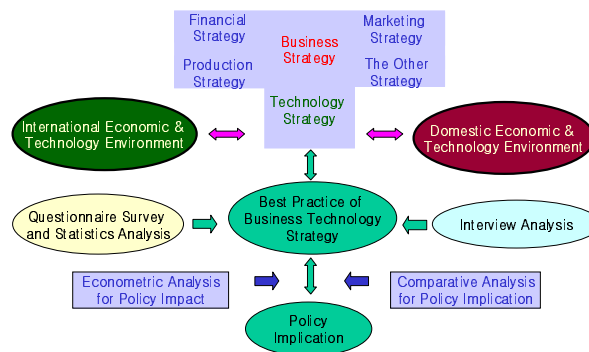


Technology Strategy in Korean Leading Edge Companies - Survey & Interview

2002. 11

Jong Guk SONG and Jung Won LEE
(e-mails: jksong@stepi.re.kr ; leejw@stepi.re.kr)
Science and Technology Policy Institute (STEPI)
Korea

Research Framework



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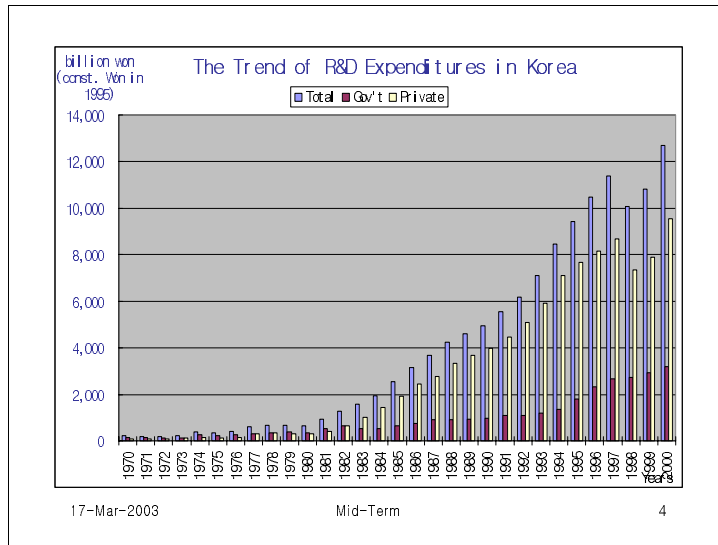
Changes in Business Environment

- International environments
 - Acceleration of globalization
 - Rapid development of new technologies(IT, BT, NT etc.)
 - Rapid growing of business R&D expenditure
 - Rising of R&D outsourcing
 - Shortening time to market
- Domestic environments
 - Foreign financial crisis in 1997
 - Changes in the direction of economic policy
 - Antitrust, unfair trade, etc.
 - Changes in corporate governance
 - Changes in industrial structure

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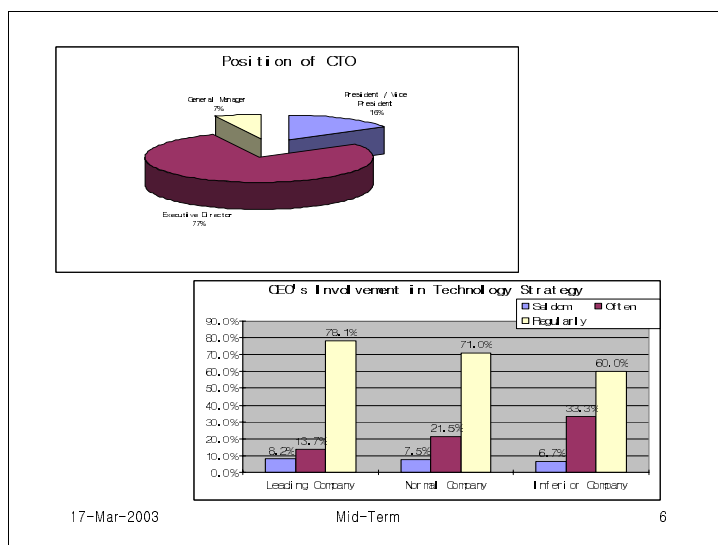
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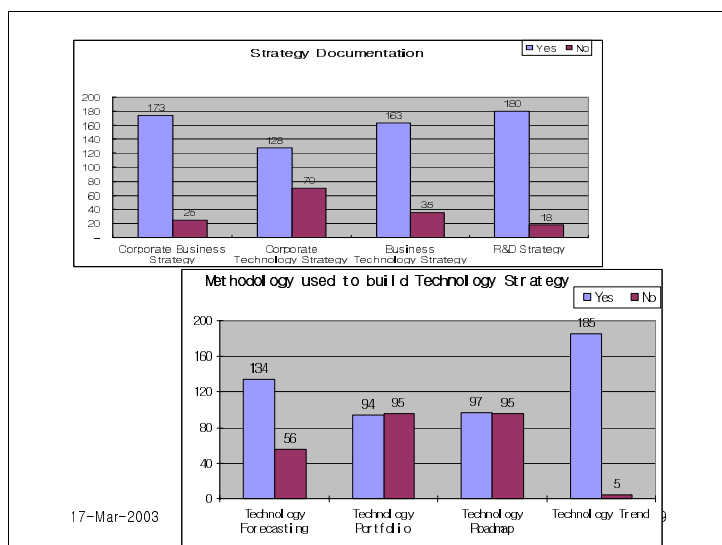
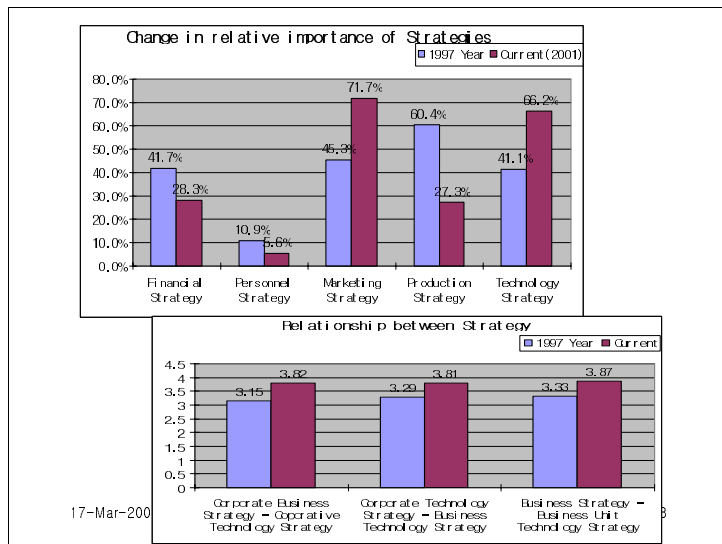
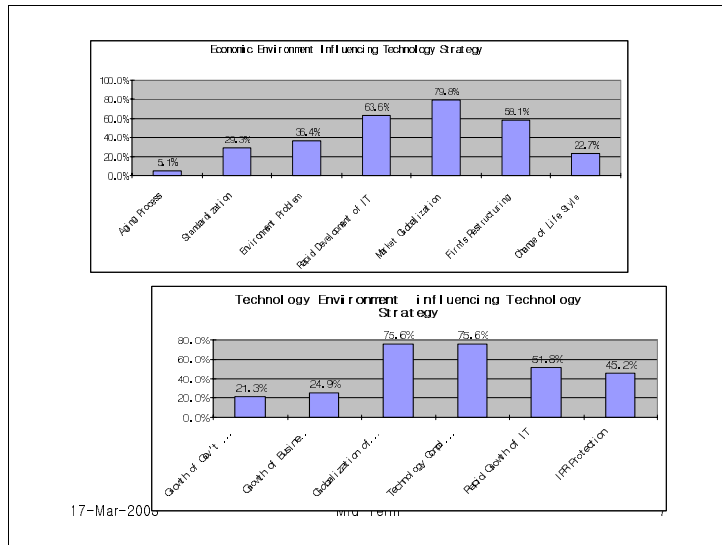


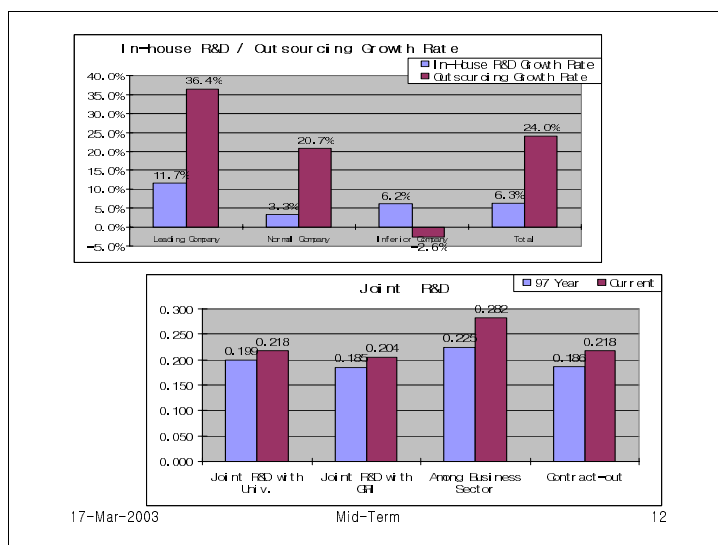
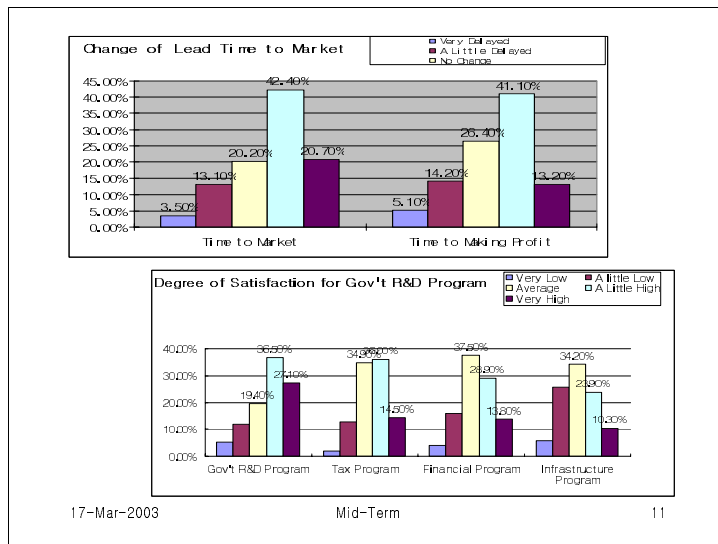
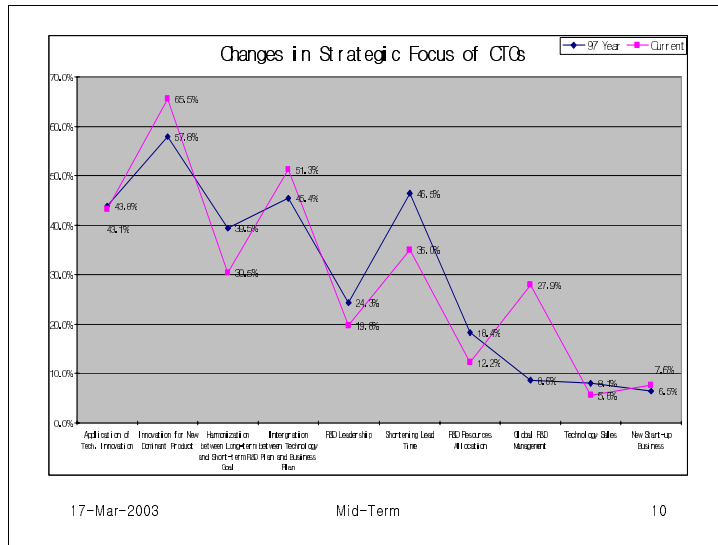
Survey on technology strategy of Korean Firms

- **Survey objectives:**
 - Identify the changing technology strategy of Korean firms in response to changing business/technology environment such as undergone foreign exchange crisis, globalisation, emerging technologies
- **Sample size of Survey firms:**
 - Pick 828 firms (450 large firms, 205 SMEs, 173 venture firms) based on a set of selection criteria (R&D institutes/units, sales volume, R&D manpower)
- **Questionnaire retrieval rate:**
 - Total 199 firms(24.0%) : LF 127(28.2%), SMEs 42(20.5%), start-ups 30(17.3%)

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Case Study on Technology Strategy of Korean Companies

I. Operating Results & R&D(2001~3)

Unit: billion Won

contents company	operating results (SV, EXP)	R&D expenditure & long-term R&D ratio	Remarks
Hyundai Heavy	7404, 6135, 535	R&D: 89 (1.2% of SV), long-term R&D: 10% of total R&D	Fund source: corporately funded
Hyundai Motor	22505, 10400, 2097	R&D: 1020 (4.5% of SV), long- term R&D: 6.2% of total R&D	Fund source: corporately funded
Samsung Electronics	32380, 21870, 2295	R&D&E: 2,400(7.5% of SV), long- term R&D: total R&D	SAIT(Fund source: 50% from corporately funded, 40% contract
LG Chemical	3616, 1508, 269	R&D: 115(3.2% of SV), long-term R&D: 15% of total R&D	Fund source: corporately funded
LG Electronics	16601, 10517, 796	R&D: 759(4.6% of SV), long-term R&D: 3%~4% of total R&D	Fund source: corporately funded
Hyundai Mobis	2965, 1194, 357	R&D: 21 (0.7% of SV), long-term R&D: 20% of total R&D	Fund source: corporately funded
Iljin	221, 122, 1	R&D: 0.6(0.3% of SV) long-term R&D: 20% of total R&D	Fund source: corporately funded

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contents \ position	Position & Role of CTO
Hyundai Heavy	President, Member on board of directors, participate executive meeting
Hyundai Motor	Executive of Vice President, No, participate executive meeting
Samsung Electronics	President, Member on board of directors, participate executive meeting
LG Chemical	President, No, participate executive meeting
LG Electronics	President, No, participate executive meeting,
	Authority of R&D personnel management
Hyundai Mobis	President(both R&D and Marketing), Member on board of directors,
Iljin	Executive director, No, participate executive meeting

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Hyundai Heavy	To increase Value added of current business sectors and Produce world best products	Acquire core technology in main products. Direction of R&D is more important than speed (regards to industrial characteristics)
Hyundai Motor	Focus on future technology development such as environment related technology	Direction of automobile technology: Auto and Environment, Auto and Human, Auto and Society, Deal with Environmental issues in development of engine and transmission
Samsung Electronics	Take international leadership with own technology, basic technology patents, and international standardization	Advancement of technology management(6 sigma), advance research in strategic technology, accelerate 3P (people, process, product) innovation
LG Chemical	Keep leadership to find new business fields (R&D driven business development)	To find new business, focus on R&D in future competence of information-electronics materials and bioscience fields, Develop high value added products and process
LG Electronics	Innovation for the competence of current business and develop future complex fields products by researching new technology	Strengthen the relationship with business unit, Executing technology leadership 2005 innovation program
Hyundai Mobis	Shift aim from intergrated technology to source technology, accumulate self capability in new business (aerospace)	Leadership create in frontier technology, Focus on mechatronics technology, Acquire own technology in current business
Iljin	Focus on new business fields such as optical fibre, ceramics	R&D is creating new future customers

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4. Organizational Structure for Research

Contents Company	Main organizational sub-unit	Role of sub-unit	Globalization of R&D
Hyundai Heavy	R&D Headquarters, Shipbuilding & Ocean Research Institute, Industrial Research Institute, Machine-Electricity Institute, Techno Design Institute	Under the Headquarter 4 institutions are working independently	Local research institute in Hungary & Russia. Employ foreign manpower in drawing unit
Hyundai Motor	Planning & Coordination Office, Automobile development Institute (3 locations), Powertrain Development Institute, Design & Test Institute; in L.A., Detroit, Chiba in Japan, Germany, Sweden.	Manage and Coordinate domestic and abroad institutions, R&D priority setting.	No foreign researcher in domestic institute
Samsung Electronics	Samsung Advanced Institute of Technology(SAIT), Samsung Semiconductor Research Institute, and 41 business unit research Institute, Abroad Institution in Japan, Britain, Germany, and Russia	Operating Technology Group in matrix system and Project team. Process infra team is consist of a special technician group of infra maintenance (reduced R&D cost 20-30%)	Joint Lab abroad. Researchers from Russia and China in domestic research institute. Establish 24 hours cyber research system world wide. Increase R&D outsourcing up to 30%

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continued

Contents Company	Main organizational sub-unit	Role of sub-unit	Globalization of R&D
LG Chemical	In LG Chem Research Park, Corporate R&D(New Biz Incubation Unit, Core Technology Platform, Process Innovation) and Business Unit Institute(Information Electronic Materials, Battery Tech Center, Industrial Material, Petrochemicals)	Direction of Business Unit Institute(Cash Cow role); In house R&D and Joint Venture. Coporate R&D Institute: Find New Business Seed, Acquire World Best Core Tech	Local research institute and operation Satellite lab in the USA Liasion office in Russia & Europe. 10 foreign researchers in domestic institute
LG Electronics	LG Electronics Institute of Technology as a central Research institute and several Culture Unit(CU) in several business units	Cash cow business(Home appliances); Business related Innovation, LG&T: Future oriented new business	Local research institute in the USA & India. M&A or estblish local start-up company. Few foreign researchers
Hyundai Mobis	Technical Research Institute consist of 20 teams	Research activities of 20 teams comprise development of core parts, engineering analyses, and test & evaluation.	Utilize HMC Relationship
Hjin	Optical communication Research Institute and Ceramic Research Institute	To find new business field	Strategic alliance.

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5. Decision Process of Strategy and Project Management

Contents	Decision Process of Strategy	Project Management
Hyundai Heavy	Make a Long-Term business Forecast in each business unit every later half of the year. Decide corporate level strategy in technology policy meeting(with the review of the council of Technology Development, members are CTO, business unit technology executive directors, president of each institute).	20% of projects are from researchers' free idea, by strategic planning is the rest.
Hyundai Motor	Set up corporate strategy for 10 years and revise it each year. After completion of long-term products planning, make a development plan, and make a plan of each research institute's role and function	Select development model through various process including a review of deliberation of products council. Under the authority of project manager prjects of each development stage are managed comprehensively and systematically.
Samsung Electronics	Long term technology starategy document exists. Select research topic from new technology (or product) map. For the selection of project related to current business, discuss topics with business unit every 3 month. For basic research, researchers hand in self-report and checked by self-control inside of institute	Apply stage gate method to project management. Invite business unit persons to take design review in each stage.

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(Continued)

Contents	Decision Process of Strategy
LG Chemical	Make an alignment process of corporate strategy on corporate level. Reflect technology strategy in Corporate strategy to develop new technology and new market opportunity. Use scenario planning method, technology road map, technology portfolio
LG Electronics	Long term technology strategy and a year plan is decided by business technology strategy meeting every year. Concessus building process by regular meeting with business unit
Hyundai Mobis	Set up target technology by top-down and bottom up process. Focus on building up core technology capability in automobile module business and aerospace business.
Iljin	On the criteria of customer needs and opportunity of future value Strategy is decided by investment council consists of executive directors.

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6. Methodology of Setting up Technology Strategy

contents company	Methodology
Hyundai Heavy	Technology tree, Technology tree, negative to use TRM
Hyundai Motor	TRM
Samsung Electronics	Technology tree, Technology tree, TRM, and Design for 6 Sigma
LG Chemical	TRM, QFD, Tech tree, TRIZ, DOE etc.
LG Electronics	TRM, AHP
Hyundai Mobis	utilize TRM
Iljin	-

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7. Human Resource Management

Contents Company	Foci of Performance Measurement	Free Research Time	Mobility and Technology Transfer
Hyundai Heavy	Incentive on royalty within a certain amount of revenue. Reports or papers are in difficulty of evaluation as an	Not officially approved free research, give an opportunity to carry out a research project by researcher's idea	Recently pursue co-works between researcher and engineer in production line. Technology development in major business products form
Hyundai Motor	Operate patents management team. Incentive on royalty within a certain amount of revenue.	Give free research opportunity and reward for excellent paper	Operate start-up business plaza inside firm
Samsung Electronics	Operate patent council to manage and evaluate patent. Individual knowledge capability is the most important factor in evaluation. Patent, technology transfer, royalty are important measures	10% of total R&D is allocated to the free theme research	Researcers often move out to production field case by project and usually return. Establish commercialization architecture for timely technology transfer and shortening time to business.

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