

S20-2**EFFECTS OF ADOPTING KMS BASED BUSINESS PROCESS
MANAGEMENT IN DESIGN COMPANIES IN KOREA**

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ABSTRACT: The value of intangible assets of a company attracts attention in enterprise management environment drastically changing. Following such a trend, many companies have adopted knowledge management. Especially in construction industry of which success of a project is easily affected by the capacity of various participants and work performers, we may find many cases to which the knowledge managements have been adopted. However, the domestic design companies have tended to be late to introduce the knowledge management or have difficulty in effective use of KMS already constructed. This study suggests KMS based on BPM (Business Process Management) and drives its effects to improve problems mentioned above. We drives the expected effects by studying the existing studies and surveying domestic design companies and suggests Prototype for introducing a real system.

Keywords: Knowledge Management, Business Process Management, KMS, BPM, Design Business Process

1. INTRODUCTION**1.1 BACKGROUND AND PURPOSE OF THE STUDY**

The value of intangible assets of a company attracts attention in enterprise management environment drastically changing. Following such a trend, many companies are adopting knowledge management to use invisible but intrinsic knowledge of work performs in management.

In construction industry of which success of a project is easily affected by the capacity of various participants and work performers and many performers cooperate for one project, big construction companies have tended to adopt knowledge management. However, the domestic design companies are late to introduce the knowledge management or have difficulty in effective use of KMS (Knowledge Management System) already constructed because of their complicated business process which has various participants and because of their business process performed by the tacit knowledge.

To improve such problems, we analyze the expected effects of KMS based on BPM (Business Process Management) which classifies knowledge respecting work of performers, visualizes a process and provides actively the knowledge on the process in domestic design

companies. Also, we suggest the concept of KMS Prototype based on BPM to improve work effectiveness of a domestic design company.

1.2 SCOPE AND METHOD OF THE STUDY

The study will be limited to the works of domestic design companies for the purpose of constructing the KMS based on BPM supporting design work of general constructing designing companies.

The method of the study will be following:

(1) Analyze the concept of knowledge management and KMS of domestic design companies by considering the existing studies

And, consider the concept and the function of BPM to conceptualize KMS based on BPM;

(2) Survey people who work for construct design companies to find the current situation of KMS in domestic design companies and the expected effects of application of KMS based on BPM in that field; and,

(3) Suggest the concept of Prototype for constructing KMS based on BPM in designing companies.

2. BACKGROUND

2.1 KNOWLEDGE MANAGEMENT

2.1.1 DEFINITION OF KNOWLEDGE MANAGEMENT AND KMS

Knowledge management, as a paradigm of general management, is the new management method which develops systematically intellectual property of an organization or knowledge or know-how of its constituents, share them as a general knowledge of the organization inside and improve the competitiveness of the whole organization by using the knowledge.¹

Table 1 Character of Business Process of Design Companies

Author	Title	Contents	Character
Bae Jungik and etc.	Suggest the way to improve design working process for design control model development	<ul style="list-style-type: none"> • Construction design is linear decision making process 	Linearity
Jeon Jaeyeol and etc	The method of constructing the supporting process of step-by-step cooperative construction design decision making	<ul style="list-style-type: none"> • Construction project requires the participation of various performers in design process because of its trend of complicatedness and diversity • Necessity of technical support in various field such as construction and mechanics 	Collaboration
Jung Yoon and etc.	Study for system development of step-by-step information management of design	<ul style="list-style-type: none"> • Construction plan is based on experienced facts rather than on hypothesis • Architect considers the demands of his client, function of a building, and limits • Character of creative work 	Importance of experience (knowledge)
Sin Jaewon and etc.	Suggest the method of business process modeling centered for effective design management in the process of cooperation in design work	<ul style="list-style-type: none"> • Big design companies have a manual of making blueprint but the rate of real application of the manual is at most 10% • Business process depends on the capacity of manager of each project 	Atypicality

Also, the knowledge management is the new management method for the survival of a company and the raise of the competitiveness of the company by creating and sharing knowledge in drastically changing management environment.¹

¹ Tichy, Noel & Sherman, Stratford, "Control Your Destiny or Someone Else Will", Now York: Dobuleday Currency, 1993, p.171.

Knowledge Management System (KMS) means a form of information system applied for controlling knowledge of an organization. In other words, KMS is the information technology base system to support and ameliorate the system process of creation, save, search, transference and application of knowledge.

Currently, in the field of domestic design, most of KMS have been adopted by big design companies and small and medium design companies rarely constructed the system. Even though they adopted the system, they did not use the KMS system successfully in practice.

2.2.2 THE CHARACTER OF BUSINESS PROCESS OF DESIGN COMPANIES

The work of design companies shows distinctive character of business by intrinsic personal experience and know-how. Furthermore, many participants involve in decision making process and communicate various information in such a complicated business processes. Table 1 shows the character of the business process of design companies.

When we derive the requirement functions of KMS of design companies based on the characters analyzed as characters of business process of design companies, we can formalize them as a systematic support of linier business process, a support of management of the knowledge which derived from the former process, a support of work participation of various cooperative constituents and a support of cooperative knowledge management, and a support of visualization of atypical and intrinsic business process and knowledge.

2.2 THE CONCEPT AND FUNCTION OF BPM

The flow of process management which has its purpose in amelioration of management effectiveness has changed through the concepts of 6 Sigma, BPR, and PI. Among those concepts, BPM (Business Process Management) which coordinates organization and information system centering around business process has been called the

Table 2 Functions of BPM

Function	Contents
Process design	Make performer design business process according to the inside or outside necessities
Process monitoring	Provide a chance to improve process through monitoring process for the purpose of process amelioration
Process management	Provide a function of management and improvement by letting performer participate in changing and modifying the process
Process automation	Function of automation which provides reiteration process which runs an another process in a process and automatically provide performers with former and post processes
Unification	Unifying performers and informations created in the process of business by coordinating information system and process

attention since 2002 by Smith and has spread in various industries including construction industry.²

The functions and the expected effects of BPM which were analyzed by considering the existing studies on BPM are following. The functions of BPM are generally divided into 5 functions of design, process monitoring, process management, automation, and unification. Table 2 shows the main functions of BPM.

When we arrange the effects of introducing BPM based on the functions of BPM, we can classify them into improvement of quality of produced goods, automation of a process, improvement of flexibility of a process according to the company inside or outside environmental change. Table 3 shows effects of BPM.

Table 3 Effects of BPM

Effects	Contents
Reduce Cost	Prevent the loss by avoiding overlapping and confusing works
Improving quality of goods	Improve the quality of goods by effective management and continuous amelioration of business process
Process visualization	Acquiring the effectiveness and easiness of management by visualizing business process
Process automation	Raising the effectiveness of business by automatically transferring step-by-step work to performers
Improving the flexibility on the company in and outside environmental change	Acquiring the flexibility of countering easily and quickly against the in and outside environmental changes by the on-time monitoring and management of business process

Through analyzing the existing studies, in the consideration of the functions and the expected effects of BPM, we concludes that the application of KMS based on BPM will satisfy the demanding function of KMS of construction design companies as following:

- (1) Support of linear construction business process character and knowledge management through the functions of process management and automation;
- (2) Support of participation of cooperative constituents in the business process and cooperative work knowledge through the functions of acquiring the flexibility of business process and unification; and,
- (3) Support of visualization of intrinsic business process and knowledge through the function of process visualization.

3. THE CURRENT SITUATION OF KNOWLEDGE MANAGEMENT OF KOREA DESIGN COMPANIES

We surveyed people working for domestic design companies for grasping the current situation of knowledge management and knowledge management system of domestic design companies and for additional

² Song Young Woong, Study for management model for continuous business process of constructing companies, 2007

analysis of expected effects of introduction of KMS based on BPM into the field of design companies based on the analysis of the existing studies.

Table 4 Survey Outline

Classification	Survey Outline
Purpose	- Finding the current situation of knowledge management of design companies - Expected effects of application of KMS based on BPM
Duration	2009. 1. - 2009. 3
Subjects	People working for domestic design companies
Survey methods	1st time : Through telephone introducing the survey and finding the possibility of participation in the survey 2nd time: By visiting, explaining the concept of the survey and the ways to answering the survey/ distributing the questionnaire 3rd time: Collecting the questionnaire by visiting or by mail. 4nd time: Consulting experts.
Survey collection	- Total number of distribution of questionnaire: 60 sheets - Distribution in detail : 12 sheets to each 5 companies - Collected questionnaire: 21 sheets - The rate of collection: 33%

The survey was performed from January 2009 to March of the same year during 2 months targeting people working for 5 big constructing deign companies by visiting in person. We distributed 60 sheets of questionnaire and collected 21 of them. It shows 21% of collecting rate.

Does your company use KM?

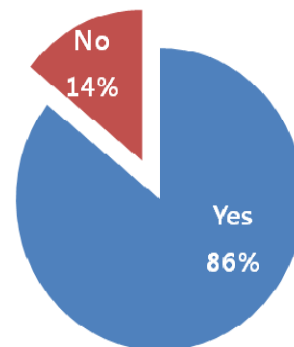


Fig. 1 KM Using Rate in Design Companies

86% of them gave positive answers to the question of the instruction of knowledge management into the company. It shows that KM has been adopted in domestic design companies and used in practice in high rate.

Furthermore, to the question of whether the KMS provides knowledge which is required for work performance, 95% of the answers were positive. And most of the knowledge provided were manual, design references, design documents, rules and regulations.

Does KMS provides the knowledge for your business?

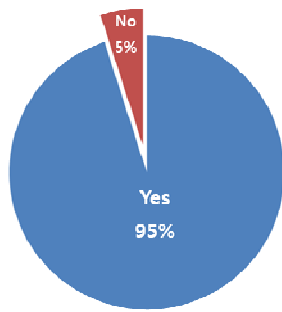


Fig. 2 Knowledge Providing Status of KM

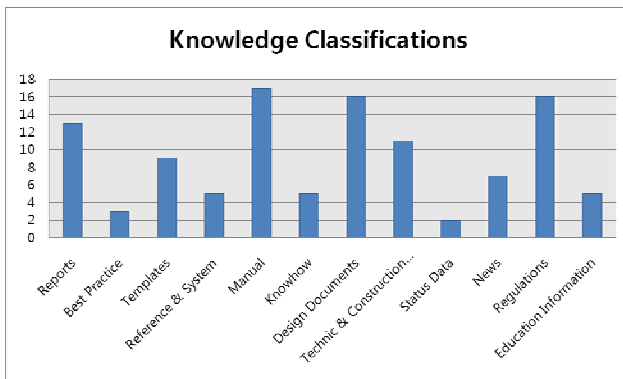


Fig. 3 Provided Knowledge Classifications

To find the rate of work performer’s use of KMS, we asked the ways of acquiring knowledge necessary for business by allowing plural answers. It shows that the rate of acquiring knowledge through other media such as reference books, thesis or through superior or colleague is higher than to get knowledge through KMS within a firm.

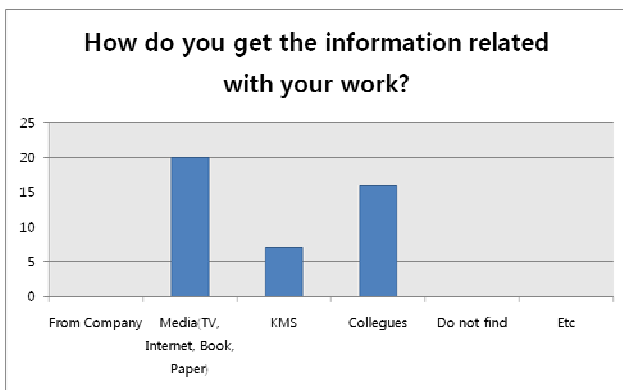


Fig. 4. Way to get work related information

Also, when we asked to evaluate the rate of use of KMS, the average of general use of KMS scored low points by 4.3 of 10.

By synthesizing the analysis results above, the construction of KMS of big design companies have been highly made and the grounds for providing with knowledge necessary for business through KMS. However, it shows that the rate of real use of KMS in practice is quietly low.

4. THE EXPECTED EFFECTS OF KMS BASED ON BPM AND PROTOTYPE

4.1 THE ANALYSIS OF INTRODUCTION OF KMS BASED ON BPM AND ITS EXPECTED EFFECTS

We suggested the participants into the survey the KMS based on BPM which provides knowledge accompanying to business process performance as a substitute for improving the effectiveness of business by solving the low rate of use of KMS currently constructed and raising the rate of use of KMS. When we set the current KMS use rate into 5 and asked the participants to evaluate the expected effects of KMS based on BPM, they scored it as 7.9 of 10. It shows that we may expect the 60% of improvement of effectiveness of business compared to the current system.

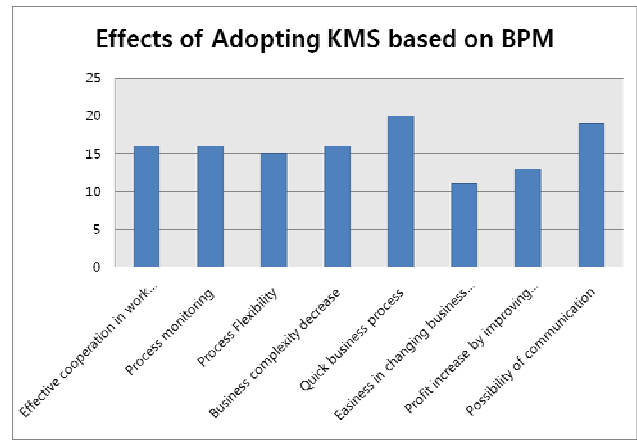


Fig. 4 Effect of Adopting KMS based on BPM

It also shows that as concrete expected effects of the introduction of KMS based on BPM they expected the effects which support the character of work of design companies such as effective cooperation in work performance, possibility of communication, quick business process.

On the question of the possibility of introduction of KMS based on BPM, the work performers scored 5.95 of 10 and it shows they did not consider the possibility of its introduction highly.

We found through the survey and consulting of experts their low expectation of introduction of the KMS was based on constructing duration, funds and difficulty of introduction such as difficulty of standardization of business process because of the diversity of projects, difficulty of classifying and creating database, and short of professionals.

When we synthesize the result of the survey, the rate of KMS construction in domestic design companies is very high in degree and provides manuals and directions necessary for work performance. However, the rate of real use by work performers is low. Therefore, it shows that there is a problem of weak link between KMS and work performance.

Furthermore, as the existing studies show, we found that work performers have high expectation on the effects of the application of KMS based on BPM. However, we analyzed that the problems such as business process

standardization and setting database of knowledge should be preceded for introducing the KMS in the field.

4.2 PROTOTYPE OF KMS BASED ON BPM FOR DESIGN COMPANIES

We suggest Prototype of KMS based on BPM for raising the use of KMS in domestic design companies.

Through the survey, it shows that the participants in the survey has high expectation on KMS based on BPM which provides knowledge in balance with the progress of business process and we analyzed that KMS based on BPM might support the character of business of design companies such as cooperation oriented and quick business process.

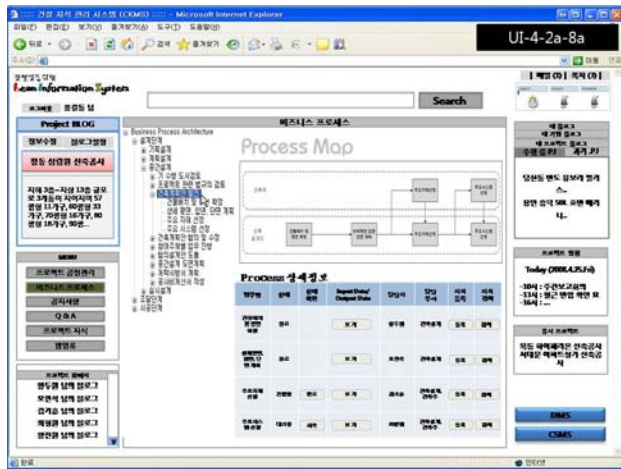


Fig. 5 Prototype of KMS based on BPM

KMS prototype based on BPM is constructed based on the detailed business process which a design company performs and it makes a user perform the minute operation according to the visualized business process, grasp the relation of former and post works and enroll and inspect the related knowledge.

As a Fig. 5 shows, the screen of the system is divided into three. On the left of the screen, BPA (Business Process Architecture) is shown and it helps a user to follow the structure of menu in the form of tree and to find the works in need. When the user clicks the work he needs, the business process respecting is shown in the center of the screen in the form of Process Map and it makes the user to grasp his work position and the following works in easy. Also, low part of the screen, the system provides the detailed information of process such as the status of current business process, status confirmation, Input/Output Data, a subject performing, parts in charge, enrollment of knowledge and inspect of knowledge and it helps to understand the status of the business process of the current business. By providing Input/Output Data necessary for a process in the subject and by providing the functions of easy search and enrollment of the knowledge respecting, the system raises the rate of utility of KMS.

5. CONCLUSIONS

It tends for construction industry centering for big construction companies to use KMS in order to manage

intangible knowledge facing the worldwide management paradigm. However, the construction of KMS disregarding its users has depressed the utility of the system. Especially, in the field of construct design companies which has the character of frequent use of intrinsic knowledge compared to other industries, the necessity of KMS is urgent but it is slow in the introduction of the system and the KMS already adopted has not been used effectively.

To improve such problems, this study, through considering the existing studies, analyzed the demanding functions of KMS in deign companies according to the characters of construct design business process and the functions and the expected effects of BPM and finally analyzed the expected effects of the introduction of KMS based on BPM in the field of construct design companies. Furthermore, we surveyed to grasp the current status of knowledge management of domestic design companies and to drive the expected effects of the introduction KMS based on BPM from work performers in the field.

The results of the survey shows that the work performers in the field would have the expectation in the improvement of the effects in case of applying KMS based on BPM compared to the existing system. However, they also expect the difficulties in introducing the system.

Finally, we suggested the concept of Prototype of KMS system based on BPM for its common use. KMS based on BPM provides the knowledge necessary to work performers in the balance with business process and may improve the work effectiveness of design companies.

It will be necessary to support the settlement of KMS based on BPM in the field of construction design companies through the upcoming studies on the procedure and the methods of application of KMS based on BPM to construction design companies.

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