The Structure of Knowledge Management Capability and Its Impact on Organizational Performance

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What the structure of knowledge management capability (KMC) to improve the organizational performance is an important issue for researchers and practitioners with growing interest in recent years. In this paper, we begin with a deep thinking about the resource-based view and knowledge-based view of the firm applying to knowledge management issues. By exploring the two underlying theories of knowledge management, together with an intensive review and interpretation of existing literatures, we obtain six major dimensions of KMC. We then propose an integrated conceptual model of KMC and its relationship with organizational performance. A PLS analysis of the gathered data from organizations in Korea which already have enterprise-wide knowledge management systems is conducted to validate the proposed model. We discuss several meaningful implications and draw several insightful conclusions surrounding the KMC.

Key words : Knowledge management capability; Organizational performance; Resource-based view; Knowledge-based view

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1. INTRODUCTION

In recent, organizations increasingly compete on the basis of their intellectual assets [23]. To lead competitive edges in a market, organizations should continuously create and accumulate organizational intellectual assets such as knowledge, experience, expertise, and associated soft assets from internal and external sources, and use effectively them to introduce superior products and services. What and how their intellectual assets are produced and accumulated crucially depends on a particular inquiring system that is in place in an organization [1]. With the inquiry system, organizations can acquire or create their intellectual assets and use them to sustain their competitive advantage under dynamic and rapidly changing current business environment.

However, in practice, developing such a system is far from easy because it is not simply a

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matter of assembling groups of learning teams or installing an electronic document management system with database, communication, and intelligent systems technologies. Rather, it is a management paradigm shift involving people and other resources such as organizational structure, culture, information technologies, and so on [16, 27]. Furthermore, each organization has fundamentally different predisposition to exploit internal and outside knowledge and related resources, evaluate their values, assimilate them, and apply them to commercial ends for their organizational innovative ability. Many researchers have labeled this predisposition a firm's "*capability*" and suggested that it is a critical source of successful knowledge management [7, 22, 40]. With the realization that knowledge management is a strategic differentiator, increasing attention has been paid to understanding the role of organizational capabilities in knowledge management in distinguishing organizational performance [14]. While most previous works emphasize conceptual studies and normative prescriptions about knowledge management capability (KMC), there has been little empirical research on the conceptualization of KMC and their relationships with organizational performance.

The objectives of this study are to develop an integrated framework for building organizational capabilities of knowledge management and to empirically examine the effect of KMC on organizational performance. More specifically, this study models the integrated framework, through the exploration of the resource-based view and the knowledge-based view, which consists of six underlying dimensions: *knowledge strategy; knowledge management process; internal knowledge culture; external knowledge linkage; technical knowledge infrastructure; and knowledge worker.* We then test the proposed structure of organizational capability in knowledge management itself, and the relationship between KMC and organizational performance using a sample of 221 responses from 51 organizations that already implemented enterprise-wide knowledge management systems in Korea.

2. ORGANIZATIONAL CAPABILITIES OF KNOWLEDGE MANAGEMENT

According to the literature in the area of learning organization and knowledge management, an organization is viewed as a knowledge system where knowledge or intellectual assets are created and used [1, 8]. For example, Daft and Weick [8] viewed an organization as an inquiry system that they make an sense of the information they deem necessary. That is, organizations usually scan their environment and interpret possible problems or opportunities. Based on the interpretation, organizations do their actions and finally, learned. Argyris and Schon [1] also saw firm as a system of knowing activity and defined organizational learning as a process of putting cognitive theories into actions through the single and double loop. According to them, organizational learning is the

process of experiencing and analyzing, or the process of communicating the knowledge previously generated by others. Therefore, we can say that an organization is a knowledge system when knowledge is created, shared, and utilized for achieving organization's objectives.

In an organization as a knowledge system, knowledge can be divided into individual knowledge and social knowledge sometimes called as collective knowledge [5, 44, 47] It is based on the assumption that knowledge can be held by an individual or a collectively within an organization [44]. Collective knowledge is defined as a shared and institutionalized one that is the most secure and strategically significant kind of knowledge [44]. Organization members create individual knowledge from their events or data or sometimes acquired it from external sources. Then, individual knowledge can be shared among organizational members through their social activities such as dialogue, speeches, discussions, and presentations. Through this process, individual knowledge becomes a shared knowledge and institutionalized as a social knowledge that is generally represented as rules or routines. Finally, organizational members solve their problems based on the social knowledge and create a new knowledge by comparing their experience with the existing social knowledge.

To build and make a knowledge system of organization more active and effective, many theorists and practitioners have recommended diverse managerial actions such as making organizational structure more flexible, exercising empowerment, changing organizational culture into knowledge oriented, providing autonomous, and so forth. Accordingly, lots of organization managers focus their managerial efforts on creating, sharing, and utilizing enterprise-wise knowledge, under the name of knowledge management, which is defined as management paradigm which manage and diffuse a set of activities of knowledge-resource acquisition, creation, and sharing to improve organizational performance.

The fundamental question of the above efforts is how organizations gain and sustain their competitive advantage over rivals. With increasing uncertainty and dynamics of business environments, focus of the strategy and knowledge management research has shifted from the structure-conduct-performance paradigm to the internal resources of organizations as a key determinant of competitive advantage [46]. Grant [17] notes that this shift reflects dissatisfaction with the static, equilibrium framework of the traditional approaches and leads to a more internal perspective called the resource-based theory of firm.

The resource-based view suggests organizational resources and capabilities as the principle sources of competitive advantage and its sustainability [3]. Accordingly, the organizational capability depends on valuable resources, such as knowledge, that are inimitable, unsubstitutable, and durable; it depends on an organization's ability to acquire and use them for competitive advantage. Later, this allows development of a dynamic capability approach. While the term 'dynamic'

refers to the capacity to renew organizational resources and capabilities to achieve congruence with the changing business environment, the term 'capability' emphasizes the role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational resources and competencies to match the requirements of the changing environment [46]. Mowery et al. [36] say that a key factor in the 'dynamic capabilities' view of firm strategy is the acquisition of new capabilities through organizational learning.

The research interest in organizational capabilities has been recently expanded by the knowledge-based view [16, 18, 24, 44]. These researches argue that organizational knowledge, such as operational routines, skills or know-how, are the most valuable organizational resources, and its strategic management capability is the most significant source of organizational competitive advantage in an increasingly more dynamic and rapidly changing environment. Based on the knowledge-based perspective, many theorists have suggested various types of organizational capabilities as the essence of organizations as shown in Table 1.

From the above literature, we can deduce the following implications. First, organizations will need to acquire critical knowledge externally as well as to build them internally [7, 24]. Cohen and Levinthal [7] emphasized role of the absorptive capability in recognizing the value of new, external information, in assimilating it, and applying it to commercial ends for an organization's innovative capabilities. Kogut and Zander [24] also defined organizational capability as the combination capability of internal and external learning. Second, the final goal of knowledge management is to gain and sustain a competitive advantage by producing new products/services or enhancing organizational processes in terms of speed, quality and costs [41]. Grant [16] argued that, since production requires the application of many types of specialized knowledge, the primary role of an organization is the integration of knowledge. Finally, the strategic role of an organization should reflect the dynamic view of organizational capabilities [18, 42, 46] because knowledge management is a continuous managerial activity adapting to the changes of market needs. Accordingly, we can say that knowledge management is not just an operational activity but a strategic one with far-reaching consequences, and the capability of knowledge management is essential.

In spite of the diverse concepts of organizational capability in knowledge management, there is no common agreement on how to manage organizational initiatives for knowledge management due to the lack of an integrative view about the organizational capability in knowledge management. To overcome the backdrop, this study introduces the notion of KMC from a holistic perspective through the exploration of both the resource-based and the knowledge-based views, and defines it as "*organizational ability to effectively manage organizational knowledge acquired from internal and external resources to improve organizational*

<Table 1> Organizational capability in knowledge management literature (Adopted from Lee and Kim [27])

Org. capability	Definition	Typical Theorists
Creation Capability	The creation capability of knowledge by introducing the knowledge conversion model and the spiral model	[39]
Combination Capability	Organizational ability to learn new skills from the combination of internal and external learning	[24]
Integration Capability	Organizational capability as the knowledge integration and its ability to perform repeatedly a productive task for creating values on its outputs	[18]
Absorptive Capability	An organization's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends for organizational innovation capabilities	[7]
Leverage Capability	Organizational leveraging capability of managing organizational knowledge according to the changes of environment with a dynamic perspective	[22, 41]
Link Capability	Organizational ability to learn or acquire its needed knowledge from other organizations	[2, 40]

performance and to maintain competitive advantage over rivals."

3. STRUCTURE OF KMC

In this part, we now need to identify major objects or dimensions of KMC from the light of two major theories in knowledge management area - the resource-based view and the knowledge-based view. As a first step to identify key factors or drivers for successful knowledge management, typical previous studies are summarized as in Appendix A.

The resource-based view (RBV) originates from the nature of the change in business environment. The RBV perceives the firm as a unique bundle of idiosyncratic resource and capabilities where the primary task of management is to maximize value through the optimal deployment of existing resources and capabilities. This view helps us a lot to learn the underlying mechanism of why and how knowledge is so valuable to an organization and therefore is used most frequently in the research of knowledge management. According to Barney [3], the resource can be classified into three categories: physical capital resources, human capital resources, and organizational capital resources. Given the origin of all physical capital resources lies outside the organization and these resources are undistinguishable, competitive advantages more likely result from the intangible firm-specific knowledge which adds values to the human and organizational capital resources in a relatively unique manner [44]. Furthermore, organizational

knowledge is inherently created and resides in individuals. In this sense, *knowledge worker*, as the primary agents of knowledge creation and knowledge carrier, is one of the principal dimensions of KMC. Based on the RBV, Meyer [33] emphasizes the special role of *information technology*. Technology can integrate the fragmented flows of information and knowledge between different parts of the organization [14]. It thus strengthens the organizational resources and their utilization.

Davenport and Prusak [9] believe the functional, cultural, positional and regulatory capabilities as a whole constitute and determine the competitiveness of the organization. In other words, the cultural issue is central in the organizational capability of managing its knowledge more effectively so that more and more scholars agree that *corporate culture* is one of the most crucial factors that can influence the effectiveness and efficiency of organizational resources. *Knowledge management process* is a widely discussed issue in knowledge management. It claims that knowledge management consists of a continuous set of processes and practices embedded in individuals and groups [39]. Therefore, this is a central issue of all physical, human, and organizational capital resources.

Over the past several decades, much of the strategy literature has shown the popularity of the resource-based view and its great contributions. However, the central premise of resource-based view emphasizes resources internal to the firm as the principle driver of firm profitability and strategic advantage. It doesn't address the extraordinary sense of external resources and point out the superior importance of knowledge. Thus, in an increasingly dynamic environment, only adopting resource-based view cannot answer the fundamental question of why firms are different and how firms achieve and sustain competitive advantage by deploying their resources.

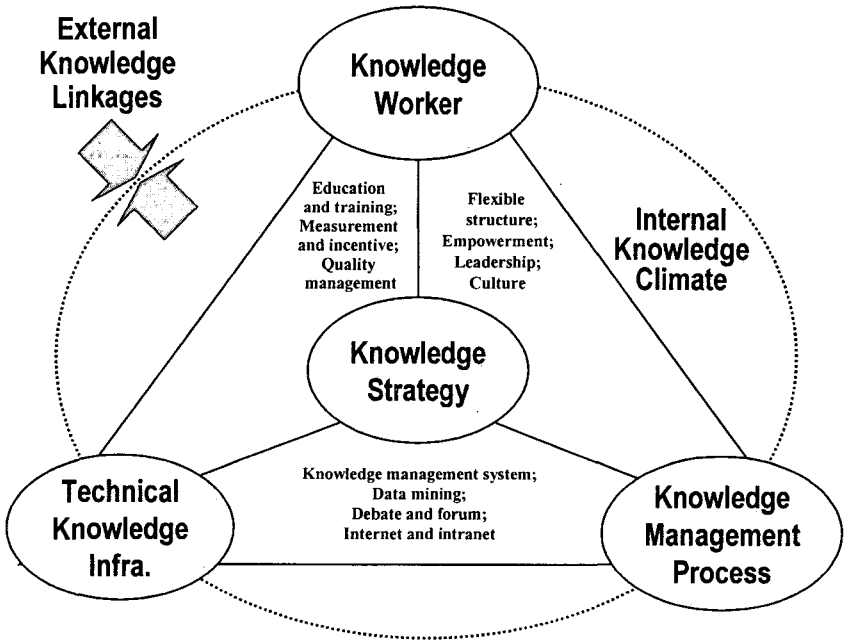
Knowledge-based view (KBV) becomes one of the dominant theories of knowledge management studies in recent years. This perspective extends RBV to be more knowledge-focused. It holds the point of view that knowledge assets can be a unique resource that may lead to long-term sustainable competitive advantage. Even if most researchers holding resource-based view tend to focus on internal technological competences as the basis of organizational competitive capability, other knowledge-based components may underlie the organizational competitiveness as well, according to the KBV. For example, organizational culture could be a fundamental source of core competences and sustained competitive advantages [3]. Leonard-Barton [28] emphasizes the importance of knowledge and considers core competence as a complex knowledge system that includes skills and learning of employees, technology system, managerial system and the value system of the organization. Therefore, we can claim that four key dimensions of KMC - internal knowledge culture, knowledge worker, knowledge infrastructure, and knowledge management process - recognized in RBV should

be emphasized in KBV.

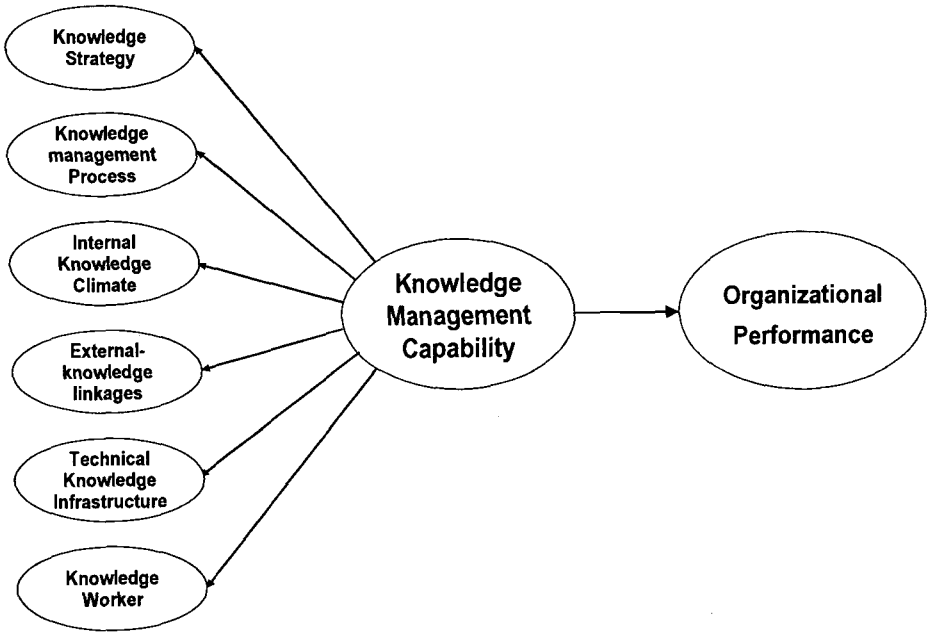
Furthermore, since KBV suggests that organizations are enduring alliances between independent knowledge-creating entities, not only individuals and teams but also other organizations [44], *external knowledge linkage* with outside partners [36, 37] is a crucial component of KMC from this perspective. Virtually, distinct organizational capability in knowledge management often goes beyond traditional boundary of an organization and results from capabilities integrating across multiple entities in the industry, even in the whole society. Besides, *knowledge strategy* [19] plays an important role in KBV because this perspective considers knowledge in nature a strategic resource for organizations, and knowledge strategy actually directs all knowledge management activities and determines the utilization of all organizational resources.

In sum, from both RBV and KBV, based on an intensive review of the knowledge management literature, six key components as target objects of KMC have been identified as shown in Figure 1.

The ultimate goal of these identified dimensions of KMC is to gain and maintain competitive advantage over competitors through the increase of organizational effectiveness [9, 14]. In other words, performance differences between organizations can be the result of their different knowledge bases and capabilities in developing and deploying knowledge. As illustrated in Figure 2, this study integrates six critical components of



[Fig. 1] Major dimensions of knowledge management capability



[Fig. 2] Structure of KMC and its impact on organizational performance

KMC identified from the existing literature into a comprehensive framework as a second-order multidimensional structure, and then makes the linkage between KMC and organizational performance.

3.1 Knowledge Strategy

If knowledge itself and its management are critical for firm performance, then the establishment of knowledge strategy is likely to be an important area in embarking on a knowledge management project. Since environmental pressures such as globally increasing competition and changing customer demands for knowledge-intensive products/services enforce the implementation of knowledge management [33], the major issue of knowledge management is how to make its organization prepare for the enterprise-wide knowledge management initiative.

Many theorists suggest that an organizational strategic change is generally realizable when organizational collaboration and strong commitments from all organizational members are acquired [20]. A strong commitment and voluntary involvement of organizational members can be acquired only when they share the same vision and goals. Furthermore, knowledge management is not an easy task, requiring a long-term time period and significant organizational resources such as human power, capital and managerial efforts [9]. Therefore, organizations need to make a long-term plan for organizational change into a knowledge

management paradigm strategically and systematically. Consequently, organizations should clearly specify shared visions and goals of knowledge management and disseminate them over the whole organization through diverse communication channels.

3.2 Knowledge Management Process

Knowledge management process is a process of organizational activities at the enterprise level to facilitate individual's knowledge related activities. Since the tacit and explicit knowledge are created and shared through the 'self-transcendental process' [39], knowledge management should be viewed as a process under a particular business context. Many researchers have defined that knowledge management is a process of capturing, storing, sharing and using knowledge [9].

However, to be sharable easily and valuable as an organizational asset, knowledge should be justified as a useful source by organizational members. In addition, it can be not only created by individuals through their cognitive processes or intellectual interactions with others but also acquired from internal and external knowledge sources. Another issue of knowledge management process is that the value of organizational knowledge can be realized by the efficiency of its management process. Since organizations have limited management resources and individuals also have limited cognitive capabilities, organizational knowledge should be efficiently managed for the maximum use of its strategic value [42]. Therefore, the knowledge management process consists of following activities; knowledge acquisition or creation, justification, storing, sharing and application, and evaluation.

3.3 Internal Knowledge Culture

Since knowledge management is as much a social activity as a managerial or technical activity, cultural change is a prerequisite for its successful implementation [23, 48]. The organizational culture involves the shared meanings, norms and values that have been collectively constructed over the years. The creation and change of an organizational culture usually take a long time and are context or culture-dependent [39].

If a supportive organizational culture for knowledge management does not exist, there will be no motivation for organizational members to engage themselves into unfamiliar social activities. From the knowledge management and learning organization literature, typical characteristics of organizational culture include leadership, learning orientation, commitment, trust-based communication and collaboration, openness, and voluntary participation. Since knowledge is inherently created and resides in individuals [39] and knowledge management is a social activity requiring active participation from organizational members [25], creating internal knowledge partnership between employees at all levels of an organization and the characteristics of organizational culture are crucial for the success of a knowledge management initiative.

3.4 External Knowledge Linkage

Many scholars have emphasized strategic alliances as one of the major motives of learning and knowledge acquisition [2, 40]. However, knowledge transfer among different organizations is not an easy task [16]. Nonaka [37] noted that knowledge creation and transfer is based on the specific organizational context so that knowledge, especially tacit knowledge, cannot easily be created and transferred among organizations with different cultures, structures, and goals. Therefore, the key management issue of the external knowledge linkage is how to facilitate the knowledge transfer and sharing through strategic alliances or partnerships.

Successful knowledge alliances require managerial premises such as clear visions and goals, a wide range of possible alliances, collaborative activities, shared goals, and trust-based relationships with customers, suppliers, and even competitors [2]. The first actions by organizations are to find and evaluate a partner, and devise a form for the relationship. Partnerships through alliances for knowledge sharing and transfer should be based on mutual trust and managed through not only diverse communications but also formally specified policies and rules [2]. Therefore, the clear common visions and goals of alliances and specified contracts are key factors for successful relationships.

3.5 Knowledge Infrastructure

The usefulness and roles of information technologies in knowledge management have been founded in tremendous literatures [46]. Lank [26] summarized the roles of information technologies for knowledge management into three major components: repositories, maps, and communication channel. He also emphasized the using of information technologies to support organizational learning because information technologies can support the amount and richness of bi-directional information flow, multi-communication channels, and performing tasks that can not be performed manually.

With information technologies, organization can integrate not only people to people but also people to knowledge internally and externally [22]. Thus, these integrations can eliminate communication barriers between different parts of an organization and with other external organizations [46]. 'Knowledge map' or 'expert map' is the example of using information technologies for the integration. Organizations can also support formal or informal communities by providing diverse communication channels with E-mail, Groupware, Intranet and Extranet.

3.6 Knowledge Worker

Knowledge worker is generally defined as an individual who creates and uses organizational knowledge [28]. Therefore, it is not surprised that the human resource management, including motivation and reward systems, personnel rotation and education/training, has been emphasized in knowledge management. Accordingly, most literatures in knowledge management have discussed the importance of human resource as a

key component for organizational changes and innovations.

The key managerial concerns of knowledge management on knowledge workers are how to recruit best professionals and then, to increase individual's knowledge capabilities and finally, to build trust-based human networks. Quinn et al. [41] introduced the concept of 'hyper-selection' in recruiting professionals and emphasized the roles of top-flight professionals in successful organizations like consulting service industries. After acquiring their high quality of human resources, organizations should enhance the individual's knowledge capabilities through personnel training [45] and work turnover [39]. The knowledge capabilities should include individual's learning processes such as active scanning, experimentalism, learning from others, about environmental changes and opportunities.

3.7 KMC and Organizational Performance as a Symbolic Relationship

As organizational environments change, the required knowledge will be also changed. Therefore, organizations should continuously manage their organizational knowledge and its related activities to keep their products or services to the market requirements [48]. Since organizational knowledge is used to develop new products or services and improve business processes, it may be related to organization performance. While there are many internal and external factors that contribute to organization performance, it is acceptable that KMC is eligible to be one of them. Though the focus of this study is to provide an integrative capability of knowledge management by identifying their major dimensions, it is worthwhile for practitioners and academics to see whether KMC is associated with organizational performance.

The concern of organizational capability in knowledge management has been a continuous major issue because the firm's ability to harness and integrate the knowledge of many individual specialists has impacts on social relationships, business impact as a strategic means, customer services, management's decision making, and operational work performance [16, 41]. Those previous research offers insight into the linkage between organizational knowledge capability and competitive advantage. The extent of which a capability is distinctive depends primarily on the firm's different knowledge bases and differing capabilities in developing, integrating, and deploying knowledge. Further, longevity of competitive advantage depends upon the inimitability of the knowledge capabilities [16]. Therefore, creating and sustaining distinctive knowledge capability is one of the major contributors to gain and maintain competitive advantage over rivals [14]. In short, it is acceptable that effective knowledge management with high level of KMC contributes to some degree of organizational performance.

4. DESIGN AND METHODOLOGY

4.1 Measure Development

Survey instruments were designed to measure six key dimensions of KMC and organizational effectiveness. Based on the previous literature on knowledge management, we developed a questionnaire to empirically test the proposed model. In this study, perceptual measures were employed for all variables. When developing the measurement, the multiple-item measures were used for all variables to improve the reliability and validity of the measures. In addition, each variable was measured based on a 7-point Likert scale from 'completely inaccurate' to 'completely accurate'. Since there is little empirical research on KMC, these measures are derived from conceptual definitions and theoretical statements of the existing literature. Operational definitions of all constructs are included in Appendix B.

For organizational performance that is the dependent measure of our research, the economic performance of businesses was measured with the scale developed by Morrison and Roth [35]. Four dimensions of perceived performance were measured: absolute (or objective) and relative (or subjective) performance in terms of sales growth and return on investment respectively. For the absolute performance, respondents were asked to choose a range (among seven ranges from 'negative' to 'greater than 25%') which best described their business' average sales growth and return on investment for the past two years. For the relative performance, respondents were asked to indicate, on a 7-point scale ranging from 'much worse' to 'much better,' how their business' sales growth and return on investment were performed over the past two years, as compared to the industry average. The structure of all measures used in this study is shown in Appendix C.

An initial version of the survey instrument was subsequently refined through extensive pre-testing with five academics who have significant expertise in the study of knowledge management. The instrument was further pilot tested with ten companies in Korea. The multiple phases of instrument development resulted in a significant degree of refinement and restructuring of the survey instrument as well as establishing the initial face validity and internal validity of the measures.

4.2 Data Collection and Sample Characteristics

As the sampling frame of this study, we selected 92 organizations in Korea as convenient samples, which already have enterprise-wide knowledge management systems. The source of the sampling frame was success stories published in magazines or the practitioner literature on knowledge management and case studies in academic journals. A total of 920 surveys were mailed to 92 organizations, assigning 10 questionnaires to each organization with personalized cover letters accompanying an explanation of the study and assurance of confidentiality of collected data.

To increase the response rate, Dillman [10]'s

Total Design Method was adopted. Finally, 256 responses from 59 organizations were received representing a response rate of about 28 percent of all distributed questionnaires and around 64 percent of total samples. Among them, 32 responses were eliminated from the analysis due to incomplete data, and 224 responses from 52 organizations could be used as an input of the next step.

4.3 Aggregation of Individual Reponses in an Organization

While the unit of analysis in this study is the organization, the questionnaire was distributed to organizational members to measure facts or characteristics of their organizations. Accordingly, answers from the same organization were aggregated and used as an organizational indicator. Given the perceptual nature of the measures for all dimensions of KMC and the conversion of individual responses into organizational indicators, inter-rater reliability was checked. The agreement level of all respondents from the same organization was calculated based on the Jame's [21] recommendation. The inter-rater agreements were assessed with both single-measure and average-measure as shown in Table 2.

The averaged agreement levels of all variables for each organization also ranged from 0.192 to 0.920 for single-measures, and from -0.046 to 0.985 for average-measures. Among the 52 companies, only one company had a negative value of agreement for average-measure. Although the average agreement level for single-measure of this company was positive, we decided to rule out the record of that company since a negative intra-class correlation is usually taken to be zero reliability. All of the rest 51 organizations showed acceptable agreement levels and supported the aggregation. Finally, 221 responses from 51 organizations could be used for the final analysis.

5. ANALYSIS AND RESULTS

5.1 Analysis Method

Instead of exploratory approaches like

<Table 2> The results of inter-rater reliability test

Variables	Averageagreementonsingle measure	Averageagreementonaverage measure
Knowledgestrategy	0.852	0.967
Knowledgemgt.process	0.688	0.939
Internalknowledgeculture	0.670	0.924
Externalknowledgelinkages	0.827	0.960
Knowledgeinfrastructure	0.716	0.938
Knowledgeworker	0.757	0.949
Organizationalperformance	0.750	0.947

regression analysis, this study selected a confirmatory approach using Partial Least Squares (PLS). The PLS method was chosen to examine the proposed model because of the following reasons: First, PLS is suitable for assessing theories in the early stages of development [12], as in this study. Second, PLS requires minimal demands on sample size in order to validate a model compared to other SEM techniques [6]. Due to the scale of the survey and the complex data collection process of eliciting participation, the size of sample for the final analysis seems to be in the minimum level. This makes PLS appropriate for testing the proposed model using the gathered data.

5.2 Measurement Model

The content validity in this study was established from the existing literature and the pretesting with experts in the field of knowledge management. In the assessment of the discriminate validity, we tested 35 items that measured the 6 components of our independent variable and 6 items that measured the dependent variable. The correlation of items with each scale, the corrected item-to-total correlations, the effects on ALPHA if the item were deleted were used to determine which items were candidates for elimination [34]. As a result, two items in the independent variable were dropped because they had low item-to-total correlations.

The path loadings between the six variables of KMC and their items range from 0.796 to 0.956, which implies that the item measures for the dimensions of KMC are all significant at 0.01 level. With respect to the estimated model weights of the items of independent variable, the values range from the lowest one, 0.160 (knowledge management process), to the highest value, 0.246 (knowledge infrastructure). Furthermore, results of PLS confirmatory factor analysis are shown in Appendix D. These results identify that all measures of the six different dimensions contribute uniquely to KMC.

As shown in Table 3, the composite reliability of values ranges from 0.860 to 0.940,

<Table 3> The result of confirmatory factor analysis

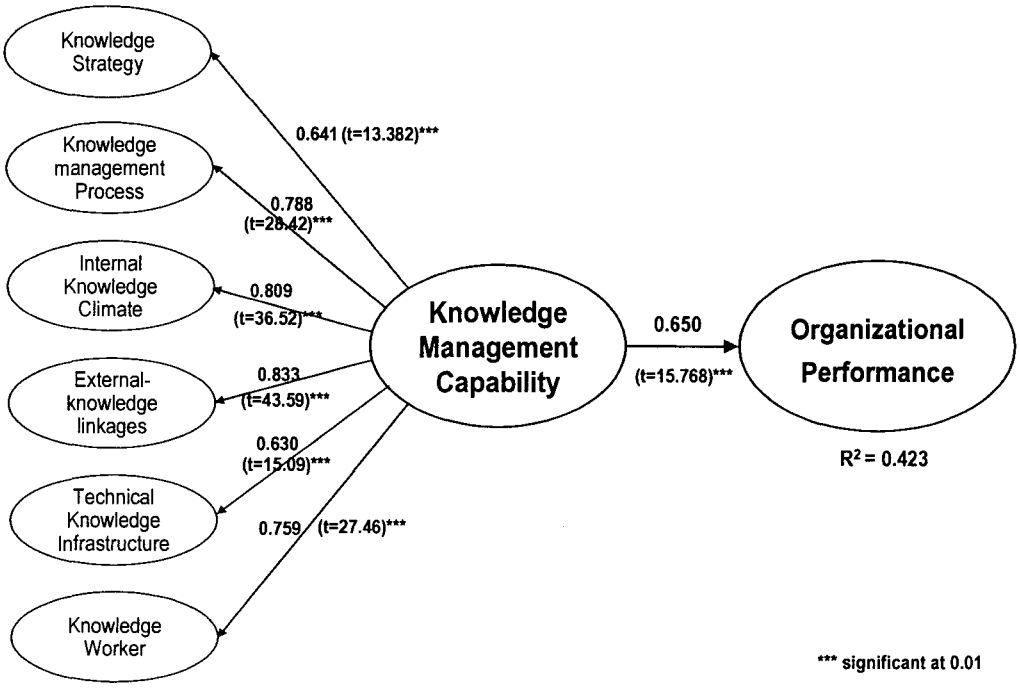
Measure	Items	Composite Reliability	Average Variance Extracted
KnowledgeManagementCapability			
Knowledge Strategy	5	0.974	0.884
Knowledge Process	7	0.952	0.740
Internal Knowledge Partnership	5	0.951	0.794
External Knowledge Partnership	5	0.969	0.861
Knowledge Infrastructure	5	0.959	0.824
Knowledge Worker	6	0.960	0.799
OrganizationalPerformance	6	0.960	0.800

which were higher than the recommended level of 0.7 to be a reliable construct [6]. As for average variance extracted by measures in our study, the scores are in the range from 0.740 to 0.884, which exceeded the acceptable value of 0.5 [12].

5.3 Structure Model

Besides the validity assessment of the measurement model, we checked the correlations between the six dimensions of KMC. The highest correlation, 0.680, existed between external knowledge linkages and knowledge management process. The remaining correlations range from 0.298 to 0.649. There are three high values of correlation, 0.609 (knowledge management process and internal knowledge culture), 0.680 (knowledge management process and external knowledge linkages), and 0.649 (internal knowledge culture and external knowledge linkages). We further conducted Variance Inflation Factor (VIF) test in SPSS. As a result, the VIF values of six variables indicated acceptable level of collinearity, ranging from 1.368 to 2.388.

The results of PLS analysis are summarized in Figure 3. The path loadings and R squares resulting from the PLS model are illustrated. The results indicate that, as we expected, the six dimensions of knowledge management are significantly important for KMC. Furthermore, the KMC (path coefficient=0.650, t=15.768) of an



[Fig. 3] Results of PLS analysis

organization is significantly related to organizational performance. The better the organization does in the association of these six dimensions of KMC, the higher is the possibility of achieving a better organizational performance. Furthermore, it is worth to mention that the R square of organizational performance is 0.423, which is very high. The organizational performance can be influenced by various political, economic and environmental variables. However, according to our model, KMC explains over 40 percent of the variance of the organizational performance, which indicates the KMC is a significant influencing factor of the financial performance of an organization.

6. DISCUSSION AND IMPLICATIONS

This study has proposed a conceptual model of KMC, which consists of six major dimensions, and its impact on organizational performance based on the resource-based and knowledge-based views of the firm. Survey data from 221 respondents in 51 companies, showed that KMC in six dimensions - knowledge strategy, knowledge management process, internal knowledge culture, external knowledge linkages, knowledge infrastructure, and knowledge workers - impacts organizational performance significantly. In addition, the data empirically verify the assumed structure of KMC and the individual relationships with organizational performance.

External knowledge linkages and the internal knowledge culture were found to represent the most significance aspects of KMC. In nature, these two dimensions reflect the developing trend of knowledge management as an integrated system, which is internally generated but also links to the concept of the network organization. Helped by the development of information technologies, geographical distances and organizational boundaries are to some extent no longer the major bottlenecks of organizational growth. For organizations nowadays, the most important things are how to build and consolidate an active atmosphere inside the organization, and with whom and how to connect outside.

Another interesting finding is that the technical infrastructure does not act as a highly important factor in KMC, but ranks the last among our six dimensions. Technology is no doubt a crucial enabling factor in knowledge management. However, as discussed above, it acts as a tool to make knowledge acquisition, transfer, and sharing feasible and to facilitate knowledge activities in organizations. Even though information technologies are quite important, they are not sufficient to ensure success in knowledge management. Drawbacks in other key aspects of knowledge management can still lead organizational efforts to fail. Only combined with all other key aspects can information technologies fully take effect. That can probably explain why the knowledge infrastructure was not the first key dimension, as previous researchers have imagined.

The results further suggest several implications of both academic and practical

importance. First, the model proposed here integrates the two basic theoretical perspectives — the resource-based view and knowledge-based view of the firm — and validates six major dimensions of KMC in order to propose an integrated capability model of knowledge management. In attempting a holistic analysis of the effects of the dimensions on KMC, this study will help academics to have a more comprehensive view of knowledge management from a capability perspective. Six dimensions have been shown to comprise organizational capability in knowledge management, and their weights and correlations with the capability factor have been estimated. This can serve as early groundwork for researchers seeking to understand issues in knowledge management and organizational performance from a more specific point of view. The measures developed can also provide a useful benchmark for the knowledge management activities in organizations in practice, giving practitioners some guidelines on how to enhance their KMC and eventually to improve their performance.

While the findings provide some implications, this study has several limitations as well. First, although the sample size is acceptable for PLS analysis, its relatively small size, 51 companies, limits the generalizability of the findings. The respondent companies represent various industries, but are restricted to Korean companies. A larger and more heterogeneous set of organizations needs to be analyzed in the future. Second, the results reported in this study resulted from analysis at the company level. Different respondents in a same company may have distinct opinions on an organizational subject, and this should not be ignored. The data were aggregated to the company level only when the average agreement of all respondents from one company was acceptable. However, it is likely that this led to some bias in the analysis. Third, with respect to knowledge workers, we did not define who they were because being knowledge workers were dependent on organization types and context. But, it might lead some respondent bias. Finally, the knowledge management structure and its impact on organizational performance ought to receive more attention from IS researchers. This study provides a starting point for such future research. The six dimension classification is open to refinement and further verification. What other potential variables contribute to KMC? The six dimensions tested here were formulated by reviewing previous theories and literature, however, there should be more variables affecting organizational capability in knowledge management. Future theory development and industrial practice will stimulate the exploration and illustration of new variables. This study has shown that KMC contributes to organizational performance. It would be worthwhile for researchers to study not only other independent variables but also moderating variables between KMC and organizational performance from other theoretical standpoints. While the results of this study may benefit businesses implementing enterprise-wide knowledge management initiatives, more empirical research is needed to recommend practical

guidelines for each dimension of KMC individually.

7. CONCLUSION

It is widely accepted that effective knowledge management through capability development benefits the key aspects of organizational performance [14]. If so, what are the major dimensions of KMC, and does KMC impact organizational performance? How to validate and measure the significance of KMC in terms of organizational performance? These were basic research questions of the study.

The results show that the integrated model developed in this study has revealed the multiple dimensions of organizational capability in knowledge management, and the KMC is an important predictor of organizational performance. Therefore, an organization must realize the importance of six proposed dimensions in order to have a better organizational performance.

Highlighting a holistic view of KMC now opens up several avenues for future knowledge management research; exploring a more comprehensive model by refining current dimensions of KMC, by finding and adding new dimensions of KMC, or by understanding antecedents of KMC. Such research will allow us to view knowledge management not as an operational activity and decisional island, but rather as a strategic activity with far-reaching consequences linked other organizational activities.

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APPENDIX A. Previous Studies for Factors of Successful Knowledge Management (Non-exhaustive)

Studies	FactorsorDrivers	StudyTypes
Becerra-Fernandez and Sabherwal [4]	- Internationalization, externalization, combination and socialization to increase knowledge management satisfaction	Survey (159 KSC employees)
Brown and Duguid [5]	- Knowledge ecosystem (communities of practice): Physical and social environments, relations, trust and belief	Literature review
Davenport and Prusak [9]	- Principles for KM: Knowledge-based culture, technical and organizational infrastructure, management support, link to economics or industry value, modicum of process orientation, clarity of vision and language	Interview and review of KM projects
Foil and Lyles [11]	- Culture: Belief and norm - Strategy: Perception and interpretation of environments - Structure: Decentralized and flexible structure	Literature and survey
Gill [13]	- Richness of bi-directional information flow - New communication channels - Emphasis of technology	Case study
Graham and Pizzo [15]	- Shared value: Personal freedom, cooperation, community	Survey and case study
Klein [23]	- Creating culture: Autonomous decision making, visible top management support, employee's participation, infrastructure, and management	Literature reviews
Leonard and Sensiper [29]	- Barriers to generating and sharing tacit knowledge: lack of reward, mentoring and assisting, inequality in status among participants, physical or time distance, inexpressibility of knowledge, uneasiness of group members	Innovation literature
Lewis et al. [30]	- Belief about IT Use: Individual factors, social factors and institutional factors	Survey (121 US academic faculty members)
Liebowitz and Beckman [31]	- Executive leadership and commitment - Healthy culture - Expertise - IT infrastructure	Interview and review of KM projects
Massey et al. [32]	- Defining process, Understanding people, Specifying technology	Case study
Nonaka [37]	- Individual commitment for knowledge creation: Intention, autonomy, environmental fluctuation	Literature and cases
Nonaka and Konno [38]	- 'Ba' provides a platform for advancing individual and collective knowledge	Literature and cases
Ruggles [43]	- Current biggest impediment to knowledge transfer: culture, top management's failure to signal importance, lack of shared understanding of strategy of business model, organizational structure, lack of ownership of the problem, non-standardized process, information/communication technology restraints, incentive system, staff turnover, configuration/physical features of workspace	Survey (431 US and European firms)

APPENDIX B: Operational Definitions for All Constructs

Variables	Operational Definition	Key References
Knowledge strategy	The degree to which knowledge vision, goals and guidelines clearly and effectively direct the knowledge management activities in organizations.	Husman and Goodman [19]
Knowledge management process	The degree to which an organization efficiently and effectively manages a set of activities such as knowledge capturing, storing, sharing and using at the enterprise level.	Davenport and Prusak [9]; Wiig [48]
Internal knowledge culture	The degree to which the corporate climate enables knowledge management activities inside the organization.	Krachhardt and Hanson [25]
External knowledge linkages	The degree to which an organization connects with external partners, including customers, suppliers, competitors and research institutions, etc. to nurture its knowledge management.	Badaracco [2]
Knowledge infrastructure	The degree of appropriateness of the knowledge-related architecture in an organization in order to meet its knowledge management objectives.	Lank [26]; Teece et al. [46]
Knowledge workers	The degree of effectiveness of the management processes applied to managing individuals, such as selecting, staffing, training and assessing.	Nonaka and Konno [38]; Nonaka and Takeuchi [39]
Organizational performance	How well an organization operates in terms of financial success and growth, such as indicators of increasing sales, ROI.	Morrison and Roth [35]

APPENDIX C. The Structure of Questionnaire Items

Items Measuring Knowledge Management Capability

Dimensions	Items
Knowledge strategy	• Clear vision for knowledge management • Clear objectives for knowledge management • Effectiveness of knowledge management planning • Integration of business planning, IT strategic planning, and knowledge management planning • Consistency of knowledge-related policies throughout the enterprise
Knowledge management processes	• Effective processes for creating knowledge from existing knowledge • Effective processes for acquiring knowledge from other organizations • Effective processes for filtering valuable knowledge • Effective processes for validating gathered knowledge • Effective processes for sharing knowledge throughout the organization • Effective processes for utilizing knowledge to improve organizational efficiency • Effective processes for updating outdated knowledge thought feedback
Internal-knowledge culture	• Top management sponsorship of knowledge management initiatives, • Employees' commitment to knowledge management projects • Climate nurturing knowledge management project championship • Climate that encourages knowledge management for building a learning organization • Effective communication between employees for knowledge management • Effective collaboration between employees for knowledge management
External-knowledge linkages	• Knowledge-based links with customers • Knowledge-based entrepreneurial collaborations with external partners • Knowledge-based links with suppliers • Acquiring knowledge from competitors within our industry • Acquiring knowledge from the best practice in any industry
Knowledge infrastructure	• Appropriateness of knowledge repository architecture • Appropriateness of knowledge map architecture • Appropriateness of knowledge search engine architecture • Appropriateness of knowledge index/directory architecture • Appropriateness of professional profiling architecture • Adequacy of architectural flexibility
Knowledge workers	• Effective processes for selecting knowledge workers • Effective processes for staffing knowledge workers • Effective processes for maintaining continuity of knowledge workers • Appropriateness of education/training for knowledge workers • Adequacy of performance appraisal of knowledge workers • Adequacy of reward/measurement systems for knowledge workers

Items Measuring Organizational Performance

Dimensions	Items
Average financial performance over the past two years	• Annual increase in total sales 1. greater than 25% 2. 21% -- 25% 3. 16% -- 20% 4. 11% -- 15% 5. 6% -- 10% 6. 0% -- 5% 7. negative net drop in sales • After-tax return on total investment 1. greater than 25% 2. 21% -- 25% 3. 16% -- 20% 4. 11% -- 15% 5. 6% -- 10% 6. 0% -- 5% 7. negative net return total investment
Financial performance compared to the industry average over the past two years	• Annual increase in total sales (1 - much worse to 7 - much better) • After-tax return on total investment (1 - much worse to 7 - much better)
Satisfaction with the financial performance	• Annual increase in total sales (1 - not at all satisfied to 7 - highly satisfied) • After-tax return on total investment (1 - not at all satisfied to 7 - highly satisfied)

APPENDIX D: Results of PLS Confirmatory Factor Analysis

	Knowledge Strategy	Knowledge Management Process	Internal Knowledge Culture	External Knowledge Linkage	Technical Knowledge Infrastructure	Knowledge Worker
K_STRA1	**0.887**	0.073	0.130	0.115	0.113	0.176
K_STRA2	**0.902**	0.050	0.160	0.110	0.181	0.180
K_STRA3	**0.880**	0.097	0.161	0.175	0.174	0.142
K_STRA4	**0.892**	0.076	0.144	0.094	0.175	0.167
K_STRA5	**0.881**	0.135	0.098	0.177	0.104	0.151
K_PROC1	0.121	**0.794**	0.223	0.235	0.076	0.067
K_PROC2	0.043	**0.675**	0.181	0.389	0.079	0.281
K_PROC3	0.102	**0.756**	0.237	0.240	0.109	0.209
K_PROC4	0.062	**0.828**	0.178	0.145	0.114	0.233
K_PROC5	0.063	**0.847**	0.153	0.124	0.096	0.227
K_PROC6	0.120	**0.798**	0.230	0.233	0.066	0.064
K_PROC7	0.025	**0.654**	0.182	0.354	0.085	0.299
K_INT_CUL1	0.157	0.258	**0.664**	0.242	0.070	0.171
K_INT_CUL2	0.166	0.206	**0.784**	0.320	0.169	0.148
K_INT_CUL3	0.160	0.311	**0.805**	0.152	0.124	0.205
K_INT_CUL4	0.167	0.305	**0.812**	0.153	0.110	0.199
K_INT_CUL5	0.167	0.214	**0.793**	0.302	0.173	0.143
K_EXT_LINK1	0.229	0.318	0.263	**0.771**	0.167	0.144
K_EXT_LINK2	0.117	0.353	0.217	**0.810**	0.126	0.168
K_EXT_LINK3	0.199	0.292	0.265	**0.710**	0.155	0.208
K_EXT_LINK4	0.236	0.294	0.279	**0.773**	0.156	0.151
K_EXT_LINK5	0.132	0.352	0.245	**0.812**	0.124	0.160
K_INFR1	0.133	0.034	0.133	0.042	**0.859**	0.163
K_INFR2	0.105	0.112	0.065	0.112	**0.923**	0.129
K_INFR3	0.178	0.107	0.170	0.213	**0.814**	0.172
K_INFR4	0.212	0.099	0.097	0.098	**0.764**	0.303
K_INFR5	0.122	0.125	0.079	0.105	**0.923**	0.121
K_WORK1	0.165	0.171	0.151	0.041	0.116	**0.882**
K_WORK2	0.198	0.189	0.142	0.225	0.191	**0.797**
K_WORK3	0.123	0.130	0.080	0.122	0.178	**0.783**
K_WORK4	0.191	0.251	0.161	0.213	0.232	**0.756**
K_WORK5	0.150	0.178	0.149	0.036	0.109	**0.877**
K_WORK6	0.145	0.256	0.202	0.227	0.221	**0.770**

Notes: K_STRA: Knowledge Strategy; K_PROC: Knowledge Management Process;
K_INT_CUL: Internal Knowledge Culture; K_EXT_LINK: External Knowledge Linkage;
K_INFR: Technical Knowledge Infrastructure; K_WORK: Knowledge Worker

요약

지식 관리 역량의 구조 및 기업 성과에 미치는 영향에 대한 연구

이재남* · 이장환**

최근 몇 년 동안 연구자들과 실무자들에게 중요한 이슈가 되고 있는 것은 기업의 성과를 향상시키기 위한 지식 관리 역량이 어떠한 구조로 이루어져 있는가 하는 것이다. 본 연구에서는 자원 근간 이론과 지식 근간 이론에 대한 심도 있는 논의를 통해 이 이슈에 대한 답을 찾고자 하였다. 이 두 가지 이론들을 바탕으로 지식 관리에 관련된 기존 문헌의 심도 있는 검토와 실무자들과의 인터뷰를 통해 지식 관리 역량의 6가지 중요한 차원들을 도출하였다. 그런 다음, 지식 관리 역량의 통합적 개념 모델을 제안하고 이 지식 관리 역량이 기업의 성과와 어떠한 관계가 있는지를 분석하였다. 한국에서 전사적으로 지식 관리 시스템을 도입한 기업들로부터 수집된 자료를 바탕으로 PLS 분석을 실시하여 본 연구에서 제시한 모델을 검증하였다. 이 분석을 통해 실무자들과 연구자들에게 지식 관리 역량에 대한 의미 있는 결과와 향후 보다 효과적인 지식 관리에 대한 방향을 제시하였다.

Key words : 지식 관리 역량; 기업 성과; 자원 근간 이론; 지식 근간 이론

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