KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL PERFORMANCE

Byounggu Choi and Heeseok Lee

Corporate Information System Laboratory
Graduate School of Management
Korea Advanced Institute Science and Technology
207-43, Cheongyangri-dong, Dongdaemoon-Gu, Seoul 130-012, South Korea

ABSTRACT

Because of the increasing interests on knowledge management (KM), various researches have been accomplished. However, most researches are investigated within the conceptual framework. As a result, these studies are not likely to give substantial benefits for the firms which attempt to introduce KM. Therefore, it is necessary to shift the focus of KM to the empirical researches. To meet this requirement, this study focuses on the following objectives. First, this research analyzes the current research frameworks and finds their relationship. The research model is built by incorporating KM processes into organizational performance. Second, to analyze correlation between firm's internal activities for KM and organizational performance, the various measures are identified for the empirical study. Third, it shows the relationship between KM processes and influencing factors such as organizational structure, organizational culture, and information technologies.

KEYWORDS
Knowledge management, Knowledge management process, Organizational performance

1. Introduction

In the past few years, the interests in knowledge management (KM) have grown rapidly, and various researches have performed. Despite all these activities and prospective, KM still remains hazy to many people [19]. There are two reasons. First, there is no generic framework that unifies KM concepts. Although many researchers and consulting companies have their own KM framework, there is no individual KM framework that subsumes the others [17]. Second, there are no integrated empirical studies on KM. Previous researches show only relationship between KM influencing factors and KM processes or show only relationship between KM processes and organizational performance [6].

The purpose of this research is to show the relationship between KM and organizational performance. This approach can help understand major KM components and establish some practical guidelines for each company that Struggles to introduce KM.

2. KM Framework

Holsapple and Joshi [17] classified KM frameworks into descriptive and prescriptive frameworks. In this research, we investigated twenty descriptive KM frameworks. We classified KM frameworks into broad frameworks that focus on whole KM processes and specific frameworks that focus on specific processes in KM (shown in Table 1).

Broad KM Framework

There are many broad KM frameworks in academia. Choo [7] described the principal ways in which an organization

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uses information strategically, and those were sensemaking, knowledge creation, and decision making. Pan and
Scarborough [28] addressed socio-technical view of KM by highlighting the experience of Buckman Laboratories.
Probst [31] tried to define the standard for KM concept or model that have basic aspects such as compatibility,
problem orientation, comprehensibility, action orientation, and appropriate instrument. Schuppel et al [34] described
four bipolar dimensions for forming KM. Along with the bipolar dimension, they create options and install
instruments for KM tailored to the specific situation of the focal organization. Demarest [11] discussed KM as a new
discipline and defined the relationship between KM and traditional measures of firm performance. Van der Spek and
Spiervert [39] described the core of KM as a learning process of conceptualizing, assessing, acting on, and evaluating
alternates in cycles. Pentland [29] introduced a framework for the analysis of organizations as knowledge systems
composed of a collection of knowledge processes. Wiig [43] illustrated KM framework as being supported by three
pillars that are exploring the knowledge management and its adequacy, establishing the value of knowledge, and
managing knowledge explicitly.
Arthur D. Little [3] proposed a process for introducing KM based on four integrated dimensions of KM. They
insisted that KM include both codifying tacit knowledge for broader access and applying explicit knowledge for
gaining mastery. Delphi [11] has constructed a knowledge chain. They represented the organization's ability to
develop its internal and external awareness and responsiveness. Ernst & Young [14] proposed KM framework that
linked knowledge to business results and values. KPMG [20] presented knowledge cycle that helped identifying
knowledge problems and solutions in organization. Arthur Anderson and APQC [2] designed to capture tacit
knowledge and make it explicit for all individuals within an organization.

Specific KM Framework

Leonard [22] introduced knowledge-building activities framework. These activities create and control the knowledge
necessary for organization's current and future operations. Nonaka and Takeuchi [24] proposed five-phase model of
the organizational knowledge creation process. They assumed that knowledge was created through the interaction
between tacit and explicit knowledge. Szulanski [38] proposed knowledge transfer process through analyzing internal
stickiness. This model suggested knowledge transfer processes that were made up of initiation, implementation,
ramp-up, and integration. Jang and Lee [18] suggested knowledge creating organizational memory model focusing on
knowledge creation based on Asian Yin Yang theory. Wijnhoven [44] proposed framework for organizational memory
contents and means for storing organizational knowledge. Stevin and Zwass [37] developed a model for an
organizational memory information system that was rooted within the context of organizational effectiveness. Walsh
and Ungson [40] proposed a structure of organizational memory which referred to the stored information from
organization's history that could be brought to bear on present decisions.

<table>
<thead>
<tr>
<th>Research scope</th>
<th>Researcher</th>
</tr>
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<tr>
<td>Practical research</td>
<td>Arthur D. Little [3], Delphi group [10], Ernst &amp; Young [14], KPMG [20], Arthur Anderson and APQC [2]</td>
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<td>(Consulting co.)</td>
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<tr>
<td>Knowledge Creation</td>
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<td>Knowledge Transferring</td>
<td>Szulanski [38]</td>
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<td>Knowledge Storing</td>
<td>Jang and Lee [18], Wijnhoven [44], Stein and Zwass [37], Walsh and Ungson [40]</td>
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</table>

Table1. Classification of KM frameworks

Comparative Analysis on KM Processes and Knowledge Influencing Factors

We classified influencing factors into strategy, knowledge content, organizational, and technological context.
Organizational context includes organizational structure, organizational culture, and organizational people (shown on
Table 2). The comparative analysis revealed several distinguished observations in influencing factors. First, many
researches do not consider strategy in KM [7, 18, 30, 40, 43, 44] although an organization’s strategic context helps
identify KM initiatives that support its purpose or mission, strengthen its competitive position, and create shareholder value. Second, most researchers referred to the importance of organizational context. N-form or hypertext organization is an example of organizational structure in KM [16, 24]. Many researches also showed culture to be the principal determinant of the success of KM. Third, knowledge creation frameworks and transfer frameworks excessively disregard the information technology although it is important in KM [31]

Comparing KM processes showed two interesting observations (in Table 3). First, knowledge store process in knowledge creation and transfer frameworks has received little attention comparatively. However, knowledge store process is very important for KM. Second, there has been little attention to tacit knowledge in knowledge store frameworks.

3. Empirical Study

Previous Empirical Research in KM

In this paper, we focused on creation and sharing process on the basis of these three reasons. First, the creation and share of knowledge has been emerging as one of the most important and widespread practical management issues of the latter half of the 1990s [22, 38, 46]. Second, there are some objective measurements in this area. Third,
knowledge creation and sharing are affected by various influencing factors. The comparison of previous empirical studies yielded some observation. First, there were no integrated empirical studies on KM. Second, there were few empirical studies on organizational performance in KM. Third, most empirical researches did not consider strategy in KM.

<table>
<thead>
<tr>
<th>Authors</th>
<th>KR Processes</th>
<th>Org.</th>
<th>IT</th>
<th>Create</th>
<th>Share</th>
<th>Org. Performance</th>
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<td>Oldham &amp; Cummings [27]</td>
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<td>Nonaka et al. [25]</td>
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Table 4. Comparative analysis of previous empirical study

Amabile et al. [1] developed new instrument, KEYS, designed to assess perceived stimulants and obstacles to creativity in organizational work environments. Oldham and Cummings [27] examined the independent and joint contributions of employees' creativity relevant to personal characteristics of organizational context to employees' creativity. Nonaka et al. [25] conducted confirmatory factor analysis to test Nonaka's organizational knowledge creation model. Massetti [23] insisted individual creativity support system have positive influence on individual and organizational creativity. Couger [8] measured the climate for creativity of the representative in IS organization based on the work environment inventory.

Bock [5] proposed the theoretical framework for knowledge sharing behavior on the basis of the theory of reasoned action. Hansen [15] combined the concept of weak ties from social network research with the notion of complex knowledge to explain the role of weak ties in sharing knowledge across organization subunits in a multiunit organization. Szulanski [38] suggested that characteristics of knowledge, characteristics of recipients of knowledge, characteristics of recipients of knowledge, and characteristics of organizational contexts influenced on knowledge transfer process. Zander and Kogut [46] showed that the degree of codification and the degree of teachability had significant influence on the speed of transfer.

Drew [13] presented results of a research study into benchmarking and its links to improvements in organizational performance. In his research, he used self-reported measures of organizational performance. Simonin [36] proposed a model of how firms learn from their strategic alliance. He tested the relationship between collaborative experience and collaborative know-how, and between collaborative know-how and the achievement of both tangible and intangible performance. Bierly and Chakrabarti [4] tried to identify groups of firms with similar generic knowledge strategies, determine how these strategies change over time, and compare profit margins of the group. The summary of previous empirical studies on KM is shown on Table 5.

<table>
<thead>
<tr>
<th>Focus</th>
<th>Criteria</th>
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<td>Developed new instrument for organizational creativity</td>
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<td>Coopert [8]</td>
<td>Climate for creativity in IS organization</td>
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<td>Massetti [23]</td>
<td>Individual creativity support system positive influence on idea generation</td>
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<td>Theoretical framework for sharing behavior</td>
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<td>Share</td>
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<td>Hansen [15]</td>
<td>Role of weak ties in sharing knowledge</td>
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<td></td>
<td>Zander &amp; Kogut [46]</td>
<td>Creativity and teachability</td>
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<td></td>
<td>Rand &amp; Schilbradt [29]</td>
<td>Creativity and teachability</td>
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<td>Bronholzer [32]</td>
<td>Knowledge transfer</td>
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<tr>
<td>Performance</td>
<td></td>
<td>Sturdy &amp; Cundiff [4]</td>
<td>Benchmarking as knowledge acquisition strategy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simonin [36]</td>
<td>Collaborative experience and know-how</td>
</tr>
</tbody>
</table>

Table 5 Empirical study in KM

Research Model and Its Hypotheses

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The objective of this study is to propose integrative view of KM by identifying the relationship between KM and organizational performance. We suggested a research model as shown on Figure 1 based on input-process-output model. Influencing factors affect organizational performance through KM process. However, we did not consider all influencing factors and KM processes because of limited time and cost. Out of the influencing factors of KM, we selected organizational context and technology context. We also selected creation and sharing in KM processes.

![Figure 1. Research model of KM](image)

For KM processes, we adopted and modified Nonaka's construct for measure knowledge creation process and Szulanski's construct for measure knowledge sharing process.

KM is related to organization structure [16, 26]. It has profound implication for organizational structure [24]. Two of the most common dimensions of structural frameworks are centralization and formalization. Centralization refers to the locus of decision authority and control within an organizational entity. Formalization refers to the degree to which decisions and working relationships are governed by formal rules, standard policies, and procedures. Centralization and formalization are the important variables in our study.

H1a: There is a negative relationship between centralization and knowledge creation.  
H1b: There is a negative relationship between centralization and knowledge sharing.

H2a: There is a negative relationship between formalization and knowledge creation.  
H2b: There is a negative relationship between formalization and knowledge sharing.

Most researches have shown culture to be the principal determinant of the success of KM [26, 9, 24]. Concerned with cultural factors, support and collaboration reduces fear and increases openness and therefore encourages new ideas and risk taking [35]. Collaboration is also one of the fundamental problems of sharing knowledge [21]. Support and collaboration is the degree to which people in the group actively help one another in their work. Trust is critical in a cross-functional or an interorganizational team, because the withholding of information by the lack of trust can be especially harmful to the processes of knowledge articulation, internalization, and reflection [21]. Learning and development is one of important factors in KM. Learning and development is the degree to which learning and development is encouraged in an organization. Therefore, collaboration, trust, and learning and development are the important variables in our study.

H3a: There is a positive relationship between collaboration and knowledge creation.  
H3b: There is a positive relationship between collaboration and knowledge sharing.  
H4a: There is a positive relationship between trust and knowledge creation.  
H4b: There is a positive relationship between trust and knowledge sharing.
H5a: There is a positive relationship between learning & development and knowledge creation.  
H5b: There is a positive relationship between learning & development and knowledge sharing.

People is one of the most important influencing factor in KM. Among the components related with people, skills and knowledge embodied in employees are the dimension most often associated with KM. People who have T-shaped skills are extremely valuable for managing the integration of very diverse knowledge sets [22]. T-shaped skill of organizational people is an important variable in this study.

H6a: There is a positive relationship between T-shaped skill and knowledge creation.  
H6b: There is a positive relationship between T-shaped skill and knowledge sharing.

Technology context is the existing information technology infrastructure and capabilities supporting the KM architecture [45]. Information technology is pervasively used in organizations, and so qualifies as a natural medium for flow of knowledge. Therefore, support of information technology is an important variable.

H7a: There is a positive relationship between support of information technology and knowledge creation.  
H7b: There is a positive relationship between support of information technology and knowledge sharing.

To measure organizational performance in KM, we selected financial measurement to measure organizational performance because of easiness and objectivity. For financial measure, we adopt return of invest (ROI). We also adopted subjective measurement to measuring organizational performance. Subjective measurement is self-reported one of organizational performance [12,13].

H8a: There is a positive relationship between knowledge creation and nonfinancial performance.  
H8b: There is a positive relationship between knowledge sharing and nonfinancial performance.  
H8c: There is a positive relationship between knowledge creation and financial performance.  
H8d: There is a positive relationship between knowledge sharing and financial performance.

4. Research Design

Research constructs are operationalized based on protest, the related literature reviews and various theories. For the questionnaire, the multiple-item method was used and each item was based on 6 point Likert scale form ‘very low’ to ‘very high’. We used multiple regression method to test the gathered data.

The unit of analysis in this study was organization. For this study, we selected 200 organizations in Korea as a convenience sample. At our request, these organizations identified the representatives in charge of the firm's KM project or similar project. We focused on the middle managers that were emphasized in Nonaka and Takeuchi [24]. The survey was performed by mail survey in parallel with visiting. We collected 75 questionnaires, but three were not appropriate for our study. In sum, we collected 72 valid respondents.

Since each variable was measured by the multi-item constructs, factor analysis with varimax was conducted to check the unidimensionality among the items. Analysis was performed on the 26 items that measured the components of KM processes, on the 43 items that measured the components of influencing factors, and on the 6 items for nonfinancial performance and return on investment (ROI) for financial performance. Items with factor loading values lower than 0.5 were abandoned for further analysis. Among them, 7 items related to KM process and influencing factor had loading of less than 0.5 or had item-to-total correlation less than 0.4 was dropped. There was one item with factor loading of lower than 0.5 for organizational performance.

5. Results

Testing the Hypothesis
For the organizational structure factors, we found that centralization was a significant predictor of knowledge sharing (β=-0.266, p <0.01), which support H1b. However, formalization was not significantly related to the KM processes. Thus H2 was not supported. For the organizational culture factors, collaboration, learning and development, and trust had significant positive influence on knowledge creation, which support H3a, H4a, and H5a. Contrary to knowledge creation, only collaboration had significant effect on knowledge sharing. That is to say, learning & development and trust was not significant in knowledge sharing. For the information technology factors, there was no significant effect on both knowledge creation and sharing. As proposed in hypothesis 8, the KM processes showed strong positive relationship with nonfinancial performance. The knowledge creation also had positive relationship with financial performance (β=0.240, p <0.01). The strength of this association indicated a very significant relationship between KM processes and organizational performance (shown on Table 6).

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>S. beta</th>
<th>t-value</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Centralization and knowledge creation</td>
<td>-0.122</td>
<td>-1.135</td>
<td>Reject</td>
</tr>
<tr>
<td>H2a: Formalization and knowledge creation</td>
<td>-0.073</td>
<td>-0.815</td>
<td>Reject</td>
</tr>
<tr>
<td>H3a: Collaboration and knowledge creation</td>
<td>0.250</td>
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<td>Not Reject</td>
</tr>
<tr>
<td>H4a: Learning &amp; development and knowledge creation</td>
<td>0.238</td>
<td>2.460</td>
<td>Not Reject</td>
</tr>
<tr>
<td>H5a: Trust and knowledge creation</td>
<td>0.342</td>
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<td>Not Reject</td>
</tr>
<tr>
<td>H6a: T-shape skill of organizational people and knowledge creation</td>
<td>-0.086</td>
<td>-0.894</td>
<td>Reject</td>
</tr>
<tr>
<td>H7a: Support of IT and knowledge creation</td>
<td>0.044</td>
<td>0.446</td>
<td>Not Reject</td>
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<tr>
<td>H8a: Knowledge creation and nonfinancial performance</td>
<td>0.530</td>
<td>5.226</td>
<td>Not Reject</td>
</tr>
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<td>H8c: Knowledge creation and financial performance</td>
<td>0.240</td>
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<tr>
<td>H1b: Centralization and knowledge sharing</td>
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<td>-2.122</td>
<td>Not Reject</td>
</tr>
<tr>
<td>H2b: Formalization and knowledge sharing</td>
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<td>H3b: Collaboration and knowledge sharing</td>
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<td>H8d: Knowledge sharing and financial performance</td>
<td>0.138</td>
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</table>

Table 6. Result for hypotheses

Findings and Implications

In the relationship between KM processes and organizational performance, we found that knowledge creation and knowledge sharing are significant predictors of organizational performance. The findings of this study indicate that KM processes are significant predictors for both nonfinancial and financial performance of organization. That is, organization can achieve strategic, economic benefits of KM from effective KM processes such as creation and sharing. In the relationship between KM processes and influencing factors, variables such as organizational structure and organizational culture are found to be significant in predicting the KM processes. When organizational culture variables have high values, the KM is likely to be greater. Centralization was found to be negatively related to the knowledge sharing. Factors such as perceived importance of information technology and support of information technology were not significantly related to the KM.

The nonsignificant findings in the pilot study bear discussion. In general, we expect that the technological contexts have positive relationship with KM. However, the study indicated that these contexts were not significantly related to the KM. These results may reflect the stage of KM in Korea. Since KM is in the introduction stage in Korea, many firms may have not considered technology context yet. Relationship between knowledge sharing and nonfinancial measure may reflect the unique economy environment in Korea between 1997 and 1998. During this period, Korea
had experienced the IMF. Therefore, many financial measures have great fluctuation. This implies that financial measure may not be stable.

6. Conclusion

We present an integrated view for KM frameworks and report results of relationships among KM influencing factors, KM processes, and organizational factors. There are several contributions in this paper. First, a theoretical framework is provided for empirical study on KM. Second, the relationship between KM processes and organizational performance is addressed. Third, this study attempts to find the relationships between influencing factors and each KM process such as socialization, externalization, combination and internalization.

In spite of the interesting implications, this study has the limitations as follows. First, this study is the snapshot research that did not consider the feedback effects. Second, we surveyed one individual in each organization. Even if we tried to avoid response bias through careful questionnaire design, we are not totally free from such bias. Finally, the results from this survey were limited to Korean firms. Therefore, the results of this study may have to be carefully interpreted.

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