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Factors affecting employee knowledge acquisition and application capabilities

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Abstract

Purpose – The paper aims to analyze the influences of organizational context and information technology (IT) applications on employees' perceptions of knowledge acquisition and application capabilities in five public and five private sector organizations in South Korea.

Design/methodology/approach – The paper analyzes how employees' perceptions of organizational context and IT affect employee knowledge acquisition and application capabilities in five public and five private sector organizations in South Korea. It discusses the results of regression analyses based on a survey of 322 public and private employees that explored their perceptions of organizational vision and goals, social networks, centralization, performance-based reward systems, the usage of IT applications, and knowledge acquisition and application capabilities.

Findings – The results of a survey of public and private employees show that clear organizational vision and goals, social networks, and employee usage of IT applications are all positively associated with high levels of employee knowledge acquisition and application capabilities. Centralization, however, was negatively associated with employee knowledge acquisition and application capabilities. Social network and IT application utilization were both positively associated with public employees' knowledge acquisition and application capabilities. Performance-based reward systems were positively associated with private employees' knowledge application capabilities only.

Originality/value – In 2000, the South Korean Government established a special task committee to develop knowledge management systems (KMS) in the public sector and to initiate KM strategies. Since 1997, major South Korean corporations have been developing KM information systems to allow employees to quickly respond to complex and evolving domestic and international market environments. Some of the knowledge management practices effectively implemented in these corporations have been selected as benchmarks for developing the government KMS in the South Korean Government. However, there is limited research on comparative studies of the factors affecting employee KM capabilities in public organizations and private in South Korea.

Keywords Knowledge management, Human resource management, Public sector organizations, Private sector organizations, Employee attitudes, South Korea

Paper type Research paper

Introduction

Effective knowledge management KM is considered key to the success of contemporary organizations (Bouthillier and Shearer, 2002; Davenport *et al.*, 1998;

Davenport and Prusak (1998); Gold *et al.*, 2001; Organization for Economic Co-operation and Development (OECD) 2001; Robertson, 2008; Ruggles, 1998). The recent trend in the field of strategic management has also emphasized the role of organizational knowledge as a basis of the competitive advantage of particular organizations (Argote and Ingram, 2000; Robertson, 2008; Seleim and Khalil, 2007). While KM, occurring in the early 1990s, is defined in many different ways, Argote (1999) and Huber (1991) have both suggested that KM generally refers to how organizations create, retain, and share knowledge. Scholars have addressed several KM processes or activities, including acquisition or creation, storage, sharing or transfer, and usage or application (Alavi and Leidner, 2001; Almeida, 1996; Appleyard, 1996; Bouthillier and Shearer, 2002; Beckman, 1999; Wiig, 1999).

Bennet and Bennet (2001) address that KM makes available the right knowledge to the right people at the right time to deal with complex and ever-changing organizational environments. Furthermore, KM is viewed as a process for optimizing the effective application of intellectual capital to achieve organizational objectives (OECD, 2001). In order to manage knowledge effectively, an organization serves as a knowledge-integrating institution, integrating the knowledge of many different individuals and groups in the process of producing goods and services (Grant, 1996; Holthouse, 1998; Kogut and Zander, 1992; Nonaka, 1994).

Despite the differences between public and private sector organizations, all levels of public organizations, like in private organizations, are finding it necessary to assess their KM capabilities within agencies and in governmental networks (Bouthillier and Shearer, 2002; OECD, 2003). The importance of KM has especially been emphasized in public administration and international organizations along with the emerging discourse of electronic government (e-government), human capital management, and organizational effectiveness. As knowledge is a central resource of government service, effective knowledge acquisition or application in the public sector is a significant organizational challenge for improving accountability and providing excellence in public service. Furthermore, integrating knowledge in different parts of the organization reduces redundancy, enhances consistent representation, and improves efficiency by eliminating excess volume (Davenport and Klahr, 1998; Grant, 1996).

While there is growing literature on KM, limited attention has been paid to employee KM capabilities and little empirical research has been conducted on the factors affecting employee knowledge acquisition and application capabilities in public and private organizations. For this paper, we define knowledge acquisition capability as the ability of employees to seek and acquire new knowledge or create new knowledge out of existing knowledge within or outside of the organization. We define knowledge application capability as the ability of employees to use knowledge for the purpose of creating frameworks for solving problems and dealing with challenges in the organization.

In this paper, we analyze how employees' perceptions of organizational context and information technology (IT) affect employee knowledge acquisition and application capabilities in five public and five private sector organizations in South Korea. We discuss the results of a survey of 322 public and private employees that explored their perceptions of organizational vision and goals, social networks, centralization, performance-based reward systems, the usage of IT applications, and knowledge acquisition and application capabilities. In 2000, the South Korean Government established a special task committee to develop knowledge management systems (KMS)

in the public sector and to initiate KM strategies. Since 1997, major South Korean corporations have been developing KM information systems to allow employees to quickly respond to complex and evolving domestic and international market environments. Some of the KM practices effectively implemented in these corporations have been selected as benchmarks for developing the government KMS in the South Korean Government.

In the next section, we review the current literature on knowledge acquisition and application processes and variables associated with KM for both private and public sector employees, and use the information to establish hypotheses. After presenting results from a multiple regression analysis, we discuss the major findings. Finally, lessons and implications of this study for effective KM in organizations are presented.

Knowledge acquisition and application in organizations

Scholars who have addressed specific KM processes or activities (e.g. acquisition or creation, storage, sharing/transfer, and usage/application) include Alavi and Leidner (2001), Almeida (1996), Appleyard (1996), Bouthillier and Shearer (2002), Beckman (1999), and Wiig (1999). KM is largely regarded as a process involving various activities. At a minimum, one considers the four basic processes of creating, storing/retrieving, transferring, and applying knowledge (Alavi and Leidner, 2001). These major processes can be subdivided, for example, into creating internal knowledge, acquiring external knowledge, and storing knowledge in documents versus storing in routines (Teece, 1998).

While the literature contains numerous definitions of the term knowledge, Goldstein (1993) defines knowledge as an adequate understanding of facts and concepts and their interrelationships, as well as the information foundation required for performing specific tasks. Davenport and Prusak (1998) define it as a fluid mix of framed experiences, values, contextual information, and expert insight that provide a framework for evaluating and incorporating new experiences and information. They noted that in many organizations, knowledge is often embedded in routines, processes, practices, and norms in addition to such obvious sources as documents. Overall, KM scholars have generally described an organization's employees and their social networks as important knowledge repositories.

Knowledge can be categorized into explicit and implicit (tacit) categories (Polanyi, 1966). It is much easier to use formal language to transmit explicit knowledge than tacit knowledge, since tacit knowledge is often viewed as being specific to an individual. Nonaka and Takeuchi (1995) have noted that explicit knowledge is available in the form of files, library collections, or databases, whereas some types of implicit knowledge (which also serve as an organization's knowledge capital) are either difficult or impossible to access – for instance, the accumulated experiences, creativity, and skills that reside within individuals. In this study, we focus on employees' capabilities of acquiring and applying explicit and implicit knowledge.

Several scholars agree that part of managing knowledge within the organization is developing processes that acquire knowledge (Cole, 1998; Leonard, 1995; Nonaka and Takeuchi, 1995). Two primary means for collecting knowledge are as follows:

(1) to seek and acquire entirely new knowledge; or

(2) create new knowledge out of existing knowledge through collaboration between individuals and between business partners (Cole, 1998; Leonard, 1995;

Nonaka and Takeuchi, 1995). Therefore, the knowledge acquisition requires concerted effort and a high degree of experience in recognizing and capturing new knowledge (Drucker, 1993).

Two examples of knowledge acquisition processes suggested by O'Dell and Grayson (1998) are benchmarking and collaboration. Authors indicate that through benchmarking, an organization identifies outstanding practices developed by other organizations, then assesses the current state of a particular process to identify gaps and problems. Once these practices and variances have been identified, the organization can then capture the knowledge for internal use. In addition, Leonard (1995) suggests that core capabilities of knowledge acquisition are increasingly based on an organization's ability to find and create knowledge. Several researchers also emphasize that collaboration with other organizations is critical to knowledge acquisition (Grant, 1996; Kimberly, 1981; Matusik and Hill, 1998). Furthermore, Inkpen and Dinur (1998) note that technology sharing, personnel movement, and linkages between the organization and alliance partners or joint venture partners have all been shown to assist with the accumulation of knowledge.

Another important aspect of the KM process in organizations is knowledge application or reuse to decision-making processes, related to business strategy, task implementations, service delivery, and organizational performance and effectiveness. Knowledge application processes are those processes oriented toward the actual use of knowledge (Gold *et al.*, 2001). Wiig (1999) notes that the value of knowledge assets is realized when the assets are used to create products or deliver services, or when they are sold or traded for value. Davenport and Klahr (1998) also argue that the effective application of knowledge has helped companies improve their efficiency and reduce costs. Furthermore, Alavi and Leidner (2001) note that while the processes of knowledge creation, storage/retrieval, and transfer do not necessarily lead to enhanced organizational performance, effective knowledge application does. The underlying assumption is that if an organization does not find it easy to locate the right kind of knowledge in the right form, the organization may find it difficult to sustain its competitive advantage.

Accordingly, organizational performance often depends more on an ability to turn knowledge into effective action and less on knowledge itself. However, Pfeffer and Sutton (1999) argue that organizations have gaps between what they know and what they do. Davenport and Prusak (1998) note several reasons for organizational members to access and assimilate knowledge but not apply it (i.e. act upon it): distrusting the source of knowledge, lack of time or opportunity to apply knowledge, or risk aversion (particularly in organizations that punish mistakes). Thus, it is important for organizations to understand the factors affecting employee knowledge application capabilities for problem solving and decision making.

Similar to knowledge application or reuse, Cohen and Levinthal (1990) developed the concept of "absorptive capacity" defined as the ability to recognize the value of new information, assimilate it, and apply it to commercial ends. They note that the ability to evaluate and utilize outside knowledge is largely a function of the level of prior related to knowledge. Several scholars have used the concept of absorptive capacity to understand a dynamic capability pertaining to knowledge creation and reuse that enhances a firm's ability to gain and sustain a competitive advantage and organizational learning (Cohen and Levinthal, 1990; Zahra and George, 2002).

Hypotheses

This paper analyzes how employees' understanding of organizational vision and goals, social networks, performance-based reward systems, and centralization affects employee knowledge acquisition and application capabilities in public and private organizations. This study also analyzes the impact of employees' usage of IT applications on employee knowledge acquisition and application capabilities.

Organizational vision and goals

One of the components of organizational context related to effective KM that has received scholarly attention is clear organizational vision and goals (Leonard, 1995; Kanter *et al.*, 1992). According to Kanter *et al.* (1992), organizational vision leads to the generation of a clear organizational purpose that assists in goal achievement. Goals have been considered important as expressions of organizational values that can stimulate and generally orient employees to the organization's mission (Rainey, 2003). Researchers also address that clarification of goals for individuals and work groups can improve efficiency and productivity (Rainey, 2003). Related to KM projects in corporations, scholars have suggested that clear organizational vision and goals engender a sense of involvement and contribution among employees (Davenport *et al.*, 1996; Leonard, 1995; O'Dell and Grayson, 1998). Specifically, Leonard (1995, p. 8) notes that "the clarity of the goal enables managers and operators alike to concentrate their attention on those activities that add obvious value." In order to explore how a clear understanding of organizational vision and goals affects employee knowledge application capacity, the first hypothesis was established as:

H1. The degree of clear understanding of organizational vision and goals is positively associated with employee knowledge acquisition capability (a) and application capability (b).

Social networks

Another component of organizational context receiving attention related to effective KM is social networks, social capital, and communities of practice (Leonard and Sensiper, 1998; O'Dell and Grayson, 1998; Yli-Renko *et al.*, 2001; Thorpe *et al.*, 2006).

Social networks include communications, dialogue, and individual or group interactions that support and encourage knowledge-related employee activities (Leonard and Sensiper, 1998; Levinthal and March, 1993). Research indicates that the greatest amount of knowledge is transferred in informal settings through relational learning channels (Jones and Jordan, 1998; Pan and Scarbrough, 1999; Truran, 1998). These researchers argue that relational channels facilitate face-to-face communication, which allows for the building of trust, which in turn is critical to acquiring knowledge. Both formal and informal relationships and contacts are considered important for transferring varying perspectives and knowledge within organizations (O'Dell and Grayson, 1998).

In particular, Bouthillier and Shearer (2002), Constant *et al.* (1996), and Faraj and Wasko (2002) have discussed the emerging role of communities of practice (voluntary employee forums built around specific topics of interest) as knowledge transferring networks. Brown and Duguid (1998) also found that shared learning occurs within complex, collaborative practices involving informal networks within the community. Based on a study of communities of practice in the federal government,

Snyder and de Sousa Briggs (2003) conclude that communities of practice provide a social context for building and sharing ideas and experiences, and for getting support from colleagues to try putting new approaches into practice. To further explore the impact of social networks on employee knowledge acquisition and application capabilities, the second research hypothesis was written as:

H2. The level of social networks is positively associated with employee knowledge acquisition capability (a) and application capability (b).

Performance-based rewards
What is the impact of performance-based reward systems on employee knowledge acquisition and application capabilities? Several researchers (Argote and Epple, 1990; O'Dell and Grayson, 1998; Yahya and Goh, 2002) have noted the utility of incentive systems for motivating employees to generate new knowledge, to share existing knowledge, and to help employees in other divisions or departments. Specifically, Neely (1998) has argued that the main functions of performance-based reward systems are:

- to increase the involvement of and communication among all organizational units in a targeted setting; and
- to collect, process, and deliver information on the performance of organizational units, activities, processes, products, and services.

Yahya and Goh (2002) also emphasize the linkages between human resource management and KM and the performance appraisal must be the base of evaluation of employee's KM practices.

Szulanski (1996) also addressed the lack of motivation as an important impediment to transferring best practices within an organization, and identified common reasons for such reluctance, including fear of losing the position or status tied to owning certain knowledge, lack of reward for sharing knowledge, and lack of time or resources to effect knowledge transfers. The third hypothesis focuses on performance-based reward systems issues related to employee knowledge acquisition and application capabilities:

H3. The level of performance-based reward system is positively associated with employee knowledge acquisition capability (a) and application capability (b).

Utilization of IT applications
Researchers who have emphasized the importance of IT infrastructure and application for linking organizational information and knowledge integration include Alavi and Leidner (2001), Davenport (1997), Grant (1996), Leonard (1995), Robertson (2008) and Teece (1998). Alavi and Leidner (2001, p. 122) note that technology can support knowledge usage and application by embedding knowledge into organizational routines. For example, many organizations are enhancing the ease with which directives (repair manual, policies, and standards) are accessed and maintained by making them available on organizational intranets. Also, organizational units can follow a faster learning curve by accessing the knowledge of other units with similar experiences. Moreover, by increasing the amount of organizational memory available, ITs allow the application of organizational knowledge across time and space (Alavi and Leidner, 2001; Brown, 1998).

Davis and Riggs (1999) and Wiig (1999) extended the IT application list to include internet-based network systems, groupware systems, intranets, databases (DB), electronic data management systems (EDMS), and KMS. Alavi and Leidner (1999, p. 4) define KMS as "information systems designed specifically to facilitate codification, collection, integration, and dissemination of organizational knowledge." Specifically, employee usage of and access to KMS for tasking, processing, exploitation, and dissemination might significantly affect KM capabilities in organizations.

This paper examines how employees' usage of various IT applications affects their knowledge acquisition and application capabilities in the organization. Consistent with previous studies cited earlier, the following hypothesis regarding the usage of IT applications influence on employee knowledge acquisition and application in the organization was identified:

H4. The degree of employee usage of IT application systems is positively associated with employee knowledge acquisition capability (a) and application capability (b).

Centralization

A number of academic papers discuss issues related to organizational structure and KM. Kogut and Zander (1992) have argued that the vertical transfer of knowledge among various organizational functions occurs according to higher-order organizing principles in both formal and informal structures. Formal structure examples include rules, directives, and routines; informal structures include social networks and practice communities. Nonaka and Takeuchi (1995) have also indicated that a combination of formal and non-hierarchical/self-organizing organizational structures serves to improve knowledge creation and sharing.

Meanwhile, several scholars note that decreased centralization in the form of *locus* of authority can lead to increased creation of knowledge (Hopper, 1990; Starbuck, 1992; Stonehouse and Pemberton, 1999; Teece, 2000). For example, a decentralized organizational structure has been found to facilitate employees' spontaneous participation in knowledge building processes in the organization (Hopper, 1990). Creed and Miles (1996) also noted that the hierarchical structure that marks many government organizations limits KM activities and communication between employees or between employees and supervisors. Accordingly, participatory work environments may foster knowledge acquisition or creation and application by motivating organizational members' involvements. This study examined how organizational centralization, the degree of control that top managers enjoy (Hall, 2002; Rainey, 2003), affects employees' knowledge acquisition and application capabilities in the organization:

H5. The degree of centralization is negatively associated with employee knowledge acquisition capability (a) and application capability (b).

Data and method

Sample selection and survey administration

According to a 2008 UN survey of international e-government readiness rankings, South Korea ranked sixth among top 35 nations that are actively expanding their e-government capacities (United Nations Department of Economic

and Social Affairs, 2008). This trend reflects the increase in the percentage of South Korean citizens gaining internet access between 1998 and 2001 – from 6.8 to 51.5 (Gang, 2002). Since 1987, the South Korean Government has created an IT infrastructure that includes three national, 16 metropolitan and provincial, and 232 city, county, and district government networks. In 2000, the South Korean Government established a special task committee on developing KMS in the public sector. Seven national and 26 local government agencies in South Korea are establishing a Government KMS to facilitate employee KM capabilities.

This study was conducted on a convenience sample of 322 employees in five public and five private sector organizations in South Korea. As this study is based on a convenience sample, the findings are specific and can only be generalized on a very limited basis. Two criteria were considered for selecting organizations first for the research project. First, the size of organizations was considered to select similar organizational context between the public and private sectors. Second, the organization had to have established KMS as well as IT infrastructure[1].

A division was selected from each organization, where the division employee size was between 50 and 60[2]. One of the authors visited the selected divisions and requested assistance for the sampling process. From the employee list of each division, the author and the contact person at the division selected 40 samples representing diverse age, gender, years of experience, profession, and position. A total of 400 surveys were hand-delivered to the ten divisions in August 2003.For the public sector organizations, 165 questionnaires were returned; three of those were discarded because they were incomplete. Among the private sector organizations, 163 questionnaires were returned; three were discarded as being incomplete. The final number of usable questionnaires was 322 (80 percent response rate).

Survey measures and items
Multiple-item measures were used for all of the variables in the interest of improving reliability and validity (Appendix). Responses were recorded along a seven-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree) or a seven-point Likert-type scale, ranging from 1 (almost never) to 7 (almost always). Employee utilization of IT applications was measured in terms of:

- internet, e-mail, and electronic bulletin boards;
- intranets;
- databases (DB) and EDMS; and
- KMS.

The Cronbach's alpha for these items was 0.86 (Appendix).

Dependent variables. Knowledge acquisition capabilities were assessed by three items. The items were as follows:

(1) "I invest time and endeavor to seek external information and knowledge, such as news, index, trend, or policy issue reports related to the work".

(2) "I actively use various sorts of databases within my organization to acquire knowledge".

(3) "I acquire knowledge through best practice or benchmarking within or outside my organization".

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The reliability (Cronbach's alpha) of the five items was measured as 0.81. The level of employees' application of knowledge was measured by three items:

(1) "I actively use knowledge to solve new problems or to deal with circumstances".

(2) "I actively apply knowledge learned from mistakes or experience".

(3) "I easily find out sources of knowledge and apply them to problems and challenges".

The coefficient α reliability estimate for this section of the survey was 0.86. Sector (i.e. public or private) was included as a control variable.

Independent variables. Vision and goals were assessed with a five-item scale adapted from research by Gold *et al.* (2001). Three items were developed to measure social network (Appendix). Cronbach's alpha reliability estimate for social network items was 0.81. Four items were developed to measure employee perceptions of the level of performance-based reward systems in the organization. The Cronbach's alpha reliability estimate for this section of the survey was 0.83. Centralization was assessed with a five-item centralization scale described by Hage and Aiken (1967). The items measured the respondents' perceptions of the degree to which power and authority are concentrated in the higher levels of their organizations. Cronbach's alpha reliability estimate for the centralization items was 0.85.

Control variables. Four personal characteristics were also used as control variables: gender, age, years of working at the agency or corporation, and current position.

Results

Survey respondents

Among the participants of the survey, only 44 respondents (13.7 percent) were female. In terms of age, the participants ranged from the 20s to over 50. More than 30 percent of respondents were over 40 years old (36.4 percent). Years of work distribution was as follows: less than five years: 29.5 percent; five to ten years: 34.2 percent; 11-15 years: 19.6 percent; 16-20 years: 9.3 percent; and 21 years or more: 7.4 percent. The majority of respondents reported having a bachelor degree, with 19.3 percent holding graduate or professional degrees. Position levels ranged as follows: lower level (Grade 9-8 in public organizations): 29.8 percent; middle level (Grade 7-6 in public organizations): 48.4 percent; and higher level (Grade 5-4 in public organizations): 21.7 percent.

Descriptive statistics, correlation coefficients and reliability for the study variables are presented in Table I. The majority of the zero-order correlations were statistically significant at $p < 0.01$. All of the measures appeared to be relatively distinct; the largest correlation (between knowledge acquisition and knowledge application) was 0.66. The prevalence of significant relationships may suggest some weaknesses in the study measures. In order to determine whether ordinary least square (OLS) was the appropriate estimator, multicollinearity has been tested by collinearity statistics. Six independent variables' variation inflation factor (VIF) values indicate that there is not a severe multicollinearity among the variables[3].

The data reflect significant differences in mean scores for knowledge acquisition and application between public and private employees. Regarding employees' perceptions on the KM capabilities, employees in industry perceive higher levels of knowledge acquisition capabilities than public employees (5.39 vs 4.67). Furthermore, employees in industry perceive higher levels of knowledge application capabilities

	Mean	SD	1	2	3	4	5	6	7	8
1. Vision and goals	4.74	1.16	1.0							
2. Social networks	4.44	1.17	0.54*	1.0	0.85					
3. Centralization	3.73	1.16	−0.38*	−0.33*	1.0	0.85				
4. Reward systems	3.77	1.05	0.60*	0.60*	−0.28*	1.0	0.83			
5. IT application use	5.40	1.46	0.31*	0.38*	−0.17*	0.32*	1.0	0.86		
6. Knowledge acquisition	5.02	1.05	0.51*	0.58*	−0.39*	0.48*	0.47*	1.0	0.81	
7. Knowledge application	4.68	1.14	0.50*	−0.58*	−0.35*	0.54*	0.46*	0.66*	1.0	0.89

Notes: Significant at: $^*p < 0.01$; $n = 322$

Table I.
Descriptive statistics, reliabilities, and correlations

than public employees (5.08 vs 4.29). According to independent sample t-tests, these mean differences between the public and private sector employees were statistically significant[4]. However, all of the survey respondents indicated that their respective organizations used internet-based services, intranets, EDMS, and KMS.

Multivariate analysis
Results from an OLS multiple regression analysis for both public and private employees appear in Table II. The adjusted R^2 for the model of employee knowledge acquisition capability is 0.484 and the equation achieves statistical significance at the 0.001 level. The adjusted R^2 for the model of employee knowledge application capability is 0.483 and statistical significance was also achieved at $p < 0.001$.

Among the organizational context variables, clear organizational vision was positively associated with knowledge acquisition ($p < 0.01$) and application ($p < 0.05$) capabilities. Social network was positively associated with the KM processes – that is,

	Knowledge acquisition		Knowledge application (Model 1)		Knowledge application (Model 2)	
Variables	β	SE	β	SE	β	SE
Understanding of vision and goal	0.16**	0.05	0.12*	0.05	0.06	0.05
Social network	0.25***	0.05	0.26***	0.05	0.17**	0.05
Reward systems	0.07	0.05	0.18**	0.06	0.16**	0.06
Utilization of IT applications	0.25***	0.02	0.23***	0.03	0.14**	0.03
Centralization	−0.17***	0.04	−0.11*	0.04	−0.05	0.04
Knowledge acquisition					0.35***	0.05
Gender	0.07****	0.13	0.01	0.15	−0.01	14
Years of work	0.03	0.05	0.01	0.05	−0.00	0.05
Position	−0.01	0.03	0.07	0.04	0.07	0.03
Age	−0.02	0.11	−0.006	0.12	−0.05	0.11
Sector	0.05	0.10	0.02	0.11	0.00	0.10
R^2	0.484		0.483		0.549	
Adjusted R^2	0.468		0.466		0.533	
F	29.204***		29.207***		34.275***	

Table II.
Results of regression analyses for knowledge acquisition and application

Notes: Significance at: $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$, $^{****}p < 0.10$; $n = 322$

employees with strong perceptions of available social networks reported higher levels of knowledge acquisition ($p < 0.001$) and application ($p < 0.001$) capabilities than employees who did not. In addition to, employees with strong perceptions of performance-based reward systems were more likely to express high levels of knowledge application ($p < 0.01$) capabilities. The regression analysis results show that employees who reported a high level of IT application utilization were more likely to express their knowledge acquisition ($p < 0.001$) and application ($p < 0.001$) capabilities at a statistically significant level.

Statistical support was also found for the organizational structure dimension – specifically, the degree of centralization was negatively associated with employee knowledge acquisition ($p < 0.001$) and application ($p < 0.05$) capabilities. Employees with strong perceptions of higher levels of centralization reported lower levels of knowledge acquisition and application capabilities than employees who did not. While no significant relation was found between the control variables and employee knowledge application, gender was positively associated with employee knowledge acquisition ($p < 0.10$) capabilities. Female employees reported higher levels of knowledge acquisition capabilities than male employees.

Finally, another regression analysis with knowledge acquisition capabilities as a control variable (Model 2 in the Table II) demonstrates that employees who reported high levels of knowledge acquisition capabilities were more likely to express their knowledge application capabilities ($p < 0.001$) (Seleim and Khalil, 2007). According to the results, the level of employee knowledge acquisition capabilities was the most significant variable affecting knowledge application capabilities in the public and private organizations that were the focus of this study. Social network ($p < 0.01$), performance-based reward systems ($p < 0.01$), and utilization of IT application ($p < 0.01$) were still significantly associated with employee knowledge application capabilities in the model.

Results from separate OLS analyses for each sector are presented in Table III. Both equations achieved statistical significance at $p < 0.001$. The results for the public sector employees indicate that understanding of organizational vision and goals ($p < 0.10$), social networks ($p < 0.001$), and IT application utilization ($p < 0.05$) were all positively associated with high levels of employee knowledge acquisition capabilities. However, the level of performance-based reward systems was not significantly associated with employee knowledge acquisition and application capabilities. Centralization was negatively associated with employee knowledge acquisition capabilities ($p < 0.001$). Social network ($p < 0.001$) and IT application utilization ($p < 0.01$) were both positively associated with public employees' knowledge application capabilities. Centralization was negatively associated with both public employee knowledge acquisition ($p < 0.001$) and application capabilities ($p < 0.10$). The results also showed a positive correlation between gender and knowledge acquisition capabilities in the public sector organizations ($p < 0.10$).

Results from our regression analysis for the private sector employees indicate that understanding of organizational vision and goal ($p < 0.05$), social networks ($p < 0.10$), IT application utilization ($p < 0.05$), and end-user focus ($p < 0.01$) were positively associated with high levels of knowledge acquisition and application capabilities (Table III). And the data show that centralization was negatively associated with the levels of knowledge acquisition and application capabilities. Compared to the regression

Variables	Public employees Knowledge acquisition		Private employees Knowledge acquisition		Public employees Knowledge application		Private employees Knowledge application	
	β	SE	β	SE	β	SE	β	SE
Understanding of vision and goal	0.15****	0.06	0.22*	0.08	0.10	0.07	0.20*	0.08
Social network	0.31***	0.06	0.15****	0.07	0.30***	0.08	0.18*	0.07
Reward systems	0.07	0.08	−0.03	0.08	0.09	0.10	0.21**	0.08
Utilization of IT applications	0.13*	0.03	0.45***	0.04	0.23**	0.04	0.25***	0.04
Centralization	−0.26***	0.05	−0.13*	0.06	−0.13****	0.06	−0.14*	0.05
Gender	0.13****	0.19	−0.00	0.19	0.00	0.23	0.02	0.19
Years of work	0.11	0.06	0.05	0.09	0.07	0.08	−0.00	0.09
Position	−0.00	0.03	−0.07	0.06	−0.01	0.06	0.16	0.06
Age	−0.10	0.14	0.03	0.16	−0.14	0.18	−0.04	0.16
R^2	0.440		0.475		0.340		0.530	
Adjusted R^2	0.407		0.444		0.301		0.501	
F	13.293***		15.081***		8.691***		18.772***	

Notes: Significance at: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, ****$p < 0.10$; $n = 162$ (employees in the public sector); $n = 160$ (employees in the private sector)

Table III.
Results of regression analyses comparing the public and private sector employees

analysis for the public sector employees, the degree of performance-based reward system was positively associated with employee knowledge application capabilities in the private sector ($p < 0.01$). No control variables were significantly associated with knowledge acquisition and application capabilities.

Discussion and implications
In summary, the study results evince that employees' understanding of vision and goals, social networks, and employee usage of IT applications are all positively associated with high levels of employee knowledge acquisition and application capabilities in the public and private organizations that were the focus of this study. Centralization, however, was negatively associated with employee knowledge acquisition and application capabilities. This paper also found that performance-based reward systems are significantly associated with employee knowledge application capabilities.

The data suggest that executive leaders and managers in public and private sector organizations need to acknowledge these factors when addressing the issues of employee knowledge acquisition and application capabilities, and effective KM processes. The study results show that organizational investment on IT applications and KM information systems is an important factor affecting knowledge acquisition and application capabilities through employee usage of these information systems. Indeed, the results of this survey support the findings of earlier studies conducted by Davenport and Prusak (1998), Beckman (1997), DiBella and Nevis (1998), and Leong-Hong (2001). Accordingly, executive leaders and managers need to create workforce technology environments in which individual employees perceive a supportive interest in their KM capabilities within the organization and across organizations.

Another lesson from the study is that organizational leaders should assess the degree of centralization and promote flexibility as a means of encouraging employees' knowledge acquisition and application capabilities. This lesson is based on the finding that centralized decision-making was negatively associated with employee knowledge acquisition capabilities in the organizations surveyed. For instance, in order to improve organizational flexibility, organizational leaders can encourage employee participation in decision-making. Participation is a process in which influence is shared among individuals who are not generally considered having equal status (Locke and Schweiger, 1979; Wagner, 1994).

Participatory management practices balance managerial oversight with the involvement of subordinates in the areas of information processing, decision making, and problem solving (Wagner, 1994). Support for employee participation programs has been expressed by managers, union leaders, employees, and academic researchers. Scholars indicate that greater autonomy and participation in decision making increases organizational effectiveness (Macy *et al.*, 1989). Through the creation of participatory management, organizational leaders may improve employees' knowledge acquisition and application capabilities. The practice of employee participation in decision making may improve public employees' commitment to knowledge acquisition from inside as well as outside.

The findings also suggest several management practices for consideration by organizational leaders interested in enhancing employees' KM capabilities. The first practice consists of conducting employee assessments regarding communities of practice and internal as well as external communication networks. Performing such assessments can be a first step in giving employees the perception that their departments are interested in their network environment and communication flow among teams, all of which are significantly associated with KM capabilities. Organizational leaders can also provide informal and formal support for the implementation of communities of practice, which will increase effective knowledge acquisition and application in the organization.

Another important implication of the study results is that managers and supervisors should develop a plan of action to improve employee knowledge acquisition and application capabilities. For example, executive leaders and managers can clarify the vision and goals of the organization and develop incentive and reward systems for recognizing excellent knowledge acquisition and application abilities of employees. Along with the clear goal and action plans for knowledge acquisition, the organization may provide employee training programs for KM, including specific skills of knowledge applications for decision making and problem solving.

All of these suggestions for improving employee knowledge acquisition and application capabilities require organization leaders to commit to promoting knowledge-oriented management practices and organizational effectiveness. Especially considering the emergent emphasis on the partnership among sectors and network management in both public and private organizations, organizational leaders should pay special attention to organizational strategies for encouraging employees' commitment to knowledge acquisition and application capabilities within or across teams or work units and organizational performance.

An important implication of this study for future research in the field of KM is that researchers may wish to examine the variance of employee knowledge acquisition and application capabilities in organizations in terms of culture, structure, and IT.

Furthermore, researchers may want to explore the indirect and direct effect of employee KM capabilities on organizational performance and effectiveness through their direct impact on problem-solving abilities, organizational learning, network management abilities, and quality management abilities in the organization.

Conclusion

In conclusion, the findings imply a need for greater effort and commitment on behalf of organizational leaders and managers to building KM capabilities via the establishment of a clear vision and goals, stronger informal and formal networks, performance-based reward systems, improved IT applications, and empowerment of employees. As a result, this paper extends our understanding of the organizational context and IT affecting employee knowledge acquisition and application capabilities.

Several study limitations should be noted. First, there is the potential sampling bias due to the fact that the study was neither based on a random sampling nor a representative sample. Findings of this study may not hold in other organizations. Second, the measures used here were perceptual rather than objective; a more complete analysis would require additional data from employee interviews and longitudinal data on knowledge acquisition and application dynamics and patterns within certain types of organizations. In addition, the survey response rate was high but the sample size was relatively small. Finally, this paper did not analyze specific organizational processes for putting acquired specific knowledge into specific action or application in the organizations surveyed.

The associations between organizational context, IT, and South Korean public employees' knowledge acquisition and application capabilities can serve as the starting points for more research projects on employee KM capabilities in public organizations. An assessment of the validity of our findings would be especially valuable. Future researchers may also want to focus on:

- the nature of knowledge (i.e. explicit and tacit) and its impact on employee knowledge acquisition and application capabilities;

- motivational factors (i.e. internal and external) and their impact on employee knowledge acquisition and application capabilities; and

- knowledge acquisition and application and its impact on organizational performance.

Notes

1. Phone interviews were conducted with KM administrators before the surveys were distributed. We found that the selected organizations established their KMS between 1998 and 2002. Several private sector organizations had initiated their KMS three years earlier than the public sector organizations. All of the ten organizations have appointed a chief knowledge officer within the organization. With the exception of one private firm, all of the organizations use various incentives and rewards to encourage KM practices. Two public organizations and three private organizations emphasize the creation of communities of practices for improving knowledge transfer among employees. Several public sector organizations offer prizes based on knowledge application mileage systems as incentive systems for improving KM within the organization. Furthermore, while two public sector organizations have cash reward incentive systems related to KM activities, four private organizations report monetary compensation related to KM activities.

2. All ten divisions selected for this study are located in Seoul, South Korea. The five agencies selected from the South Korean central government are in various services, including general government affairs, information and telecommunication, justice, science and technology, and culture and tourism. The five corporations selected for this paper are IT related industry firms. However, the five divisions selected from private organizations were diverse, including a strategy consulting team, a public affairs team, a marketing unit, a public affairs team, and a sales team. The five public sector divisions whose employees were asked to complete surveys for this paper were also diverse, including a local finance policy division, internet policy division, an entry control division, an industrial innovation and support division, and a cultural industry policy division.

3. According to Neter *et al.* (1992), the largest VIF value among all variables is often used as an indicator of the severity of multicollinearity. A maximum VIF value in excess of 10 is often taken as an indication that multicollinearity may be unduly influencing the least square estimates. All of the VIF values of the eight independent variables are < 2.2, led us to conclude that multicollinearity was not a problem.

4. Employees in corporations had higher mean scores than public employees for clear vision and goals (4.99 vs 4.50), and performance-base reward systems (4.24 vs 3.30). Public employees perceive slightly higher levels of centralization (3.94 vs 3.53) than employees in corporations. These findings are consistent with some of previous research on the distinction between public and private in other countries (Rainey, 2003). Interestingly, this paper found that public employees perceive lower levels of social networks (3.93 vs 4.96), IT application utilization (4.98 vs 5.82), and end-user focus of IT systems (4.53 vs 5.23) than employees in private industry.

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Appendix. Survey items

Responses to items marked with a superscript alphabet ([a]) were measured along a seven-point frequency of usage scale, with $1 =$ "almost never" and $7 =$ "almost always." Responses to all other items were measured along a seven-point agreement scale, with $1 =$ "strongly disagree" and $7 =$ "strongly agree."

Vision and goals:

- My organization has an organizational vision.
- Top management leaders present a clear organizational vision and communicate it to employees.
- Overall, organizational vision and goals are clearly stated in this agency.
- I understand my organization's goals.
- I can explain my organization's vision and goals to others.

Social networks:

- I communicate with other employees through informal meetings within the organization.
- I interact and communicate with other people or groups outside the organization.
- I actively participate in communities of practice.

Performance-based reward systems:

- I feel that employees are promoted to higher positions not for years of work but for competencies and performance.
- Individual or team-based performance is measured with fairness.

- This organization provides me with fair opportunities for advancement and rewards based on performance.
- I am satisfied with the amount of pay and rewards I receive based on my job performance.

Information technology utilization[a]:

- I regularly use the internet, e-mail, and electronic bulletin boards.
- I regularly use our organization's intranet.
- I regularly use our organization's databases (DB) and/or EDMS.
- I regularly use our organization's KMS.

Centralization:

- Little action can be taken until a supervisor approves a decision.
- A person who wants to make his or her own decision without consulting his or her supervisor will be quickly discouraged.
- Even small matters have to be referred to someone higher up for a final answer.
- Any decision I make has to have my boss' approval.
- I rarely participate in decision-making regarding the adoption of new policies or programs.

Knowledge acquisition capability:

- I invest time and endeavor to seek external information and knowledge, such as news, index, trend, or policy issue reports related to the work.
- I actively use various sorts of databases within my organization to acquire knowledge.
- I acquire knowledge through best practice or benchmarking within or outside my organization.

Knowledge application capability:

- I actively use knowledge to solve new problems or to deal with circumstances.
- I actively apply knowledge learned from mistakes or experience.
- I easily find out sources of knowledge and apply them to problems and challenges.

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