

Study on Establishment of National Technology Transfer System

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Abstract—In this paper, we examine the necessity and the role of technology transfer/diffusion in the frame of national technology innovation system. On the base of this, we present a construction plan of technology transfer/diffusion system to make the national electric industry for 21st century to possess the competitive power.

To achieve above purpose, we examine the relations between theory of technology transfer/diffusion structure and policy. Furthermore, we try to find the necessity for construction of technology transfer & diffusion system and a driving plan. Then, it is analyzed that expected design requirements for the construction of electric technology transfer & diffusion system. Finally, construction and activation plan for electric technology transfer & diffusion system are presented, which would strengthen the national technology competitiveness.

Index Terms—National Technology Innovation system, Technology Transfer, Technology Diffusion, Electric Technology, Electric Technology Diffusion Program, Diffusion system of Electric Technology

I. INTRODUCTION

Technology diffusion is defined as the process by which innovation knowledge is adopted and gains acceptance by members of economic activities. A number of factors of technology knowledge through certain intermediation tools and channels interact to influence the diffusion of an innovation (Rogers, 1971). Technology diffusion is becoming an important factor in the frame of national innovation system, in which emphasize the flow of knowledge among main members of national innovation.

To make science & technology to contribute to nation's economic growth and development, the technology diffusion from the productive section of technology knowledge to industry, the user of technology, is an indispensable factor. In the R&D section of national electric industry the public function and business of KEPCO (Korea Electric Power Corporation) converted to competitive structure, so the diffusion of research results is gathering strength for the construction of electric technology diffusion system.

Based on this background, in this paper, efficient plans

are presented for utilization and diffusion of developed technology by electricity industry to make our electric technology to possess the competitive power over 21st overall industry.

II. THE NECESSITY OF TECHNOLOGY TRANSFER AND DIFFUSION SYSTEM

To make science & technology to contribute to nation's economic growth and development, the technology diffusion from the productive section of technology knowledge to the industry, the user of technology, is an indispensable factor. The other reason, why technology transfer/diffusion is so important at present, is technology diffusion could make earlier to build knowledge based economy, which could solve our economic structural problems.

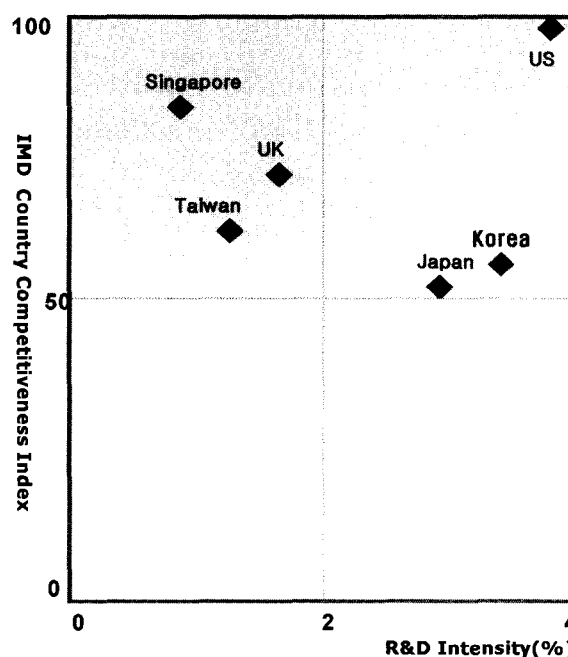


Fig. 1 Comparison of Country Competitiveness Index

Our R&D intensity against GNP is higher than Singapore and Taiwan, and possess higher or similar lever with advanced countries such as the USA, Japan and the UK. In contrast with it, it can be seen on the [Figure 1], Korea national competitiveness index against R&D intensity remains in the lowest rank.

Also, science & technology competitiveness index of Korea is lowest among compared nations such as US, Japan, Singapore and the UK as shown in Figure 2.

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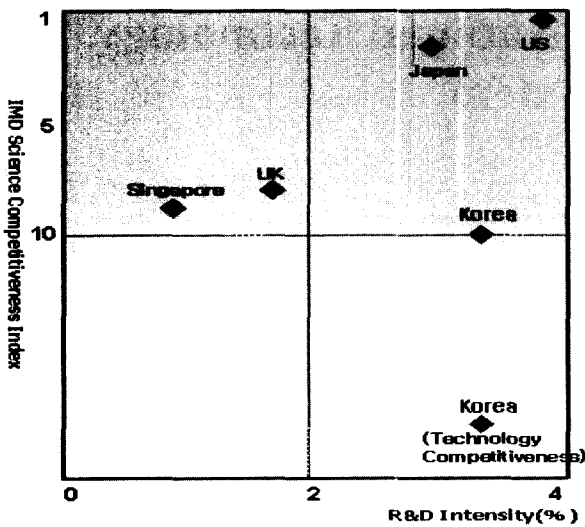


Fig. 2 Comparison of Science and Technology Competitiveness Index

It was caused by the policy, that gave the first primacy to the input but not to the results, that is to say, it was the result of low output against high input. Finally, it leads to inefficient operation of government budget. It means the results of R&D are exceedingly insignificant against R&D investment, and the transfer and diffusion of the results are insignificant too. These factors explain the necessity of formulating more efficient policy for transfer and diffusion system.

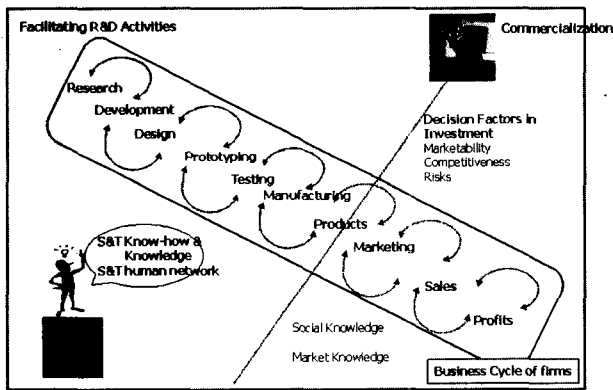


Fig. 3 Businesses' R&D Cycle

It can be seen on the [Figure 3] from a point of view of an enterprise's R&D cycle. That is, business activities of enterprise go through various processes from Research & Development to the pursuit of profit. But all sorts of accomplished policies during that time, which focused from R&D step to former step of commercialization, are estimated that the diffusion of results is not achieved smoothly.

On the government level, it brings inefficient operation of budget, and from the side of enterprises, it brings waste of time and money for sourcing technology knowledge by them, as technology diffusion is not achieved smoothly.

It is 'Technology Diffusion System,' which connects technology supply and technology demand in the national innovation system. The role of government to promote technology diffusion is to formulate a policy of the

system. Technology diffusion is the most important part in the national innovation system, which emphasizes the knowledge flow among members of technology innovation.

III. THE DESIGN AND CONSTRUCTION PLAN FOR ELECTRIC TECHNOLOGY DIFFUSION SYSTEM

The reasons, why technology transfer/diffusion were not achieved actively in the national electric technology development structure led by KEPCO, are the followings.

First, as explained before, the focus of technology development support policy for universities and industries was adjusted to input but not to output, with the technology specific character of electric technologies.

Second, the systematic management of research results is insufficient.

Third, recognition about technology transfer and diffusion to other industries or related fields is not thoroughgoing enough. Thus, related organizations have to build a database of developed technologies by government-run institutions or electric companies.

Also, technologies which could be transferred have to be unearthed, which could promote actively the technology transfer businesses of the supply leading model among government-run institutions, Electric companies, electric machinery companies and start-up businesses. At the same time, technology transfer and diffusion system has to be developed by doing research, confirm, and evaluate so that maximize technology transfer focusing on demand-oriented.

Further, demand-oriented technology transfer system has to be designed for active and effective transfer of technology and knowledge including technology information in the frame of whole national electric industry.

By this concept, the electric industry technology transfer system could be divided into following. First, it is the channel that connects technology suppliers, technology recipients and various activities. Second, the other one is external environmental factors, which influence technology transfer activities.

From this background, the electric industry technology transfer system, that promotes national electricity technology innovation ability in the frame of national electric technology innovation system and contributes to raise competitiveness in electricity industry, could be organized as below [Figure 4].

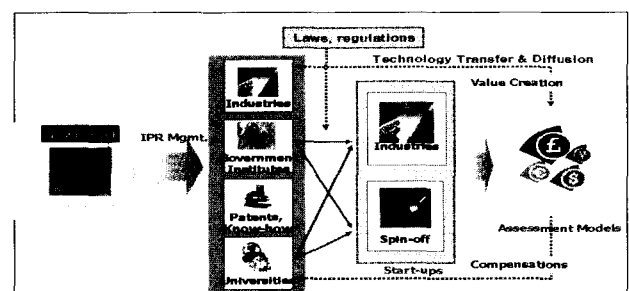


Fig. 4 Conceptual Design of Technology Transfer & Diffusion System

- In this frame, the technical requirements among technology transfer members could be subdivided into
- establishment of intellectual properties(IP) management and information,
 - distribution system,
 - construction of technology transfer management and infrastructure,
 - technology and market evaluation, technology marketing, upbringing start-up businesses business, and
 - technology transfer.

Design of the system for electric technology distribution and management, and technology knowledge transfer are shown in the [Figure 5].

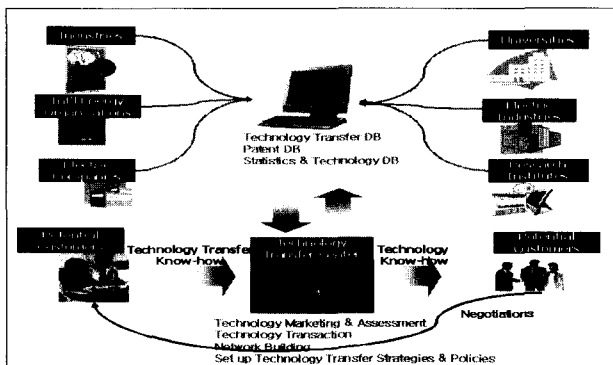


Fig. 5 Electric Technology Transfer & Diffusion System

Technology transfer policies must get rid of barriers in the system and has to promote technology transfer by organic relations with external environments. In this system technology suppliers (electric researcher) must consider using appropriate transfer channels when operating organizations, and must formulate policies and regulations that reflect the needs of technology recipients.

At the same time, the government must provide political supports, for example, establishing a law concerning technology transfer, constructing technology transfer infrastructure such as supporting science parks and incubating industries to promote smooth technology transfer activities among technology transfer members.

IV. RECOMMENDATION OF ELECTIC TECHNOLOGY TRANSFER SYSTEM

The activation plan for electric technology transfer and diffusion system could be described by [Figure 6].

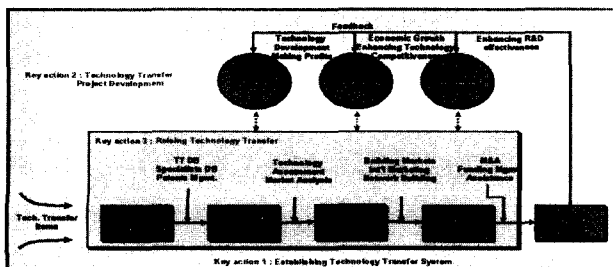


Fig. 6 Key actions for facilitating Technology Transfer

First, the electric technology related policies must drive forward to technology creation and technology diffusion by designing transfer and diffusion system, which regards in the direction of integrating electric technology policies.

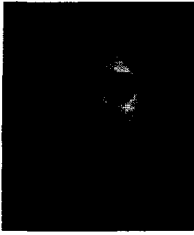
Second, it is necessary to build an exclusive organization and to raise professional staffs for facilitating technology transfer.

Third, commercialization strategies regarding the specifics of electric technology must be propelled. It is difficult to start electric related new businesses, because electric technologies possess the characteristics of software system technologies, and the market limited only for electric companies.

Therefore, it is important to develop special technologies and foster professional start-ups to induce accumulation and production of developed electric technologies. To induce professional technologies of strategic start-ups, it is necessary to support technology development fund and to prepare fund raising policy for technology transfer and commercialization from the side of public research organizations. At the same time, to induce companies to enter a foreign market and breaking from limited domestic markets, it is recommended to consider related market research and to concretely study relative system.

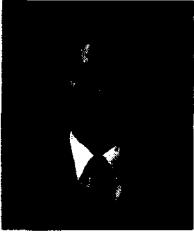
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