요약

오늘날과 같은 지식기반 산업에 있어서 지식은 기업의 경쟁력을 좌우하는 중요한 요인이라고 할 수 있다. 최근 국내 건설기업의 경우 기술력 제고와 정부의 부동산 규제정책에 따른 건설경기의 하락과 내수시장의 지속적인 불황으로 국내외의 많은 불안정적인 요인들로 인해 어려움을 겪고 있다. 본 논문은 이러한 국내 건설업체들의 문제점을 해결하기 위해 기업조직이 보유한 조직지식의 속성이 조직 내 지식획득, 이전, 활용과 경영성과에 어떠한 영향을 주는지를 알아보고자 하는데 그 목적이 있다. 이를 위해 본 연구에서는 구조방정식 모형을 이용하여 국내 건설업체들이 조직지식 속성의 내부 요인들이 지식의 획득, 이전, 활용과 경영 성과에 어떠한 영향을 주는지를 실증분석 하였다. 본 연구의 결과 국내 건설업체들의 경우 기업지식의 속성이 지식획득, 이전, 활용에 유의한 영향을 미치며, 지식이전은 경영 성과에 유의한 영향을 미치는 것으로 확인하였다.

■ 중심어 : 조직지식의 속성 | 지식획득 | 지식이전 | 지식활용 | 구조방정식모형

Abstract

In today’s knowledge-based industries, knowledge can be said to be a significant factor that has a decisive impact on corporate competitiveness. Recently, Korean construction companies have been going through a difficult period of time because of various negative domestic and foreign factors, such as economic decline and a continued sluggish domestic construction market, mainly due to the Korean government’s real estate regulations and increasing competition from overseas companies with improved technologies. To help domestic construction companies navigate such an environment, this study empirically analyzes how the nature of corporate knowledge impacts the acquisition, transfer and deployment of knowledge within the organization of a company. Through such empirical analysis, we looked into how internal attributes of corporate knowledge affect the acquisition, transfer and application of such knowledge for domestic construction companies, with the application of the structural equation modeling (SEM). According to the results of this study, it is clear that the attributes of corporate knowledge have a significant impact on the acquisition, transfer and application of corporate knowledge, and therefore on the managerial performance of domestic companies.

■ keyword : Attributes Organizational Knowledge | Knowledge Acquisition | Knowledge Transfer | Knowledge Application | Structural Equation Model
I. Introduction

The environment of today’s global economy has become increasingly fast. Companies have to learn new knowledge continuously and apply factors contingently to cope with such a dynamic and complicated managerial environment. Especially in an age of knowledge-based industries, knowledge can be said to be a significant factor[1][2]. The most significant reason for the attention of knowledge management among the hands-on workers in such a changing global environment is because inter-corporate completion is more and more knowledge-based. Recent studies in international management see a company as a knowledge group and consider knowledge-based resources among others as a source for sustainable differentiation and competitive advantage. That is, learning and attaining new knowledge helps to improve management performance of a company[3][4]. Companies, therefore, make an effort to learn and develop new knowledge faster than their competitors.

Companies are, therefore, knowledge seeking and knowledge creating organizations. Acquisition of new knowledge is considered as a key strategy of companies. As such, more and more people are interested in knowledge management that deals with how to effectively learn and apply new knowledge. With special emphasis on the study of the transfer and proliferation of knowledge assets among the main points of knowledge management, knowledge learning, knowledge transfer and sharing, knowledge creation, etc.

In recent years, companies have seriously concentrated on the organization, creation, transfer and sharing of knowledge under the umbrella of Knowledge Management[5].

This study, therefore, analyzes how the attributes of knowledge impact the acquisition, transfer, application and management performance in an organization with increasing importance in the competitiveness, the process and knowledge management of domestic construction companies.

II. Theoretical Backgrounds

1. The Attributes of Knowledge in an Organization

We can identify important qualitative differences through three attributes among various attributes identified by researchers in various existing literature. These are codifiability, completeness and diversity. These are going to be discussed in relation to two types of organizational knowledge. And these are (1) the method, activity and process to achieve the organizational goal, and (2) the result of such process which is the goal itself[6].

When the process and its related knowledge are easy to codify, it is possible to make the procedures a specific and identifiable rule or a behavioral process[1][7]. Employees can be given clear and articulated instruction about the employed process. On the other hand, knowledge related to the tacit process cannot be divided in a clear way. The effectiveness of such knowledge, instead, can be delivered in a subtle nuance of the process. Because of such subtlety, it is necessary to be a participant in the process to be able to understand the nature of such knowledge[8].

When knowledge related to the result is evident, the final result desired by an organization can be correctly specified. On the contrary, when such results of related knowledge are tacit, the correctness and strictness of the goal and object is characteristically low. In this regard, such knowledge
is based on more subjective and abstract understanding. In such case, the members of an organization make a presumption from the perspective of their past experiences, observation of other’s success or failure and a standard more suitable than (a real standard) they think. The concept of completeness means the level of availability and usability of knowledge for decision makers to use to achieve their decision making or to complete their task.

Complete knowledge reflects the certainty of work [9], and indicates that all the knowledge necessary for specific decision making is available. In this case, the circumstances of decision making do not change over time, the result is predictable and the related process does not change.

A key characteristic of incomplete knowledge is that the search for additional knowledge is necessary to make the incomplete knowledge complete. For example, methods or procedures are not known and understood completely.

The last characteristic of knowledge is diversity and that indicates the relationship to the amount of information necessary for the explanation of the characteristics of knowledge at issue. Knowledge of high diversity is derived from a unique and multiple functional area or field[7]. When process-related knowledge is not diverse, it suggests that the knowledge is specialized for a certain task.

When results-related knowledge is not diverse, it suggests that objective-related knowledge components are smaller or characteristically more specialized. For example, compared to more diverse knowledge related to such an objective as increasing the market share of a company in footwear, the diversity of knowledge related to such a narrow objective as the minimization of the input amount of money into the footwear production of the company is less diverse. For the former objective, concurrent consideration of complex issues related to such factors that impact a competing company’s strategy, consumer preference, price policy and the direction of the economy is necessary.

2. Knowledge Acquisition

The overall knowledge management process of a company begins with knowledge acquisition. This consists of processes to attain new knowledge not previously owned by the company. Such knowledge is newly created through (1) the research, experimentation and experiences of its members, or (2) obtained through search and exploration from external sources. The learning of knowledge occurs through systematic process in which the members intentionally participate or as an unintended byproduct[10]. The process though which a company obtains knowledge has been a large subject of interest to researchers in the context of the absorption capacity and learning capacity [10] of a company.

The ability to create new knowledge heavily depends on an open research strategy, continuous trial and error, subjective decisions and a continuous re-evaluation of existing knowledge reflected in newly discovered knowledge [3].

The momentum for new knowledge acquisition is expedited because existing knowledge is unsuitable or incomplete. This is more significant or relevant because there is such a need for addition with existing knowledge.

3. Knowledge Transfer

Knowledge transfer in an organization is defined as individuals, teams, and departments that are influenced through new experiences[11]. Once new knowledge is obtained, such knowledge needs to be transferred to other parts (for example, individual,
group, departments or sectors) of the organization that need such knowledge or can benefit through such knowledge. When such transfer does not occur, such absorbed knowledge cannot have much impact on the organization. Capability to disseminate knowledge beyond time and space, therefore, is an important factor in a large collection of knowledge by a company.

In fact, difficulty can arise in the process of knowledge transfer or absorption[1], and this makes knowledge transfer the most difficult aspect in knowledge management procedures. It is because knowledge has more “stickiness”, the more knowledge is internalized in the individual, environment and locality. Such stickiness slows knowledge transfer among people, increases costs and uncertainty[7]. Existing studies, however, tend to assert that knowledge transfer is essentially free, instantaneous and having no need to make a separate effort, thereby ignoring such issues. In fact, the experienced difficulties are considered as unusual rather than as the characteristic of knowledge transfer. As a result, such issues related to knowledge transfer process do not tend to get attention, compared to the step of knowledge acquisition.

[12] verified that factors that influence knowledge transfer, such as knowledge characteristics, knowledge provider characteristics, knowledge beneficiary factors and background characteristics, hinder or impact knowledge transfer.

4. Knowledge Application

The final step in knowledge management is knowledge application or employment. For an organization, the ultimate goal of the acquisition, transfer and interpretation of knowledge is to apply knowledge in line with the goal of the organization [13]. The skill of knowledge application is generated through a special method by which such pre-steps are managed. As mentioned before, a company’s capability of involvement in knowledge management procedures is not automatic. A company’s knowledge flow is much influenced by how knowledge is organized, such as the form of organization, individual collaboration and information interchange.

Procedures or instructions that are used for the management of knowledge that can be codified are different from that of tacit knowledge. Likewise, incomplete knowledge needs a different management style from that of complete knowledge. This is the same for the diversity of knowledge. Because there are few studies done for such an issue, companies know little about how to manage specific types of knowledge. In the study, therefore, we intend to deal with the issue by proving that a company’s capability of knowledge management has a big impact on the company’s management performance.

5. Management Performance

Resource-based perspective or knowledge-based perspective can be said to be a theory that explains and predicts why certain companies can built a competitive advantage and achieve outstanding performance. That is, the primary managerial task is to develop resources for the future, maximizing values through optimal development of existing resources and capabilities recognizing a company as a unique bunch of idiosyncratic resources and capabilities[1].

Such unique resources, that is, because the key capability has attributes that cannot be easily imitated by a competitor, it can provide a sustainable differentiated advantage, and thereby can improve the company’s performance[14]. Likewise, knowledge transfer of a company appears through changes in the...
knowledge and performance of its beneficiary. Knowledge transfer, therefore, can be measured by measuring change in performance. [15] measured knowledge based on the performance. According to a study by [16], the obtained level of knowledge know-how has a positive relationship with the performance of the company. [17] provide a micro basis for the reason and the way the knowledge capability of a company changes according to the outcome of a knowledge task from the perspective of productivity of knowledge sharing in an organization in their study of 182 teams of a management consulting firm.

III. Research Model and Hypotheses

Using the Structural Equation Model, the empirical investigation aims to understand how The attributes Organizational Knowledge effects on the Knowledge Acquisition, Knowledge Transfer, Knowledge Application, and Business Performance. [Figure 1] shows the study model.

Knowledge can be classified into explicit knowledge and tacit knowledge according to the type of its existence. [18] Explicit knowledge has a language or structure that enables an objective measurement and observation so that the knowledge can be delivered in an arbitrary form, but the tacit knowledge, on the other hand, is internalized by individual know-how, subjective experience informally obtained, is difficult to codify, typify and externalize, therefore making it difficult to transfer. Such tacitness of the knowledge has been a factor that attracted the most attention of existing studies.

[18] proved that the more tacit, the better it is shielded from imitation and differentiated competitive advantage, so that it is too costly to transfer tacit knowledge. And the complexity of knowledge makes it difficult to fully understand when the knowledge or the technology itself crosses the boundary of various departments, creating a causal ambiguity and thereby preventing competitors from imitating it.

In the study, therefore, the following hypotheses are set from the results of existing studies.

H1: The attributes Organizational Knowledge has a positive effect on Knowledge Transfer

Therefore, the study sets the following hypothesis through the results of the aforementioned existing studies. Because it is suitable to deal with the attributes of organization knowledge, tacitness, incompleteness, diversity, and the knowledge attribute of the related process, it is considered especially important for the effectiveness of knowledge acquisition step among the knowledge management processes. As [19] observed, hen the process is not specified or certain, the establishment of clear and undisputable factors has the boosting and concentrating effect of making the creative process-related effort in line with the desired objective. The characteristic of clear and undiversified process-related knowledge reflects a very specialized characteristic of the procedures or methods to achieve the management objective, while the completeness of knowledge indicates a small necessity of the search
for new information. Such attributes reflect the fact that process-related knowledge is available to individuals in an organization[20].

On the contrary, result-related knowledge attributes implies that result-related knowledge is less obvious and understandable. If there is no clear standard to guide the behavior, individuals would be uncomfortable to change unambiguous processes established by their organization. In the study on the relationship between the attributes of an organization and knowledge acquisition, the following hypothesis is set up.

H2: The attributes Organizational Knowledge has a positive effect on Knowledge Acquisition

The most fundamental hypothesis of the resource-based theory is that differentiated organizational performance is due to unique and different resources rather than due to industrial structure. Recent strategic management emphasizes knowledge capacity as a source of competitive advantage[21]. The concept of resources as a source of competitive advantage is variously defined among the scholars. The resources of a company means comprehensive resources that include intangible assets and tangible assets, such as capital assets, for example, machinery, technology owned by the employees, patents and brands owned by the company.

Unique resources and the ability to use them are a source of competitive advantage for each company. And knowledge management capacity of an organization is the ability to move and adjust knowledge-based resources to combine resources and their utilization ability. Various knowledge management provides a potential source for competitive advantage[22].

In the study, therefore, the following hypotheses are set from the results of existing studies.

H3: The attributes Organizational Knowledge has a positive effect on Knowledge Application

It can be said that the resource-based view and knowledge-based view are theories that explain and predict why certain corporations are able to have a sustainable competitive advantage and perform well. That is, the corporation is recognized as a unique combination of idiosyncratic resources and capacity and the primary managerial task is to develop a resource base for the future, maximizing the values through optimal deployment of existing resources and capacity[1]. Because of such unique resources, that is, the key capacity has attributes that competing companies cannot imitate easily, they can provide a sustainable competitive advantage, and thereby can improve the performance of the company. Likewise, knowledge acquisition, transfer and application, which are each a step of the knowledge management, are reflected as a change in performance. The knowledge management process, therefore, can be measured by measuring a change in performance. Darr, [15] measured knowledge based on the performance, and [16] indicated in their study that the learning level of knowledge know-how has a positive relationship with the performance of the company.

The study, therefore, sets the following hypothesis to measure what impact each step of knowledge management, knowledge acquisition, transfer and application, has on the performance of the company.

H4: Knowledge Transfer has a positive effect on Business Performance

H5: Knowledge Acquisition has a positive effect on Business Performance
H6: Knowledge Application has a positive effect on Business Performance

IV. Methodology

1. Sampling

To verify the hypothesis of the study, sample companies were selected among the member companies of the Construction Association of Korea. The questionnaires sent were collected by post, email, fax or in person. The number of collected responses was 292 copies. 254 copies were used for the study. 38 copies were discarded due to unreliable responses.

2. Characteristics of the Sample

Frequency analysis for demography rendered that male responses were 224 (88.1%), which was 194 more than the female responses, 30 (11.9%). The most in an age bracket was 116 of 30s (45.6%), 35 of 40s (13.7%) and 28 for 50 or more (11.2%).

As for their marital status, the number of married was 177 (69.7%) with the number of single at 77 (30.3%). Regarding their educational backgrounds, high school graduates were 52 (20.5%); 2-year college graduates were 51 (21.0%); 4-year college graduates were 177 (69.7%); and graduate students or more were 25 (9.8%). So in total, 79% of the respondents had at least a 4-year college degree.

Looking at their title, the highest number were assistant manager/manager, 108 (42.5%); assistant manager/chief 55 (21.7%); deputy general manager/general manager 46 (18.1%); and director (board member) 45 (17.7%), so their overall distribution was about even.

For the number of years they had been working for their company, 6~7 years was 103 (40.6%); 2~3 years was 73 (28.7%); 4~5 years was 52 (20.5%); and 1 or less was 26 (10.2%).

3. Investigation Process

SPSS Windows 12.0 and AMOS 18.0 were used for the analysis of the data collection. The confidence level of the investigation tools was analyzed with the SPSS Windows 12.0 first. Then the Confirmatory Factor Analysis was carried out with the AMOS 18.0 to verify the validity of the measuring tools. Lastly, the Structural Equation Model Analysis was carried out with the AMOS 18.0 to analyze the causal relationship among the attributes Organizational Knowledge, Knowledge Acquisition, Knowledge Transfer, Knowledge Application, and Business Performance.

V. Results

1. Development of the Measuring Items

This study looks into what impact the attributes of an organizational knowledge has on the transfer, acquisition and application of knowledge and therefore on managerial performance. Regarding the development of the items for measurement, the questions of the questionnaire were derived from existing studies. Second, related specialists reviewed whether they were properly expressed linguistically or whether there were any redundancy factors before selecting 51 questions in total, 10 questions for knowledge management, 10 questions for knowledge transfer, 10 questions for knowledge application and 11 questions for managerial performance.

2. The Findings of the Exploratory Factor Analysis

The exploratory factor and the confidence level were analyzed with the SPSS Windows 18.0, while
Cronbach’s α > 0.7 was used for the assessment of the confidence level. The Principle Component Analysis was used for the factor extraction, while Varimax Rotation was used for the rotation method and the items were made suitable for the purpose of the investigation. The exploratory factor analysis was conducted with Factor Loadings: FL>0.6 which indicates the correlation between the assessment factors. First, using the SPSS 18.0, seven items were deduced by the Exploratory Factor Analysis, and the factor loading of each item for all the The attributes Organizational Knowledge, Knowledge Transfer, Knowledge Application, Business Performance were more than 0.6. But when it comes to Knowledge Acquisition, the measurement tool was below 0.6, so one item was removed. The Cronbach’s α (>0.7) of the confidence level appeared enough in between 0.892 and 0.977 that both the convergent validity and the discriminant validity were suitable.[Table 1].

Table 1. The Findings of the Exploratory Factor Analysis

<table>
<thead>
<tr>
<th>Construct</th>
<th>Number of Items</th>
<th>Cronbach’s α</th>
<th>C.R.</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The attributes Organizational Knowledge</td>
<td>10</td>
<td>0.971</td>
<td>0.851</td>
<td>0.642</td>
</tr>
<tr>
<td>Knowledge Transfer</td>
<td>10</td>
<td>0.910</td>
<td>0.821</td>
<td>0.608</td>
</tr>
<tr>
<td>Knowledge Acquisition</td>
<td>9</td>
<td>0.892</td>
<td>0.797</td>
<td>0.526</td>
</tr>
<tr>
<td>Knowledge Application</td>
<td>10</td>
<td>0.887</td>
<td>0.764</td>
<td>0.501</td>
</tr>
<tr>
<td>Business Performance</td>
<td>11</td>
<td>0.920</td>
<td>Fact 1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 2. The Result of the Confirmatory Factor Analysis

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<tr>
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</tr>
</tbody>
</table>

3. The Findings of the Confirmatory Factor Analysis

The measurement tools in the investigation was reflected in the previous researches. They got thorough advice and review from related specialists. Therefore, it can be said to have validated the contents. Using the AMOS 18.0, the Confirmatory Factor Analysis (CFA) was carried out to test the validity of the test tools on the items that were first tested through the exploratory factor analysis and confidence analysis. First, the fitness of the concepts and measurement variables were tested with the Maximum Likelihood Method. The methods used for the adequacy of the assessment items are Standardized Factor Loadings: FL>0.6, Squared Multiple Correlations: SMC>0.5, Standardized Residual Covariance: -2.58<SRC<+2.58 [23], and the Construct Reliability: C.R.>0.7 and Average Variance Extracted: AVE>0.5 [23][24]. The methods used for the confirmation on the significance level of the study model were Goodness-of-fit-index>= 0.9 (GFI), Adjusted Goodness-of-fit-index>=0.9 (AGFI), Root mean square residual<= 0.05 (RMR), Normal fit index>=0.9 (NFI), Comparative fit index>=0.9(CFI) and Root Mean square error of approximation<=0.1(RMSEA). Lastly, the path coefficients between theoretical variables were identified using the Structured Equation Model (SEM) to verify the hypotheses of the investigation. According to the findings of the confirmatory factor analysis, all the Standardized Factor Loadings, Squared Multiple Correlations, Standardized Residual
Covariance [23] satisfied the necessary criteria value. As a result, four items were removed from the 50 items for the final selection.

4. Analysis of the Structural Model

The fit statistics of the initial model indicate that the chi-square of the model is 341.667 with a d.f. of 21. GFI is 0.901, AGFI is 0.841, NFI is 0.914, CFI is 0.919 and RMR is 0.048. All the fit statistics of the initial casual model were fit.

Table 3. The Result of the Research Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>FL</th>
<th>T-value</th>
<th>P-value</th>
<th>Hypothesis Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.942</td>
<td>15.22</td>
<td>0.000 **</td>
<td>**</td>
</tr>
<tr>
<td>H2</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.778</td>
<td>9.471</td>
<td>0.000 **</td>
<td>**</td>
</tr>
<tr>
<td>H3</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.710</td>
<td>9.211</td>
<td>0.010 *</td>
<td>*</td>
</tr>
<tr>
<td>H4</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.644</td>
<td>7.379</td>
<td>0.000 **</td>
<td>**</td>
</tr>
<tr>
<td>H5</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.205</td>
<td>1.014</td>
<td>0.114 ns</td>
<td>ns</td>
</tr>
<tr>
<td>H6</td>
<td>The attributes Organizational Knowledge → Knowledge Transfer The attributes Organizational Knowledge → Knowledge Acquisition The attributes Organizational Knowledge → Knowledge Application</td>
<td>0.012</td>
<td>0.248</td>
<td>0.134 ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

*: P<0.05, **: P<0.01, ns: not significant

According to the findings of the investigation, The attributes Organizational Knowledge appeared to have an effect on the Knowledge Transfer (H1), Knowledge Acquisition (H2), and Knowledge Application (H3). The Knowledge Transfer appeared to have an effect on the Business Performance (H4), while the Knowledge Acquisition and Knowledge Application appeared to have not an effect on the Business Performance (H5 and H6).

VI. Conclusion

This study looks into what effect the attributes of organizational knowledge has on each step of the knowledge management process, the acquisition, transfer and applications of knowledge, and on the managerial performance. To this end, sample companies were selected from the members of the Construction Association of Korea who were active in the domestic and overseas construction business. 254 responses for pilot measurement were collected.

As a result, the attributes were found to have a positive impact on the acquisition, transfer and applications of knowledge, and knowledge transfer effects managerial performance positively. The acquisition and applications, however, were found to have no effect on managerial performance. The reason seen from the perspective of the industrial characteristic of the construction company, work know–how of the employees is in the state of generalization, and the utilization of knowledge introduced from outside is low due to the authoritative industrial culture of the domestic construction companies.

참고 문헌