

Technology Transfer Principle & Strategy

Chapter 4: Information Search & Analysis Techniques

The aim of part 1 is to classify technology items traded in the technology distribution market and learn the purpose of searching technology items and their effects.

- The purpose of information search in relation to industrial property rights and expected results
- Technology item search methods using technology transfer organizations

Part 2 introduces basic offline & online search methods for efficient marketing of technology items.

Part 3 introduces evaluation types and evaluation organizations for diverse purposes including technological capability & business feasibility of technology items.

- Technology analysis/evaluation
- Demand for technology evaluations
- Domestic & international technological value evaluation systems

Part 4 introduces search methods used in the search process of technology items and the types of domestic & international information search services.

- Search methods
- Domestic & overseas information search sites and their features

Part 1: Information Search Methods

1. Technology Information Search

Technology items are technology that can be used for commercialization purposes, and they specifically include industrial technology, inventions, designs, original ideas etc. These technology items include not only patents and utility models but also designs, trademarks etc. which receive legal protection in the form of industrial property rights, so they can possess secure rights in commercialization, and know-how (there is a way to receive legal protection of rights) which is a type of intellectual property as a special technique or secret method used in industrial production having economic value but legal right is not easy to obtain. Commercial technology items are monopolistic and can secure exclusive legal rights enabling monopolistic profits through commercialization by which the value of technology transfer is secured. As a result, of the technology item discovery methods, the search method of technology information which secures rights through commercial industrial property rights is the most general.

On the other hand, the existing unit of industrial property right, the individual patent (essential technology), is a technology item which takes into consideration technology capability, rights, business feasibility etc. has been newly packaged with the activation of technology transfer organizations, the technology item market is opening up in the commercial viewpoint.

(1) Information search targeting industrial property rights

A) Industrial property

Patent information is relatively recent in terms of technology information, and because a wide range of information has been accumulated over a long period of time, it can be the priority search target

in the technology discovery process. The results that can be gained through the patent information are shown in <Table 1>.

[Table 1] Results that can be gained through the patent information search

1. R&D investment strategy can be established by determining technology trends for each technology field
2. By determining the existence of registered patents, overlap development & investment can be prevented
3. If there is concern of conflict with existing patents, patent disputes can be prevented through evasive designs
4. Secure valid patents by determining niche technology existing amongst registered patents
5. Technology implementation or cross licensing by finding owners of relevant technology patents
6. Data collection to obstruct & invalidate the patent acquisition of other companies
7. Decide on rights possibility through the judgment of originality, advancement potential etc. of technology in the patent application process

B) The purpose of industrial property search

The purpose of industrial property research such as patents etc. is as follows.

- Check for any prior applications of identical patents before application in acquiring patents after invention
- Response to objections, judgment appeals (for example, patent & counter patent check by the sanctioned party to counter the sanction measures such as document warnings etc.)
- In the case where a patent in relation to products being manufactured is publicized, appeal application related patent research to invalidate this publicized patent.
- Incorporation of prior technology relevant to technology development
- Research of prior technology for patent application
- Determining technology direction of competitors
- Research to confirm patent violations after development to establish technology development plans
- In the case of technology implementation and technology alliances, research to determine the extent of technology implementation & technology alliance and technology ownership status
- Check rights of the target country in the case of product exports

- Check rights within Korea in the case of product imports
- Check the rights of others in relation to new products

C) Types of industrial property information research

As shown in <Table 2> the types of patent information research include subject research, technology trend research, number inquiry research, judgment progress research, original register research, counter patent research etc. and the details are as follows.

The subject research is the focus in patent research and is the most widely used. This falls into the search of open data of the intellectual property office, and the classification number is the most important search key. Therefore, sufficient examination of the relevant classification and the possibility of being able to search with the patent classification must be conducted. Apart from the international patent classification for common use around the world, it is advisable to use in combination with classifications exclusively developed by information service organizations such as Derwent, FTERM, and various other patent classifications such as compound classifications.

Technology trend research is the extraction of all numbers in relation to corporate patent application notifications and announcements by using the index of applicants and the names of applicants on the database as the search key. There is the application number, notification number, patent number, judgment appeal number etc. in the patent related number inquiry. On the other hand, judgment progress research is to find out the progress and current status of a particular application. To find out information on continuation, termination, setting of the exclusive execution right (commercial), transfer of rights etc. of patents and utility models, inspection of the original register is the only

research method.

Counter patent research (included in the patent family research, particular patent research) is the research of patent materials of identical inventions in the application country in the case where identical inventions are applying for patents in 2 or more countries. With counter patent research there is only the existing manual search method, but counter patent service is developing with the recent database search, and the services that can be used for this search are World Patent Index (WPI) of Derwent, Patent Family Services (PFS) of INPADOC, Concordances of Chemical Abstracts etc.

<Table 2> shows the purpose and with which search key the previously mentioned 6 types of patent information searches can be used.

[Table 2] Types of patent information research

No.	Research Type	Research Data	Search Key	Research Purpose
1	Subject research (technology details research)	Classification index Abstracts	Various patent classifications Keyword	
2	Technology (company) trend research	Applicant index	Applicant code Company name Individual name	
3	Number table research	Number table Index	Patent number (application, notification, announcement, registration)	Stage by stage patent no. (Confirmed no., pending no.) classification check
4	Judgment progress research (patent wrapper research)	File wrapper	Application no. Registration no.	Judgment progress & applicant, ownership by 3 rd party & details
5	Original research register	Original register	Application no. Registration no.	Existence of rights, termination, right of exercise setting, rights transfer
6	Counter patent research	DIALOG etc. Commercial DB	Priority DATA Application no. Registration no.	High priority announced patent discovery, overseas patents check, obtain patent specification for reading

D) Discovery of technology items taking into account commercial viability

With previous technology items, key technologies were transferred & distributed in the viewpoint of industrial property centered on the developer, but with the development in the technology transfer market the scope of technology items is becoming wider. That is, technology transfer organizations, research organizations, TLO (Technology Licensing Office) within universities & TP (Techno Parks) within venture incubation centers etc. are packaging various technology items by combining a number of key technologies taking into account commercialization to enable technology transfer in the commercial viewpoint, by which they are showing trends of not only single patents but also technology item developments in a commercial sense being distributed in the transfer market. As a result, the commercialization of combined technologies, which had been difficult due to the difficulties in searching through the existing industrial property search, has become easier.

With technologies of the industrial property unit, there are many cases where it is hard to simply understand the commercial usage just by looking at the technology name, but with technology items packaged with a commercial viewpoint, commercial characteristics can easily be known just by the technology name, so they are items that are especially effectively traded in the customer centered technology transfer market.

2. Search & Discovery of Technology Demand

In the position of developers, technology transfer organizations, and technology transfer companies which possess technology items, the effective discovery of technology demanding parties at the right time and the right place is a very important process. The common search methods in relation to technology items can be divided into the offline method and the online marketing method using the internet, but ultimately both on & offline are just methods, and in reality the most commercialized existing search methodologies can be considered.

(1) Technology transfer search based on technology transfer organizations

Organizations that consider technology transfer can be classified into technology development organizations (universities, research centers, firms, individual inventors etc.) and intermediary organizations (transfer centers, transfer companies etc.).

A) Technology transfer search through technology transfer bodies

To discover demanding parties of in-house developed technology, universities, research centers, firms, individual inventors etc. can conduct technology transfer marketing. Of these, mostly universities & public research organizations are establishing specialized technology transfer frameworks and conducting specialized technology transfer search & marketing. In accordance with the technology transfer promotion law coming into effect, exclusive technology transfer organizations have been established in some universities, research centers etc. emphasizing the importance of research results proliferation, but in reality they are not being operated systematically, and there are many cases where marketing through personal networks such as area & university associations are being conducted rather than through objective market principles. Until now, universities in Korea were in a situation where they did not have structured technology transfer systems, but through the technology transfer promotion law and the recognition of the importance of securing industrial property by universities, advanced plans are being devised in relation to the operation of the exclusive technology transfer organizations and university operation systems.

B) Technology search methods using intermediary systems

These are comprised of organizations or individuals to simplify technology transfer between technology providers and buyers. Although these intermediary organizations are not required for all technology transfer, in most technology transfer processes the requirement of a 3rd party intermediary function is being suggested because the efficient contact between the developer and demanding party is not easy, and especially with important corporate technology buyers, technology outsourcing is being recognized as the crucial market survival strategy rather than in-house technology development. If the case of GE, one of the most competitive corporations in the world, is taken as a representative example, they claim "the survival strategy as one of the most competitive corporations in the world is to implement (by outsourcing) the most superior technology first and commercialize it first."

Organizations which deal exclusively with technology transfer engage in a comprehensive range of technology transfer related duties including technology transfer introduction & information supply, individual technology & buyer consultation, technology (value) evaluation etc. Intermediary duties of technology transfer agency can be conducted comprehensively through technomarts, and technomarts include independent technology transfer organizations, technology transfer consultants (technology transfer firms, lawyers, patent attorneys etc.) law firms, and technology transfer related associations.

The technomart in <Figure 2> is a market where technology buyers and technology providers meet and conduct technology transfer. The technomart plays a role where both parties register at the technomart and are supplied with information, and by participating in technology briefings and consultations held periodically, transfer counterparts are found. Moreover, in an overall sense, along

with the technology transfer aspect, it also plays the role in the collection, management, provision of technology information, research & analysis of technology information, distribution, intermediation, & agency for technology information, and holds seminars, consultations etc.

For these kinds of technomart functions to be implemented effectively, the technology information distribution system, which is the basis for the technomart, must be established and utilized, and active participation is required by exclusive intermediary organizations providing specialized functions such as consultation, licensing, and patent advice.

[Figure 2] Comprehensive meaning of the technology intermediation concept

Technology buyer

Register

Information supply

Principal business organization

Event host, combine DB management

Technology information distribution

DB production, information collection, processing/supplementation

Technomart

1: Technology information collection/management/supply

2: Research & analysis of technology information

3: Distribution/intermediation/ agency of technology information

4: Seminars & consultations

Principal business organization

Register

Information supply

Technology provider

Intermediary organization

Consulting, licensing, patent advice etc.

Part 2: Online / Offline Technology Search

Technology developers (organizations) and technology transfer intermediaries (organizations) etc. can conduct diverse marketing activities for the discovery of technology buyers, but technology analysis methods which are fundamentally used as commercial methods are being diversely applied and utilized. These kinds of methods are being conducted as follows through online & offline means.

1. Offline

Unlike general consumer products, it can be said that effective media which could directly connect buyers requiring technology information to the technology item have not been in existence. As a result, in the past the standard methods for buyer discovery included individual visitations in order of priority to corporations operating in related technology fields, individual contacts in technomarts & technology exhibitions etc, or contact with retired experts in the related fields and usage of intermediaries, but there were limitations in effectively connecting with appropriate buyers using these means.

However, with the periodic openings of the domestic & international technology transfer markets, and the technology transfer intermediary activities of technology transfer organizations such as

research organizations, technology transfer organizations within universities (TLO) etc. and technology transfer firms, opportunities to gain contact with buyers are gradually increasing.

Also, with the gradual activation of the technology transfer market, opportunities to enter new businesses and contact with developers through direct visitation of the relevant technology transfer markets to increase competitiveness of the existing business are increasing, and the trend is showing that technology transfer is being conducted more efficiently than in the past.

2. Online

With the development of the internet, efficient technology search has been made possible while minimizing cost and the online search discovery is being used as all commercial means. This is not an exception for the technology search in relation to technology items.

(1) Marketing using websites

Websites focusing on technology transfer organizations are mainly being used for marketing technology items.

In the case of Korea Technology Transfer Center, a separate website called National Technology Bank is operated, and is conducting comprehensive marketing for technology items. The NTB website is providing technology transfer related portal services including technology register, technology search, technology transfer seminar promotions, technology transfer DB operation, technology implementation consultation etc.

Domestic & international websites relating to technology transfer & commercialization are as follows.

- Association of University Technology Managers (AUTM)
<http://www.autm.net>
- Commercial Development Association
<http://www.commerciadevelopment.com/>
- Federal Laboratory Consortium(FLC)
<http://www.federallabs.org/>
- Licensing Executive Society(LES)
<http://www.lesi.org/>
- National Technology Transfer Center(NTTC)
<http://www.nttc.edu/>
- Product Development and Management Association(PDMA)
<http://www.pdma.org/>
- NASA Regional Technology Transfer Centers(NTTCS)
<http://www.ctc.org/index.html>
- Technology Entrepreneur's Intrapreneur's Network(TEIN)
- Technology Transfer Society
<http://www.t2s.org/>
- The University of Cincinnati Intellectual Property Office
<http://www.ipo.uc.edu/>
- Technology Services (TS)
<http://ts.nist.gov>
- THE BAYH-DOLE ACT
<http://www.tmc.tulane.edu/techdev/Bayh.html>
- National Center for Agricultural Utilization Research (NCAUR)

- <http://www.ncaur.usda.gov/technology.html>
- Institute of Telecommunication Sciences (ITS)
<http://www.its.bldrdr.gov/Home.html>
- The Illinois Coalition (I.T.E.C)

<http://www.ilcoalition.org/index.jsp>
- Technology Transfer and the U.S. Biotechnology Industry
<http://www.tekes.fi/julkaisut/index.html>
- Federation of Americal Scientists
<http://www.far.org>
- THE AERONAUTICS ENTERPRISE
<http://www.hq.nasa.gov/office/codez/aeronautics.html>
- NASA Headquarters
<http://www.hq.nasa.gov>
- The Technology Commercialization Office (TCO)
<http://afc.gsfc.nasa.gov/mainFS.html>
- Small Business High Technology Institute
<http://sbir.dsu.edu/>
- International Technology Transfer Market (Cyber Technomart)
<http://www.technomart.org>
- Korea Technology Transfer Office
<http://www.kttc.or.kr>
- Korea Institute of Science & Technology
<http://www.kist.re.kr/Teams/kist/>
- KAIST
<http://www.kaist.ac.kr/main2000.html>
- Institute of Information Technology Assessment
<http://ita.iita.re.kr>
- Electronics & Telecommunications Research Institute
<http://www.etri.re.kr>

(2) Marketing using email transmissions

Despite the fact that the cost burden on the information sender is low, the spam mails appearing as a byproduct of the internet medium, is causing problems where information is not being properly delivered to potential buyers.

As a result, email transmission utilizing just the spam function of information delivery does not seem to be an effective method, rather email transmissions between organizations and individuals on the internet where more reliable interaction can be achieved will not only add reliability to the information but also increase the probability of effective transmission.

(3) Other marketing means

There are methods including newspaper articles, TV, DM transmission using postage etc. but due to the costs involved and the development of the internet medium, they are not commonly used as marketing means for technology items.

Part 3: Analysis of Searched Technology

1. Technology Analysis & Evaluation

(1) Types of analyses & evaluations

To analyze and appraise technology, the purpose must be determined precisely first. Depending on the purpose, technology analysis & evaluation can largely be classified into 5 categories, and the applicable methodologies & results differ in accordance with the analysis type.

The first type is the technology evaluation analysis (technology asset) conducted on the site of technology innovation. This analysis deals with idea superiority, R&D project selection, continuance of project, comparison with other technologies etc. and has been conducted in relation to many researches. This type is not limited to just 1 kind but can be classified into scientific or engineering analysis, and for each analysis evaluation purpose for R&D or technology development projects.

The second type is the forecast evaluation of technology and is called the technology foresight. This evaluation is a forecast of how the technology will develop in the future, and is an evaluation activity to determine the general direction of technology innovation and whether the particular technology can develop. This kind of evaluation can be said to be a requirement for the establishment of national industrial policy.

The third type is the technology assessment which is to determine the social & economic influences of a particular technology. Technology assessment seeks to determine the negative social influences of a particular technology, and simultaneously examines the economic aspect & social aspect of the subject technology, and the positive aspects along with the negative aspects are examined. With these characteristics, it is an evaluation type mainly conducted in the sociology, philosophy, and history fields. Technology assessments have become rather weak in recent times while environmental assessments have become more active.

The fourth type is the cost benefit analysis in relation to the technology. With this approach, feasibility study focusing on the site is mainly done by the industry engineering field, and economic effects analysis is mainly conducted by the economics field. The economic effects analysis determines in numerical terms the effects to the whole economy, and generally involves a complex calculation process. The technology evaluation mentioned in the science & technology promotion law of Korea represents the third and fourth types.

The fifth technology evaluation type is the technology valuation. This type disregards all social & economic effects of the technology and only measures the monetary value. It is basically the evaluation that forms the basis of the transfer. This type of evaluation has become very significant recently, and is the technology evaluation mentioned in the industrial technology infrastructure formation law and the special law on venture enterprise cultivation.

Of these 5 types of technology evaluation methods, the method that is the most closely related to technology transfer is the cost benefit analysis, and in the viewpoint of technology valuation, technological capability, rights, marketability etc. can be taken into consideration.

(2) Analysis evaluation method

In the case for analyses of technological capability in regards to technology items, the degree of technology completion, the degree of importance & standard of the core technology, technology life cycle, technology competitiveness etc. can be taken into consideration. In the case for rights, acquisition status of technological rights, rights protection period for technology exclusivity etc. can be taken into consideration. And in the case for the technology item marketability analysis, level of product contribution using the technology item, domestic & international market trends, demand

trends, entrance & penetration possibilities in domestic & international markets, product price competitiveness, possibility of replacement by other related technologies & products, expected profitability etc. can be taken into consideration. (Refer to <Table 3>)

[Table 3] Technological capability, rights, marketability analysis details

Evaluation Factors		Specific Analysis Details
	Level of completion, reliability	Width & depth of technology, independence in terms of condition, reliability
	Existence of substitutes, similar technologies (domestic & international)	Existence of substitutes, similar technologies, exclusive originality
	Possibility & difficulty of imitations (simplicity)	Technology originality, imitation possibility, difficulty
	Level of importance & standard (core details)	Technology superiority, standard relative to competition technology
	Life cycle position, longevity	Technology life cycle position, expected utilization period
	Technology competitiveness	Innovativeness, national evaluation of originality
	Form of right	Technology rights situation, level & grade
	Period of right, expected life	Exclusive technology right, rights protection period
	Level of technology contribution to the product	Level of contribution to product application, core significance, need for combination with other products
	Marketability, growth potential of technology item	Domestic & international market trend, demand trend, evaluation of counteraction
	Entrance, penetration possibility into domestic & international markets	Market position, contribution possibility to market share improvement
	Price & comparative price competitiveness of the product	Comparison of performance, quality, price with similar items domestically & internationally, growth potential
	Other related technology, replacement possibility	Similar products domestically & internationally, product substitution possibility, competitiveness
	Expected profitability	Manufacturing cost reduction effect, long-term value addition prospect

According to the definition of OTA (Office of Technology Assessment) in the US, technology evaluation is “a series of activities converting into monetary terms the market value of technology by combined analysis of opportunity & risk factors in relation to feasibility, rights, and substitutes of new technology.” Here, evaluation is the view that the value of the subject must be precisely determined, and there are many other words to express evaluation including evaluation (results, effects), assessment (forecast, influence), and valuation (value calculation).

The basic factors of technology evaluation are classified into evaluation purpose, evaluation theme, evaluation subject, evaluation demand, evaluation information etc. The usage for technology evaluations are as follows. First, as a function for the management of R&D and technology developments by individual technology development bodies, it is the evaluation of R&D project selection, progress management, results analysis etc. Second, as a function for the technology project derivation & technology funding support management, technology support project selection, feasibility studies, interim assessments, post assessments etc. are carried out. Third, as a function for the evaluation of technology transfer subject projects, feasibility studies are carried out for technology transfer & implementation, technology exports etc. Fourth, as a function for technology investments and M&A of technology intensive firms, the technology aspect is appraised including lab establishments, venture capital organizations etc.

(3) Technology evaluation & analysis period

In the process of technology transfer, analysis methods and technology evaluation systems etc. to analyze technology commercialization possibilities are gradually being established within Korea. With the enactment of the technology transfer promotion law, the government has established the Korea Technology Transfer Center (KTTC) and is constructing technology evaluation systems for technology transfer & transactions, and the start-up support divisions & technology transfer

divisions within government funded research organizations including the Institute of Industrial Technology Evaluation & Planning, the Technology Transfer Center of Korea Technology Credit Guarantee Fund, Korea Institute of S&T Evaluation & Planning, the subsidiary Technology Transfer Center of the Institute of Information Technology Assessment, the Technology Transfer Center of the Small Business Corporation, KAIST etc. are also forming systems for technology evaluation. Especially, the technology evaluation systems for venture enterprise designation and technology collateral loans are being actively constructed by various organizations including Korea Technology Credit Guarantee Fund, Institute of Industrial Technology Evaluation & Planning, Korea Institute of S&T Evaluation & Planning, Small & Medium Business Administration etc.

Actual technology valuations are being conducted by the technology evaluation centers of the Institute of Industrial Technology Evaluation & Planning and Korea Technology Credit Guarantee Fund focusing on collateral value of technology, and technology valuations also accompany technology transfer by the KTTC.

In the case of the Institute of Industrial Technology Evaluation & Planning, technology valuations are conducted only for secured loans, and they are not used as intangible asset valuations for capitalization. The technology evaluation center of Korea Technology Credit Guarantee Fund conducts technology valuations for technology collateral loans, venture enterprise KOSDAQ registrations, purchasing etc. The methods of technology valuations are classified into monetary valuation and grade valuation, and although the usage limitations are specified, corporations can utilize them within the scope of the valuation center having no liability.

Unlike the technological capability evaluation of corporations, evaluation systems in relation to individual technology are at the stage where evaluation models & procedures, selection of core evaluation factors, construction & utilization of related DB etc. are being examined to enable various organizations including KTTC, private technology transfer organizations etc. to create efficient systems. Especially for technology transfer, KTTC is developing a standardized method for evaluation systems in relation to potential value, standard value in transfer transactions, future value that can be gained through technology utilization etc. of individual technology, by which the adoption of objectivity in line with the technology field or technology scale is being devised.

Also, the evaluation for reference in technology start-up & venture enterprise investments is the field that is in most demand, and these evaluations are being conducted with in-house model evaluation procedures by the technology evaluation center of Korea Technology Credit Guarantee Fund, technology evaluation teams in universities, some consulting organizations, and other organizations established to perform specialized technology evaluations.

Of the 3 factors, technological capability, marketability, and business feasibility, to which the focus will be on is according to the technology evaluation purpose, and the technology valuation method can also be considered. Commercially, the current trends are gradually showing demand for analysis from the technology transfer process to technology valuation.

However, domestically & internationally, not only the standardized concept of technology valuations but also the standardized alternatives for related theories & methods have not yet been established.

2. Demand for Technology Evaluation

It is expected that the demand for technology evaluation will increase dramatically in the future. Corporate M&As will also rapidly increase as a means for securing technology, and a rise in demand is expected for evaluation of technology transfer & technology investments, technology development results as well as value assessments for technology & business rights as a part of the

intangible assets in valuations of bankrupt companies. Especially, demand for technology valuations are expected to increase in the following 3 aspects.

First, future intangible corporate value which cannot be seen with the eye will be appraised focused on technology value. Although it is an era where the value of venture enterprises, which cannot be compared in terms of sales or profits, is being valued higher than traditional firms, there is a problem in comparing venture enterprises or traditional firms only with a standardized measure. The common evaluation standards for successful firms either venture enterprises or traditional firms until now did not take into account the value that could not be seen nor measured. It is the corporate value generally referred to as technological capability.

Second, as a new evaluation standard for corporate value, the intellectual property value has become significant. According to the results of a study on corporate value done by a US accountants association, intangible assets especially intellectual property make up on average more than 60% of the entire corporate value, and the more superior the corporation, the higher the value of these kinds of intangible intellectual property. It is the standard for the 60% or more corporate value of intellectual property which previously had not been properly appraised, and through the development and evaluation of the intellectual property value, corporations can not only raise corporate value but also secure opportunities for new profit creation.

Third, as the key solution for corporate restructuring, it is expected that this type of demand will increase further as the methods for intangible asset value has been developed. American corporations that experienced painful restructuring due to the weakening of production results in the late 1970s, found ways to secure corporate competitiveness and national economy recovery focusing on maximizing intellectual property value, and from the 1990s they have been enjoying prosperity.

3. Oversees Technology Evaluation Systems

In America, the ASA (American Society of Appraisers), NACVA (National Association of Certified Valuation Analysts) IBA (Institute of Business Appraisers) etc. are conducting technology evaluation tasks, and they are mainly of accounting backgrounds or those engaged in corporate evaluation. Also, many individuals are practicing independently as specialized corporate appraisers, intangible asset appraisers, and technology appraisers.

The NTTC (National Technology Transfer Center) centered on public research organizations are also active in technology transfer & transactions and related technology evaluations. Consulting firms such as AUS Consulting, ADL Consulting etc. are conducting intangible asset & technology valuations during corporate value evaluations, and universities including the technology transfer center of Stanford University are also partly involved in technology evaluation.

In the case of Japan, the CTA of Japan Industrial Technology Promotions Institute, Japan Technomart, Institute of Intellectual Ownership Evaluation Techniques etc. are conducting technology evaluation, and they have a tendency to focus on valuations of intellectual ownership rights such as patents and collateral valuations. Lately, their main efforts have been in the development of models for technical fee calculations in international technology transfer, and valuations for corporate M&As.

Part 4: Related Data Bank

1. Search Methods

The search methods introduced below, that is the usage method of short symbols or item limits will be commonly applied in all search modes to be explained.

- Search by word: type in the subject word in the search window and click the search button, example) semiconductor
- Short symbol search: symbol: ? (this short symbol can differ for each data bank)
Example 1) information? (search of contents starting with "information")
Example 2) smok?2 (search of contents with up to 2 letter combinations that come after "smok") the search will find smoke, smokes, smoker etc.
- Item limits: the DB item limit is the entry of commands through the detailed search, "/" after the key word and 2 English items designated.
Example) information/TI (search of contents with "information" in the TI item category)
database/AB,TI,KW (search of contents with "database" in the AB, TI, KW item categories)
- Search question type designation: attach # in front of the question type number
Example) #1/TI, (#1 AND #2) Or #4

- Operator: when entering key words all standard operators can be used

Operator	Operator Explanation	Search Example
AND	Search of contents with both A & B	Korea AND Economy
OR	Search of contents with either A & B	Korea OR Economy
NOT	Search of contents with A but not B	Korea NOT Economy
ADJn	Search of contents close to A & B in order	Korea ADJn Economy
NEARn	Search of contents close to A & B regardless of order	Korea NEARn Economy
?	Short operator	Korea?
>=	Magnitude comparison finding contents with A greater or equal to B	AD>=1999
<=	Magnitude comparison finding contents with A less or equal to B	AD<=1999
>	Magnitude comparison finding contents with A greater than B	AD>1999
<	Magnitude comparison finding contents with A less than B	AD<1999
()	Priority processing of operator in () (Korea AND Economy)	
#n	Search question type number n #1, #2	

- Korea ADj2 economy: this searches contents close to "Korea" & "economy" in order, but searches results that include up to 2 words between the 2 search words.
Example) "Korea household economy activity research" "Korea economy"
- Korea NEAR3 economy: searches contents close to "Korea" & "economy" regardless of order, and finds results that include up to 3 words between the 2 search words.
- These are used to control the number of results in the case where too many results or too few results appear after entering the initial search. Also, because this can add weight to the level of relation through the context, it enables appropriate text research.

2. Types of Information Search Services

(1) Domestic search sites

The most important point in patent search is to check whether there is an abstract, record, or the full text within each DB. Also, by determining which items are recorded in the B, a judgment must be made on whether the search is possible or not. Important items in patent search include bibliography, scope of application, abstract, blueprints, specialized specifications etc. and in the case of KRISTI patent, utility model announcements, and parts of the scope of application are provided in the notification. In the case of PIS, essential points of the invention are provided in the patent, utility model notification materials, but only summaries of parts of the publicized materials are provided. In the case of KIPRIS, abstracts, representative blueprints, specialized specifications are provided, and they seem to be the most useful free of charge information provider.

1) KIPRIS search site (www.kipris.or.kr)

<Source> www.kipris.or.kr

As the specialized patent search DB provided by the Korea Institute of Patent Information, it is the largest domestic search site which has provided industrial property information since 1947 (patent, utility model, design, trademark).

KIPRIS is a patent search DB with records of domestic intellectual property including bibliography, abstract (including representative blueprint), and the entire specialized specification, and a variety of search methods are possible including key word search, various number search (application, notification, announcement, priority right), IPC search, applicant & inventor search, design & trademark search etc.

<Source> www.kipris.or.kr

New Special Search (general)

New Special Search Result Example

SGML Specialized Search Result Example

<Source> www.kipris.or.kr

Tiff Specialized Search Result Example

New Special Search Result Example (advanced)

<Source> www.kipris.or.kr

Patent Information Classification Method Example

IPC classification	Example) G06f, G11B, H04L
Design classification	Example) G2-210
Trademark classification – Korean products, NICE	Example) 001, 002...
Key word – specialized, abstract, subject	Example) Refrigerator, noise* (reduction + elimination)
Applicant	Example) Samsung Electronics, Samsung Electronics Co. Ltd.
Inventor	Samsung Electronics Co. Ltd, Samsung Electronics
Representative	-
Application date, announcement date	Example) 1988, 199901, 19990101-19990630
Notification date, registration date	-
Application number	Example) 10-1999-123456
Priority rights number	Example) KR001234
Announcement number	Example) 10-1999-123456
Notification number	Example) 10-1998-123456
Registration number	Example) 10-123456-0000
Judgment number	Example) 1999-110-00123

Features of the KIPRIS search DB

- Korean patent document search & data acquisition possible
- Because the search results limit is limited to 1,000, year must be designated for key words for cases exceeding 1,000
- Search in the required field possible as there are separate subject, abstract, and specialized

search fields

- There is a filing function which enables convenient extraction of required data

- Search period & scope

[Table 10] Technology commercialization process of Kokubu

Classification	Item	Record Type	Record Period	Key word search scope
	Bibliography, abstract, representative blueprint	Text / image	1947~	1947~
		Image	1947~1996	Image provided
		Text / sgml	1997~	1997~
	Bibliography	Text	1947~	1947~
	Official design report	Text	1986~	1986~
	Bibliography	Text	1950~	1950~
	Text & figure trademark	Text / image	1950~	1950~
	Bibliography	Text	1947~	1947~
	Judgment, decision statement	Image	1947~	Image provided
	Overseas	US, Japan, European patent search site link service		

2) KISTI-IR search site (www.kisti.re.kr)

As the DB provided by the Korea Institute of Science & Technology Information, it is a technology search site where a variety of technology documents can be found (scientific technology, industrial technology, theses, patents etc.).

Technology documents, patents & academic theses etc. can be searched in the KISTI-IR search DB, and in the case of patent documents, bibliographies & abstracts can be accessed free of charge while the original patent text can be obtained at cost through application.

KISTI-IR Data supply status

- Domestic patent information

DB Name	DB Explanation	Record Period	Record Details
KUPA	Domestically announced patent	1983~	
KUUM	Domestically announced utility model	1983~	
KPTN	Domestically notified patent	1970~	
KUMO	Domestically notified utility model	1980~	
KODE	Domestic design	1980~	

- Overseas patent information

DB Name	DB Explanation	Record Period	Record Details
EUPA	European patent	1976~	As a database constructed with processed information from the European patent office and the international patent office, it has been formed based on announced patents
JEPA	Japanese patent	1976~	Recorded based on announced patents with the data provided by the Japanese patent office
USPA	American patent	1976~	Recorded based on announced patents with the data provided by the American patent office
JAPA	Japanese utility model	1990~	Of the Japanese patents & utility models, notification & registered data are recorded from June 1990 to August

			1997, and the announced data records are from January 1993 to the present
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KISTI-IR site connection (www.kisti.re.kr)

<Source> www.kisti.re.kr

If the science technology DB menu is clicked on the main screen, a sub-menu appears as follows.

<Source> www.kisti.re.kr

After clicking DB search in this menu, if patent technology information search is clicked on the left menu, access is made to the actual search menu. Before this of course, the ID and password must be entered to complete the login process.

<Source> www.kisti.re.kr

Separate search for each country can be done by selecting the menu on the left of the main search screen, and if the search word is entered in the main menu screen the entire patent database is searched all at once.

Search case

- Perform the search in the above menu using semiconductor device & Samsung Electronics as the name and applicant.

<Source> www.kisti.re.kr

Research Results

<Source> www.kisti.re.kr

- Search result cases are shown and the relevant document numbers, names, application dates etc. are outputted. It can be seen that the search result cases on the left only show Korean patents because country selection was not made and a combined search was performed entering search words only in Korean.

3) WIPS search site (www.wips.co.kr)

WIPS is a patent search engine that has been constructed with the combined worldwide patent DB. It has been formed as an internet service to enable combined search of patents in Korea, America, Japan, and Europe by obtaining worldwide patent data from the patent offices of each country, and also provides the save search function, cabinet function, Japanese patent translation function, as well as the Patent Map. The Japanese patent translation function especially, translates the records to Korean in real time and simultaneously provides the Japanese original together with the Korean translation.

<Source> www.wips.co.kr

Korea's largest patent DB provided

The patent data provided in WIPS is the largest in Korea with possession cases close to 100million, and if converted into 300 page novels it amounts to a quantity equivalent to 750 books. The patent information possessed includes Korean patents/utility models, Japanese patents/utility models, American patents, EP patents, PCT patents, INPADOC Family/Legal (English version abstracts of patents in 71 countries) etc, and future expansion to service China, Global PAT (patent DB of 7 European countries including Germany, France etc.) is in progress. The feature of this DB is the standardized manner in which WIPS has processed the DB of each country. It provides a combined search function by standardizing the data into country codes, various number systems, search item names, date information etc. and creates an environment for users where convenient patent research can be conducted with just a single search.

DILS (Distributed Information Linkage System), Convenience added to patent information inquiries WIPS has developed the DILS method which is a system that has improved the inquiry efficiency of related information. In the case of important and valuable patents, it is standard to lodge patent applications not only in one's own country but also in other countries around the world, but previously, determining patent application/registration status for each different country using existing search systems was difficult due to language and systematic differences causing omissions or long research time consumption. However, with the standardization of data & development of the DILS method by WIPS, relevant information [Page 140] can be automatically extracted without too much separate user manipulation, and on a single screen inquiries can be made in relation to overseas application, domestic & international priority rights information, registration etc. Also, a user interface that can be conveniently used by beginners and experts alike is provided. The search in accordance with the purpose has been made possible with field search, number search, staff search etc. and with approximately 30~40 search items per country, it provides the most search items of the DBs around the world.

4) Other domestic search sites

- PATpen patent law, precedent center www.patpen.co.kr: Web search, post 1976 search, domestic & international industrial property DB construction & online services, domestic & international news, prior technology & trademark research, free membership
- Brand Web www.brandweb.co.kr: American, Japanese, European patent abstracts, bibliography & original document image information, Korean patent, trademark, design search, patent search for countries around the world provided
- <http://chollian.net>: trademark search (1950-, bibliography & trademark sample provided), other trademark related information provision Chollian
- World patent information service wpi.chollian.net: patent, utility model (1983-), design (1986-), trademark application announcement DACOM Chollian
- Korea www.gnk.co.kr: domestic & international original patent document service, patent information from about 40 countries around the world G.NET Green.net
- Search plus www.searchplus.co.kr: industrial property information search, technology research, education etc.
- Brand Korea Net www.brandkorean.net: worldwide patent DB search through its own DB search
- Brand Watch www.brandwatch.co.kr: charged trademark search & related information, additional service provision
- Daewoo Patrom INTERNET www.wips.co.kr: monitoring services for similar patent registrations
- Zoom Technology www.zoomtech.co.kr: patent, utility model ('83~'97), Korean trademark information ('81~'97) provided

Search features, strengths & weaknesses of domestic patent search DBs

Search features, strengths & weaknesses of each DB are as follows. In the case of KISTI, precise search is possible through the BRS system, and with the reprocessing of patent related terms there

is uniformity of terms. Also, an accurate search is enabled with applicant codes. In the case of PIS, the renewal period is very fast at twice per week, but because the terms are entered as they are, the terms are not uniform. So, when conducting a search, search words, synonyms, & related words must all be entered. In the case of TPI, classifications are limited to part sections. Also, in entering IPC classification data, even if they are relevant to many classifications, they are entered only as the representative IPC classification.

If the domestic patent DB search is compared to the famous commercial Databank, there are significant insufficiencies in search items & natural language, control language classifications, thesaurus functions, code functions etc., but if other patent related areas are examined, the level of DB completion is relatively high.

(2) Japanese patent search sites

1) Japan Patent Office patent search site (www.jpo.go.jp)

As the search DB of the Japan Patent Office, it is a search site where industrial property information (patents, utility models, designs, trademarks) possessed by the Japan Patent Office can be searched free of charge through various search methods.

In the Japanese patent search site there are separate search items for beginners, and in terms of patent search various searches are possible including IPC search & F-term search, but it is comprised mainly with number searches, and the key word search introduced 5 years after establishment (1993) is in Japanese so this is an inconvenience. However, English key word search is possible for the abstracts of Japanese patents translated into English (PAJ).

Japanese Open English Abstracts (PAJ) are announced Japanese patents of which the abstracts have been translated into English and with the addition of the representative blueprint the key word search was made possible making it convenient for user search. However, the online PAJ search incorporates data 5 years after establishment (1993) with key word searches only possible in names & abstracts, and because it only comprises of patents, there is a weakness in that the search of utility models cannot be conducted.

<Source> www.jpo.go.jp

2) PATOLIS search site (www.japio.or.jp)

As the patent search site provided by Japan Patent Information Organization (JAPIO), it is a charged site where various search methods can be conducted on Japanese patents & utility models 46 years after establishment (1971) with bibliography information & number & key word (Japanese) in abstracts, IPC, applicant, application date etc.

<Source> www.japio.go.jp

(3) Search sites of America

1) USPTO search site (www.uspto.gov)

As the patent search site provided by the US Patent Office, bibliography search & full text search in relation to patent registration official report data from 1976 to the present can be conducted free of charge.

The USPTO search site is classified into quick search (Two-term Boolean Searching) and Advanced Boolean Search, where the quick search enables quick abstract and bibliography search, and the Advanced Boolean Search has a strong point in that it enables the search for the entire specification.

<Source> www.uspto.gov

Access to relevant materials published between 1971 & 1976 is possible through a charged service, and patent information before 1971 can be accessed by visiting the Patent and Trademark Depository Library (PTDL). Also, the USPTO search site enables searches with various operators and has the feature of downloading and printing specialized images of official patent reports free of charge.

2) IBM patent information search site (www.delphion.com)

As a charged patent search site provided by the company, Delphion, it enables the search of American, European, INPADOC & Japanese patents. American patents after 1971 have been classified into advanced search, Boolean search & patent number, and searches in relation to bibliographies, abstracts, & full texts can be conducted. Advanced search can be performed by entering key words and operators, and patents can be searched with patent numbers.

Another characteristic of the Delphion patent search site is that PAJ is recorded and Japanese patents from 1976 can be easily searched by entering key words in English.

<Source> www.delphion.com

(4) European Search Sites

1) EPO search site (www.epo.co.at)

As a free patent search site operated by the European Patent Office, it enables the search of European & international patents (PCT) through esp@cenet, and as the PAJ is recorded, Japanese patents can be searched by entering key words in English.

<Source> www.epo.co.at