논문

Validation of the Knowledge Management Stage Model

Dae Young Lee* and Young Gul Kim**

Contents

An effort for validating and refining the knowledge management (KM) stage model, suggested by Lee and Kim (2001) was made. A survey and a multiple case study were conducted and analyzed based on related literature. Our findings verify the existence of the temporal sequence in KM implementations, validating the KM stage model. In an effort to update the stage model, we propose a new management object, community of practice (COP), which has come to the front of knowledge management issues lately and supplementary managerial actions.

Keywords: Knowledge Management Stage Model; KM Implementation

* 한국국방연구원 연구원, cupido@kida.re.kr
주요논저 : Dae-Young Lee, "Validation of the Knowledge Management Stage Model: A Triangulation Approach", Master's Thesis, KAIST, 2003

**한국과학기술원 테크노경영대학원 교수, domino2@unitel.co.kr
주요논저 : Gee-Woo Bock, Robert w. Zmud, Young-Gul Kim, and Jae-Nam Lee, "Behavioral Intention Formation in Knowldege Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate," *MIS Quarterly*, Vol. 29, No. 1, 2005, pp. 87-111.

I. Introduction

As the 21st century spreads out, many people regard the strategic management of knowledge resources as one of the key factors for sustainable competitive advantages. O'Dell and Grayson (1998) stressed only those organizations that methodically, passionately, and proactively find out and transfer what they know, and use it to increase efficiency, sharpen product-development edge, and get closer to their customers, will not only survive, but excel. The increasing interest on knowledge management led to a considerable number of studies on organizational knowledge initiatives.

However, in spite of various theoretical development and practical attempts in knowledge management, there is no common agreement on how to manage organizational initiatives for knowledge management (Lee and Kim, 2001). Although many researchers have investigated which factors are essential for managing knowledge effectively, there is little research which focuses on when and how organizations should manage them.

A knowledge management stage model proposed by Lee and Kim (2001) addresses the process of building organizational capacity of knowledge management. Despite the model's contribution through the provision of an integrated knowledge management framework, the model lacked solid empirical validation. This article aims to validate and refine the knowledge management stage model based on real world KM implementations.

II. Research Design

1. Research Framework

Lee and Kim (2001) provided four management objects of knowledge management organizational knowledge, knowledge workers, knowledge management process and information technology. Additionally they explained the current growing organizational

initiatives around the four management objects with an integrated framework.

By combining perspectives of life cycle theory and teleology, they also proposed a stage model to explain the process of building organizational capacity of knowledge management. According to the model, organizational capability of knowledge management grows through the following four stages: Initiation, Propagation, Integration, and Networking.

The first stage is an initiation stage in which organizations start to recognize the importance of organizational knowledge management and prepare for enterprise-wide knowledge management efforts. The major issue of strategic management in this stage will be how to make its organization prepare for the enterprise-wide knowledge management initiative. The propagation stage is a stage where organizations start to invest in building their knowledge infrastructure to facilitate and motivate knowledge activities. The main concerns of organizational managers at this stage are how to build knowledge infrastructure efficiently and how to expand knowledge activities.

The integration stage is where organizational knowledge activities are institutionalized as daily activities over the whole organization. The key management concern of this stage is how to integrate the diverse and distributed organizational knowledge and leverage them to organizational products, services, or processes. The final stage is an external integration stage where organizational knowledge is networked not only within an organization but also with external entities such as suppliers, customers, research firms, and universities. The key management issue of this stage is how to facilitate the knowledge transfer through external alliances. Managerial actions to achieve management goals in each stage are also provided in their model.

To validate the proposed stage model, they conducted a latent content analysis of 21 knowledge management case reports after developing a set of checklists for management goals, managerial actions, and characteristics of management objects in each stage. A content analysis is a technique of making inferences from secondary data to measure or observe variables of interests (Kerlinger, 1973). It is generally applied to available materials such as archival records, documents, live reportage, newspaper articles, and so on, as sources of data, especially produced for a particular research problem. The materials of a content analysis can

be analyzed, based on either manifest or latent contents (Babbie, 1992). While the manifest content analysis is to count the number of the visible and surface content, the latent content analysis is to find the underlying meaning of the contents. As Lee Kim tried to validate the suggested model with a preliminary study, a latent content analysis, they could not verify the temporal sequence in knowledge management implementation.

In this article, more solid empirical validation of the stage model will be conducted. Based on empirical study methods, there will be some explanations, modifications and additions to the stage model. Dimensions of analysis are the management goals, management objects and managerial actions of knowledge management.

2. Research Methodology

Previous studies that proposed a stage model of organizational development and changes validated their models by testing the antecedents and consequences of strategic changes. While some of them utilized large samples and statistical methods, others conducted a set of in-depth case studies spanning several years (Miller & Friesen, 1984). Though a large sample cross-sectional study cannot explain the causes and results of the process and a small sample longitudinal study is short on generalizability, both methodological approachesin organizational change theories are mostly focused on organizational events or strategic actions (Rajagopalan & Spreitzer, 1996; Van de Ven & Poole, 1995).

Therefore, in this article, a survey will be conducted as a preliminary study for refining the foci of analysis, that is, selecting items worthwhile to investigate thoroughly in the checklist for managerial actions. Based on the refined foci of analysis, a multiple case study with the investigation of related literature will be conducted to explain, modify and add to the stage model.

(1) Survey

To find the foci of analysis on which we should focus in a case study, checklists for

managerial actions in knowledge management implementation was distributed. As other checklists in the stage model for knowledge management objects and goals were not easy to answer objectively, only the checklists for managerial actions were distributed. Part of the checklists for managerial actions of Lee and Kim (2001) are presented in table 1. A respondent, the leader of a knowledge management team (henceforth referred as a KM team) in each company was required to choose one answer out of three 'already implemented', 'plan to implement in half a year' and 'no plan to implement'- for 37 items. A KM team is an organizational unitwhich plans, implements, and administers knowledge management initiatives within an organization.

〈Table 1〉 Lee & Kim's checklists for managerial actions

Initiation	Propagation	Integration	Networking
Create visions and goals of knowledge management.	Introduce the knowledge management system..	Define 'core knowledge' or 'core competence' areas.	Make knowledge alliances with suppliers, customers, or other knowledge partners.
Conduct case study (or benchmarks) of best practices.	Set up an organizational knowledge typology.	Monitor or control knowledge activities.	Link the knowledge sharing system to that of partners'.

In this survey, the unit of analysis was the organization that had launched knowledge management initiatives. To make a sample frame, a list of 1,337 organizations which had enrolled their employees or executives in knowledge management education programs or communities in Korea was made. After selecting 630 organizations randomly from the list, we contacted the leader of the KM team of each organization to ascertain whether his/her organization was actually running knowledge management programs and explain the purpose of this study. Among organizations contacted, 250 organizations expressed an intention to receive survey questionnaires. Survey questionnaires were mailed to the KM team leaders of 250 organizations with a brief description of the survey and a return envelope.

Out of 250 distributed questionnaires, we made the first analysis of 48 questionnaires which were collected from April 1, 2002 to May 8, 2002 through plotting graphs. Based on the result of the first analysis, questionnaires of three firms were excluded from further

analysis because those firms seemed to neither implement knowledge management nor have the will to introduce it (they implemented less than 5 and do not plan to implement more than 20 out of 37 check items). As the questions were made in nominal scale, the analysis was mainly based on plotting some graphs. The analysis of questionnaires was conducted as follows.

Selecting the target firms for analysis: After excluding three firms from the analysis which implemented less than 5 and have no plan to implement more than 20 out of 37 check items, 45 firms were selected as the targets of analysis.

Clustering target firms into four groups: As the degree of knowledge management implementation of each firm was differentiated, target firms were clustered into four based on the number of 'already implemented' items in each stage (Cluster Analysis).

Sorting the check items: After we compared the graphs of each group, some check items which showed different characteristics from other items in the same stage were moved to other stages. Those moved items were focused on as the major foci of analysis in the case study.

Adding the meaning to the sorted checklist: Some explanations and modifications were given to the sorted checklist by integrating with the result of case study. After that, a revised set of checklist was obtained as one of the results in this research.

(2) Case Study

Through the systematic review of some literatures, Eisenhardt (1989) provided a guideline for building theories from case study research. Although this research is not for building theories, empirical validation and modification of existing model can be done through a case study in the similar way. So this research was conducted based on Eisenhardt's guidelines as follows.

Getting Started: Firstly, a comprehensive research question was defined as 'What should be managed for successful knowledge management evolution? how should the managerial actions for knowledge management change over time and' Based on the knowledge

management stage model of Lee & Kim (2001), management goals, management objects and managerial actions were selected as major dimensions of analysis to answer the research question. Those dimensions of analysis were refined by a preliminary survey.

Selecting Cases: As this research is for investigating the development of knowledge management in the organization, it is desirable to select firms in which it has been some time since the introduction of knowledge management and firms which show quantitative or qualitative performance as the result of knowledge management implementation. For this, six firms which were recognized as the pioneering ones in knowledge management implementation were selected out of forty firms in a consortium with KAIST Knowledge Management Research Center. In addition to that, four firms which were in the state of knowledge management initiation were selected additionally to supplement the characteristics of initiation stage on the grounds that knowledge management of most firms in Korea were in the state of initiation.

Crafting Instruments and Protocols: Before getting into the interview, the focus of interview was determined after some data of target firms were collected from newspapers and websites of the firms. Three different kinds of interview sheets were comprised. CKO, the leader of a KM team and general employees in the field were determined as the target interviewees. The goal and vision of knowledge management would be collected through interviewing CKO. Change in management objects and managerial actions as firms'knowledge management develop would be collected through interviewing the leader of KM team. And by investigating the recognition and satisfaction of general employees in the field, the knowledge management stage to which each firms belonged would be determined more objectively.

Entering the Field: Interviews were conducted from January to March of 2002. In all ten firms, the leader of a KM team and two or three general employees in the field were interviewed. As there were no CKOs or it weren't able to make appointments with him in four firms, the contents of the interview sheet for CKO were gotten from the leader of a KM team for those firms. The interviews were conducted for about 3 hours. More than three investigators participated in each interview. There was discussion between the investigators

and interchange of the opinions right after each interview. The templates for the interviews were also modified and complemented at that time. Additional data for firms were collected from September to October in 2002.

Analyzing Data: Each case was summarized after the analysis of findings in the interview and additional data. After that, the characteristics of case firms were described in about two or three pages by applying same dimensions to each case. The stage to which each firm belong is decided through the discussion of the interviewers. Cross-case pattern analysis was also attempted.

Shaping Hypotheses: After summarizing the findings of survey and cross-case analysis, there were some efforts for explaining the logic for new findings. Instead of making hypotheses, the stage model was revised with some modifications and additions.

Enfolding Literature: For the explanation of findings, some literatures which were closely related to the findings were provided. Besides, some trials were attempted to explain findings which contradicted the framework for this research.

Reaching Closure: Research was finished with revised knowledge management action-lists and additional management object, Communities of Practice (henceforth referred as CoP).

III. Results

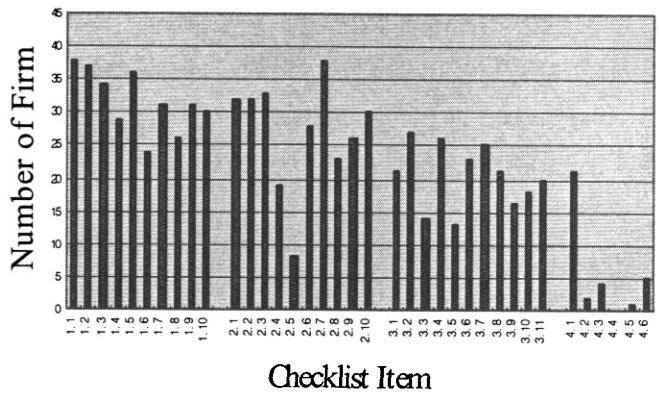
1. Survey Results

In Figure 1, number of firms which implemented some activities closely related to each item in the checklist is shown. On the horizon axes of the figure, 37 items in the checklist are indicated. '2.1'in the axis, for example, means the first item of the second stage (i.e. the propagation stage). On the vertical axes, numbers of firms are marked.

Out of 45 respondent firms, more than 35 firms implemented such items as '1.1', '1.2', '1.5', and '2.7'. As '2.7' is an item of the second stage in the checklists, it looks abnormal (i.e. too many firms already implemented it) because even some items of the first stage are

implemented in less than 30 firms. Item '2.5'looks also abnormal because it is implemented in less than 10 firms and more than 10 firms replied that they did not plan to implement it. To find such abnormal items in detail, it is better to divide 45 firms into a fewgroups and investigate the differences in characteristics of each group.

<Figure 1> Implementation status of KM checklist items

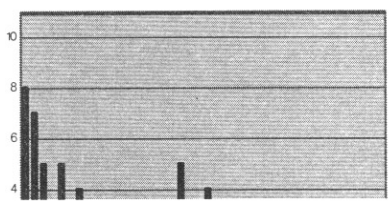


As the degree of knowledge management implementation of each firm is different, firms were divided based on the number of items they implemented in each stage.A clustering analysis was conducted for that. Since there is no standard technique for determining the appropriate number of clusters, and clustering, in this research, is just for exploratory division of firms to investigate the characteristics in detail, we fixed the number of clusters as 4. A hierarchical clustering analysis was conducted with Ward's methods which apply sum of squares as measures of similarity.

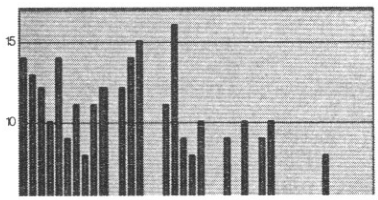
As a result of the clustering analysis, firms in four groups were determined. Those groups were named as the initiation group, the propagation group, the integration group, and the networking group depending on the number of implemented items, i.e. initiation group had implemented the least items while networkinggroup, the most. There were 11 firms in the initiation group, 17 firms in the propagation group, 12 firms in the integration group, and 5 firms in the networking group.

Number of firms which implemented each item in each group is shown in figure 2. More than 4 firms in the initiation group implemented items '1.1', '1.2', '1.3', and '1.5' while less than 2 firms implemented '1.6', '1.8' and '1.10'. The average number of firms that implemented the items of initiation stage of this group is 3.7 firms. When we draw a horizontal line which represents that average number (i.e. 3.7), items '1.4','1.6','1.8'and '1.10' are detected as abnormal items because numbers of firms which implemented those items are far below the average line. Items '2.1', '2.7' and '2.10'are also detected because too many firms in the initiation group implemented those items of the later stage. In the same way, we can detect items '2.4'. '2.5', '3.2', '3.4', '3.6' , and '3.7' as abnormal ones in figure 2 (b) by drawing an average line (i.e. 10.2 firms, the average number of firms which implemented the items of the propagation stage of the propagation group). We can also detect items '2.4', '2.5', '3.5', and '4.1' in figure 2 (c) by drawing an average line (i.e. 8.7 firms), and items '4.2', '4.4', and '4.5' in figure 2 (d) by drawing an average line (i.e. 2.5 firms).

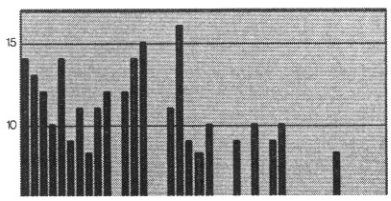
<Figure 2> Implementation status of checklist items in each stage group



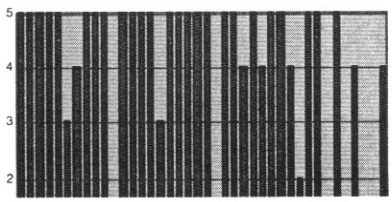
(a) Initiation Group (11 firms)



(b) Propagation Group (17 firms)



(c) Integration Group (12 firms)



(d) Networking Group (5 firms)

Based on the results above, arrangement of items in the checklists was modified. Therearranged checklist is shown in table 2 (Items in bold style are the ones which moved to different stages).

〈Table 2〉 Rearranged checklist

Stage	Items	# of items
The 1st stage	1.1 1.2 1.3 1.5 1.7 1.9 2.1 2.7 2.10	9
The 2nd stage	1.4 1.6 1.8 1.10 2.2 2.3 2.6 2.8 2.9 3.2 3.4 3.6 3.7 4.1	14
The 3rd stage	2.4 3.1 3.3 3.8 3.9 3.10 3.11	7
The 4th stage	2.5 3.5 4.2 4.3 4.4 4.5 4.6	7

Those 15 items written in bold style in table 2 (i.e. the items which were rearranged to another stages) and 3 items ('4.2', '4.4' and '4.5') which most companies had not implemented yet were selected as major foci of analysis for the following case study research. To see the temporal sequence of knowledge management implementation which Lee & Kim (2001) could not verify through a latent content analysis, we calculated the average implementation period of each group. As can be seen in table 3, the initiation group has the shortest implementation period in average while the networking group has the longest implementation period in average.

〈Table 3〉 Implementation period of each group (months)

Period / Group	Average	Standard Deviation	Minimum	Maximum
Initiation	19	15.9	2	48
Propagation	25.3	18.8	3	87
Integration	34.7	11.5	15	51
Networking	40.8	15.5	26	67

We can see that the period of KM implementation gets longer as the stage of group gets higher. Therefore, it can be concluded that firms implement items in the initiation stage firstly, and then implement items in the next stages sequentially.

2. Case Analysis

(1) Characteristics of Case Firms

Based on the degree of knowledge management implementation, case firms can be categorized into three. Firm A, B, C and D are in the integration stage because organizational knowledge activities are institutionalized as daily activities over the whole organization. Most of them consider how to integrate the diverse and distributed organizational knowledge and leverage them to organizational products, services, or processes. Although some of them make efforts to link with external entities, those are still in the incipient stage of making external knowledge networks. As firm E and F started to invest in building their knowledge infrastructure to facilitate and motivate knowledge activities, they are in the propagation stage. The main concernsof them are how to build knowledge infrastructure efficiently and how to expand knowledge activities. Lastly, firm G, H, I and J seem to be in the initiation stage. They started to recognize the importance of organizational knowledge management and prepare for enterprise-wide knowledge management efforts.
Some characteristics of knowledge management implementation are provided in table 4. Firm A, B and C initiated knowledge management in 1999 while firm G, H and I introduced it in 2001. Although firm A, B,C, D and F introduced KMS in 2000, firm G and J don'thave it yet. Top managers proposed the knowledge management implementation in 7 firms while middle managers or employees suggest it in other firms.

The KM teams of firm B, C, G and J belong to human resource departments. Those of firm A, D, E, and F belong to kinds of management planning and strategic department. Other firms' KM teams are in IT department. Firms in the integration stage and the propagation stage have CKO except firm A. But, the leader of KM team in firm A has

enough power to implement knowledge management strategy without CKO. Firms in the initiation stage have appointed neither CKO nor KM related employees in the field division.

〈Table 4〉 Some KM related characteristics of case firms

Firm	Date of KMS introduction	Proposer for KM	Number of CoPs
A	2000/10	Middle	900
B	2000/02	Top	120
C	2000/09	Top	420
D	2000/07	Top	50
E	2001/09	Middle	25
F	2000/06	Top	None
G	-	Top	177
H	2002/02	Top	None
I	2002/01	Top	None
J	-	Bottom	None

(2) Integration of Case with Survey Results

As a result of a preliminary survey study, 18 items of the checklist for managerial actions were selected as the foci of analysis in the case study research. To explain the reason why those items show abnormal characteristics, we analyzed each item by integrating with the knowledge management implementation histories of case firms.

Firstly, transition period from one stage to the next stage was deduced by comparing the characteristics of management goals and major managerial actions in the stage model with those of case firms. Table 5 summarizes those transition periods of firms. As Firm A, B, C, and D were in the integration stage, they have two transition periods, i.e. one transition period from the 1st stage to the 2nd and the other one from the 2nd stage to the 3rd. Firm E and F have one transition period because they were in the propagation stage. Other 4 firms were still in the initiation stage.

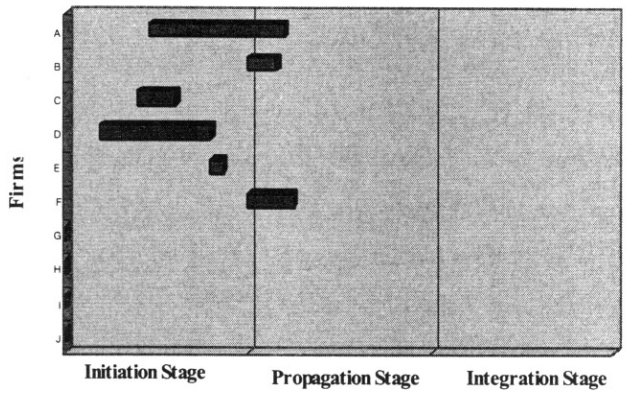
〈Table 5〉 Transition period of KM stages

Firm	Date of KM initiation	Transition period from 1st to 2nd stage (months from initiation)	Transition period from 2nd to 3rd stage (months from initiation)
A	1999/03	2000/03 ~ 2000/06 (12 ~ 15)	2001/01 ~ 2001/03 (22 ~ 24)
B	1999/05	1999/12 ~ 2000/02 (7 ~ 9)	2001/01 ~ 2001/03 (20 ~ 22)
C	1999/01	2000/03 ~ 2000/06 (14 ~ 17)	2001/06 ~ 2001/09 (29 ~ 32)
D	2000/01	2000/05 ~ 2000/07 (4 ~ 6)	2001/12 ~ 2002/02 (23 ~ 25)
E	2000/04	2001/06 ~ 2001/08 (14 ~ 16)	Not yet
F	2000/04	2000/12 ~ 2001/01 (8 ~ 9)	Not yet
G	2001/04	Not yet	Not yet
H	2001/06	Not yet	Not yet
I	2001/06	Not yet	Not yet
J	2001/09	Not yet	Not yet

Figure 3 and 4 shows implementation period of item '2.1' and '2.7'in the checklist for each case firm respectively. As the date of knowledge management initiation andtime spent for reaching next stage is differentiated in each firm, we normalized time to interested events from the knowledge management initiation through dividing it by time to transition period in table 5. In case of firms in the initiation stage, we guessed when they could reach the propagation stage.

In figure 3, implementation period for item '2.1' of each firm is shown. Item '2.1' is 'Make a team (Committee or management team) to manage organizational knowledge resources'.

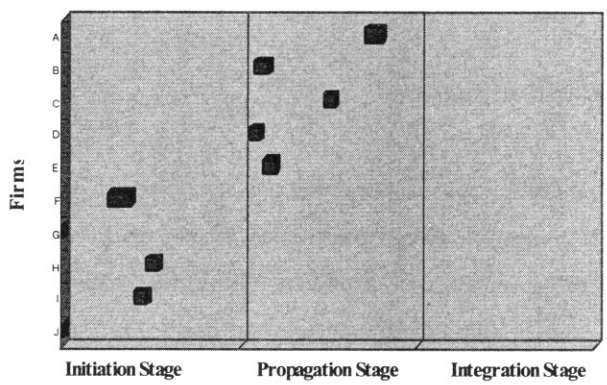
<Figure 3> Implementation Period for Item '2.1'



In the figure, we can see that most firms implemented it in the initiation stage. Firm B, C and D appointed the team or employees almost at the same time with appointing KM team. Although firm G, H and J did not implement it, they had plans to make the teams or employees soon. Only firm I had no plan to implement it because the purpose of knowledge management of the firm is making employees share the documented information through the KMS. The firm was trying to make KMS a basic tool for processing employees' work.

As the goal of this item doesn't contradict the management goal of initiation stage, i.e. preparation for enterprise-wide knowledge efforts, it would be better for this item to move into the initiation stage.

<Figure 4> Implementation Period for Item '2.7'



In figure 4, implementation period for item '2.7' of each firm is shown. Item '2.7' is 'Introduce the knowledge management system'.

In the figure, we can see that firm A, B, C, D and E introduced the KMS in the propagation stage while firm F, H, and I introduced it in the initiation stage. The former firms introduced KMS after fostering knowledge management culture. Firm G and J also had tried to foster knowledge management culture by the time we interviewed them. As knowledge management of firm F, H, and were IT-oriented, their knowledge management started with the introduction of KMS.

When we measure the performance of knowledge management by the number of registered knowledge and number of knowledge-viewing, the performance of IT-focused firms was worse than other firms which introduced KMS after fostering knowledge management culture. So we recommend the introduction of KMS should stay in the propagation stage in which the goal of knowledge management is for infra-building.

As space is limited, detailed explanations on other 16 abnormal items in the survey results will not presented in this article. The final results of the analysis on the 18 abnormal items can be summarized as follows.

Items which need movement into other stages (i.e. items which support survey results): 2.1, 2.4, 2.5, 3.4, 3.7, 4.1

Items which need not to move (i.e. items which do not support survey results): 1.4, 1.6, 1.8, 1.10, 2.7, 2.10, 3.2, 3.5, 3.6

Items which have difficulties in actual implementation: 4.2, 4.4, 4.5

(3) Additional Analysis of Cases

In this section, additional findings of case study not directly related with the survey study will be presented. As a new knowledge management object which needs to be managed effectively, CoP will be suggested. Some knowledge management actions to supplement the checklist of the stage model will also be treated.

As shown in table 4, a large number of CoPs are managed in many firms. Since CoPs

were regarded as main subjects of managing the quality of knowledge in firm A, they had been managed since the initiation of knowledge management implementation. Firm B also had managed CoPs for cultivating knowledge-sharing mind and promoting communications between employees since September, 2001. CoPs of firm C were famous for their visible performance. In the firm, culture of learning was settled and lots of problem-solving had occurred through the activities of CoPs. CoPs had been managed since the beginning of year 2000 which was in the firm's initiation stage of knowledge management.

CoP is defined as a group of people informally bound together by shared expertise and passion (Wenger and Snyder, 2000). According to Wenger and Snyder (2000), it gives much value to companies such as solving problems quickly, transferring best practices, developing professional skills, helping strategy, starting new lines of business, and helping companies retain talent. It has not been so long time since the importance of CoP was emphasized. It has been brought to fore with the dissemination of knowledgemanagement paradigm due to the nature of knowledge. Wenger et al. (2002) explained those nature of knowledge knowledge lives in the human act of knowing, knowledge is tacit as well as explicit, knowledge is social as well as individual, and knowledge is dynamic.

Although Lee and Kim (2001) proposed knowledge worker as a knowledge management object, they missed regarding community as a separate object which needs to be managed specially. As methods for management of individual person are different from those for management of community, we propose CoP (or knowledge community) as a separate object of knowledge management.

To provide some managerial actions for managing CoP, we adopted Wenger et al.(2002)'s stage model of CoP. In their model, CoPs develop through potential stage, coalescing stage, maturing stage, and stewardship stage.

Firm A, B, and C in the case study introduced CoP strategically for managing quality of knowledge, promoting communications and solving lots of problems. Firm B startedto manage CoP with the introduction of KMS. After appointing some CoPs instead of letting them be grown spontaneously, KM team supported them to set up their goals. And then, the team disseminated best practices of CoP to motivate other CoPs'activities. As the next

step of CoP management, the team considered making network with external partners.

Based on the observations in the case study and the literature,we propose to add managerial actions in each stage to Lee and Kim's model of knowledge management implementation as shown in table 6.

〈Table 6〉 Recommended Managerial Actions for CoP Management

Stage	Recommended Actions
Initiation stage	Discover and identify potential communities
Propagation stage	Legitimize community coordinators to help communities to set up their goals
Integration stage	Disseminate best practices guidelines of CoP
Networking stage	Seek relationship and benchmarks outside the organization

In addition to CoP-related activities, we found two knowledge management actions to add to Lee & Kim's model. Firm A, B, C, D and E had a problem on how to measure the performance of knowledge management implementation. Their focus of knowledge management in the early part of implementation was disseminating the needs of knowledgemanagement and promoting the employees'knowledge activities. As time went by, they could not help answering what benefits knowledge management had brought to the organization. By answering this, they could get continuous support from top managers and also make employees do the knowledge activities continuously. A KM team leader reminded us of the famous saying, "If you don't measure, you can not manage it". One of common methods they tried to adopt for measuring the outcomes was surveying knowledge capital of the firm.

The goal of measuring the outcomes of knowledge management also coincides with the that of integration stage in the Lee and Kim's model. Therefore, we suggest adding one action item into the integration stage as follows.

Measure the outcomes of knowledge management which contribute to the organization and individual workers, for example, by surveying knowledge capital.

We could find another novel action in firm A and B both of which were in the integration

stage. Firm A started knowledge-based businesses (KBB) in 2001 while the KM team of firm B were making a plan to start it. As they thought the outcomes of knowledge management could be commercialized, they were making some efforts for producing lots of knowledge packages. It also coincides with the management goal of integration stage in the Lee and Kim's model, that is, integration of knowledge management efforts to organizational outcomes. Therefore, we suggest adding another action item into the integration stage as follows.

Start knowledge-based business founded on the outcomes of the knowledge management.

IV. Discussion and Conclusion

To validate and refine the knowledge managementstage model, this study conducted a survey and a multiple case study. As a result of the survey study, we found abnormal actions we should focus on in the case study. In the case study, we observed when each firm had implemented those actions. Based on the observation, some movements and explanations were made on the location of each item. Out of 18 items we selected as abnormal items in the case study, 6 items were moved to other stages. Besides the observation on the original checklist of managerial actions, we found one additional knowledge management object and provided related managerial actions. Two more actions which firms in the integration stage had a tendency to implement were also found.

In the survey results, we could also observe the temporal sequence of knowledge management implementation which Lee and Kim (2001) could not verify in their study. As the stages of check items of Lee & Kim (2001) get higher, there were less items firms had already implemented. And the period of KM implementation gets longer as the stage of group gets higher. Besides, most firms investigated in the case study also followed the sequence of their stage model.

In this study, we could validate Lee and Kim (2001)'s knowledge management stage model by observing the sequence of managerial actions and the change of knowledge management

goals. Additionally, we proposed a new managementobject which has come to front of knowledge management lately and supplementary managerial actions. In other words, we could come to make up-to-date stage model.

This study is of interest from both academic and practical perspectives. Firstly, Lee and Kim (2001)'s stage model was validated empirically. Though they could not verify the temporal sequence of knowledge management implementation with a latent content analysis, the sequence was observed in this study.

Secondly, the framework of stage model is reinforced with the introduction of CoP as a separate knowledge management object. It means up-to-date knowledge management issue was reflected on the existing model.

Thirdly, this study also helps knowledge management practitioners by providing richer checklists to measure various knowledge management constructs. As managerial action items for managing CoPs and two other actions were complemented, practitioners come to get more comprehensive guidelines. They can also utilize the checklist for diagnosing their current status of knowledge management implementation.

The findings of this study are interesting, but they should be considered in the light of its inherent limitations. Firstly, the findings cannot be easily generalized due to the specific samples we gathered in the case study. As those samples were selected from the KM consortium at a university, there is a possibility that they may not represent the general firms. Secondly, as this case study was conducted at one point in time, it was not easy to catch the dynamics of the organization. Therefore, it might be desirable to conduct a longitudinal study on the migration of knowledge management from earlier stages and identify the critical success factors for successful knowledge management evolution over time. Thirdly, as none of the ten case firms was in the networking stage, it was hard to explore the abnormal items in the networking stage in detail. Investigation of the more mature firms in their knowledge management implementation is needed.

Lastly, although 6 items were added based on the observations and related literature, they are in the lack of empirical validation. They also need empirical validation in the same way we validated the existing items.

References

Babbie, E., *The Practice of Social Research*, Sixth Edition, Belmont, California: Wadsworth Publishing Company, 1992.

Eisenhardt, K.M., "Building Theories from Case Study Research", *Academy of Management Review*, Vol. 14, 1989, pp. 532-550.

Kerlinger, F.N., *Foundations of Behavioral Research*, Second Edition, New York: Holt, Rinehart and Winston, Inc., 1974.

Lee, J. H., and Kim, Y. G., "A Stage Model of Organizational Knowledge Management: a Latent Content Analysis", *Expert Systems with Applications*, Vol. 20, 2001, pp. 299-311.

Miller, D., and Friesen, P. H., "A Longitudinal Study of the Corporate Life Cycle," *Management Science*, Vol. 30, 1984, pp. 1161-1183.

O'Dell, C., and Grayson Jr, C.J., *If Only We Knew What We Know*, NY: The Free Press, 1998.

Rajagopalan, N., and Spreitzer, G. M., "Towards a Theory of Strategic Change : a Multi-Lens Perspective and Integrative Framework," *Academy of Management Review*, Vol.22, 1996, pp.48-79.

Van de Ven, A. H., and Poole, M. S., "Explaining Development and Change in Organizations," *Academy of Management Review*, Vol. 20, 1995, pp. 510-540.

Wenger E., Snyder, M., "Communities of Practice: The Organizational Frontier," *Harvard Business Review*, Jan-Feb, 2000, pp. 139-145.

Wenger E., McDermott R., and Snyder W., *Cultivating Communities of Practice*, Boston: Harvard Business School Press, 2002.

Appendix: Checklists for managerial actions

(a) Check lists for the initiation stage

No	Managerial Actions
1	Conduct a feasibility study of knowledge management implementation
2	Conduct seminars, training or education to disseminate the needs of knowledge management
3	Assess current organizational problems of knowledge management
4	Interview or survey to extract the requirements of knowledge management
5	Create visions and goals of knowledge management
6	Disseminate the knowledge management visions and goals through organizations events such as formal meetings
7	Appoint CKO (Chief Knowledge Officer) or Make T/F team to initiate knowledge management
8	Make a long-term plan for knowledge management with or without external help
9	Conduct case study (or benchmarks) of best practices
10	Conduct pilot projects

(b) Check lists for the propagation stage

No	Managerial Actions
1	Make a tem (Committee or management team) to manage organizational knowledge resources
2	Define a preliminary knowledge management process ranging from knowledge management acquisition to determination
3	Set up a performance and reward system such as 'knowledge mileage system' or 'knowledge master'
4	Develop KM education or training programs for knowledge managers
5	Make a career path program or recruiting program to acquire experts
6	Set up a organizational knowledge typology
7	Introduce the knowledge management system
8	Conduct organizational events such as a 'knowledge contest' or 'knowledge fair' to activate knowledge activities
9	Encourage or support informal or formal knowledge communities such as 'common interest group', 'discussion group' or 'study group'
10	Show leadership by top and middle managers to activate knowledge activities

(c) Check lists for the integration stage

No	Managerial Actions
1	Scan or analyze the changes of knowledge requirements according to environmental changes
2	Define 'core knowledge' or 'core competence' areas
3	Assign ownership of knowledge areas to managers of core business functions or processes
4	Monitor or control knowledge activities
5	Evaluate the quality and effectiveness of organizational knowledge by expert groups
6	Conduct the quality management activities such as editing, feedback, and determination of organizational knowledge by expert groups
7	Reward individuals or teams based on the quality of knowledge
8	Integrate the knowledge sharing system with other knowledge related systems such as EDMS, workflow management system, GroupWare
9	Link the knowledge sharing system to legacy operating system
10	Emphasize the leveraging organizational knowledge to process innovation or improvement by managers
11	Disseminate best practice guidelines for utilizing organizational knowledge

(d) Check lists for the networking stage

1	Manage the internal or external resources of organizational knowledge by expert groups (resource development, evaluation, maintenance)
2	Make knowledge alliances with suppliers, customers, or other knowledge partners
3	Conduct organizational activities such as regular meetings, and create committee with knowledge partners to share knowledge management visions and goals
4	Extend (or link) knowledge related policies or rules (measurement, rewards) to those of knowledge partners'
5	Link the knowledge sharing system to that of partners'
6	Facilitate or support external knowledge sharing activities such as conferences, contests, seminars with knowledge partners

국문요약

지식경영 성장단계 모형의 실증적 고찰

이대영 · 김영걸

지식 자원을 효과적으로 관리하기 위해 어떤 요인이 중요한 가에 대한 연구는 많이 있어왔지만, 언제 또 어떻게 그 요인들을 관리할 수 있는가에 대한 연구는 거의 없는 실정이다. 본 연구는 성공적인 지식경영을 위해 언제, 무엇을, 어떻게 관리해야 하는가에 초점을 맞추고 있다. 체계적인 문헌 고찰을 통해 지식경영이 발전해 나감에 따라 각 단계에서 관리해야 하는 목표와 관리활동을 네 개의 관리대상과 함께 제시한 이장환과 김영걸(2001)의 지식경영 성장단계 모형에 바탕을 두어 연구의 틀을 설정하였다. 제시된 모형은 전략적 변화 및 발전 이론을 지식경영에 적용함으로써 이론적, 실무적으로 큰 공헌을 하고 있지만, 실증적 검증의 부족이라는 한계를 안고 있다. 그러므로 본 연구에서는 설문 조사와 사례 연구를 통하여 성장 단계 모형의 검증을 수행한 후 보완된 단계 모형을 제시하고자 하였다. 본 연구는 이장환과 김영걸의 연구에서 검증할 수 없었던 성장 단계의 시간적 순서를 검증하고 모형의 세부 내용을 검증하였다는 점에서 이론적인 기여를 찾을 수 있다. 또 최근에 지식경영 이슈로 대두된 CoP를 기존 모형에 추가함으로써 보다 보완된 모형을 구성하였으며 지식경영 실무자들에게도 풍부한 관리 활동 지표를 제시함으로써 지식경영 구현에 도움이 되는 가이드라인을 제시하였다는데 실무적인 의의가 있다

주제어: 지식경영, 지식경영 성장단계 모형, 지식경영 구현