swanson and Wang, 2005]. Rich supportive networks are a major source of such emotional resources and, therefore, we propose the following hypothesis.

H1: Supportive network position positively influences self-efficacy.

Informational network position represents how an individual actor is involved in exchange of information and advice needed to accomplish their workplace tasks [Bruque *et al*., 2008-9; Cross and Cummings, 2004; Ibarra, 1993]. Informational networks provide individuals with an ability to help absorb knowledge acquired elsewhere [Cross and Cummings, 2004]. Informational networks may play a critical role in a situation of ICT-induced changes since learning to use a new ICT entails a knowledge transfer process across organization members with different levels of skills [Sykes *et al*., 2009].

A newly introduced ICT is likely to provide challenges for organization members when they try to cope with redesigned work processes, technology features, and user interfaces [Beaudry and Pinnsoneault, 2005; Sykes *et al*., 2009]. So it poses substantial learning requirements [Aiman-Smith and Green, 2002]. Given that absorptive capacity revolves around the ability to acquire, assimilate, transform, and exploit knowledge, it plays a significant role in meeting the learning requirements by ICT-induced changes. Rich informational networks provide a higher level of information sharing, collaboration, and cooperation that facilitate absorbing knowledge about a new ICT. Resources available through informational networks at the workplace are likely to enhance overall absorptive capacity of organization members by helping them learn new features of the ICT, get the skills on how to use it, and deal with the redesigned business processes driven by it. Rich informational networks provide various technical and organizational supports, and those supports are expected to improve organization members' capability in using the ICT. Therefore, we propose the following hypothesis.

H2: Informational network position positively influences absorptive capacity.

Individuals with a high level of self-efficacy tend to perceive themselves as having the capability, motivation, and resources required to solve the problems. Consequently, strong self-efficacy provides individuals with the belief that they are able to do well their work and adjust easily to the new environment. This results in higher likelihood that individuals with higher level of self-efficacy are more actively searching for relevant knowledge and acquiring it when facing some difficulties, compared to individuals with weak self-efficacy. Tsai and Tsai [2003] showed that individuals' high level of self-efficacy is closely related to the superior information search capability of individuals. Individuals with strong self-efficacy are likely to have strong confidence on learning how to use a particular system and thereby easily assimilate and exploit new knowledge on the system, which increases individuals' absorptive capacity [Murphy, 1988]. Therefore, we propose the following hypothesis.

H3: Self-efficacy positively influences absorptive capacity.

Since self-efficacy emerges out of the cognitive assessment of one's capabilities, it has an impact on an individual's choice of activities, skill acquisition, effort expenditure, and the initiation and persistence of coping efforts [Bandura, 1986]. Individuals with a high level of self-efficacy tend to engage more frequently in work-related activities and persevere longer in coping efforts, which leads to more mastery experiences [Gist, 1987]. Those who are frequently participating in task-related activities and keep trying to overcome problems tend to be easily accustomed to the new tasks through the accumulated work experiences, which results in higher likelihood to appropriately respond to the unexpected changes. In addition, an individual's persistence of coping efforts in the face of challenges gives them opportunities to gain the corrective experiences, which in turn enhances their adaptability to obstacles. Subsequently, it leads to higher likelihood for individuals to better adapt to the new environment such as ICT-induced changes. Therefore, we propose the following hypothesis.

H4: Self-efficacy positively influences individual adaptation.

ICT-induced changes tend to pose significant challenges for organization members in which organization members face various learning requirements about newly designed processes and the latest technologies. Strong absorptive capacity can help organization members learn the skills to use the new ICT and understand the related business processes, especially by facilitating knowledge assimilation and exploitation. Consequently, individuals with a higher level of absorptive capacity are likely to better adapt to the newly introduced ICT as well as business practices. On the contrary, a lack of absorptive capacity strengthens the tendency to stick to the knowledge one already possesses, and this tendency negatively influences one's adaptability to organizational changes [Szulanski, 1996]. Absorptive capacity is also considered as the main factor influencing the use of information technology within an organization [Boynton *et al.*, 1994]. The effective use of ICT requires that organization members conduct individual learning activities such as taking part in training activities, participating in seminars, and referring to the relevant manuals. At this juncture, the conclusion can be reached that individuals with a higher degree of absorptive capacity will accept and understand the information pertaining to the usage of the ICT better than those with a lower degree of absorptive capacity. Furthermore, considering that the former type of users tends to attempt to constantly acquire something new around them, as they share their experiences with others, they will come to gradually develop and incorporate their own know-how, which enhances their adaptability to ICT-induced changes. Therefore, we propose the following hypothesis.

H5: Absorptive capacity positively influences individual adaptation.

Individuals' adaptation to ICT-induced changes is the process by which individuals learn, negotiate, enact, and maintain the behaviors appropriate to a given organizational environment [Bruque *et al.*, 2008-9]. Since adaptation reflects the behaviors conducted by the individuals such that they are able to achieve valued goals [Ashford, 1986], appropriate adaptation is closely

associated with the individuals' performance. The degree to which organization members adapt to a new ICT can significantly influence the effectiveness of the individual operation directly depending on the ICT as well as the performance of the organization as a whole [Bruque *et al*., 2008-9]. So we can expect that organization members' adaptation positively influences their task performance. Therefore, we propose the following hypothesis.

H6: Individual adaptation positively influences performance.

Ⅳ. Research Methodology

4.1 Sample and Data Collection Procedure

We conducted our research with students in one of the major universities in Korea who took a class of Java programming language that was new to them. Considering that the subjects had little experiences with the programming language and should complete a task using the programming language at the end of the semester, this context can be easily translated into a workplace with a newly introduced ICT. A total of 85 out of 88 respondents completed the entire survey; three responses were disregarded due to several missing answers. The sample consists of 64.7% male and 35.3% female students. Since the participants were university students, most of them were between the ages of 21 and 30.

The questionnaire administered in this study largely consisted of two parts; one is the social network constructs part and the other is the traditional psychometric constructs part. We collected social network data using a two-step name generator/interpreter methodology that elicit and then characterize respondents' relations [Cross and Cummings, 2004; Scott, 2000; Wasserman and Faust, 1994]. To elicit supportive network relationships, we asked the respondents to give the names of people "who you know you can count on, who are dependable in hard times" [Bruque *et al*., 2008-9; Ibarra, 1993]. For informational network relationships, the respondents were asked to list the names of people "who are important in terms of providing you with information to learn Java programming language or helping you think about complex problems posed by the assigned project" [Cross and Cummings, 2004]. There were no initial limitations on the number of names to be listed, which represents the size of each social network. However, following a procedure suggested by previous social network studies [e.g., Morrison, 2002], we conducted further data collection regarding only the first five persons that the respondents already elicited before for each type of social networks, in order to gather additional social network data explaining supportive and informational network positions such as closeness, frequency, and density. After completing the part of social networks, the respondents were asked to answer the rest of questions regarding other research variables and demographics as usual.

4.2 Measurement

In this study, a social network is seen as a set of individuals and the relationships between them in which the relationships represent communication or interaction directed towards ex-

changing task-related information (informational networks) or gaining emotional support (supportive networks). Traditional social network studies have devised various measures to assess the extent to which individuals have such kinds of relationships [e.g., Scott, 2000; Wasserman and Faust, 1994]. Based on those studies, we propose that individuals' social network positions are determined by size, closeness, frequency, and density of social networks (refer to Appendix A).

The size of a network is one of the salient characteristics of an individual's social network that indicates his/her position in a network. We measured size of a social network as the number of alters listed in the network following Morrison's work [2002]. The strength of relational ties is also considered one of the important features that affect an individual's social network position. It is well known by previous studies that a degree of the closeness and frequency of contact represents the strength of relationships among individuals [Burt, 2000]. We measured two kinds of strength of a social network by respectively averaging responses to the question on an ego's degree of contact closeness and frequency to each alter using a seven-point Likert scale, ranging from strongly disagree (= 1) to strongly agree (= 7) [Ibarra, 1993; Morrison, 2002]. Finally, as another feature of an individual's social network, network density represents the extent to which an individual's social network is well connected, resulting in cohesive relationships [Oh *et al*., 2005-6]. Following the procedure proposed by other studies of social networks [e.g., Bruque *et al*., 2008-9; Oh *et al*., 2005-6], we measured the network density of an individual as the sum of the actual links between the members of the network (excluding ego) relative to the total number of possible links. The formula is as follows.

$$ND_i = \frac{\Sigma_j t_j}{n(n-1)} \times 100$$

Where ND_i = network density of individual i,
t_j = the number of links from alter j,
n = the total number of alters

The items used to operationalize the psychometric constructs included in this study were adopted and modified primarily from previous studies, with necessary changes for the research context. In addition, each question item was discussed with and scrutinized by two other IS researchers to check their face validity before the survey was conducted. All research variables were measured using multi-item scales, as shown in Appendix B. More specifically, self-efficacy was measured based on the instrument developed by Schunk [1990] and Compueau and Higgins [1995], which consists of four items. Absorptive capacity was measured using two subdimensions: assimilation and exploitation. Assimilation and exploitation were measured each by three items selected from the instrument developed by Szulanski [1996], Ko *et al*. [2005], and Tanriverdi [2005]. Items for measuring individual adaptation were adopted from Bruque *et al*. [2008-9], and modified to fit this study context. We measured individual adaptation using four items. Performance was measured by evaluation scores for the project that was given to the subjects. All question items except for the performance measurement were measured using a seven-point Likert-type scale with anchors ranging from strongly disagree (= 1) to strongly agree (= 7).

Ⅴ. Analysis and Results

5.1 Analysis Method

In this study, a confirmatory approach was chosen using the Partial Least Squares (hereafter PLS). Thus, we used the PLS-Graph version 3.0 for analyzing measurement and structural models. We selected PLS for the data analysis in this study based on the following reasons. First, PLS considers a structural path that simultaneously explains the theoretical relationships between latent variables and indicators. Second, PLS does not assign the same weights to the indicators of a latent variable; it assigns different weights based on the indicators' degree of contribution to the latent variable [Wold, 1989]. Third, PLS does not have strong constraints on the sample size as compared to other structural equation modeling techniques like LISREL [Chin, 1998].

5.2 Measurement Model

According to the two-stage analytical procedure [Anderson and Gerbing 1988], we first conducted confirmatory factor analysis in order to evaluate the measurement model, and then examined the structural model. All constructs used in this study were modeled to be reflective without any exception. We first needed to look at composite reliability and average variance extracted (hereafter AVE) to assess the reliability and the convergent validity of our measurement model, as shown in <Table 1> [Hair *et al*., 1995].

<Table 1> The Results of Convergent Validity Testing

Construct	Item	Factor loading	Composite reliability	Average variance extracted
Supportive network position	SNP1	0.738	0.770	0.531
	SNP2	0.614		
	SNP3	0.820		
Informational network position	INP1	0.645	0.790	0.501
	INP2	0.753		
	INP3	0.916		
	INP4	0.425		
Self-efficacy	SEF1	0.798	0.927	0.760
	SEF2	0.905		
	SEF3	0.890		
	SEF4	0.890		
Assimilation	ASS1	0.856	0.881	0.711
	ASS2	0.860		
	ASS3	0.813		
Exploitation	EXP1	0.929	0.921	0.796
	EXP2	0.904		
	EXP3	0.842		
Adaptation	ADA1	0.917	0.937	0.790
	ADA2	0.923		
	ADA3	0.862		
	ADA4	0.850		
Performance	PFM1	1.000	1.000	1.000

<Table 2> The Results of Discriminant Validity Testing and Correlations

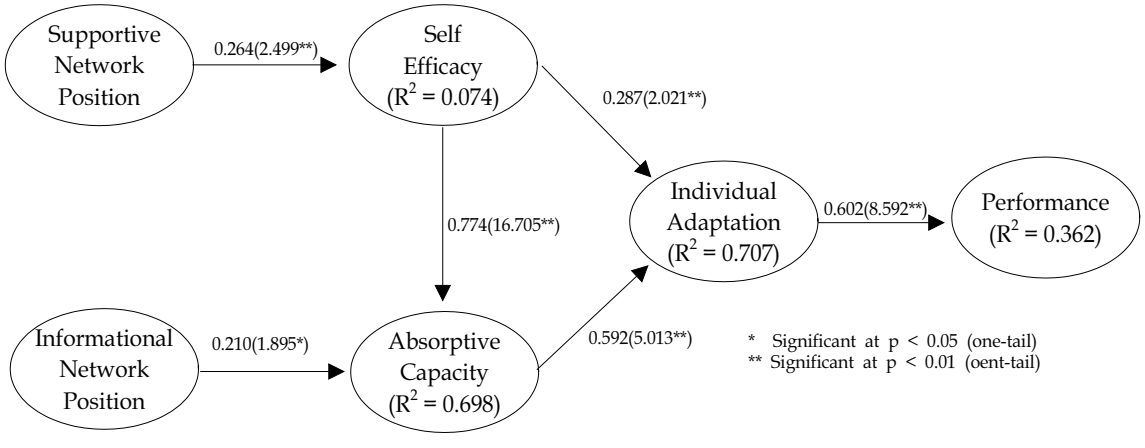
Construct	Mean(SD)	SNP	INP	SEF	ASS	EXP	ADA	PFM
SNP	N/A	0.729						
INP	N/A	0.379	0.708					
SEF	3.079(1.385)	0.271	0.118	0.872				
ASS	3.910(1.361)	0.350	0.203	0.756	0.843			
EXP	3.282(1.501)	0.242	0.362	0.724	0.689	0.892		
ADA	3.077(1.405)	0.242	0.194	0.765	0.710	0.796	0.889	
PFM	64.04(22.44)	0.266	0.192	0.627	0.670	0.521	0.602	1.000

Note: Leading diagonal shows the square root of AVE of each variable. Off diagonal entries are the correlations among constructs. The means and standard deviation of SNP and INP are not applicable because items do not have the same measures.

The composite reliability for our measurement model ranged from 0.770 to 0.937. Considering an acceptance level of 0.7 [Chin, 1998], the value was very satisfactory. AVE ranged from 0.501 to 0.796 in the measurement model, which was also higher than the recommended level of 0.5 [Fornell and Larcker, 1981]. Furthermore, the square root of the AVE, as shown in <Table 2>, for testing the discriminant validity was also greater than the correlations between that construct and the other constructs, indicating that discriminant validity was established [Fornell and Larcker, 1981]. This meant that the measurement models are strongly supported by the data gathered, which is ready for further analysis.

5.3 Structural Model

The proposed hypotheses were tested using PLS. The results of the structural model analysis are described with standardized path coefficients and t-values in <Figure 2>. The respective significance of all the paths in this model was generated using the bootstrap resampling procedure.



<Figure 2> The Results of PLS Analysis

As can be seen, all the seven hypothesized paths were found to be significant at the 0.01 or 0.05 level.

Supportive network position was found to be significantly related to self-efficacy ($\beta = 0.264$; $t = 2.499$; $p < 0.01$), and accounted for 7.4 percent of the variance in self-efficacy. Informational network position ($\beta = 0.210$; $t = 1.895$; $p < 0.05$) and self-efficacy ($\beta = 0.774$; $t = 16.705$; $p < 0.01$) were also significantly related to absorptive capacity, and explained 69.8 percent of the variance in absorptive capacity. Self-efficacy ($\beta = 0.287$; $t = 2.021$; $p < 0.01$) and absorptive capacity ($\beta = 0.592$; $t = 5.013$; $p < 0.01$) were found to be significantly related to individual adaptation, and accounted for 70.7 percent of the variance in individual adaptation. Finally, individual adaptation was significantly related to performance ($\beta = 0.602$; $t = 8.592$; $p < 0.01$), explaining 36.2 percent of the variance in performance.

Ⅵ. Implications and Limitations

This research offers several implications to both researchers and practitioners. For researchers, first of all, this study provides a theoretical model of individual adaptation by focusing on the coping effort mechanism of individuals from the perspective of coping theory. Although the coping theory plays a critical role in theoretically accounting for individual adaptation behavior towards organizational changes, particularly technochanges, there has been little empirical research that specifically deals with two types of coping effort mechanism, i.e., problem-focused and emotion-focused coping mechanism. Our empirical study contributes to IS research by deepening our understanding of organization members' adaptation process in the context of ICT-induced changes. This study sheds some light on how the coping theory is possibly translated into the research model that can be empirically proved.

Second, this study should help understand better the individual adaptation mechanism and its effect on performance by incorporating the social network constructs into the research model. This paper shows that the social network constructs used in this study can effectively capture important aspects of individual adaptation that may not be explained by traditional psychometric constructs. By providing the social network perspective as a source of overcoming knowledge and emotion barriers towards individual adaptation, this study helps view the adaptation process through a different lens and extends the inventory of research constructs into the social network domain, which contributes to IS research by identifying new and plausible explanations and creating opportunities for further research.

Third, a methodological contribution of the present study rests in our choice of research constructs design. This study suggests the social network constructs as latent variables that consist of multiple dimensions. Unlike traditional social network studies in which a social network measure, e.g., density, simply becomes a corresponding construct having single item (i.e., a degree of density), this study modeled the social network constructs to have multiple items of various social network measures (i.e., network size, a degree of density, and a degree of closeness, and a degree of frequency), which are modeled to be reflective. This design of research constructs

helps researchers interpret the proposed variables more usefully and effectively by appropriately categorizing various social network indices into an interpretable construct.

Our research findings also have some practical implications for managerial interventions. First, this study suggests that managers should pay attention to the social networks of organization members in order to better understand their adaptation mechanism during the process of ICT-induced changes. To better manage the emotion-focused mechanism, managers need to understand the supportive social networks of employees to make sure that employees gain the required emotional support towards the uncertainty during ICT-induced changes and thereby keep their psychological balance. To do so, for example, managers might encourage employees to engage with colleagues through various non-work socialization activities. To better support the problem-focused mechanism, managers should focus on the informational network positions of employees to make sure that employees have access to reliable information when they need it. In doing so, for example, managers might identify isolated actors (employees) who don't have access to proper advice from informal networks and give them more formal support, such as personalized training and mentoring.

Second, the results of this study also suggest that organization members' social networks should be considered as another influencing factor in addition to technical and organizational ones when engaging in technochange management involved in deploying and implementing a new ICT within organizations. Prior studies have emphasized the role of both technical (e.g., system quality and ease of use) and organizational (e.g., management support and training) factors in heightening the level of individual adaptation and thereby achieving the successful technochange induced by the introduction of new ICT. Although those factors are still important in conducting managerial intervention, this study indicates that managerial practices supporting social aspects of exchanging and sharing information and emotion may also contribute to heightening organization members' adaptation and their performance.

While the results of this study suggest some implications for both academic and practical development, we need to be cautious when generalizing the results of this research for several reasons since the implications of any study must be considered in the context of its limitations. First, this study has the cross-sectional nature. Therefore, causality can only be inferred via theory so a longitudinal approach needs to be considered in future research. How social network constructs influence the coping mechanism over time may provide new interesting insights. The second limitation has to do with the data set. Given the fact that the use of a student sample presents weakness, we have to be careful in interpreting and generalizing the results. However, since we examined the research variables that are supported in prior IS research and individualistic rather than group-based, we believe that the sample may represent the proper population.

Ⅶ. Conclusion

This research has shown that organization members' social capital derived from their social network positions aids in our understanding of coping process towards technochanges such as an introduction of new ICT. The proposed re-

search model suggests that emotion-focused coping process is associated with individual's supportive network position, while problem-focused coping process is related to individual's informational network position. The empirical results based on PLS analysis show that individual adaptation is enhanced by organization members' self-efficacy and absorptive capacity, which in turn are influenced by their supportive and informational network position respectively. This study also reveals that the social network perspective might play an important role in investigating various IS related issues by integrating with the traditional research perspective as shown in this paper. Such approach would enable us to gain an alternative lens to view IS research domain as well as an alternative instrument for managerial intervention.

〈References〉

[1] Ahuja, M.K., Galletta, D.F., and Carley, K.M., "Individual Centrality and Performance in Virtual R&D Groups: An Empirical Study," *Management Science*, Vol. 49, No. 1, 2003, pp. 21-39.

[2] Aiman-Smith, L. and Green, S., "Implementing New Manufacturing Technology: The Related Effects of Technology Characteristics and User Learning Activities," *Academy of Management Journal*, Vol. 45, No. 2, 2002, pp. 421-430.

[3] Anderson, J.C. and Gerbing, D.W., "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin*, Vol. 103, No. 3, 1988, pp. 411-423.

[4] Ashford, "Feedback-Seeking in Individual Adaptation: A Resource Perspective," *Academy of Management Journal*, Vol. 29, No. 3, 1986, pp. 456-487.

[5] Bandura, A., Social Learning Theory, Englewood Cliffs, NJ: PrenticeHall, 1977.

[6] Bandura, A., Social Foundations of Thought and Action, Englewood Cliffs, NJ: Prentice Hall, 1986.

[7] Beaudry, A. and Pinsonneault, A., "Understanding User Responses to Information Technology: A Coping Model of User Adaptation," *MIS Quarterly*, Vol. 29, No. 3, 2005, pp. 493-524.

[8] Boynton, A.C., Zmud, R.W., and Jacobs, G.C., "The Influence of IT Management Practice on IT Use in Large Organizations," *MIS Quarterly*, Vol. 18, No. 3, 1994, pp. 299-320.

[9] Bruque, S., Moyano, J., and Eisenberg, J., "Individual Adaptation to IT-Induced Change: The Role of Social Networks," *Journal of Management Information Systems*, Vol. 25, No. 3, 2009, pp. 177-206.

[10] Burt, R.S., "The Network Structure of Social Capital," *Research in Organizational Behavior*, Vol. 22, 2000, May, pp. 345-423.

[11] Chin, W.W., "The Partial Least Squares Approach to Structural Equation Modeling, In G.A. Marcoulides(ed.)," *Modern Methods for Business Research*, Lawrence Erlbaum Associates, Mahwah, NJ, 1998, pp. 295-336.

[12] Compeau, D.R. and Higgins, C.A., "Computer Self-Efficacy: Development of a Measure and Initial Test," *MIS Quarterly*, Vol. 19, No. 2, 1995, pp. 189-211.

[13] Cross, R. and Cummings, J.N., "Tie and Network Correlates of Individual Performance in Knowledge-Intensive Work," *Academy of Management Journal*, Vol. 47, No. 6, 2004, pp. 928-937.

[14] Davis, F.D. and Venkatesh, V., "Toward Preprototype User Acceptance Testing of New Information Systems: Implications for Software Project Management," *IEEE Transactions on Engineering Management*, Vol. 51, No. 1, 2004, pp. 31-46.

[15] Fichman, R.G. and Kemerer, C.F., "The Illusory Diffusion of Innovation: An Examination of Assimilation GAPs," *Information Systems Research*, Vol. 10, No. 3, 1999, pp. 255-275.

[16] Folkman, S. and Moskowitz, "J.T. Coping: Pitfalls and Promise," *Annual Review of Psychology*, Vol. 55, No. 1, 2004, pp. 745-774.

[17] Fornell, C. and Larcker, D.F., "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Management Science*, Vol. 40, No. 4, 1981, pp. 440-465.

[18] Gist, M.E., "Self-Efficacy: Implications for Organizational Behavior and Human Resource Management," *Academy of Management Review*, Vol. 12, No. 3, 1987, pp. 472-485.

[19] Griffith, T.L., "Technology Features as Triggers for Sensemaking," *Academy of Management Review*, Vol. 24, No. 3, 1999, pp. 472-488.

[20] Hair, J.T., Anderson, R.E., Tatham, R.L., and Black, W.C., Multivariate Data Analysis, Prentice Hall, Upper Saddle River, New Jersey, Fifth ed, 1998.

[21] Ibarra, H., "Personal Networks of Women and Minorities in Management: A Conceptual Framework," *Academy of Management Review*, Vol. 18, No. 1, Fifth ed, pp. 471-501.

[22] Jasperson, J., Carter, P.E., and Zmud, R.W., "A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems," *MIS Quarterly*, Vol. 29, No. 3, 2005, pp. 525-557.

[23] Kanter, J., "Have We Forgotten the Fundamental IT Enabler: Ease of Use?," *Information Systems Management*, Vol. 17, No. 3, 2000, pp. 70-77.

[24] Ko, D.G., Kirsch, L.J., and King, W.R., "Antecedents of Knowledge Transfer from Consultants to Clients in Enterprise System Implementations," *MIS Quarterly*, Vol. 29, No. 1, 2005, pp. 59-85.

[25] Lankau, M.J. and Scandura, T.A., "An Investigation of Personal Learning in Mentoring Relationships: Content, Antecedents and Consequences," *Academy of Management Journal*, Vol. 45, No. 4, 2002, pp. 779-790.

[26] Lazarus, R.S. and Folkman. S., "Stress, Appraisal, and Coping," *New York: Springer Publishing Company*, 1984.

[27] Madjar *et al*., 2002 Madjar, N.; Oldham, G.R.; and Pratt, M.G., "There's No Place Like Home? The Contributions of Work and Non-Work Creativity Support to Employees' Creative Performance," *Academy of Management Journal*, Vol. 45, No. 4, 2002, pp. 757-767.

[28] Majchrzak and Cotton, "A Longitudinal Study of Adjustment to Technological Change: from Mass to Computer Automated Batch Production," *Journal of Occupational Psychology*, Vol. 61, 1988, pp. 43-66.

[29] Morrison, E.W., "Newcomer's Relationships:

The Role of Social Network Ties During Socialization," *Academy of Management Journal*, Vol. 45, No. 6, 2002, pp. 1149-1160.

[30] Mumford, M., Weeks, J., Harding, F., and Fleshman, E., "Measuring Occupational Difficulty: a Construct Validation Against Training Criteria," *Journal of Applied Psychology*, Vol. 72, No. 4, 1987, pp. 578-587.

[31] Murphy, C., "Assessment of Computer Self-Efficacy: Instrument Development and Validation," ERIC Document, ERIC #: ED307317, 1988.

[32] Oh, W., Choi, J.N., and Kim, K., "Coauthorship Dynamics and Knowledge Capital: The Patterns of Cross-Disciplinary Collaboration in Information Systems Research," *Journal of Management Information Systems*, Vol. 22, No. 3, 2005-6 Winter, pp. 265-285.

[33] Orlikowski, W.J., "Improvising Organizational Transformation over Time: A Situated Change Perspective", *Information Systems Research*, Vol. 7, No. 1, 1996, pp. 63-92.

[34] Orlikowski, W. and Gash, D., "Technology Frames: Making Sense of Information Technology in Organizations," *ACM Transactions on Information Systems*, Vol. 12, No. 1, 1994, pp. 174-207.

[35] Schunk, D.H., "Goal Setting and Self-Efficacy During Self-Regulated Learning," *Educational Psychologist*, Vol. 25, No. 1, 1990, pp. 71-86.

[36] Scott, J., "Social Network Analysis: A Handbook," London: Sage Publications, 2000.

[37] Swanson, E.B. and Wang, P., "Knowing Why and How to Innovate with Packaged Business Software," *Journal of Information Technology*, Vol. 20, No. 1, 2005, pp. 20-31.

[38] Sykes, T.A., Venkatesh, V., and Gosain, S., "Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use," *MIS Quarterly*, Vol. 33, No. 2, 2009, pp. 371-393.

[39] Szulanski, G., "Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm," *Strategic Management Journal*, Vol. 17, Winter Special Issue, 1996, pp. 2-43.

[40] Tanriverdi, H., "Information Technology Relatedness, Knowledge Management Capability, and Performance of Multi Business Firms," *MIS Quarterly*, Vol. 29, No. 2, 2005, pp. 311-334.

[41] Tsai, M.J. and Tsai, C.C., "Information Searching Strategies in Web-Based Science Learning: The Role of Internet Self-Efficacy," *Innovations in Education and Teaching International*, Vol. 40, No. 1, 2003, pp. 214-231.

[42] Tyre, M.J. and Orlikowski, W.J., "Windows of Opportunity: Temporal Patterns of Technological Adaptation in Organizations," *Organization Science*, Vol. 5, No. 1, 1994, pp. 98-118.

[43] Wasserman. S. and Faust, K., "Social Network Analysis," Methods and Applications, Cambridge: Cambridge University Press, 1994.

[44] Wold, S., "Multivariate Data Analysis: Converting Chemical Data Tables to Plots," In Computer Applications in Chemical Research and Education, Heidelberg: Dr Alfred Huetithig Verlag, 1989.

[45] Zuboff, S., "In the Age of the Smart Machine: The Future of Work and Power," Basic Books, NY, 1988.

〈Appendix A〉 Questionnaire used to Measure Social Network Constructs

1. Supportive network position

A: Please list the names of people who you know you can count on, who are dependable in hard times.

Name	Gender	Age
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

B. Please indicate the following data for the first five people you listed above in the part A.

Name	How frequently you talk to this person*							How close you are to this person**							How many people from the list this person usually talks to
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1.															
2.															
3.															
4.															
5.															

* 1 = less than 10 a year; 2 = once a month; 3 = twice or three times a month; 4 = once a week; 5 = several times a week; 6 = once a day; 7 = several times a day

** 1 = never close; 7 = very close

2. Informational network position

A: Please list the names of people who are important in terms of providing you with information to learn Java programming language or helping you think about complex problems posed by the assigned project.

Name	Gender	Age
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

B: Please indicate the following data for the first five people you listed above in the part A.

Name	How frequently you talk to this person*							How close you are to this person**							How many people from the list this person usually talks to
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1.															
2.															
3.															
4.															
5.															

* 1 = less than 10 a year; 2 = once a month; 3 = twice or three times a month; 4 = once a week; 5 = several times a week; 6 = once a day; 7 = several times a day

** 1 = never close; 7 = very close

〈Appendix B〉 Questionnaire used to Measure Psychometric Constructs

1. Self-efficacy
   A: I feel that I am able to easily look for information needed in the class.
   B: I feel that I have all the skills needed to perform my class tasks (assignments, quiz, term project, etc.) very well.
   C: I feel that I have a lot of idea about how to perform my tasks.
   D: I am often praised from professor or colleagues in the class.

2. Assimilation
   A: I understand the skills needed to use Java language.
   B: I possess the latest information on how to use Java language.
   C: I am able to promptly analyze and interpret any requirements associated with the performance of my tasks.

3. Exploitation
   A: I am able to exploit the knowledge obtained from the class.
   B: I am able to apply the knowledge obtained from the class to other task beyond the class.
   C: I share the knowledge obtained from the class with others.

4. Individual adaptation
   A: I am able to skillfully use the tools and applications needed in the class.
   B: I have quickly become familiar with the class.
   C: It was not difficult for me to adjust myself to the class.
   D: I am accurately aware of all the tools required in the class.

◆ About the Authors ◆



Kee-Young Kwahk

Kee-Young Kwahk is an Associate Professor of Management Information Systems at Kookmin University in Seoul, Korea. He received his B.A. in Business Administration from Seoul National University, his M.S. and Ph.D. in MIS from the Graduate School of Management of the Korea Advanced Institute of Science and Technology (KAIST). His research interests include IT-enabled organizational agility, social media, knowledge management, and social network analysis and its application.