

# **A Study of Technology Development Strategy & Management Performance on New Technology-based Firms of IT Industry**

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## **Abstract**

Technology development strategy factors which are summarized as technology's integration, technology's rotation, and technology's receptiveness are generated by technology development variables through survey of new technology-based firm of IT industry. They have the significant influence on management performance such as Net Sales Growth Rate, ROA and ROI .

## **1. Introduction**

IT industry of our nation is becoming core industry of national economy as a role of high profit and potential market power in the field of employment, export, manufacturing. It has technology-driven industrial features that are focusing on the high-technology environment. Most of all, small and medium enterprise based on venture of IT Industry has the idea of technology development and Innovation to make exuberant technology superiority as core of competition and management strategy. Therefore, technology development of IT industry is crucial factor which get the preeminent power. Despite of the importance of technological development in IT industry, NTBF(new technology-based firm) of

IT industry doesn't try to overcome the chasm of advanced technology as well as doesn't plan, do and see the technology development process.

The reality of NTBF IT industry show that current nation's technology status is low level therefore, I point out the issue and suggest an efficient technology development strategy.

## **2. Background of Research**

### **1) Meaning of technology development**

If we mention the technology development, Technology development should distribute resource available and get the priority of resource based on environment in the technological process and stipulate intentional objective and set the behavioral goal about how to manage the multiple technology development.

### **2) System of technology development**

If we compose the system of technology development, It at first is necessary to get acquisition of technology, second it is necessary to command technology abundance third, it need to apply usage of technology

There are several researches on the technological development strategy as followings.

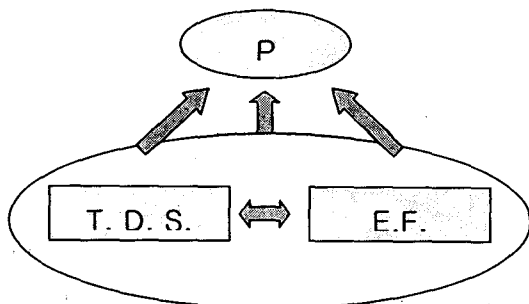
Section	T.D.S. contents	researcher
T.E.S. preparation	Strategy discrimination Strategy change	1, 7, 12 4, 8, 10
Choice of superiority acquisition method	Investment level decision of R&D Connection bet. Firm & tech.	4, 5, 12 12 4 12
Choice of technology	Leading tech. Manifestation of synergy Decision about leading tech.	2, 3, 5, 7, 13 2, 5, 11, 12 12, 13
Tech-acquisition and commanding	Getting tech. Choice of tech. Resource Manage tech-capital Marketing tech. &tech. Innovation process	2, 3, 5, 7, 9, 13 3, 13 6, 13 3, 13 1, 7 14

1. Wilkinson(1985) 2. Porter(1985) 3. Canpon & Glazer(1987) 4. Hamilton et al(1990) 5. Ansoff & Stewart(1967) 6. Ford(1985) 7. Ford & Ryan(1981) 8. Soukup & Cooper(1983) 9. Frohman(1982) 10. Clarke & Thomas(1990) 11. Miller & Frieman(1982) 12. Sethi et al(1985) 13. Granstrand & Sjolander (1990) 14. Maidique & Patch(1982)

<table 1. technological development strategy >

### 3. Research Methodology and Postulation

#### 1) Research Methodology



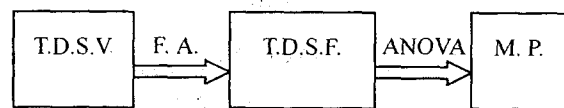
<Fig.1 Research Model>

I suggest that management performance is generated by technology development strategy

through both strategy of technology and interaction of technology including the operation of external factor about the state of market that can be uncontrolled variable.

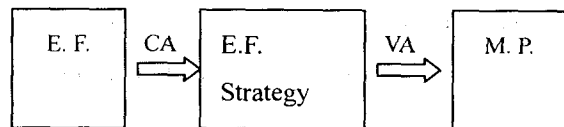
That is to say, I show the research model on figure 1.above. Let me show. research procedure in detail.

#### 가) Research I.procedure



< Fig.2 Research Procedure I >

#### 나) Research II.procedure



< Fig.3 Research Procedure II >

#### 2) Definition of variable and method of measuring the variable

Variables	Scope of measure
Tech-innovation	Scale bet. 1-5 (from absolutely not to agree much more)
Integration of technology	
TPL	
Tech-level	
Tech-level relative to peer	
Tech-acquisition	
Tech-development investment cost	
Tech-affiliation.	
Tech-accept	
Patent	

<table 2. Definition of Variable>

Variables of management performance are applied as followings : three factors are Net Sales growth, rates ROA, and ROI.

### 3) Research hypothesis

#### 가) Hypothesis 1.

H0 : Cluster of each tech-strategy is same regardless of relative technological intensity on management performance.

#### 나) Hypothesis 2.

H0 : Interaction of cluster of tech-strategy is same regardless of relative technological Intensity on management performance.

#### 다) Hypothesis 3

H0 : Cluster of each tech-strategy with the external factor is same regardless of relative technological Intensity on management performance.

#### Hypothesis 4

#### 라) Hypothesis 4

H0 : Interaction of cluster of tech-strategy with the external factor is same regardless of relative technological Intensity on management performance.

### 4. Result of research

I found out three factors of tech-strategy from 11 number of tech-strategy variables.

Section	Factor	Contents
Factor 1	Tech-integration .	Tech- innovation Integration of tech Tech-level relative to peer Tech-acquisition Tech.-development investment cost
Factor 2	Tech-rotation	TPL Tech. Level Patent
Factor 3	Tech-Receptivene ss	Tech. affiliation Tech. accept

<table 3. Deduction of Factor>

Hyp othe sis	Description	Result of test
Hypot hesis 1	Cluster of each tech-strategy is same regardless of relative technological Intensity on performance	I.reject II.accept III.accept
Hypot hesis 2	Interaction of cluster of tech-strategy is same regardless of relative technological Intensity on performance.	I,II,III accept
Hypot hesis 3	Cluster of each tech-strategy with the external factor is same regardless of relative technological Intensity on performance	I. reject/ II. reject/ III.accept
Hypot hesis 4	Interaction of cluster of tech-strategy with the external factor is same regardless of relative technological intensity on performance.	I.II.III reject

<table 4. Result of Test>

### 5. Conclusion

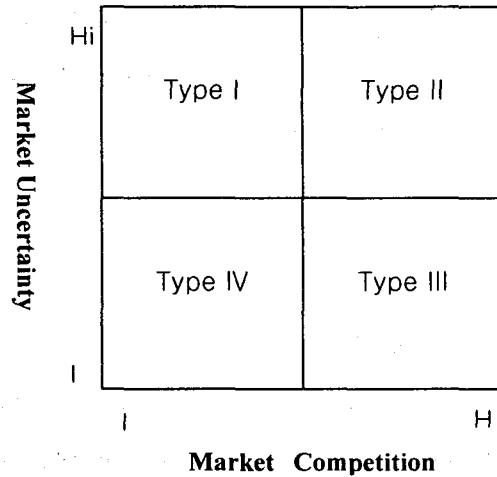
The external factors such as uncertainty of market and competition of market show us the significant meaning about rearranging technology strategy as standard which describe new tech-

development strategy. They consist of tech-analytic type, tech-leading type, tech-sensitive type and tech-defensive type.

External factor (Market)	Performance factor	Tech. Development Strategy		
		Tech-integration	Tech-rotation	Tech-receptiveness
Competition	Net Sales Growth Rate	✓	✓	
	ROA			
	ROI			
Uncertainty	Net Sales Growth Rate	✓	✓	✓
	ROA			
	ROI			
Potentiality	Net Sales Growth Rate			
	ROA			
	ROI			

<table 5. three factors generalization>

Type I commands strategy of analyzing the technology like tech-innovation, product difference and business diversification and type II commands strategy of leading the technology like aggressive investment on technology and type III commands strategy of getting tech-superiority strategy and type VI should withdraw strategy.



<table 6. figuring technology strategy>

### Reference

- [1] 송광선 (1994), 우리나라 혁신적 중소기업의 유형별 특성 및 성과, 한국과학 기술원 경영과학과 박사학위 논문
- [2] 이재근 (1996), 국가연구개발사업과 기업의 기술개발전략에 관한 연구, 한국과학 기술원 경영과학과 박사학위 논문
- [3] 최동규 (1994), 중소기업의 기술혁신을 위한 방안과 과제, 산업과 기술, 한국산업기술진흥협회
- [4] Balakrishnan, S. and B. Wernerfelt (1986), Technical Change, Competition and Vertical Integration, Strategic Management Journal, 7, pp. 347-359.
- [5] Burgelman, R. A. (1988), Strategic Management of Technology and Innovation, Richard Irwin, Inc.
- [6] Clarke, K., D. Ford and M. Saren (1989), Company Technology Strategy, R&D Management, 19(3), pp.215-229.