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1. Overview of Model and Approach

Since knowledge asset is regarded as a core competence to achieve competitive sustainability, many firms are launching knowledge management projects extensively. However, one of the representative myopia is that those projects are approached in the form of information projects in reality. In numerous cases the KM (Knowledge Management. Hereinafter 'KM' in abbreviation) project itself does not bring forth innovative improvement of process, nor expected performance to be measured in terms of an increased ROI, or enhanced customer satisfaction index.

While internet technology is disrupting every aspect of business on global level, the IT (information technology)-oriented KM approaches are flourishing with ever- updated introductions of KMS (Knowledge Manage System) software, apart from continuous outsourcing of consulting activities from experts.

IT infrastructure must be an indispensable component and enabler for supporting knowledge management, but too much reliance on IT can only add to the existing myopia. As many researchers and practitioners are asserting, the most important topic in knowledge management is to share or apply tacit knowledge of individuals on organizational level. In this simple perspective, apparently IT must be one of the enablers to this process in terms of coverage of scope and speed of knowledge distribution. But this role of IT in most cases revolves round '*efficiency*' of organization, whereas knowledge management focuses on *effectiveness* rather than *efficiency*.¹ While IT is regarded as a practical tool for knowledge management in terms of knowledge processing efficiency, many researchers, on the other hand, also pay keen attention to corporate culture to motivate employees in the knowledge management process, since they are the actual players without whom knowledge management itself can be losing its dynamics. (Nonaka, 1994; Garvin, 1993; Romer, 1999). The concept of 'knowledge workers' is obviously based on this thinking.

Along with these two dimensions of IT and culture, the firm-specific organization structure² can also be a key dimension of knowledge management. Apparently this structure can serve as

1 John S. Brown, and Paul Duguid: "Capture Knowledge Without Killing It," Harvard Business Review, May-June 2000, pp. 73-80.

a more strategic instrument for an enterprise that would like to embark on a knowledge management project.

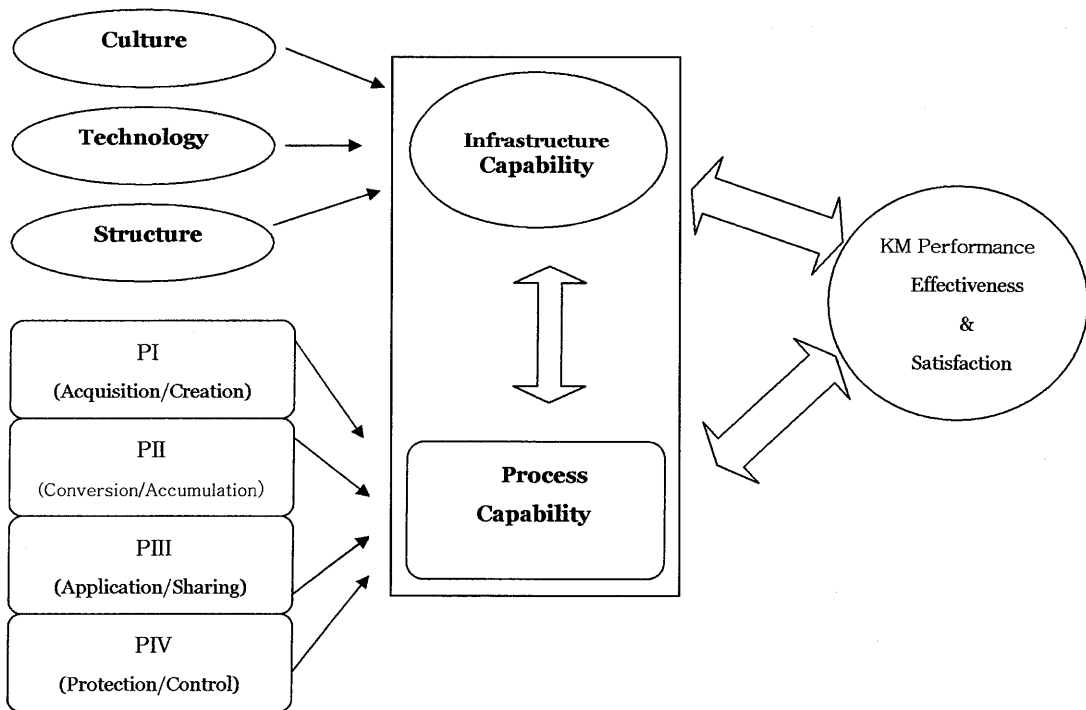
Importantly, organizations may not be equally pre-disposed for successful launch of knowledge management initiatives. A key factor to access smooth running of KM is identification and assessment of pre-conditions that are necessary for the effort to flourish. These preconditions are broadly described as ‘capabilities’ or ‘resources’ within the organizational behavior literature (Kelly and Amburgey, 1991; Law et al., 1998; Leonard-Barton, 1995). In this perspective, the three dimensions of culture, technology, and structure mentioned above can be regarded as main components for KM capability in the infrastructure aspects. Along with this infrastructure, one other aspect of KM capabilities is process, which is recognized by academics and practitioners alike as a prerequisite for success in organizations (e.g. Nonaka, 1991; Porter-Liebskind, 1996; Cole, 1998; Davenport and Klahr, 1998; Powell, 1998; Malhotra, 1998).

In order to leverage infrastructure, KM process must also be present to store, transform, and transport knowledge throughout the entire organization (e.g. Mowery et al., 1996; Szulanski, 1996; Spender, 1996; Porter-Liebskind, 1996; Grant, 1996; Almedia, 1996; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995; Leonardo-Barton, 1995).

In this study we have classified the KM process into four dimensions: PI (Acquisition/Creation), PII (Conversion/Accumulation), PIII (Application/Sharing), and PIV (Protection/Control). These four process capabilities do not simply mean the information processing flow itself. They should rather be interpreted as the focus of activity, or aspects of knowledge activity on which the organization is focusing more importantly, since some companies can put an emphasis on PI while others can focus on PIV. These four dimensions can operate independently as well as interdependently. At this point it is obvious that the decision to which dimensions an organization has to give more preferences, should be left to the organization itself in accordance with the situation of resources to input and the main purpose of the KM initiative. At any rate, if we combine the infrastructure aspects with the process perspective, we come to conclude that the KM capabilities can be built and developed based on interactivity between these two components. In other words, separately from the infrastructure, there must be accompanied a company-specific value-added process of knowledge management. To put it more clearly, if we consider the infrastructure aspects to be the hardware of KM, the process aspects could be seen as the software of KM. As such, KM capability of an organization is to be determined by these two capabilities in combination. Taking into account that the ultimate purpose of KM can be categorized into KM effectiveness and satisfaction, our analyzing model thus could be outlined as

2 The ‘structure’ in here is referred to in broad terms, not only meaning organizational structure but also various systems to support KM activity such as rules, policies, procedures, hierarchy of reporting relationships, incentive systems, and departmental boundaries that organize tasks within the firm.

Figure 1: KM Capability Model



below.

2. The Organizational Capabilities Perspective

As outlined in Figure 1, organizational capability to effectively initiate and maintain knowledge management project can be framed along the broad lines of infrastructure and process. Infrastructure and process can be positioned to be the independent variables, based on which the dependent variable of KM performance (Effectiveness and Satisfaction) can be determined. The infrastructure has three key dimensions of culture, technology, and structure, while process has four dimensions of PI (Acquisition/Creation), PII (Conversion/Accumulation), PIII (Application/Sharing), and PIV (Protection/Control). These reflect an additive capability to launch and sustain a program of change (Bollen, 1989; Bollen and Lennon, 1991; Law et al., 1998). In other words, these variables ('constructs') are not high-level abstractions of their underlying dimensions. Instead, they are a combination or additive sum of their respective factors. This is consistent with the notion of a 'capability' or 'resource' in the organizational behavior literature (Kelly and Amburgey, 1991; Law et al., 1998; Leonard-Barton, 1995). In this section we would

like to further conceptualize the definition of each capability with the practical implication in mind based on academic research and the practice of the business world, as well as to point out each capability's relationship with the other ones.

1) Infrastructure Capabilities

a) Cultural KM Infrastructure

Table 1 shows a summary of the cultural KM infrastructure. As is indicated in the table, each of the components for infrastructure can be related to the processes it can support. This is to show that infrastructure has a close relationship with the process aspects, which the next chapter will elaborate by correlation analysis and empirical study of Korean KM experts. As for the concept of culture, although there is no widespread agreement on the meaning of culture, there is certain consensus that culture can be described in terms of values, norms, and practices (DeLong, 1997). These are influenced by member's activities and can be observed in behaviors (Schein, 1991; Laine-Sveivy, 1991). Executives cite the internal 'culture' of resistance to sharing as the hardest barrier to overcome in implementation of KM.³ As such, cultural adaptability to KM is regarded as one of the key variables for successful KM operation, because culture of trust and collaboration improves knowledge sharing and organizational effectiveness in general. It is perhaps the single most powerful force of cohesion in the modern organization⁴. Cultural issues relating to KM can be largely grouped under four headings of components based on general recognition in the various literature and practice, although not yet proved in a particular case study, namely, *knowledge culture, employee interaction, clarity of vision, and management support*.

First, *knowledge culture* refers to the extent to which the members of organization see the values of knowledge per se and how eager they participate in the day-do-day knowledge activities. Hence, it is imperative that all the members recognize the importance of knowledge along with proactive participation in KM projects, where there must be a corporate level commitment and awareness that these projects bring forth more benefits than costs. 'Communities of Practice' (COP) are very conducive to active exchange of knowledge. They often use explicit formal or 'canonical practices' during the course of their work; however, they will also resort to 'non-canonical practices' that are informal, contingent, and improvised (Lave and Wenger, 1991). Brown and Duguid (1991) argue that communities are effective in the creation of knowledge, since they display overt contingent thinking in the analysis of problems. On top of these elements, we cannot omit the external relation with partners such as customers, suppliers,

3 In a Conference Board report by Hackett (2000), managers identify the major obstacles to knowledge management as culture of resistance, culture of hoarding knowledge, etc.

4 Rob Goffee & Gareth Jones (2003): *The Character of a Corporation*, Profile Books Ltd., London, p.14.

and collaborators. This is particularly becoming important as the ‘economy of knowledge’ is rapidly being developed with ever-increasing deployment of out-sourcing and strategic alliance, even with enemy companies. Hence, the knowledge culture is not only governing internal operation, but also external relations, accelerated by the introduction of various technology tools like ‘Extranet’, CRM (Customer Relationship Management), SCM (Supplier Chain Management), etc.

Secondly, *employee interaction* is prerequisite to build relationships and contacts that enable the sharing of different perspectives (O'Dell and Grayson, 1998; Leonardo and Sensiper, 1998). This type of interaction is especially important when managing tacit knowledge (e.g. Polanyi, 1967; Nonaka, 1994; Nonaka and Takeuchi, 1995).

Pragmatic consultants such as Davenport and Prusak (1998) warn managers not to make ‘utopian assumptions’ about the sharing of knowledge in organizations, but to respect the impacts of important tenets such as social transaction theory. These authors stress the potential role of ‘reciprocity’, ‘altruism’, and ‘reputation’ as a motivating force to share knowledge. Employee interaction has two aspects: formal and informal.

Von Krogh et al (1996)⁵ describe ‘knowledge connections’, which provide the potential for people to convey the messages. These are principally made up of relationships, both those that occur through more formal means and those formed on an informal basis as a result of structure and underlying culture of organization.

In particular the informal type of interaction is getting much attention among academics as well as practitioners, since KM is based on connection, not collection, and this connection ultimately depends on choices made by individuals.⁶

Individuals must choose to interact and share knowledge at a level over and above that required getting their job done. Hence informal contact and conversation among the employees are regarded as one of the key success factors to KM projects as a whole.

Davenport and Prussic (1998) highlight the difference between more formalized transfer mechanisms and informal exchanges. According to them, compared with formalized mechanisms as documents, databases, intranets, and groupware, informal exchanges usually take place face to face, i.e. in conversation. Hence, the organization should encourage these unstructured exchanges to happen voluntarily and spontaneously. Evidence of such efforts can be seen in Japan, where “talking lounge”⁷ is deliberately established in which people get together to converse or chat freely.

5 Von Krogh, G., Roos, J. and Slocum, K (1996), “An essay on corporate epistemology”, In Von Krogh, G. and Roos, J. (Eds), *Managing Knowledge: Perspectives on Cooperation and Competition*, Sage Publications, London.

6 Vicky Dougherty, “Knowledge is about people, not databases”, *Industrial and Commercial Training*, Vol.31. Number 7, 1999, pp. 262-266.

7 Danwasitsu (談話室) in Japanese, which is often used as communication place among employees.

Knowledge fair, notably at Earnest and Young, can be regarded as one example of deliberately structured event.

Thirdly, *clarity of vision* stresses the organization's goal and its values, and the role of the knowledge culture. KM strategy must be set on the basis of overall strategy of an organization. Hence the KM vision must be in accordance with the corporate vision and values so that it can impact on the behavioral change of the employees in the run up to effective KM operation. Knowledge management pertains to opportunity enhancement rather than cost control; its goal is to make a quantum leap forward rather than incremental adjustments.⁸ As such, KM initiative should be undertaken with proper thought and planning from the beginning. In other words, KM initiative is a framework where organizational leaders can structure debate at a strategic level. Hence the management must communicate clearly the vision of the future and ideals pursued to the members of an organization. Sveiby (1997) states that "a leader must be motivated by a genuine desire to lead, inspired by a vision of where the organization is heading, able to unite people in the effort to realize the vision, totally committed to his or her task, and action-oriented."⁹

There are four types of knowledge perspective that can determine the criticality of knowledge: strategic, tactical, operational, and project-related. Business vision, goal and mission are strategic knowledge perspective which must be set by management, whereas others are to be set and implemented by *the competency knowledge manager* (tactics), *the line knowledge manager* (operational) and *project manager* (project-related).¹⁰

Fourthly, *management support* is to facilitate the KM to evolve in a smooth way based on its ongoing mission and vision. The management has the ultimate enterprise-wide responsibility for the KM in general, supporting and encouraging knowledge-related activities (e.g. DeLong, 1997; Davenport et al., 1998). In doing so, the management must believe that knowledge is the strongest source of competitive advantage in the long term and understand that true organizational knowledge resides in tacit form, in individuals, who are the real sources, keepers, and developers of organizational knowledge. This means that 'people-centered' KM is generally more imperative than 'technology-driven' KM. However, this does not necessarily mean that KM strategy should be built only on a 'people-centered' aspects, disregarding the whole benefit of 'technology-driven' aspects. The two mechanisms are not exclusive to each other and accordingly not inter-changeable. Hence it is critical that the management makes sure that an appropriate technology infrastructure should be in place along with a 'people-centered' strategy.

8 Davis, Michael C., "Knowledge Management", *Information Strategy: The Executive's Journal*, fall 1998, Vol. 15, Issue 1.

9 Karl E. Sveiby (1997), *The new organizational wealth*, Berrett-Koehler Publishers Inc., San Francisco, p. 61.

10 Davis, Michael C., *-ibid-* list up the responsibilities of the line knowledge manager, the competency knowledge manager and the chief knowledge officer (CKO).

Table 1. Summary of Cultural KM Infrastructure

Components	Conceptual implementation	Process to support
Knowledge Culture	• Widely shared value, symbols, behavior and assumptions about importance of knowledge to the organization along with positive thinking about KM project on corporate level • Employee's participation in KM activities including COP (Communities of Practice). • Knowledge sharing and collaboration with external related organizations	PI/PII
Employee Interaction	• Encouraging employee interaction, both formal and informal	PI/PII
Clarity of Vision	• Clear stressing of the organization's goal and its values, and the role of knowledge in achieving them.	PI/PII/PIII/PIV
Management Support	• Encouragement and support of KM activities by senior management	PI/PII/PIII/PIV

Since the KM issues are strategically important, academics stress in particular the top management support of knowledge practices within organization (e.g. O'Dell and Grayson, 1998; Davenport et al. 1998; Inkpen, 1996; Nonaka and Konno, 1998).

b) Technological KM Infrastructure

The literature on KM and organization deals very little with IT (information technology). However, reality is that many organizations are capitalizing on innovative and complex applications of IT to gain a significant knowledge advantage, either for competitive market positioning or for productivity and service response gains. Management theorists and practitioners are unlikely to be surprised to learn that the KM initiatives have captured attention of manufacturers of IT systems. One of the central questions in relation to the technological developments aimed at KM revolves around the interpretation of 'knowledge'. It is apparent that authors are becoming more sensitive to the distinction between data ('points of reality'), information ('organized data'), and knowledge ('information, context and experience'), and are starting to take care of the classification of technical applications.¹¹ Technological systems within an organization determine how knowledge travels through the enterprise and how it is accessed (Leonardo-Barton, 1995). There are numerous aspects of the technological infrastructure, particularly with the advent of Internet technology. These systems not only facilitate sharing of knowledge

¹¹ Neal G. Beamish and Collin G. Armistead, "Contemporary Endorsements for the Role of Knowledge", *International Journal of Management Reviews*, June 2001, Vol.3, Issue2, pp.101-111.

on the enterprise level, but they also contribute to collaboration – seen as one of the key areas within the organization where knowledge is transmitted and created (e.g. Leonardo and Sensiper, 1998; Teece, 1998; O'Dell and Grayson, 1998; Grant, 1996; Nonaka and Takeuchi, 1995). Efficiency, speed, and synergy are greatly facilitated by the effective use of IT. Although studies done in the 1980s conclude that IT had added little value to enterprises, recent studies have shown that IT has brought a great deal of value to customers and changed the rules of being successful in the market place.¹²

Table 2 shows a summary of the technological KM infrastructure, which encompasses component technology facilitating KM activities. The creative application and combination of these IT solutions can facilitate how tacit knowledge within individuals is shared and “synergized” with that of others, and how it grows through additions from experience, new combinations, and external explicit knowledge. Hence it is the role of system integration to challenge the management of a variety of issues, such as diversity, rapid evolution, and security, etc. Again, it is very critical for senior management to ensure that proper resources are made available just

Table 2. Summary of Technological KM Infrastructure

Components	Function	Example Sub-categories
Knowledge creation and capture	Facilitating in knowledge creation	Abstraction, Authoring, Inference/Deduction
Knowledge structuring and storage	Facilitating knowledge organization and storage	Knowledge Repository, Expert D/B, Indexing, Document Management
Knowledge retrieval	Knowledge retrieval and searching	Search Engines and Agents, Data Mining and warehousing
Collaboration	Facilitating group work and interactions	KMS, Groupware, Workflow, Electronic Conferencing, Video Conferencing, Real-time Chatting, Email, BBS
Distribution	Automated notification and subscribing	Push Technology, Web Casting
Assimilation	Facilitating analysis, assimilation and understanding of information	e-Learning, Visualization
Networking	Networking with external related organization	CRM, SCM

Source) On the basis of Bourdreau. A and Couillard. G, *-ibid-* the author rearranged.

12 Bourdreau. A and Couillard. G, “Systems Integration and Knowledge Management,” *Information Systems Management*: Fall 1999, Vol. 16, Issue4, p. 24.

in time for systems integration work.

As mentioned above, the role of IT systems is becoming more important than ever, particularly in the current era of information economy. Many innovations associated with the Internet (e.g. hypertext navigation and information search engines) are now arriving on desktop level as the computing paradigm shifts from mainframe to client/server systems. Despite these technological changes underway, it is also true that conservative perspectives are still deeply rooted. The reason for this is that technological approaches are restricted to managing information rather than knowledge, though they could be regarded as powerful facilitating tools in knowledge creation.¹³

c) Structural KM Infrastructure

Effective KM requires a fundamental change in the way most organizations do business, and people are at the heart of any effective changes. Hence significant changes to organizational structure and rewards are typically required to support KM.

Table 3 shows a summary of the structural KM infrastructure, which encompasses component technology facilitating KM activities.

Firstly, the organizational structures within an organization may encourage or inhibit interactions among employees, a practice thought to be vital in effective management of knowledge (e.g. O'Dell and Grayson, 1998; Nonaka and Takeuchi, 1995; Grant, 1996; Sanchez and Mahoney, 1996). The structure must be flexible enough to encourage these vital interactions as well as to give the firm the flexibility to adapt to an ever-changing environment (e.g., Miles et al., 1997; Sanchez and Mahoney, 1996; Grant, 1996). Given the flexible organizational structure, the members of an organization can be encouraged to share knowledge and collaborate with each other across boundaries. In other words, organizational structure should be such a format that it can promote collective behavior rather than individual one, facilitate new knowledge systematically, and encourage knowledge sharing regardless of hierarchical position, department or function, gender and age, etc. On top of this, the organizational structure should facilitate easy access to knowledge holders within the KM framework. Institutionalizing KM department under the CKO (Chief Knowledge Officer), along with the designation of line and competency knowledge managers can also be supportive to these processes.

Sanchez and Mahoney (1996) suggest that a modular organization with a modular product design can reduce the costs of coordination and adaptation, thus increasing strategic flexibility. Sveiby (1997)¹⁴ points out that there are two types of structure: internal and external ones. The internal structure can be defined as the whole of patents, concepts, models, administrative system,

¹³ Neal G. Beamish and Collin G. Armistead, *-ibid-*

¹⁴ Karl E. Sveiby (1997), *-ibid-*, pp. 10-11.

Table 3. Summary of Structural KM Infrastructure

Components	Conceptual implementation	Process to support
Organizational structure	Formal and informal organizational structure -to share knowledge and collaborate each other across boundaries -to promote collective behavior -to facilitate new knowledge systematically -to encourage knowledge sharing regardless of hierarchical position, department or function, gender and age -to facilitate access to knowledge holders within the KM framework -to institutionalizing KM department, the CKO (Chief Knowledge Officer) and designation of line and competency knowledge manager	PI/PII/PIII/PIV
Incentive System	Recognition for improving organizational knowledge and collaboration with others	PI/PII/PIII

and organizational culture, whereas the external structure can be defined as the relationship with customers and suppliers, which encompass brand names, trade marks, and the company's reputation or image.

Another distinct structure with respect to KM was developed by Nonaka and Takeuchi (1995) under the name of 'hypertext organization', designed to support the '*middle-up down*' management style. Such kind of organization is made up of three interconnected layers or contexts: the business system, the project team, and the knowledge base. This type of an organization has a combination of a formal organization structure and non-hierarchical, self-organizing structure. Along with these issues, incentive systems can support the KM activity as a structural capability. Organizations are used to being held together by rules and procedures providing continuity and clear code of behaviors. In order to encourage knowledge creation and sharing activities, incentive systems are needed in addition to organizational structure (Leonardo-Barton, 1995; O'Dell and Grayson, 1998).

2) Process Capability

Table 4 shows a summary of perspectives based on KM process in the literature. Unlike the KM infrastructure, the definitions and implementation are not clearly defined, with fragmented or redundant views as per the table. Some authors are emphasizing PI (Acquisition/Creation) as the most important aspect of KM process but there are others giving their preferential importance to PII (Conversion/Accumulation) or PIII (Application/Sharing). This is also the case with the PIV (Protection/Controlling) as well, apparently reflecting the enhanced awareness about the intellectual properties along with security of computerized data and system resources.

Table 4. Perspectives Summary on KM Process in literature

Sub dimension	Theorist	Conceptual Implementation
PI (Acquisition/ Creation)	Thurrow, 1996; Inkpen and Dinur, 1998	Improved use of existing knowledge
	O'Dell and Grayson, 1998	Benchmarking for identifying gap and problem
	Leonard-Barton, 1995 Nonaka and Takeuchi, 1995	Collaboration between individuals. Creating knowledge
	Powell, 1998; Inkpen and Dinur, 1998	Collaboration between organization
PII (Conversion/ Accumulation)	Nonaka and Takeuchi, 1995	Articulating tacit knowledge into explicit concept and combining different bodies of explicit knowledge
	Davenport, 1998	Community-based electronic discussion and knowledge repository
	Hansen, 1999	Developing networks for tacit knowledge sharing
	Kogut and Zander, 1995	Structuring, coordinating and communicating through guide lines, technology, and employee interaction
PIII (Application/ Sharing)	Appleyard, 1996	Utilization of public and private channel for knowledge transfer and expecting benefits outweighing the cost for knowledge sharing
	Kogut and Zander, 1992; Kraatz, 1998	Effective storage and retrieval mechanism for organizational knowledge
PIV (Protection/ Control)	Porter-Liebskind, 1996	Incentive alignment, employee conduct rules for knowledge protection

a) Creation and Acquisition Process (PI)

Part of managing knowledge within the organization is having process in place that creates or acquires knowledge. Two primary means for collecting knowledge are (1) to create new knowledge out of existing knowledge through collaboration among individuals and partners, or (2) seek and acquire entirely new knowledge (e.g. Leonardo-Barton. 1995; Inkpen. 1996 ; Nonaka and Takeuchi. 1995; Mowery et. al. 1996)

In order to achieve these capability, an organization should distribute knowledge throughout the organization and exchange knowledge even with external partners so that knowledge upgrade can happen incessantly through bench-marking best practice, feedback of projects experience to subsequent projects, etc.

b) Conversion and Accumulating Process (PII)

An organization must also acquire the capability to make knowledge useful (i.e. convert it into useful form). There are numerous aspects to this process characteristic. The organization must organize and structure knowledge, thereby making it easier to access and distribute it

within the organization (O'Dell and Grayson, 1998; Nahapiet and Ghoshal, 1998; Nonaka and Takeuchi, 1995). Through combining or integrating knowledge, redundancy can be reduced and efficiency can be improved by excess volume (Baumard, 1996; Daft and Weick, 1984; Davenport and Klahr, 1998; Grant, 1996). In addition, the conversion and accumulating of specialized knowledge represents a fundamental aspect of transformation (Grant, 1996; Walsh and Ungson, 1991; Wernerfelt, 1984). Organizations must carefully transform aspects of tacit knowledge into explicit knowledge. If the firm does not recognize transferable components of tacit knowledge, then efficiencies in production and innovation may be lost. In order to perform conversion/accumulating process, following activities are necessary: converting competitive intelligence into action plans, filtering and evaluating knowledge, transferring organizational knowledge into individuals, absorbing individual knowledge into organization, absorbing partner knowledge into the organization, integrating different sources of knowledge, and replacing outdated knowledge, etc.

c) Application and Sharing Process (PIII)

In order for the accumulated knowledge to be shared by other employees who require it, effective storage and retrieval mechanism should be available for quick and easy access. In addition, sharing knowledge with outsiders is also seen as an effective way to improve knowledge about competitors and the industry and acquire local knowledge (Almeida, 1996; Appleyard, 1996). In order to perform application/sharing process, following activities are necessary: applying knowledge from past mistakes, using knowledge to solve new problems, matching sources of knowledge to problems, applying stored knowledge for improve efficiency, using knowledge to adjust strategic direction, and linking sources of knowledge for solving problems.

d) Protection and Controlling Process (PIV)

Knowledge should be protected from inappropriate use or illegal use or from theft. Protection is vital if the knowledge is used to generate or preserve a competitive advantage (Porter-Liebskind, 1996). While part of the protection mechanism can be built into the technology infrastructure, other forms of protection should also be established that control the behavior and conduct of employees as well as aligning incentives (Kaplan, Naidu and Tripathi, 1984; Hansen, Nohria, and Tierney, 1998; Porter-Liebskind, 1996). These steps will help to prevent inappropriate use of the knowledge although nothing can guarantee complete protection. In order to perform the protection/controlling process, following activities are necessary: protecting knowledge from inappropriate use or being leaked in and outside the organization, restricting access to some sources of knowledge by password technology, identifying restricted knowledge easily, protecting tacit knowledge, and, most importantly, communicating the importance on corporate

level.

3 . Conceptual definitions of KM Performance¹⁵

As concerns the knowledge management performance, we must admit that knowledge management is only one of several contributing factors of organizational performance. There is no widely agreed-upon measure of organizational performance, since it can be either market-based or profitability-based, with numerous iterations of each. Thirdly, direct inference of causal implementation is virtually impossible given the current stage of theoretical development within the knowledge management. In this study we suggest two categories of conceptual implementation, namely KM effectiveness, and satisfaction. As implied in the preceding discussion, a central tenet underlying the existence of KM capabilities is its association with *organizational effectiveness* (Cohen and Levinthal, 1990; Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995). Observers of strategic management note that organizational effectiveness is not a well-developed concept. It is likely more complex in terms of description than measures or financial ratios (Chakravarthy, 1987; Hart and Bainbury, 1994; Hart, 1992; Ramannujam, Venkatraman, and Camillus, 1986; Venkaraman, 1990). Therefore we have divided the effectiveness into three sub-groups in accordance with characteristics and its focus: *innovativeness*, *productivity*, and *adaptability*. *Innovativeness* includes contributing to management renovation, and development of new products and services. In particular, the organization should experience effects in which it improves over time in its capabilities for creating value (Bohn, 1994; Dutton and Thomas, 1985; Galunic and Rodan, 1998; Kelly and Amburgey, 1991; Kogut and Zander, 1993; Huber, 1991). Therefore, while it seems that capturing the contribution of knowledge capabilities in terms of bottom line figures (ROI, ROE, etc.) may be significantly confounded by many uncontrollable economic and environmental factors, other less confounded contributions of performance may provide insight into the value-added and *productivity* aspect of this organizational resource. These include 'decreased customer response time', 'avoiding overlapped approach by units', 'streamlining and integrating internal process', 'reducing redundancy of information', 'coordinating the development efforts of different units', etc. Meanwhile, a key contribution to *adaptability* includes 'adapting to unanticipated changes'. Satisfaction is evenly regarded as an important resultant performance, since customers are the very sources of all business activities. It is not only important for external customers, but also internal ones with particular points that without satisfying the internal customer, no satisfaction is sustainable for the external one either.

¹⁵ In organizational learning literature, as a core organizational functional superiority the term of 'absorptive capacity' is placed for firm bounded rational mind, striving for relative excellence. (See 'Absorptive and Technology change', Khalid M.Bhatti, Swedish School of Economics and Business Administration, 2003)

Table 5. Perspectives Summary on KM Performance

Category		Conceptual Implementation
Effectiveness	Innovativeness	Contributing to management renovation Developing new products and services
	Productivity	Decreasing customer response time Avoiding overlapped approach by units Streamlining and integrating internal process Reducing redundancy of information Coordinating the development efforts of different units
	Adaptability	Adapting to unanticipated changes
Satisfaction	Internal C/S External C/S	Customer satisfaction (C/S) level improvement

4 . Conclusion

What are the key dimensions of organizational capability as they relate to knowledge management? The various discussions and perspectives so far in the knowledge management arena have been revolving around two main streams: one based on process, and the other on infrastructure. These perspectives by academics as well as practitioners seem to be much fragmented in terms of level of analysis and its strategic implication. This is why a lot of organizations and executives still find much difficulties and disorder in a certain sense as to how to go about the KM project or as to what KM is really about. In this study, we suggest that these two perspectives, fragmented in its nature, should be integrated to enhance its applicability in real business setting. This rather simplistic view, analogized by the software and hardware side of computing, further suggest that KM process (software) and infrastructure (hardware) should be approached simultaneously in a strategic context of KM capability which has to be developed on both organizational and individual level. In short, the research model of this study conceptualizes KM performance – the ultimate purpose of KM – as a dependent variable, is the function of these two capabilities as the determinant or independent variables. Based on the questionnaire toward Korean KM experts, we will further investigate the validity of this model through empirical survey, through which we will be able to examine our further research question more clearly: what sort of activities and attributes¹⁶ in each capability dimension will determine the KM performance (effectiveness and satisfaction), and what is the correlation among the variables?

16 In this paper, to simplify we use the terminology 'proxies' as components of each capability. A total of 60 proxies are developed along the discussions of this paper, mostly similar to 'conceptual implementation' in Table 1-5 of chapter 2 of this paper: 24 proxies for infrastructure, 26 proxies for process, and 10 proxies for performance. Details of the proxies consist of an actual questionnaire, which will be included in the appendices of this study.