A Study on the Impacts of Intellectual Capitals on Organizational Performance: The Intellectual Property Office in Korea

Byul Jeon*, Kwang Min Moon, Youn Baek Jeong***, and Hosung Sohn******

Abstract: This study analyzes the impacts of the intellectual capitals of the Korea Intellectual Property Office (KIPO) on organizational performance. In particular, the following have been analyzed: how KIPO's human capital, structural capital, and relational capital affect the activities of the organization's knowledge management; to what degree the levels of knowledge management activities affect the organization's performance; and to what extent the organization's performance varies in accordance with KIPO's intellectual capital levels. This study conducted empirical research and analysis of how the intellectual capitals that KIPO possesses activate knowledge management activities, and which intellectual capitals influence knowledge management and organizational performance. Furthermore, it derived strategic suggestions that can be used for making successful policy on intellectual capital management. The results of the study revealed that in order to enhance organizational performance, KIPO needs to make efforts to promote cognition on the importance of intellectual capitals that it holds, and adopt operational methods to raise the level of relational capitals.

Keywords: Intellectual Capital, KIPO, Knowledge Management, Path Analysis

INTRODUCTION

This paper analyzes the impacts of KIPO's intellectual capitals on the organization's performance. In particular, the following have been analyzed: how KIPO's

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Manuscript received January 2008; out for review January 2008; review completed February 2008; accepted February 2008.

The Korean Journal of Policy Studies, Vol. 22, No. 2, 89-108 (2008)

human capital, structural capital, and relational capital affect the activities of the organization's knowledge management; to what degree the levels of knowledge management activities affect the organization's performance; and to what extent the organization's performance varies in accordance with KIPO's intellectual capital levels. Although there have been numerous studies on the knowledge management of public institutions, there has been no research on the intellectual capitals and organizational performance of public institutions. In order for public institutions to manage knowledge, it is important to precisely recognize and evaluate the intellectual capitals that organizations possess, and then to establish administrative goals or develop systems for intellectual capital management. That is, defining, classifying, and evaluating the intellectual capitals that public institutions hold is the starting point of knowledge management. However, there has been no discussion on the importance of classifying and measuring intellectual capitals with respect to the establishment of strategies related to knowledge management, construction of knowledge management systems, or evaluation of knowledge management operations. The existing knowledge management focuses too much on making and sharing knowledge. Moreover, most of the research starts with knowledge making. This kind of management takes a narrow view by supporting competitiveness; innovative idea creation and sharing by an organization's members is generally regarded as the purpose of knowledge management. Also, the creation of these ideas is considered knowledge creation (Jeong et al., 1999). In addition, the theory of intellectual capitals has no meaning with regard to the establishment and operation of strategies related to knowledge management. Previous studies have emphasized the role of strategic management, organizational behavior theory, human resources management, and knowledge management systems; there has been little research on how intellectual capital contributes to knowledge management, and applications based on such research have not been utilized (Jeong et al., 1999). Nonaka (1991) asserts that although companies are advocating knowledge management, they do not really understand what intellectual capitals are. Thus, because they do not recognize precisely what should be done to develop intellectual capitals, effective knowledge management has not been achieved (H.G. Kim et al., 2003).

Accordingly, this study analyzes the impacts of KIPO's intellectual capitals on KIPO's organizational performance. In order to make the analysis, structural elements of intellectual capitals, which are said to affect KIPO's organizational performance, have been first defined by classifying them into human capital, structural capital, and relational capital. For our purposes, intellectual capitals refers to intellectual capitals related to knowledge management activity, not those of KIPO's whole organization. This study also addresses to what extent intellectual capitals and knowledge management affect the organizational performance of KIPO. This research is intend-

ed to provide a road map of strategic resource allocation and to suggest which intellectual capital factors KIPO should invest in to promote its organizational performance most efficiently.

EXAMINATION OF PREVIOUS RESEARCH

The Concept and Measurement of Intellectual Capitals

The concept of intellectual capital was first raised by the fiscalist John Kenneth Galbraith. Intellectual capital was defined as the degree of intellectual actions, not as the knowledge of pure knowledge. The implication is that intellectual capitals are not stationary capital forms but dynamic ones (Edvinsson & Sullivan, 1996). Galbraith defined the various intellectual capitals as knowledge capital, nonfinancial capital, immaterial assets, hidden assets, invisible assets, means to achieve targets, and market value minus book value.

Since then, many scholars have presented a variety of definitions of intellectual capitals, according to their research areas. Brooking (1996) defined intellectual capitals as the compounds of market assets, human assets, intellectual assets, and structural assets. Accordingly, he extended the meaning to include all the intangible assets needed to operate companies. Stewart (1997), on the other hand, defined the term as intellectual entity, information, intellectual properties, and experience, all of which can be used to create wealth. Other scholars have also defined intellectual capitals and acknowledged the importance of the term. This multiplicity of definitions highlights the importance that has been placed on intellectual capitals in recent years, and it is expected that this capital will be an essential factor in the competitiveness of organizations in the future (Batchelor, 1999; Booth, 1998; Edvinsson & Sullivan, 1996; H.G. Kim et al., 2003; C.G. Lee, 2005; Lev, 2000; Miller, 1999; Roos & Roos, 1997; Stewart, 1997; Sullivan et. al, 1996; Teece, 1998; Wiig, 1997).

H.G. Kim et al.'s (2003) analysis divided intellectual capital into individual capitals, organizational capitals, and relational capitals. Y.-J. Moon et al. (2006) contended that intellectual capitals are the sum of experience and skills that an organization's members hold for promoting the value of organizations in the future, the knowledge accumulated in the organizational structure, the knowledge stock produced between customers or the persons concerned with organizations and thereby accumulated and inhered, and dynamic and valuable knowledge processes that have been used as input to promote the knowledge stock. Choi & Seoul (2005) defined the term by categorizing it into four subordinate factors: human capital, structural capital, innovative capi-

tal, and customer capital. S.M. Kim et al. (2000) analyzed the intellectual capitals of government organizations by dividing the term into human capital, which is incorporated in the public servants; structural capital, which is incorporated in the organizations; and customer capital, which is related to the citizens.

This paper analyzes (a) the level of intellectual capitals stored in the internal KIPO that can support and activate the knowledge management activities within the organization and (b) to what extent it influences organizational performance. On the basis of the aforementioned scholarly definitions, intellectual capitals will be defined and measured as follows.

Table 1. Intellectual Capital Classification and Structural Elements

	Matters Related to Members	Matters Related to Organizational Structure and Business Procedures		Matters Related to Customers and External Relations
Stewart, 1997	Human capitals	Structural capitals		Customer capitals
Brooking	Man-oriented capitals	Intellectual ownership capitals	Infrastructure capitals	Market capitals
Sveiby	Capacity capitals	Internal capitals		External capitals
Edvinsson & Sullivan	Human capitals	Process capitals	Innovative capitals	Customer capitals
Han	Human capitals	Intellectual capitals	Infrastructure capitals	Customer capitals
H.-G. Kim et al.	Individual capitals	Organizational capitals		Relational capitals
Choi et al.	Human capitals	Structural capitals	Innovative capitals	Customer capitals
S.-M. Kim et al.	Human capitals	Structural capitals		Customer capitals
Moon et al.	Human capitals	Structural capitals		Relational capitals
Structural Elements	– Business related knowledge/ability – Educational training – Psychological satisfaction – Creative problem solving ability – Leadership of the management	– All Kinds of intellectual properties – Organizational cultures – Corporate governance – Managerial technique & administrative method – Decision making system – IT infrastructure & back up system		– Brand recognition – Customer satisfaction – External reputation and honor – Customer loyalty/reliability – External network

Adapted from ETRI (2005).

Intellectual capitals are defined as the compound of human capitals, structural capitals, and relational capitals, and they are referred to as the sum of all the intangible assets that are needed for efficient operation of KIPO. These intellectual capitals may appear variously as intellectual entity, information, intellectual property, and experience, all of which are used for creating the business performance of KIPO. Human capital is the ability and capacity that KIPO's public servants possess for sharing and applying knowledge; these abilities are obtained through the knowledge management system (KOASIS). Human capital can be measured as the level of educational attainment of KIPO's public servants, the length of employment in KIPO, the level of computer usage through email and Internet, and the degree of application of KOASIS. Structural capital refers to the organizational structure and infrastructures that KIPO's public servants use for sharing and applying their information and knowledge with colleagues. In KIPO, KOASIS has been established and operated to promote knowledge management activities. This capital can be measured by whether the structure of the screen and related menu of KIPO's KOASIS are well designed or familiar, whether one can search and apply business-related information, and whether KOASIS is organically linked with other information systems. Relational capitals are the measure for activating knowledge management activities with regard to the public servants who are the customers of the knowledge management activities. This capital can be measured by whether there is a station bearing the exclusive responsibility of KIPO's knowledge management activities and fulfilling the appropriate roles; whether KIPO's public servants are supporting study clubs such as the knowledge club; whether these public servants are implementing their education and training to the extent needed for knowledge management activities; and whether KIPO is conducting the evaluation of customer satisfaction with respect to KIPO's public servants, who are the customers of knowledge management activities.

Knowledge Management

Knowledge management is an effort to enhance problem-solving skills through efficient management of the intellectual capitals that organizations possess, and to promote the organizations' sustainable development (H.-J. Lee, 2007). As stated above, in order for intellectual capitals to become essential abilities, knowledge must be managed and developed. The efforts of public sector organizations to manage knowledge can be understood accordingly.

Knowledge management can be defined as organizations' core resources that can be used in managing knowledge effectively. The definition of knowledge management activities, or knowledge management processes, has been variously presented among

scholars (Ha, 2005; Hosapple & Joshi, 2003; Kang, 2002; G. Kim, 2005; H.-J. Lee, 2007; Marquards, 1996; Myers, 1996; Park & Lim, 2001). Putting all accounts together, knowledge management activities can be defined as a series of activities such as knowledge accumulation, knowledge sharing, and knowledge application for creating organizational competitiveness. However, the difference between the characteristics of private sector knowledge and public sector knowledge does not necessarily mean that the effects of knowledge management activity appear different. This is because the importance of intellectual capitals is huge with respect to public sector organizations, because they are the essential resources in creating organizations' future vision. The fact that accumulating, sharing, and applying intellectual capitals can affect organizational performance also means that they are not different (Kang, 2005; G. Kim; 2002; G.-C. Lee, 2002; Park et al., 2001). Making intellectual capitals a foundation for creating future competitiveness and vision requires managing these capitals through knowledge management activity. The importance of knowledge management lies on its roles: (a) enhancing problem-solving skills and (b) as an intermediary in promoting organizations' sustainable development.

Organizational Performance

There are few generally applied unified evaluation indexes in any organization that can be used to appraise public sector organizations' performances. This means that vagueness of public sector performance is high (Jeon, 2004) and objective evaluation is difficult. People have different point of view regarding the meaning of performance (Rho, 2006). The difference as to the meaning of performance is caused by government officials' functions and educational backgrounds, and by whether the organizations belong to the private sectors or the government. In the private sectors, performance means mainly profits. Needless to say, in private company management, the goal is to raise the profit of stakeholders, through improving the welfare state of employees, preservation of natural environments, and development of the regions that companies are located on. However, most of the performance measurement methods are carried by out through accounting means. On the other hand, these financial assessments cannot capture all the phases of performance, particularly in public sector organizations and non-profit organizations. In non-profit organizations and public sector organizations, most of the values created by institutions are related to the missions pursued by the institutions (Brinckerhoff, 1994).

This paper analyzes the level of intellectual capitals stored in the internal KIPO that can support and activate the knowledge management activities within the organization, and to what extent intellectual capitals influence organizational performance.

Accordingly, the organizations' performance, which KIPO can deduce by activating the knowledge management and effectively managing the intellectual capitals, can be defined as the level of perceived availability of public servants' belief that their work performance will be enhanced by effectively using information or knowledge that is provided by the knowledge management activity—especially the knowledge management system (KOASIS)—and the degree of enhanced business performance that is generated when managing the real business.

CONCEPTUAL FRAMEWORK AND RESEARCH DESIGN

Operational Definition and Measurement Index

The conceptual definition and operational definition of measurement items in this study are shown as follows. The methods that have been verified in previous studies are used to measure the human capitals, structural capitals, relational capitals, and knowledge management application and business performance. Four measurement questions have been designed to measure each human capital, structural capital, and relational capital. Two measurement questions are used for knowledge management activities and two for business performances.

The items that fall under human capitals are the length of employment, the educational attainment of public servants, the level of application on IT technology, and the degree of application using KOASIS. In structural capitals, familiarity of the knowledge management system, convenience in using the knowledge management system, search ability of the knowledge management system, and connectivity of the knowledge management system are used. Customer satisfaction with respect to knowledge management activities, level of assistantship toward study club, stations' level of ability responsible for knowledge management, and level of education and training with regard to knowledge management are used for the relational capitals. The foundation of selecting these items can be explained in liaison with the aforementioned theories. Among the human capital items, the length of employment in KIPO can be found in S.-M. Kim et al. (2002), H.-G. Kim et al. (2003), and Moon et al. (2006). The level of application on IT technology, and the degree of application using KOASIS can be derived from the index of public servants' ability of business management and employee abilities that are used in S.-M. Kim et al. (2002) and H.-G. Kim et al. (2003), as well as Compeau and Higgins's (1995) computer self-efficacy model. Among the structural capitals, familiarity of the knowledge management system, convenience in using the knowledge management system, search ability of the knowledge

Table 2. Intellectual Capital Measurement Item and Conceptual Definition

Measurement Item		Conceptual Definition	Source
Human Capital	Length of employment in KIPO	Degree of employment continuance for those who are currently in KIPO's office	S.-M. Kim et al. H.-G. Kim et al. Moon et al.
	Civil servant's level of educational attainment	Degree of knowledge and ability that each employee possess	
	Level of application on IT technology	Application of email and messenger using computers	S.-M. Kim et al. H.-G. Kim et al. Compeau & Higgins
	Level of application in KMS	Ability to do business freely by applying KMS	
Structural Capital	Familiarity in KMS	Structure of screen in KMS and degree of convenience in design of menu items	Heo et al. S.-M. Kim et al. H.-G. Kim et al. Moon et al. Davis, Bailey, & Pearson
	Convenience in using KMS	Degree to which one believes that using KMS is beneficial psychologically and physically	
	Search ability of KMS	Degree to which one can find the knowledge with KMS	
	Connectivity of KMS	Connectivity with other information systems	
Relational Capital	Customer satisfaction with respect to KMA	Level of satisfaction in regard to public servants' (customer) KMA	S.-M Kim et al. H.-G. Kim et al. Y.-J. Moon et al. C.-H Kim
	Level of assistantship toward study club	Level of institutional support on the public servants' KMA	
	Stations' level of ability responsible for KM	Squad team's level of function who can only push on KMA	
	Level of education and training with regard to KM	Level of opportunity offering to public servants as to KMA	
Knowledge Management	Knowledge sharing	An act of taking other people's knowledge and sharing their knowledge by using KMS	
	Knowledge application	An act of applying KMS's information and knowledge in real business management	
Business Performance	Perceived business performance	Degree to which one believes that KMA information will enhance one's job performance	
	Business performance	Level of increased business performance by using KMA	

management system, and connectivity of the knowledge management system were illuminated by the information technology items used in the work of S.-M. Kim et al. (2002), H.-G. Kim, et al. (2003), Heo et al. (2005), and Moon et al. (2006). Perceived availability of usage is described in Davis's (1989) work and search function items in Bailey and Pearson's (1983) work. Customer satisfaction with respect to knowledge management activities, which is categorized as a relational capital, is deduced from the customer satisfaction items in S.-M. Kim et al. (2002), C.-H. Kim (2003), H.-G. Kim et al. (2003), and Moon et al. (2006). On the other hand, level of assistantship toward study club, stations' level of ability responsible for knowledge management, and level of education and training with regard to knowledge management are taken from the customer correspondence, brand value, and general marketing activity factors presented in the work of S.-M. Kim et al. (2002), H.-G. Kim et al. (2003), and Moon et al. (2006).

The items that belong to knowledge management activities have been selected from knowledge sharing and knowledge applications used in the work of DeLone and McLean (1992), Szulanski (1996), and Kohli (1993).

The items that correspond to business performance are the level of enhancement of perceived business performance and the level of enhancement of business performances. These items are selected from the ideas of perceived availability (Davis, 1989) and individual performance (DeLone & McLean, 1992; Gueutal & Surprenant, 1984).

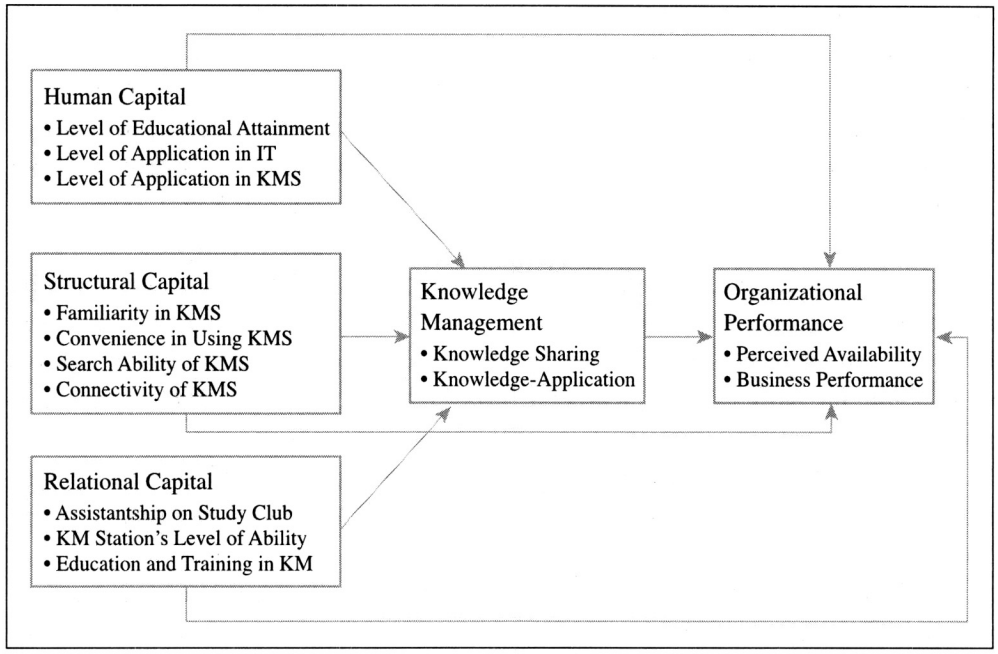
Causality Model

The hypotheses were constructed by examining all the theoretical and empirical analyses that have been presented in the previous research. The content of the hypotheses and the bases on which the hypotheses are established are as follows.

Hypothesis 1. Human capital is positively related to activating knowledge management.

According to Ha (2007), a knowledge management system is intended to promote knowledge sharing, diffusion, and knowledge creation, and therefore, when its application frequency or the level of employment participation is high, its knowledge creating effect would be huge. Heo et al. (2005) asserted that work ability and personal relationship, which are the components of human capitals, have a significant effect. Compeau and Higgins (1995) held that computer skills and computer application affect knowledge sharing activities. Thus, it can be inferred that human capitals have significant effects with respect to knowledge management.

Figure 1. Causality Model



Hypothesis 2. Structural capitals will positively affect the activation of knowledge management.

Davenport (1998) and Wathne (1996) emphasized the importance of various methods of understanding ideas and maintained that various knowledge networks in organizations affect knowledge transition. Venkatesh (2000) maintained that even if the system is very useful, people will not utilize the system if it is complicated and difficult. Heo et al. (2005) stated that business culture, information technology, business strategy, and process, all of which are components of structural capitals, will significantly influence knowledge management systems. Jablin (1984) contended that although organization members are provided with various information to minimize uncertainty, that information is not sufficient with regard to contents and quantities. Therefore one can experience a relative shortage of information. In order to solve these phenomena, one will observe the situation and ask questions directly of other people (Ashford, 1986). Accordingly, it can be deduced that structural capitals have significant effects regarding knowledge management.

Hypothesis 3. Relational capitals are positively related to knowledge management activation.

Liedtka (1997) underscored the importance of learning, such as education and training through cooperation, and explained the relationship between knowledge and members, all of which are used in dealing with inner and outer environmental change. On the other hand, McDermott (2001) argued that what is important in sharing knowledge is disseminating the study communities within the organizations. Moreover, he contended that study forums within the organizations will foster knowledge and information sharing among members and will induce learning (Kwon, 2002). According to Heo et al. (2005), customer capitals will significantly influence knowledge management systems. According to the motivation endowment theory, human actions are executed when there is a desire that can be satisfied by those actions. In addition, organizational behavior theory substantiates that the actions of members within organizations are dependent on their perception and attitudes. Therefore, it can be inferred that relational capitals have significant effects in regard to knowledge management.

Hypothesis 4. Human capitals are positively related to organizational performance.

It is believed that human capitals are vital resources for most companies (Pfeffer, 1994), and recently it is generally stated that education, experience, and technology, which are recognized as human capital factors, influence business performance. Hitt's (2001) study clarified the relationship between human capitals and business performance. Moon et al. (2006) found that educational levels, work experience, and ability, all of which come under personal abilities, have effects on organizational performances. H.-G. Kim et al. (2003) stated that although personal capitals do not directly affect performance, the knowledge that organization members possess will be transformed into structural capitals or relational capitals and affect them indirectly. Hence, we can infer that human capitals are positively related to organizational performances.

Hypothesis 5. Structural capitals have positive effects with respect to organizational performance.

Structural capitals are composed of organizations' culture, know-how, and technology. It has turned out that these structural capitals and business performances are related. H.-G. Kim et al. (2003) showed that the quality of the applied system, the integrity of the applied system, organization members' perception of informationalization, and business management efficiency-all of which fall under organizational capitals-have indirect effects on organizational performance. Therefore, on the basis of the resource-dependent perspective, resource-based perspective, and previous research, we can deduce that structural capitals will influence organizational performance.

Hypothesis 6. Relational capitals are positively related to organizational performance.

Customer satisfaction, market orientation, competitiveness in markets, and customers are the factors that constitute the relational capitals, and these are related to organizational performance. According to H.-G. Kim et al. (2003) and Moon et al. (2006), customer satisfaction and the level of brand management, both of which are relational capitals, affect organizational capital. Thus the hypothesis that relational capitals affect organizational capital can be inferred.

Hypothesis 7. Knowledge management is positively related to organizational performance.

G. Kim (2002) analyzed the business performance differences among knowledge sharing types. In a study of public servants in a local autonomous entity, the business performance of the knowledge-code type was shown to be high. On the other hand, in a study of the Education Administration, the estimated business performances of the confrontational knowledge sharing type was found to be relatively high. These findings indicate that there is a relationship between knowledge sharing and business performance. Park et al, (2001) also argued that knowledge diffusion is an important factor that directly affects business performance. G.-C. Lee et al. (2002) asserted that knowledge sharing influences knowledge management efficiency, which includes personal business satisfaction and individual business efficiency. Kang (2005) confirmed that among the influencing factors that affect knowledge sharing, organizational factors and individual factors positively affect knowledge sharing. Accordingly, we can infer that knowledge management activities influence organizational performance.

Data

In order to analyze the effect of intellectual capitals on organizational performance, we implemented a survey of KIP that involved a direct visit and the distribution of total of 120 survey forms. Of the 107 surveys returned, 7 were deemed to have been answered insincerely; a total of 100 (valid withdrawal rate: 83%) were used in the empirical analysis. A 5-point Likert scale was used for each question.

RESULTS

With respect to the methodology of this study, explanatory factor analysis and confirmatory factor analysis were employed to verify the reliability of variables and validities. Furthermore, in order to verify the causality of the research model, path analysis models were applied. These analyses were carried out using SPSS 12.0K and AMOS 7.0.

Characteristics of the Samples

The survey respondents' characteristics were as follows. The explanatory factor analysis was employed to verify the hypotheses. The value of the sample suitability with respect to all the questions was 0.825, which means that the selection of questions for factor analysis was appropriate. Also, Barlett's spherical examination estimates, which indicate the appropriateness of the model for factor analysis, show test statistics of 511.874 and a p-value of 0.000. Therefore, the null hypothesis can be rejected, and the questions used in this study are appropriate for factor analysis as well as to conclude that there are common factors. We employed exploratory factor analysis by adapting the method of oblique rotation, because correlation has been assumed between five composition concepts. The result of the factor analysis is shown in Table 3.[1] As a result of exploratory factor analysis on the composition concept, three of the four human capital items were combined into one factor. For the relational capitals, three out of five items were combined into one factor. In addition, each measurement item of the structural capitals, as well as knowledge management activities and business performance, all constitute well as to composition concepts along with their operational definitions.

Table 3. Examination of the Internal Consistency Between the Composition of Items

Composition Concept	Number of Measurement Items	Number of Revised Items	Chrobach's α
Human Capitals	4	3	0.573
Structural Capitals	4	4	0.789
Relational Capitals	5	3	0.692
Knowledge Management Activity	2	2	0.767
Business Performance	2	2	0.728

1. We established the factor loading of more than 0.3 for the evaluation criteria of exploratory factor analysis, and more than 50% for the variance extraction.

Next, confidence testing of model was employed. The internal consistency between measurement items was examined with the value of Chronbach's α. Except for the human capital, the values of Chronbach's α were higher than 0.6, indicating internal consistency between the composition of the items.

In this research, criteria validity can be judged by testing the correlation between individual capitals, structural capitals, relational capitals, knowledge management activities, and business performance (G.-S. Kim, 2007). The results of the correlation analysis show that correlations between each component of concepts were significant. Therefore, it can be concluded that the composition of factors satisfies the criteria validity.

Lastly, confirmatory factor analysis was conducted on the measurement model, including human capital, structural capital, relational capital, knowledge management activity, and business performances. The value of χ^2 in this model was 168.69 (df73), and p-value was 0.00 Moreover, the values GFI = 0.91, AFGI = 0.852, RMR = 0.051, and NFI = 0.921 indicate that the data conform well with respect to the covariance structural model.[2]

Table 4. Sample Characteristics

Classification		Frequency	Ratio (%)
Age	20s	6	6
	30s	59	59
	40s	31	31
	50s	4	4
Length of Employment	Less than 2 years	26	26
	Less than 4 years	26	26
	Less than 6 years	10	10
	Less than 8 years	5	5
	More than 8 years	33	33
Class	Rank 3	1	1
	Rank 4	17	18
	Rank 5	46	49
	Rank 6	19	20
	Rank 7	8	9
	Rank 8	2	2
	Rank 9	1	1
Education	Junior College grad.	5	5
	College grad.	50	50
	Master's degree	21	21
	Ph. D.	24	24

Research Model Testing

The hypotheses as to the causality model's path relation that has been presented in this study were tested with t-value. T-value makes it possible to test the statistical significance of path coefficients, which is the integrated concept that deals with the research model's exogenous variables and endogenous variables as well as intermediary endogenous variables and endogenous variables.

Table 5. Results of Hypothesis Testing

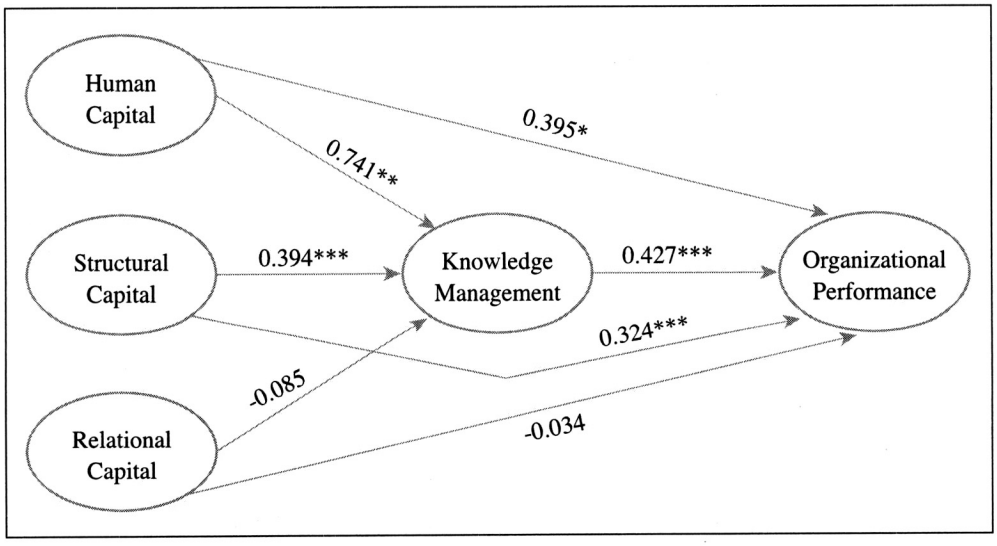
Hypothesis		Expected Sign	Unstandardized Coefficient	Standard Error	t-value	p-value
Hypothesis 1	Human Capital → KM	+	0.852	0.197	4.322	0.000
Hypothesis 2	Structural Capital → KM	+	0.316	0.081	3.903	0.000
Hypothesis 3	Relational Capital → KM	+	-0.093	0.094	-0.987	0.324
Hypothesis 4	Human Capital → BP	+	0.495	0.262	1.886	0.059
Hypothesis 5	Structural Capital → KM	+	0.283	0.109	2.589	0.010
Hypothesis 6	Relational Capital → KM	+	-0.041	0.096	-0.427	0.670
Hypothesis 7	KM → KM	+	0.465	0.247	1.885	0.059

First, the independent variables—human capital, structural capital, relational capital and knowledge management—are examined. The path relationship indicates that except for the relational capitals, the p-value in all the paths have shown the estimate of less than 1%, which means that they are all significant. In human capital and knowledge management activity, the path coefficient (unstandardized coefficients) was 0.852, and t-value was 4.322 (p-value: 0.00). In the relationship between structural capital and knowledge management, the path coefficient was 0.316, and t-value was 3.903 (p-value: 0.00). However, between the relational capitals and knowledge management, the t-value was -0.987 (p-value: 0.323), which indicates that they are not significant. As a result, in the relationship between the independent variables and intermediary variables in knowledge management, only the relational capitals did not produce a significant estimate. So, hypothesis 3 does not hold. Next, the effects of the independent vari-

2. With respect to judging the suitability of the model, even if we reject the null hypothesis because the p-value of the chi square statistics is too small (p = 0.000), one cannot exclude the possibility that the model might indeed be the appropriate model and reflect the reality. That is, it is not wise to evaluate the suitability on the basis of the chi square statistics alone (Cho, 2000:103-4). One should synthetically judge the model by considering other suitable indexes in various points of view (G. Kim, 2006).

ables—human capital, structural capital, and relational capital—and a dependent variable, business performance, were examined. As previously analyzed, the variables human capital and structural capital were significant at the 10% level and 1% level with respect to business performance. On the other hand, relational capital was not significant (t-value: -0.041, p-value: 0670). Consequently, compared to hypothesis 4 and hypothesis 5, hypothesis 6 is not supported by the analysis. Lastly, the relationship between the intermediary variable, knowledge management, and the dependent variable, business performance, were examined. The result was that it was significant in 10% level. Therefore hypothesis 7, which states the positive relationship between the level of knowledge management and business performance, was confirmed. The path relationship in accordance with path coefficients and the results of hypothesis testing are presented in Table 4. The overall structural model has been shown in Figure 2.

Figure 2. Causality Relationship Research Model



Note 1: ***denotes significance at the 1% level, **denotes significance at the 5% level, and *denotes significance at the 10% level.
Note 2: All of the path coefficients are standardized coefficients.

CONCLUSION

The aforementioned results of the empirical analyses show which factors have significant effects with respect to KIPO's organizational performance. Moreover, they help us to judge which factors may need to be adjusted in order to raise the level of

organizational performance. The results of the empirical analyses indicate the necessity of inducing management strategies to promote organizational performance. Accordingly, the following comments are intended to illuminate the policy implications of these determinants of organizational performance.

First, to enhance the organizational performance, there should be an effort to recognize the importance of the intellectual capital that KIPO possesses. KIPO itself should bear in mind that intellectual capital is the key factor in increasing the overall competitiveness of members and organizations. As McElroy (2003) emphasized, we should recognize that intellectual capital is the essential factor in sustainable innovation. A policy of promoting awareness of these findings needs to be in place to reinforce publicity and education regarding intellectual capital and to provide rewards for contributions to intellectual capital.

Second, KIPO should improve its level of relational capital. H.-G. Kim et al. (2003) argued that although individual capitals do not directly affect performance, organizational capital as well as relational capital have indirect effects. This means that the ability possessed by members of the organization is transformed into intellectual capital within the organization and influence organizational performance. However, the negative effects of KIPO's relational capitals with respect to knowledge management activities and organizational performance indicate that they not only obstruct the synergy effects within relational capital itself but also cut off the synergy that can occur in human capital. It seems that the loss of assets is huge. In addition, the fact that KIPO's relational capital is negatively related to knowledge management and organizational performance indicates that there are problems in existing operational methods that are intended for public servants, the customers who activate knowledge management activities. Therefore there is a need for enhanced support of (a) the activities of the knowledge club or study club, (b) ability education, and (c) training regarding knowledge management activities.

In conclusion, this study conducted empirical research analysis to identify KIPO's intellectual capital and to clarify which intellectual capitals influence knowledge management and organizational performance. Moreover, it derived strategic implications that can help build successful policy with regard to intellectual capital management. This research used intellectual capital management perspectives to provide an analysis that goes beyond previous research based on knowledge management perspectives. Thus we expect that this paper will present a systematic direction for the development of the knowledge management sector. We also expect that future research into the level and type of intellectual capital that can improve the level of KIPO's organizational performance can be used to develop policy alternatives.

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