The Exploratory Study on SMEs' R&BD Knowledge Information Needs and Supporting Programs

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1. Introduction

Domestic SME's commercialization capability is measured as 73.7% based on the world standard and relatively vulnerable to success ratio in technology commercialization in comparison with large companies([1]). Korean SMEs indicate the main causes of bottleneck for technology commercialization are the lack of information and networks.

However, the technology commercialization supporting program of Korean governments focus on supplying hardware such as fund and manpower and the programs which supplement lack of network and information of SMEs for technology commercialization are almost absent. Moreover, the government's information supporting programs for SMEs are provider-oriented and focus on R&D trend information at the first stage of commercialization or market trend information at the end stage.

This research explores SMEs' knowledge information needs at each stage of technology commercialization and compares the required knowledge information needs among industries. From the results of exploratory study, we propose a market pull-based technology commercialization intelligence-support program covering all the stages' information needs of technology commercialization process, and establish a road map technology commercialization information supporting system.

2. Related Works

Goel et. Al.(1993), Henry Chesbrough(2003), Churchill & Lewis(1983) considered 3 major factors influencing commercialization of SMEs as technological standard, characteristics of market, and policy standard. Technological standard represents the characteristics of R&D, process and product, technology maturity and complexity, the characteristics and suitability of information, The characteristics of market was evaluated by size of available market, unification and diversification, industrial concentration. They analyzed SMEs avoid technology commercialization due to the sales uncertainty in market, the difficulties in entering new market, and lack of conviction about success in technology commercialization.

Kim(2003) analyzed that one of the reasons that SMEs fails in the market is inadequate market survey and the resultant difficulty in predicting the uncertainty of market.

Kim(2010) analyzed that SMEs require high quality information about market, technology, policy and laws, and expert networks providing comprehensive solution regarding establishment of a strategy, however, Korean government supporting program for SMEs' commercial-ization only provide simple technology and market information. Thus, this acts as limitation for facilitating the commercialization of SEMs

3. Proposed Method

Based on literature surveys on technology commercialization type, characteristics, current statues of Domestic SME's technology commercialization, SME's difficulties and information needs at each stage of technology commercialization and in each industry, 4 steps' technology commercialization process is proposed and questionnaire model is designed and field survey, brain storming, and focus group interview in 5 industries are performed and technology commercialization information supporting program and activation methods are proposed based on the survey results.

4. Results and Summary

From the field survey results, it was investigated that SMEs require market and technology in-depth information of new promising business items at R&D planning stage, additional technology information for commercialization at the commercialization technology development stage, equipment application information, and product standard/certification information at mock-up stage, market status and forecasting information, customer information and sales channels at the final stage, production and sales stage, respectively.

[Table 1] Information Needs Comparison at Technology Commercialization Stages

	R&D Planning	Development of Commercialization Technology	Mock-up	Production and Sales
Difficulties	Difficulty in market research and demands expectation Difficulty in finding new emerging business items	Difficulty in understanding commercialization technology Difficulty in acquiring additional technology	Lack of facilities for mock-production Lack of manpower and raw materials	Lack of information on production equipment on mass production Losing competitiveness by competitor's appearance Change of market trend
Technology information Needs	Information on main and substitute technologies Technology development trend of competitors Technology standards market requires	Information on technology commercialization issue and trends. Government Supporting program information on technology commercialization	Information on experiment and measuring equipments Information on certification process and institutes	Technology information of competitors Next product-related technology information
Market Information Needs	Information on Market trend and size forecasting of new emerging business items Information on major competitors Information on customers and sales channels	Market size and trend information on each application of products Major customers and sales channels	Mock-up related main product information Market size and trend information on each application of products	Market size and trend information on different applications of products Information on Domestic and Global customers and sales channels

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In case of IT and materials industries, demand on market information is higher than other industries, while bio and chemical industries shows higher technology information demand. IT industries require information on technology level market requires, technology issue and trend, while BT require government supporting program information and certification process information. Materials require information on product-application-technologies, while chemistry and machine require main and substitute technology information and experimental and measuring equipment information.

From the results of exploratory study, we propose a market pull-based technology commercialization intelligence-support program covering all the stages' information needs of technology commercialization process, and establish a road map technology commercialization information supporting system. By providing customized information program covering all the stages information needs, from strategic extraction of promising technology and business items, -> matching of promising technology and technology providers -> technology commercialization opportunity analysis, to technology commercialization matchmaking process, we could enlarge information value chain. 4 major information supporting programs are proposed. From continuous providing program of simple technology and market issue information of new emerging technology and business items, to customized in-depth market and technology information(technology opportunity intelligence program, technology provider matching intelligence program, market opportunity intelligence program, competitor opportunity intelligence program, government regulation/supporting program intelligence), new emerging business item extracting consulting program, and global commercialization supporting program(customer information, market channel and matchmaking), various level's information supporting programs are proposed.

5. References

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