

An Empirical Analysis to Strengthen the Knowledge Management Capability in Korea SMEs

MoonKoo Kim*, JongHyun Park*, JongHyun Paik**

*Future Strategy Research Team, ETRI, 136 Gajeongno Yuseonggu, DaeJeon, Republic of Korea

**Standardization Department TTA, 267-2 Seohyeondong, Bundanggu, Seongnam, Gyonggi-do, Republic of Korea

mkkim@etri.re.kr, stephanos@etri.re.kr, jhpaik@tta.or.kr

Abstract — This paper identified the relationship between the effect factors of knowledge management and management results, in order to propose a direction for strengthening knowledge management capability, with focus on domestic SMEs, based on the results of a survey conducted by a commissioned survey research firm (specializing in SMEs). The expert survey conducted on domestic SMEs was analyzed with statistical processing, and the strategic implications of the results were presented from the perspective of strengthening the knowledge management capability of SMEs.

Keywords — SMEs, Knowledge Management, Capability

I. INTRODUCTION

As the economy evolves into a digital economy, the importance and value of knowledge management in enterprises are being increasingly highlighted. In particular, the importance of knowledge management is drawing attention, as global competition has intensified in the 2000s, and enterprises' survival and growth now heavily depend upon strengthened competitiveness based on improved productivity and efficiency. It is important to utilize knowledge management in enterprises' important decision-making procedures, including detailed functions such as information organization, technology development, and marketing, instead of simple information collection and accumulation. However, domestic enterprises are actively introducing and developing a system related to knowledge management, but its utilization is limited to a few areas at present. In particular, the introduction and utilization of knowledge management for Small and Medium Enterprises (SMEs) are still a long way from the goal.

This paper identifies the relations between factors affecting knowledge management and management performance, in order to present a direction for strengthening the capability of knowledge management, particularly for domestic SMEs, based on the results of a questionnaire survey conducted by a professional research firm specializing in SMEs.

The expert survey conducted on domestic SMEs was analysed with statistical processing, and the strategic implications of the results were presented from the perspective of strengthening the knowledge management capability of SMEs.

II. MEANING OF KNOWLEDGE MANAGEMENT

Generally, knowledge management refers to the clarification, collection, search, sharing, and assessment of enterprise knowledge assets, in order to improve an enterprise's efficiency in making decisions [1].

Using knowledge management, enterprises can make decisions efficiently, based on diverse, systematic, and organized knowledge, and also engage in productive and appropriate decision-making in terms of production and marketing, based on knowledge [2], [3].

However, knowledge management in Korea remains in the initial form – information sharing, knowledge creation with the shared information, and support for sales activities, based on the marketing information system [4].

The importance and value of knowledge management to SMEs cannot be under-evaluated than those of the conglomerate company. However, it is known that the level of SMEs' knowledge management is significantly lower than that of conglomerate companies, and that the level varies even among SMEs according to the size and type of business of the enterprise concerned [4]. However, knowledge management is meaningful for SMEs in the following respects. First, SMEs are likely to depend on the specialty and intuition of the management when making a decision, instead of the systematic knowledge base, as SMEs have a weaker knowledge base than conglomerate companies. SMEs also have difficulty in responding to changes in the external environmental systematically, based on the knowledge base. In addition, even though strategic alliance or association with external enterprises is the important factor in creating business performance, active relationships cannot be established easily, as the knowledge base is weak. Accordingly, knowledge management can be an effective management method for SMEs to overcome their insufficient resource capability and actively cope with the changing external environment.

III. RESULTS OF RESEARCH ON AND ANALYSIS OF THE KNOWLEDGE MANAGEMENT CAPABILITY OF DOMESTIC ENTERPRISES

2.1 Research model

This study identifies the factors which affect knowledge management capability and analyzes the relations between knowledge management capability and business performance, in order to present a method of developing and utilizing knowledge management for domestic SMEs. As described above, SMEs are more sensitive to the external environment,

the management and corporate culture directly affect business activities, and infrastructure needs to be expanded. Therefore, this study structurally identifies the external environment, organizational characteristics, infrastructure and knowledge management capability, and business performance. For this purpose, the following analysis tasks and analysis model (Figure 1) are set.

- This study separates the enterprise's knowledge management capability into knowledge creation capability and knowledge utilization capability, and identifies how the external environment, internal of the organization, and infrastructure affect each knowledge management capability.
- This study strategically examines the relationship between each knowledge management capability and business performance, based on an analysis of direct and indirect effects.

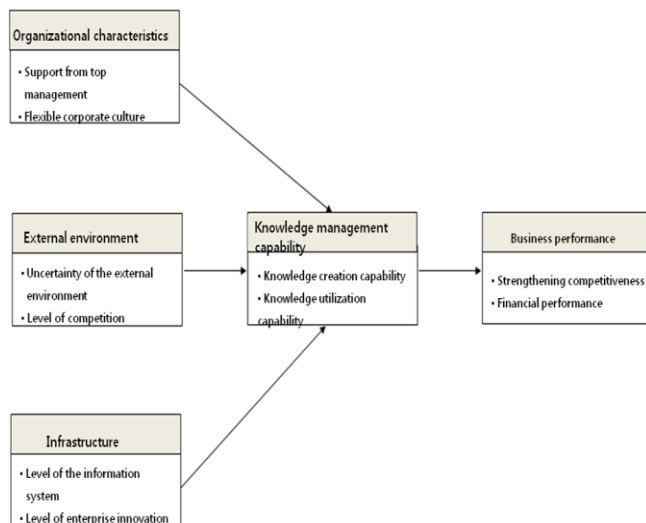


Figure 1. Research Model

2.2 Sample

In this paper, we investigate experts' survey to analysis an empirical study and data by market research firm [5], [6].

Sample SMEs were selected as subjects of the questionnaire for this analysis from among SMEs listed on the Korea Exchange and KOSDAQ market, and promising SMEs/venture companies selected by the Small and Medium Business Administration. The survey was conducted by a professional research firm using a structured questionnaire and face-to-face interview. Among the 151 questionnaires returned, invalid questionnaires were excluded (e.g., when the same answer was given for each question continuously), leaving a total of 127 valid questionnaires. The SPSS 12.0 and AMOS packages were used for the basic statistical analysis, factor analysis, reliability analysis, regression analysis, and structural equation model analysis.

2.3 Results

Table 1 shows the results of verifying the overall appropriateness of the analysis model. Indices related to appropriateness of GFI, AGFI, NFI, TLI, CFI, and RMSEA roughly satisfy the recommended standard value, which indicates that this study model is suitable for a structural equation analysis.

TABLE 1. DEGREE OF APPROPRIATENESS OF THE RESEARCH MODEL

Criteria	χ^2	p-value	Degree of freedom	GFI	AGFI	RMR	NFI	TLI	CFI	RMSEA
Research Model	378.721	0.157	352	0.844	0.794	0.089	0.882	0.991	0.990	0.025

Table 2 shows the results of statistical processing regarding the analysis model using a structural equation.

TABLE 2. RESULTS OF STATISTICAL ANALYSIS OF THE STRUCTURAL EQUATION

No.	Path	Path coefficient	Standard error	Fixed index	p-value	Result
1-1	Uncertainty of the external environment → Knowledge creation capability	0.206	0.107	1.929	0.054*	Accept
1-2	Level of competition → Knowledge creation capability	0.191	0.083	2.297	0.022**	Accept
1-3	Uncertainty of the external environment → Knowledge utilization capability	0.138	0.073	1.881	0.060*	Accept
1-4	Level of competition → Knowledge utilization capability	0.125	0.058	2.162	0.031**	Accept
2-1	Support from the top management → Knowledge creation capability	0.212	0.084	2.522	0.012**	Accept
2-2	Flexibility of the corporate culture → Knowledge creation capability	0.047	0.088	0.530	0.596	Reject
2-3	Support from the top management → Knowledge utilization capability	0.162	0.059	2.720	0.007***	Accept
2-4	Flexibility of the corporate culture → Knowledge utilization capability	0.127	0.060	2.140	0.032**	Accept
3-1	Level of the information system → Knowledge creation capability	0.152	0.067	2.283	0.022**	Accept
3-2	Level of enterprise innovation → Knowledge creation capability	0.184	0.064	2.887	0.004***	Accept
3-3	Level of the information system → Knowledge utilization capability	0.092	0.046	2.000	0.046**	Accept
3-4	Level of enterprise innovation → Knowledge utilization capability	0.083	0.045	1.852	0.064*	Accept
4	Knowledge creation capability → Knowledge utilization capability	0.087	0.076	1.147	0.251	Reject
5-1	Knowledge creation capability → Competitiveness achievement	0.266	0.123	2.151	0.031**	Accept
5-2	Knowledge utilization capability → Competitiveness achievement	0.488	0.165	2.963	0.003***	Accept
5-3	Knowledge creation capability → Financial achievement	0.052	0.110	0.469	0.639	Reject
5-4	Knowledge utilization capability → Financial achievement	0.295	0.152	1.940	0.052*	Accept
6	Competitiveness achievement → Financial achievement	0.301	0.099	3.050	0.002***	Accept

*: <0.1, **: <0.05, ***: <0.01

Using the results of the structural equation, this study uncovered the direct/indirect effects among factors. Consequentially, the external environment, organizational characteristics, and infrastructure factors of an enterprise were found to affect business performance indirectly through the knowledge utilization capability. An enterprise's knowledge creation capability indirectly affects financial achievements through strengthened competitiveness, whereas the knowledge utilization capability directly affects financial achievements, as well as indirectly affecting financial achievements through strengthened competitiveness.

The results of the analysis proved the direct or indirect influence of knowledge creation and utilization, which are the two axes of knowledge management, on domestic SMEs' attainment of financial achievements and a competitive advantage. Like conglomerate companies, SMEs are also faced with the pressing need to pursue strategic superiority and financial achievement at the same time through knowledge management.

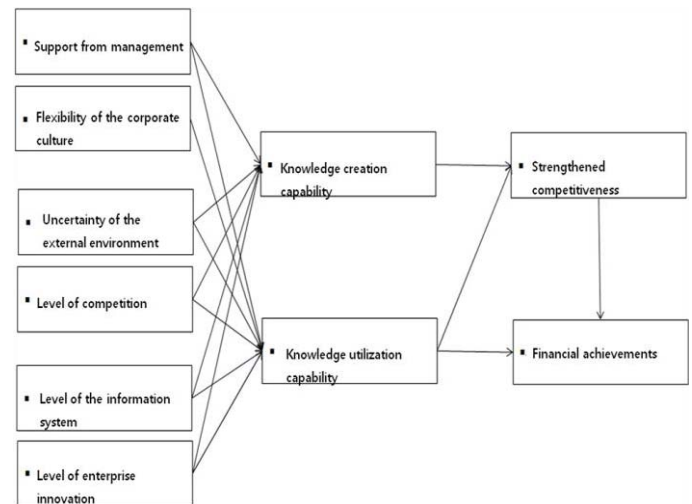
TABLE 3. RESULTS OF DIRECT/INDIRECT EFFECT ANALYSIS AMONG FACTORS¹

		Uncertainty	Level of competition	Management	Flexibility	System	Level of innovation	Creation capability	Utilization capability	Competitiveness
Total effect	Creation capability	0.206	0.191	0.212	0.047	0.152	0.184	0.000	0.000	0.000
	Utilization capability	0.156	0.141	0.180	0.131	0.106	0.099	0.087	0.000	0.000
	Competitiveness	0.131	0.120	0.144	0.077	0.092	0.097	0.308	0.488	0.000
	Finance	0.096	0.088	0.107	0.064	0.067	0.068	0.170	0.441	0.301
Direct effect	Creation capability	0.206	0.191	0.212	0.047	0.152	0.184	0.000	0.000	0.000
	Utilization capability	0.138	0.125	0.162	0.127	0.092	0.083	0.087	0.000	0.000
	Competitiveness	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.488	0.000
	Finance	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.295	0.301
Indirect effect	Creation capability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Utilization capability	0.018	0.017	0.018	0.004	0.013	0.016	0.000	0.000	0.000
	Competitiveness	0.131	0.120	0.144	0.077	0.092	0.097	0.042	0.000	0.000
	Finance	0.096	0.088	0.107	0.064	0.067	0.068	0.118	0.147	0.000

Figure 2 shows the diagram of the analysis results. The comprehensive relationships between the factors can be described as follows. The knowledge creation and utilization capabilities of domestic SMEs are largely affected by the external environment, organizational characteristics, and infrastructure. In particular, the knowledge utilization capability is closely related to environment, organization, and infrastructure. In addition, the knowledge management capability of domestic SMEs affects business performance, such as securing a competitive advantage and improving financial statements. Even though an enterprise's knowledge creation capability affects its financial achievements indirectly due to the relatively weak capabilities of domestic SMEs, knowledge management is a strategic necessity, not an optional item, for the survival and growth of SMEs. Therefore, domestic SMEs should adopt an enterprise approach that concentrates resources and capabilities on knowledge utilization and creation. To achieve this, the continuous support of management, increased flexibility of the corporate culture, and expansion of the information system and innovation system are required.

¹ Abbreviations: Uncertainty – Uncertainty of the external environment; Level of competition – strength of competition; Management – support from the top management; Flexibility – flexibility of the corporate culture; System – level of the information system; Level of innovation – level of corporate innovation; Creation capability – Knowledge creation capability; Utilization capability – Knowledge utilization capability; Competitiveness – Strengthened competitiveness; Finance – Financial achievements.

Figure 2. Results



IV. CONCLUSION

The development and utilization of knowledge management by enterprises is becoming the general trend as competition among enterprises intensifies, as the uncertainty of the external environment increases, and as IT technology continues to develop at a remarkable pace. In particular, SMEs' need to adopt knowledge management is increasing, as their resources and capabilities are weaker than those of conglomerate companies, and their ability to cope with the environment is insufficient. This paper identifies those factors which affect the knowledge management capability of domestic SMEs, and analyses the relationship with business achievements empirically, based on the results of a questionnaire survey on domestic SMEs. The results of the analysis can be evaluated, and the method of improving the knowledge management capability of domestic SMEs can be proposed as follows.

First, domestic SMEs that have effectively introduced and utilized knowledge management have also recorded excellent business achievements, relatively speaking. Therefore, knowledge management should be utilized for enterprise management as a top priority.

Second, SMEs need to adopt a strategic approach to effectively strengthen their knowledge creation capability, because it is not clear whether knowledge creation capability directly affects the financial achievements of the enterprise, and a causal relationship between knowledge creation capability and knowledge utilization capability has not yet been established.

Third, support from management and flexibility of the corporate culture are highlighted as indispensable requirements for domestic SMEs seeking to strengthen their knowledge management capability. Therefore, management should support internal resources to introduce knowledge management throughout the entire value chain of the enterprise, and associate each area with the systematic

knowledge creation and utilization structure, rather than developing and utilizing knowledge management from the perspective of a single system.

Lastly, tangible and intangible infrastructure investment is also important in promoting knowledge management. Therefore, investment in the tangible infrastructure, such as development and utilization of the related information system, and development of the intangible infrastructure, such as enterprise innovation, are important.

In conclusion, the importance of knowledge management should be consistently recognized, with the emphasis on knowledge creation and utilization, necessarily accompanied by enterprise investment and policy support for SMEs' knowledge management, in order for domestic SMEs to overcome the poor management environment and insufficient management resources, and to secure a competitive advantage and attain financial achievements on a continuous basis.

REFERENCES

- [1] Drucker, P., Hyundai Research Institute (translated), Knowledge management, 21st Century Books, 1999.
- [2] Samsung SDS, Knowledge Management in the IT Service Industry, 2004.
- [3] Jeong, G. H., and Cho, J. R., "An Exploratory Study to Analyze the Success Factors of Knowledge Management," *Academic Journal of Korea Safety Management and Science*, Vol. 11(2), 2009.6.
- [4] Song, G. S., "Knowledge Management Technology Trend," Korea Institute of Science and Technology Information, 2004.
- [5] Gang, B. Y., and Kim, E. J., "A Study on the Influence of Knowledge Management Success Factors on Knowledge Management Activities and Business Achievements," *Information System Study*, Vol. 16(2), Korea Intelligent Information System Society, 2007.06.
- [6] Lee, Y. C., "Developing a Dynamic Value Chain Model for Knowledge Management," *Information System Study*, Vol. 17(3), Korea Intelligent Information System Society, 2008.09.