Asia-Pacific
Economic Cooperation

Guidebook for SMEs' IP-Business Cycle

Intellectual Property Rights
Experts Group

March 2017

Asia-Pacific
Economic Cooperation

Guidebook for SMEs' IP-Business Cycle

Intellectual Property Rights Experts Group

March 2017

APEC Project: CTI 16 2015T

Produced by
Korea Invention Promotion Association

and

YUN Kyuseon
Korean Intellectual Property Office
Gov. Complex-Daejeon, Bldg. 4
189 Chengsa-ro, Seo-gu, 35208,
Daejeon, Korea
Tel: (82) 42 481 8229
Fax: (82) 42 472 9314
Email: qsun0109@korea.kr
Website: www.kipo.go.kr

For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

APEC#217-CT-03.1 ISBN: 978-981-11-2920-9

I. INTRODUCTION

II.
IP CREATION POLICY AND PROGRAM

III.
IP UTILIZATION POLICY AND PROGRAM

FIGURE

TABLE

I. Introduction

Guidebook for SMEs' IP-Business Cycle

I. Introduction

1.
Guidebook Overview

1.1.
Purpose

- This guidebook proposes IP (Intellectual Property) policies and standard program-related models that public institutions in APEC (Asia-Pacific Economic Cooperation) member economies can use as references when formulating policies or programs to promote IP creation and utilization by SMEs. By providing guidance, the guidebook attempts to foster an environment in which SMEs in APEC member economies can create IPR (Intellectual Property Rights) and better utilize IP.

- Among the various IP creation and utilization policies are being implemented in both APEC and non-APEC IP leader economies, this guidebook selects and introduces programs that can be implemented in line with the conditions in each APEC member economy. Furthermore, the guidebook provides overall guidance on major policies and programs so that APEC member economies can refer to it to actually design and implement IP programs.

- The ultimate purpose of this guidebook is to serve as a guide to IP-related policies and programs for APEC members, assisting them in their IP creation endeavors and establishing an enhanced infrastructure for IP creation and utilization that can promote corporate growth.

1.2. Scope

- This guidebook provides references that can help public institutions, service providing entities, and SMEs in APEC member economies to participate in IP creation and utilization programs effectively.

- This guidebook focuses on policies and programs related to IP creation and utilization. To stay on track, this guidebook does not cover policies and programs on subjects that have low relevance for IP creation and utilization, such as IP disputes and training.

- This guidebook explains with a focus on the execution process of IP creation and utilization policies and programs. Issues such as the organization of governmental bodies, budget procurement, supervision, and follow-up support by public institutions are to be adequately dealt with by persons in charge in accordance with the conditions in each member economy. Thus, these topics are not covered by this guidebook.

- While the guidebook offers guidance on program execution methods and presents successful cases of IP creation and utilization, it does not guarantee that the same effect can be achieved by implementing the programs featured. This guidebook cannot be held accountable for unsatisfactory outcomes resulting from IP creation and utilization policies and programs.

1.3. Organization

- This guidebook is largely divided into the following sections: *I. Introduction, II. IP Creation Policy and Program,*and *III. IP Utilization Policy and Program.*

- *I. Introduction* covers the purpose and overview of this guidebook, IP status in APEC member economies, and the selection process of featured programs.

- IP-related policies and programs are presented in *II. IP Creation Policy and Program* or *III. IP Utilization Policy and Program,* depending on the nature of each policy or program. *II. IP Creation Policy and Program* focuses on IPR application, while *III. IP Utilization Policy and Program* provides guidance for utilizing the acquired IPRs through commercialization and IP transaction.

- *II. IP Creation Policy and Program* and *III. IP Utilization Policy and Program* feature two and three different program groups each.

- For each program under a program group, the guidebook provides the background for program and policy implementation and illustrates the expected effects. In addition, the guidebook offers preparations required for program planning, major tasks and guidelines for participating entities, program tips, and success cases of program implementation.

1.4. Introduction

- The Introduction informs the target readers[1] of the purpose, background, and structure of the guidebook.

- *2. Glossary* in the Introduction offers explanations for frequently used terminologies in this guidebook, which are also widely used in the actual IP policy and program spheres. This part defines and explains concepts and terms used in the guidebook that may be difficult for readers to understand, thereby ensuring that participating entities in the program[2] understand the program better and are able to engage in opinion sharing processes efficiently and without barriers.

- In addition, the Introduction compares the economic indicators and the IP status of APEC member economies and analyzes the number of patent applications and registrations, the application filing rate of foreigners in order to capture the current IP environment in APEC member economies.

- Furthermore, the Introduction showcases programs implemented in member economies that are actively creating and utilizing IP and presents the process through which programs introduced in the guidebook are selected.

[1] The main readership of this guidebook is mainly presumed to be representing public institutions, service providing entities, and SMEs, which are defined in *2. Glossary.*

[2] Participating entities in this guidebook refer to public institutions, service providing entities, and SMEs.

1.5.
IP Creation Policy and Program

- IP Creation Policy and Program introduces programs that aim to promote IP[3] creation by SMEs.

- With an efficient IP creation system in place, SMEs are able to acquire more advanced IPRs and use them to make greater accomplishments through IP utilization programs. This illustrates why IP creation is the very foundation for enhancing IP utilization.

- Most APEC member economies, however, can be characterized by a low volume of patent and utility model applications and registrations. In such cases, creating IP that they can actually use should be a priority over the next step of utilizing IP. That is why IP creation policies and programs can be helpful for them.

- IP Creation Policy and Program does not limit eligible candidates to SMEs only, as IP creation activities are actively carried out not only in corporate settings but also by entities such as universities and public research institutions. Accordingly, IP Creation and Policy is divided into two sections, Support for IP Creation in the Private Sector and Support for IP Creation in the Public Sector.

- IP Creation in the Private Sector mainly touches upon programs that support IP creation by SMEs and individual inventors, while IP Creation and in the Public Sector presents programs for universities and public research institutions[4].

[3] IP mainly refers to patent and utility model here.
[4] Public Research Organization (PRO)

1.6.
IP Utilization Policy and Program

- IP Utilization Policy and Program suggests programs that can promote commercialization and transactions using IP in an environment where IP creation has sufficiently been carried out.

- If IPs are actively being created through IP creation programs, or if there is already much IP creation activity, there is a need to create programs that can support corporate growth by using IPRs.

- IP Utilization Policy and Program is divided into IP Commercialization Support, IP Trade Support, and IP Valuation Support groups.

- IP Commercialization Support comprises programs that can help SMEs and individual inventors successfully commercialize the excellent IPs they own. These programs include providing a subsidy for the production costs of prototypes of the technology, and solutions to issues such as establishing sales distribution networks of products and pursuing R&D.

- IP Trade Support comprises programs that can support technologies in danger of going unutilized by promoting utilization of the technologies through IP trade. Quite often, many technology providers and buyers want to engage in technology transactions but face very real difficulties due to lack of experience and infrastructure. IP Trade Support programs provide support to such SMEs and individual inventors who wish to engage in technology transactions.

- IP Valuation Support comprises programs that provide support in evaluating the monetary value of IP, an intangible asset, to widen the utilization scope of IP. This guidebook introduces a spectrum of programs, ranging from those that support that support IP valuation to those that utilize results of IP valuation and provide support in connection with financial institutions.

1.7. Program Guide

- The introduction to each program guide provides the implementation background, necessity, and development structures of policies and programs along with program matching tables that show which programs would be adequate for each public institution to implement under those policies.

- Each program is described with a program outline, program process, detailed guidelines for participating entities, issues to consider, and case studies.

- The program outline includes a guide map for participating entities so that participating entities can refer to the map to find out what needs to be done at each stage of program implementation.

- For each program, basic guidelines are provided for public institutions, service providing entities, and SMEs, along with case studies from various economies and working-level issues to consider. Participating entities may be added or removed from the guidelines depending on the type of the program.

- Participating entities, especially the public institutions in charge of planning and managing the program, will be able to understand the role of each entity and estimate in advance the effectiveness of the program by referring to the guidebook. Additionally, each entity can reduce trial and error and cut down on other sorts of difficulties that can arise in the actual planning and implementation process of the program by consulting the program tips in the guidebook.

1.8.
Using the Guidebook

- This guidebook has three participating entities of policies and programs: public institutions, service providing entities, and SMEs. APEC member economies may reduce the number of participating entities from the abovementioned three to two, or increase it to four or more when implementing policies and programs in line with the given conditions in each member economy and the nature of the policy and program.

- It is assumed that public organizations, such as the patent office, take on the role of the public institution. Depending on the nature of the policy or the program, an industry-related or SME-related department may take on this role instead of the patent office. In exceptional cases, a private enterprise may take on the role of the public institution.

- It is assumed that the public institution manages the overall schedule of the policy or program, executes the budget for service providing entities and SMEs, and oversees the implementation process.

- It is assumed that a service providing entity is an institution with IP expertise that supports IP creation and utilization policies and programs by working between public institution and SME. It is assumed that SME is an enterprise subject to the support provided by the policies and programs as set out in this guidebook. Also, it is assumed that SME subject to support possesses below-average IP expertise.

- Chapters 2 and 3 introduce policies related to IP creation and utilization. Individual programs within the policy are categorized from Phase 1 to 3 based on the level of difficulty. While it is also possible to implement programs according to the needs, it would be best if programs can be executed from Phase 1 to 3 in the order.

- The users of this guidebook may consult the IP policy/program TREE of individual programs per policy and the self-diagnosis chart on program execution capability to identify which program phase the user would be able to execute independently.

2.
Glossary

- APEC: Asia-Pacific Economic Cooperation
- AsialPEX: Asia IP Exchange
- Assignee: Individual and enterprise holding rights to IP such as patent, in this guidebook.
- Business feasibility analysis: Assessing the overall business prospect of commercializing patented technology by considering business factors such as business base of the commercializing entity and production and sales capability, to estimate the mass-produced product's pricing, quality competitiveness, sales volume, cashflow, etc.
- Business feasibility evaluation: Capturing market demand and reviewing whether that demand (for product or service) can be satisfied using technology, or, if an existing technology is applied to develop a product or service, assessing whether it has marketability.
- CNY: Chinese yuan
- Commercialization: Developing, producing, and selling products using technologies such as patent or enhancing the technology related to that process.
- CPC (Cooperative Patent Classification): Patent classification system developed by the European Patent Office and the US Patent & Trademark Office
- DRG: Diagnosis Related Group
- EEN: Enterprise Europe Network
- Employee invention: Invention developed by one or more employee (inventor) working at an enterprise under an employment contract while performing his/her duties.
- EUR: Euro

2. Glossary

- Exclusive license: The right to exclusively “exercise” someone else’s IPR (i.e. patent right) within a certain range. Within the scope of exclusive license, the patent holder cannot exercise (use) that patent without the permission of the exclusive licensee.
- Featured program: Of the variety of IP-related programs for the promotion of IP creation and utilization, those that are introduced in this guidebook.
- Field inspection: Checking the facts by visiting on SME or a service providing entity to identify whether the SME’s needs have been met, whether SME has any requests, whether the service providing entity is sincerely performing its duties.
- GBP: Pound sterling
- GDP: Gross Domestic Product
- IBK: Industrial Bank of Korea
- IE Singapore: International Enterprise Singapore
- INCJ: Innovation Network Corporation of Japan
- INPIT: Industrial Property Information and Training
- Inventive step (non-obviousness): Whether the level of the invention’s creative difficulty does not allow persons of ordinary skill in the pertinent art to invent the same invention based on the publicly known invention at the time of patent application.
- IP (Intellectual Property): Knowledge, information, technology, expression of ideology or emotion, marking of business or object, species, genetic resources, or others of immaterial nature that can be materialized as proprietary value. Created or discovered through human being’s creative activity or experience.
- IP management: Management activity that efficiently develops and creates IP, acquires its right, maintains confidentiality and protects for effective utilization and commercialization, through which corporate competitiveness is attained and ultimately, the enterprise’s value such as stock price is elevated.
- IP policy/program TREE: IP-related policies are largely divided into IP creation and IP utilization, the relevant featured programs of which are each categorized into phases depending on the development level of policy. The relationship between basic and derivative programs are depicted in a tree-like chart.

- IP valuation: In this guidebook, IP valuation refers to the assessment of the scope of rights, technology, marketability, and business feasibility of immaterial IP or related technology, and the documentation of the result in monetary value, rating, and grade. Here, IP generally refers to patent.
- IPC (International Patent Classification): Internationally unified patent classification system as per the Strasbourg Agreement Concerning the International Patent Classification.
- IPCF: IP Competency Framework
- IPOS: Intellectual Property Office of Singapore
- IPR (Intellectual Property Right): Proprietary right given to knowledge, information, technology, expression, marking, or others of immaterial nature created or discovered through human being's creative activity or experience, any intellectual creation that can be materialized as proprietary value.
- IRAS: Inland Revenue Authority of Singapore
- JPAA: Japan Patent Attorneys Association
- JPO: Japan Patent Office
- JPY: Japanese yen
- KDB: Korean Development Bank
- KIPA: Korea Invention Promotion Association
- KIPO: Korean Intellectual Property Office
- KOTEC: Korea Technology Finance Corporation
- KRW: Korean won
- Licensing: Person holding the rights to a patent, utility model, design, or trademark granting permission to a third party to exercise (use) that right.

- Marketability analysis: Assessing the market competitiveness of product to which patented technology is applied, based on the environmental and competition analysis of the market it belongs to. Industry characteristics and environment, market structure, product status, market entry barrier, relevant policies are reviewed. Market competitiveness is assessed based on market and industry trends at home and abroad.
- MyPIO: Intellectual Property Corporation of Malaysia
- NASA: National Aeronautics and Space Administration
- NC: Numerical Control
- NDRC: National Development and Reform Commission
- Non-exclusive license: The right to exercise someone else's IPR (i.e. patent right) under certain conditions. Unlike exclusive license, non-exclusive license is not exclusive to the licensee.
- Novelty: Whether the invention is 'new' in comparison to the prior art.
- NPOs: Non- profit organizations
- NRC: National Research Council
- NTTC: National Tech Transfer Center
- OCBC: Oversea-Chinese Banking Corporation
- OPIS: Open Patent Intelligence Search
- OTL: Office of Technology Licensing
- Patent office: Generally refers to the public institution in charge of work related to the examination of patent, utility model, design and trademark applications.

- Patent portfolio: Collection of patents owned by a single entity, such as an individual or corporation. The patents may be related or unrelated. Patent applications may also be regarded as included in a patent portfolio.

- Patentability: Whether and invention has novelty and inventive step or non-obviousness in comparison to prior art. Simply put, whether the invention can be patented.

- Patented technology: Refers to technologies, the rights of which are protected by patent, in this Guidebook.

- PCA: Problem Chain Analysis

- Phase matching flow chart: Self-check chart that lets public institution autonomously check the level of conditions required to implement and execute each featured program, and items to improve on.

- PIC: Productivity and Innovation Credit Scheme

- PM (Patent Map): Detailed investigation and analysis material on undisclosed patent information related to specific technology, presented in a way that the development flow of the patented technology can be seen at a glance, as if looking at a map. PM Can be used when setting the direction of R&D or looking for technologies to design around.

- PM (Program Manager): Person in charge of operating, managing, and overseeing each program.

- Policy: Macroscopic plans and guidelines implemented through the execution of specific budget over short/medium/long term by a public institution such as government, with reference to relevant policies and projects and stakeholders' opinions, for growth. IP-related policies are mainly dealt with in this Guidebook,

- PRO: Public Research Organization

- Program: In this guidebook, IP-related programs operated by public institutions to support (mainly) SMEs are dealt with.

- PTC: Physical Technical Contradiction

- Public institution: Institution founded and operated by government investment or financial support. It refers to institutions that operate and manage each featured program in this guidebook.

- RCA: Root Cause Analysis
- RFP: Request For Proposals
- RIPC: Regional Intellectual Property Center
- SBA: Small Business Administration
- SBCs: Small Business Concerns
- SBIC: Small Business Investment Company

3.
Comparison of Economic Indicators and IP Status in APEC Member Economies

3.1.
Introduction

- Chapter 3 takes a look at the relationship between the economic scale of APEC member economies, corporate R&D expense, and the status of patent applications and registrations. In particular, it closely examines the R&D expense per economic scale on a corporate level and the overall economy, the status of patent application and registration, and the ratio of locals and foreigners in patent applications and registrations.

- The GDP data of APEC member economies in 2015 as presented below use the statistics of the IMF (International Monetary Fund) to compare economy scales. The ratio of corporate R&D expense to GDP is from the Global Innovation Index 2016 published by WIPO (World Intellectual Property Organization). The data on patent application and registration in relevant economies are from the WIPO's 2014 statistics.

3.2.
GDP of APEC Member Economies

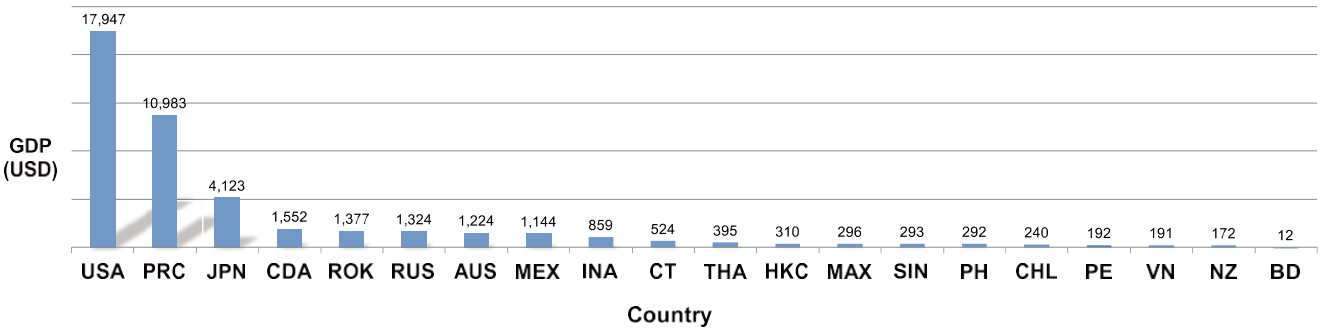


Figure 1. GDP of Member Economies
<Source: IMF World Economic Outlook Database>

- GDP figures of APEC member economies in 2015 reveal that the US reached approximately 18 trillion USD, followed by China surpassing 10 trillion USD, Japan 4 trillion USD, and Canada 1.5 trillion USD. Korea recorded 1.3 trillion USD.

3.3.
Ratio of Corporate R&D Expense to GDP in APEC Member Economies

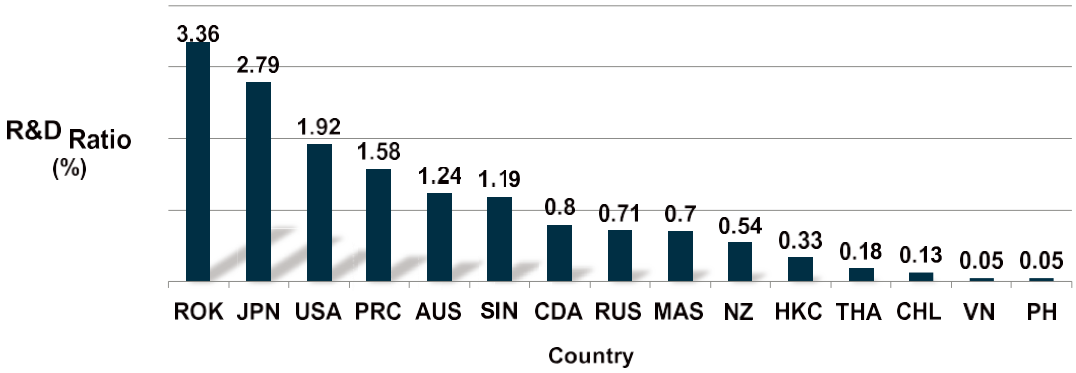


Figure 2. Ratio of Corporate R&D Expense to GDP in Member Economies
<Source: WIPO The Global Innovation Index 2016>

- Looking at the ratio of corporate R&D expense to GDP in APEC member economies in 2015, Korea's figure is at the top with 3.36%, followed by Japan with 2.79%, the US with 1.92%, China with 1.58%, and Australia with 1.24%.

3.4.
Number of Domestic Patent Applications and Ratio of Applications by Locals/Foreigners in APEC Member Economies

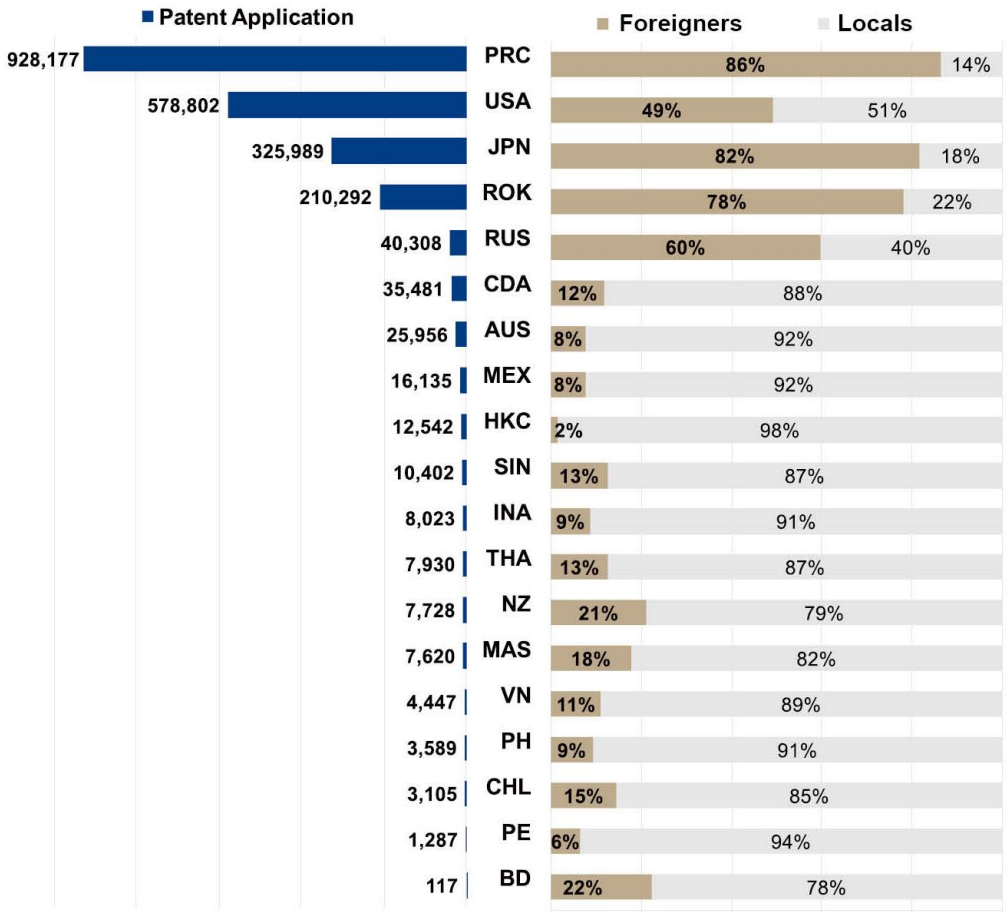


Figure 3. Number of Domestic Patent Applications and Ratio of Applications by Locals/Foreigners in Member Economies
<Source: WIPO IP Statistics Data Center>

- With approximately 930,000 patent applications in 2014, China has the most patent applications among member economies, followed by the US with approximately 580,000 applications. Japan and Korea came in third and fourth with 320,000 and 210,000 applications, respectively.

- The top five members all recorded over 40,000 patent applications. In comparison to the rest of the members, it is observed that the top five economies show a far higher ratio of patent applications by locals to foreigners.

- The economic status of the top five members reveals that they make up the top tier in terms of GDP. They also record a high ratio of corporate R&D expense to GDP.

3.5.
Number of Patent Registrations and Ratio of Patent Registrations by Locals/Foreigners in APEC Member Economies

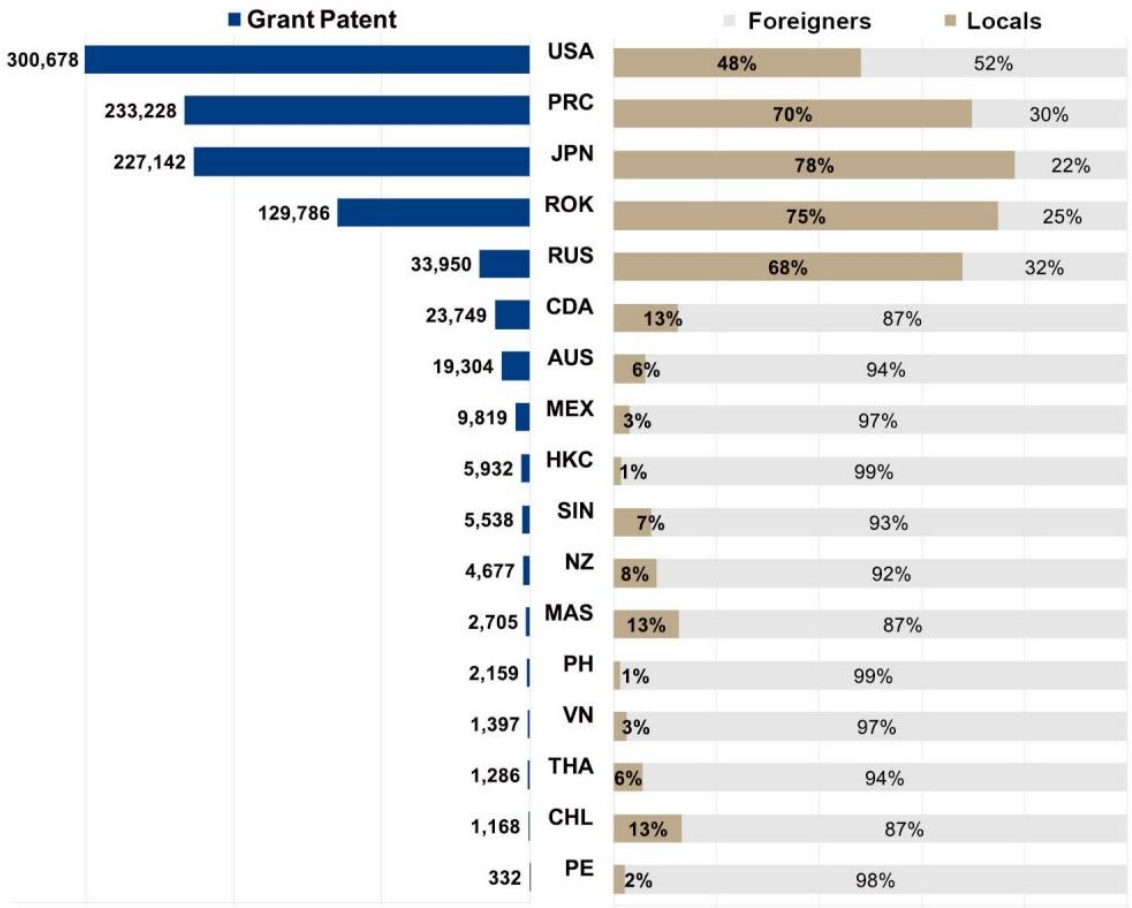


Figure 4. Number of Patent Registrations and Ratio of Patent Registrations by Locals/Foreigners in Member Economies <Source: WIPO IP Statistics Data Center>

- The US came in first among APEC member economies with approximately 300,000 patent registrations in 2014, followed by China and Japan with 230,000 and 220,000 registrations, respectively. Korea came in fourth with approximately 130,000 registrations.

- The top five members all recorded over 30,000 patent registrations. The ratio of patent registration by locals to foreigners is confirmed to be very high in the top five member economies in comparison to the rest.

- The five member economies with the most patent registrations have high GDPs, and also a high ratio of corporate R&D expense to GDP.

4.
Overview of IP Status, Policy, and Program in Leading Economies

4.1.
Introduction

- Chapter 4 shows the IP status, and policy and program environment in APEC member economies and other IP leading economies.

- The IP status per year and economy was analyzed in the categories of patent application and registration, trademark application, and design application. In addition, the chapter examines the background and purpose of IP policies and programs, detailed explanations, and the effectiveness of such measures.

- The main data and related material was acquired from the websites of governmental bodies in charge of SME support in each economy, such as the patent office, SMBA (Small and Medium Business Administration), and the Ministry of Science and Technology. In addition, some data were acquired through interviews conducted during visits to the economy.

4.2. Korea

4.2.1. IP Status

1) Patent (Including Utility Model)

(1) Status of Application by Resident/Non-Resident per Year

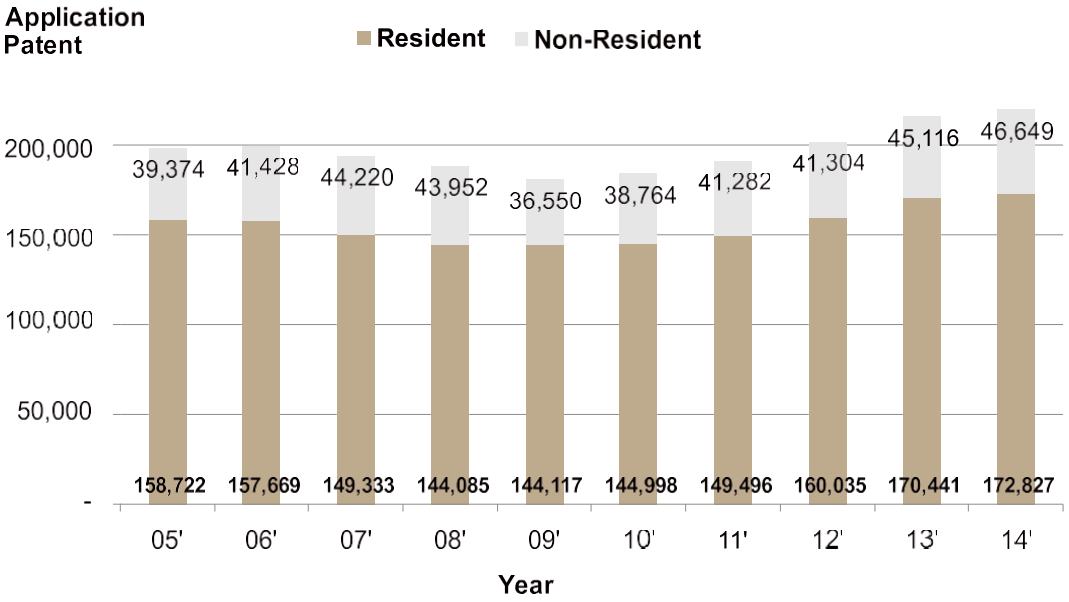


Figure 5. Status of Application by Resident/Non-Resident per Year (Korea, Patent)
<Source: WIPO IP Statistics Data Center>

- The overall number of patent applications in Korea decreased slightly around 2009 over the last ten years. The years following 2009 show an upward trend but the margin of increase is not significant. The margin of increase for applications made by residents is observed to be larger than those made by non-residents. The ratio of patent applications to residents in the past 10 years is approximately 78%, which is relatively higher than in other member economies.

(2) Status of Registration by Resident/Non-Resident per Year

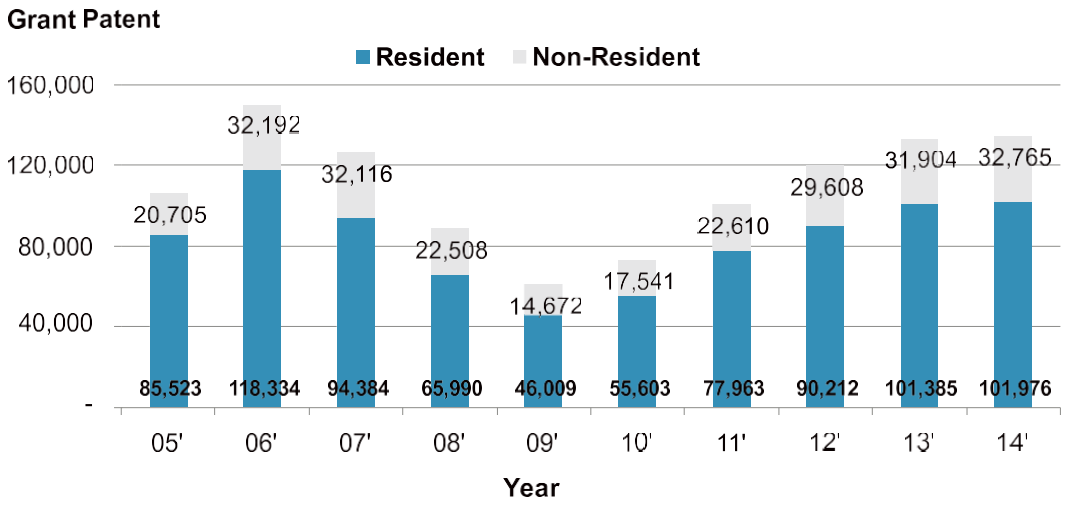


Figure 6. Status of Registration by Resident/Non-Resident per Year (Korea, Patent)
<Source: WIPO IP Statistics Data Center>

- Over the past 10 years, the overall patent registration volume in Korea decreased slightly around 2009. Both registrations made by residents and non-residents showed a decrease in number.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

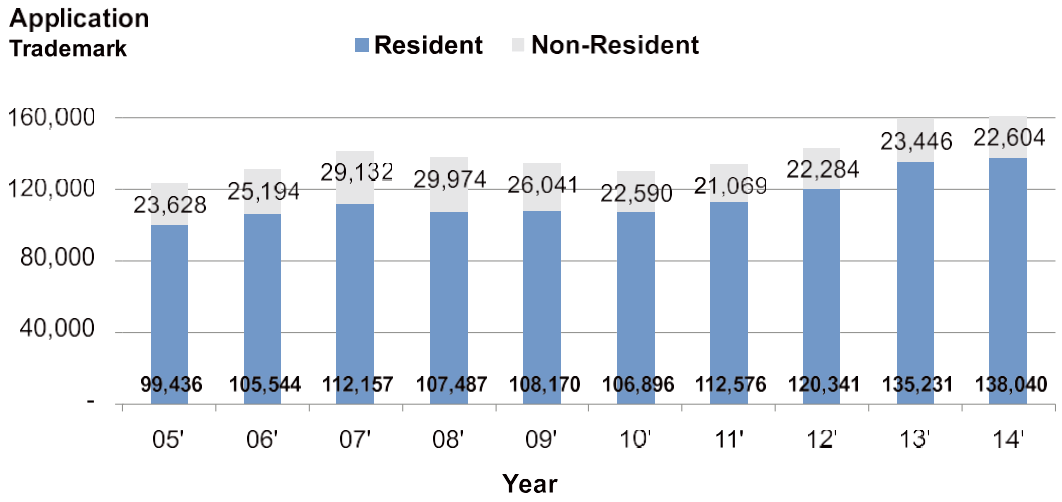


Figure 7. Status of Application by Resident/Non-Resident per Year (Korea, Trademark)
<Source: WIPO IP Statistics Data Center>

- The overall trademark application trend in Korea has shown a steady increase in the past 10 years. The number of applications made by non-residents showed a significant drop as of 2009. The number of trademark applications by non-residents in 2010 is only approximately 75% of that in 2008. This figure is showing partial recovery since 2011, while the number of applications by residents is steadily increasing. The ratio of applications by residents in the past 10 years is approximately 82%, which is relatively higher than in other member economies, while the ratio of applications by non-residents is progressively decreasing.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

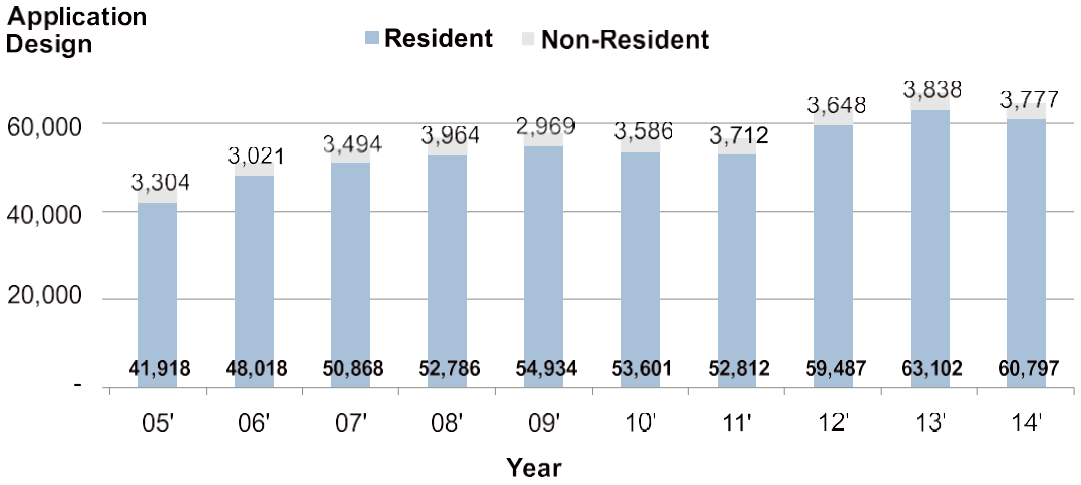


Figure 8. Status of Application by Resident/Non-Resident per Year (Korea, Design)
<Source: WIPO IP Statistics Data Center>

- The overall design application trend in Korea in the past 10 years showed a steady increase up to 2009 and a temporary halt in 2010, after which the number began to increase again in 2011, which is estimated to be due to the increase of applications made by residents. The ratio of applications made by residents in the past 10 years is approximately 94%, which is relatively higher than in other member economies.

4.2.2. Guide to IP Creation Policy and Program

1) Domestic IPR Acquisition Support

- Despite having developed promising technologies and creative ideas, SMEs are faced with many difficulties in IPR acquisition due to lack of funding. There are many cases in which SMEs have developed promising technologies and decide to carry on with commercialization without first having acquired IPR, only to have most of the market share taken by other enterprises. The domestic IPR acquisition support program was introduced to help SMEs that are having difficulties in IPR acquisition due to lack of financial capabilities in the IPR application process to promote IPR creation by SMEs. Furthermore, the program aims to get SMEs interested in IPR and raise awareness of its necessity.

- KIPO (Korean Intellectual Property Office) and local government agencies are in charge of the overall management and supervision of the program, while KIPA[5] (Korea Invention Promotion Association) supervises and oversees it, and RIPC[6] (Regional Intellectual Property Center) executes the program. Since KIPO and local government agencies form a matching fund to support the budget in a 50:50 ratio, SMEs from all regions around the economy can benefit from the program, including those based in areas where IP-related competency is relatively lacking in comparison to the metropolitan area.

- The domestic IPR acquisition support program provides support to SMEs or individual inventors on the application of patent, utility model, design, and trademark. Of the cases deemed to be promising through preliminary consulting conducted by Regional Intellectual Property Center, support is offered for as many as three cases per enterprise. The evaluation criteria are probability of registration, utilization potential, business feasibility, possible impact among others. Along with consulting provided by professional consultants based in the Regional Intellectual Property Center, up to 70% of patent attorney's fee can be covered as support for necessary expenses for the application of patent, utility model, design, and trademark.

- This program supports IPR creation and utilization by SMEs located in the non-metropolitan regions based on consulting services and contributes to gradually bridging the IPR competency gap between those areas and the metropolitan region. The increase rate of IP application, turnover, and employment volume of the supported enterprises in comparison to before the program largely exceeded the figures shown by the overall SMEs.

[5] Institution that operates and manages IPR-related programs

[6] Institution that raises awareness of IPR among local SMEs and residents and provides support for IPR-related programs

2) Client-Specific Patent Map

- Since SMEs generally have weaker patent analysis capabilities, client-specific patent map is used to provide client-specific research and analysis of patent technology to SMEs and support in proposing an effective R&D direction and establishing a patent utilization strategy.

- This program facilitates establishment of IP creation strategies, including identifying the trend of patent and technology development, establishing strategies to prevent patent risk, and setting the enterprise's R&D directions. The Client-Specific Patent Map Program performs detailed patent information research and analysis of the SMEs' technologies and presents the results by visualizing the technology development flow in a map-like way, allowing clients to identify the trend at a single glance.

- The Client-Specific Patent Map is operated on mandatory and elective modules. Mandatory modules are used for conducting research and analysis on the technology developed by the SME. Elective modules, on the other hand, offer assistance in establishing the specific strategies SMEs need. Mandatory modules include background and purpose of analysis, technical outline and issues of SMEs' technologies, scope and criteria of patent analysis, and patent technology trend (technological trends from the statistical perspective). Elective modules include establishing R&D strategies, establishing solution to technologies with issues, analysis of technology developments of competitors, establishing strategies to prevent patent risks, establishing global technology commercialization strategies, and strategic technology trade support.

- Since this program is operated by each Regional Intellectual Property Center, SMEs based in areas where IP-related competency is relatively lacking in comparison to the metropolitan area can also benefit from the program. The unit price of customized patent map support program is within 12 million KRW, and each SME is limited to one participation.

- Continued R&D efforts are a must if SMEs are to create high added value and equip themselves with global competitive power. Therefore, Client-Specific Patent Map Program is a crucial tool for SMEs that find themselves at the R&D stages and need to establish directions for R&D. Research shows that the enterprises to which the customized patent map was supported in 2013 showed a 24.6% increase in R&D expense and 50.4% increase in the number of patent applications from before the program. This illustrates that the Client-Specific Patent Map is being utilized before setting R&D directions, and that R&D endeavors begins right after directions are set, which are yielding results in the form of patent applications.

3) Dispatch IP Management Specialist

- The technology transfer rate of universities and public research institutions is around 17.6%. Also, R&D productiveness (rate of yearly technology fee income compared to yearly R&D expense) is 1.36%, which is not very high. The main reason behind the lacking results in technology transfer can be pointed to the lack of IP specialists, followed by weak IP management infrastructure. Therefore, IP management specialists with seasoned expertise in the field are dispatched to universities and public research institutions to support the establishment of IP management infrastructure and competency enhancement.

- Enterprises dispatch patent specialists experienced in IP management to universities and public research institutions to support various activities including the reorganization of relevant policies, standardization of IP management process, and establishment of patent portfolio strategies. IP management specialists set up patent management systems tailored to each university or public research institution, and contribute to raising awareness and competency of IP by hosting seminars and forums and providing IP-related consulting and advice.

- As the IP management specialist dispatch program becomes stabilized, the entities subject to support have been expanded to include public research labs lacking IP management competency.
  IP management specialists establish a human resources pool linking industry, schools, and research institutions while cooperating with patent information and commercialization consultants and enterprises to actively engage in the exchange of information on technology demand or transfer, bearing fruitful results in terms of technology transfer and commercialization at universities and public research institutions.

- As the IP competency of universities and public research institutions is improved, the role of IP management specialists is further expanded from its original focus on establishing infrastructure and strengthening competency to focus on technology transfer and commercialization and establishing IP strategies.

4.2.3. Guide to IP Utilization Policy and Program

1) Support for IP Prototype Developing

- The IP Prototype Manufacturing Support Program was introduced in 1982 to promote commercialization and product development of patents and utility models that are evaluated as promising both in terms of technology and business feasibility. It aims to support individuals and SMEs that lack funding for manufacturing prototypes. It is a system that supports 3D design and working mock-up manufacturing, which are necessary processes that take place prior to mass production.

- Applications are submitted from January to February every year. Within the limit of 70-90% of production cost, up to 20 million KRW of funding is supported. 3D design (designing in 3D the components needed for product manufacturing and the operating mechanism) and working mock-up (used for design review before mold production and product advertising) are supported with subsidies of up to a certain amount.

- Preference is given in the selection process if the applicant (or applicant enterprise) is any of the following: applicant enterprise has the Employee Inventor Compensation[7)] system in place; an applicant is a person of merit, has disabilities or is a woman inventor; applicant or applicant enterprise benefitted from KIPO-hosted support programs.

- Prototype manufacturing is performed by a separately selected manufacturer, and the support funding is paid to the manufacturer, not the beneficiary enterprise, after inspection once the program has been completed. The commercialization rate of patent technologies supported by the IP Prototype Manufacturing Support Program is higher (71.4% in 2011) than in enterprises that did not receive support (59.7% in 2011). The program is regarded as extremely useful to individuals and SMEs lacking funding.

- A survey conducted on the beneficiary enterprises after completion of the program showed that the overall satisfaction rating of the program was higher in 2011 (83.8 points) YoY (80.1 points in 2010). This is deemed to be the result of public institution directly collecting the requests regarding the program, listening and paying attention to the difficulties experienced by enterprises in patent technology commercialization, and continuously making efforts to improve on the issues pointed out.

- IP prototype manufacturing support is regarded as a very useful system in rendering individuals' and SMEs' promising patents into products, as these technologies could have died out due to financial constraint. The program is presented in regional briefing sessions and meetings for selected patent holders so that there is no inventor (or enterprise) that cannot receive support due to lack of information on the program.

---

7) System in which the enterprise succeeds the right to what was invented by employee during work and fairly compensates the employee

2) Product Innovation Using IP Data

- IP utilization strategy support provides in-depth consulting for ‘product problem solving’ and the establishment of ‘IP commercialization’ strategies. ‘Product problem solving’ strategic consulting helps the inventor to create added value through consulting with TRIZ[8], patent, and design specialists so that the issues of IP-applied products can be solved for better innovation. While existing IP consulting services approached with the perspective of designing around and prevention of rights infringement, this program supports the inventor to use patents from other areas to solve the product’s problem and arrive at the optimized design through analysis of consumers, market, trend, and IP.

- ‘IP commercialization’ strategic consulting helps SME to establish an IP management strategy in line with its business strategy and set up an IP management system so that the enterprise can implement the strategies on its own. The program is useful for enterprises wishing to maintain or expand its domestic/ overseas market share using IP, enterprises wishing to protect its business area or rule out competitors, enterprises wishing to reduce patent expenses or make profits out of IP, enterprises attempting to launch a new business or set up marketing channels through integration of its competencies and external resources, and enterprises wishing to receive financial support based on the IP asset it owns. Customized consulting is provided based on the enterprise’s needs.

3) IP Valuation and Financial Support

- In order to heighten the commercialization rate of newly created patents, policy-level support is needed to diversify the areas of utilization so that the patent can become the core element of the enterprise’s business strategy. To achieve this goal, credibility for and fairness of IP valuation are necessary. In order to establish such a foundation, KIPO designates and operates invention valuation agencies[9] (institutions that assess the excellence of patent technologies) and is continuously promoting the development and distribution of valuation methods.

- To enhance the credibility of valuation reports and facilitate the operation of valuation costs support programs based on government subsidy, the patent office designates and operates as IP valuation agencies public research institutions, government-funded research centers, corporate research labs or institutions specializing in the assessment of technology and business feasibility. When designating an IP valuation agency, the assessable area of technology, valuation performance for the past three years, availability of expert personnel, required valuation methods, and infrastructure are considered as a whole.

---

[8] Creative problem solving theory (Teoriya Resheniya Izobretatelskikh Zadach), Russia

[9] Institutions with infrastructure including valuation experience, personnel, valuation model are selected to valuation agency

- Also, ‘commercialization through IP valuation support’ program helps valuation results be used to investment in kind, technology transaction, technological certification acquisition, and business feasibility analysis, while ‘financing through IP valuation support’ program helps enterprises procure funding for commercialization through cooperation with financial (investment) institutions.

- The commercialization through IP valuation support program provides up to 50 million KRW per year per person within 70% of the expenses used on valuation. The holder of rights by the Patent Act and the Utility Model Act as of the application date, the successor, and the exclusive licensee are eligible.

- Candidates are selected through comprehensive screening that considers both the technology and utilization aspects of the patent, and extra points are given to enterprises using the employee inventor compensation system, men of merit, persons with disabilities, and awardees of invention-related events hosted by the patent office.

- When valuating patented technology, the review is done in a multidimensional manner, considering all aspects including the right, technology, marketability, and business feasibility. Valuation can calculate the excellence of the technology, business feasibility, and the monetary value of the patent right, meaning that the data can be used for calculating the reasonable price for contribution in kind, technology investment, financial securitization of technology, collateral pricing, establishing other long-term business strategies, asset valuation due to bankruptcy or restructuring, and as legal evidence in case of dispute.

- KIPO provides various types of financial support to nascent enterprises and SMEs in need of funding. Expenses for the guarantee through IP valuation is supported so that SMEs can find a guarantee through valuation of the IP they own. Also, IP-secured loans support the valuation expenses and consider the valuation amount to collateralize only IP up to 2 billion KRW. Also, the Patent Office supports the documentation of valuation reports on patents held by subjects of investment to encourage investment in enterprises with promising technologies.

4.3. United States

4.3.1. IP Status

1) Patent

(1) Status of Application by Resident/Non-Resident per Year

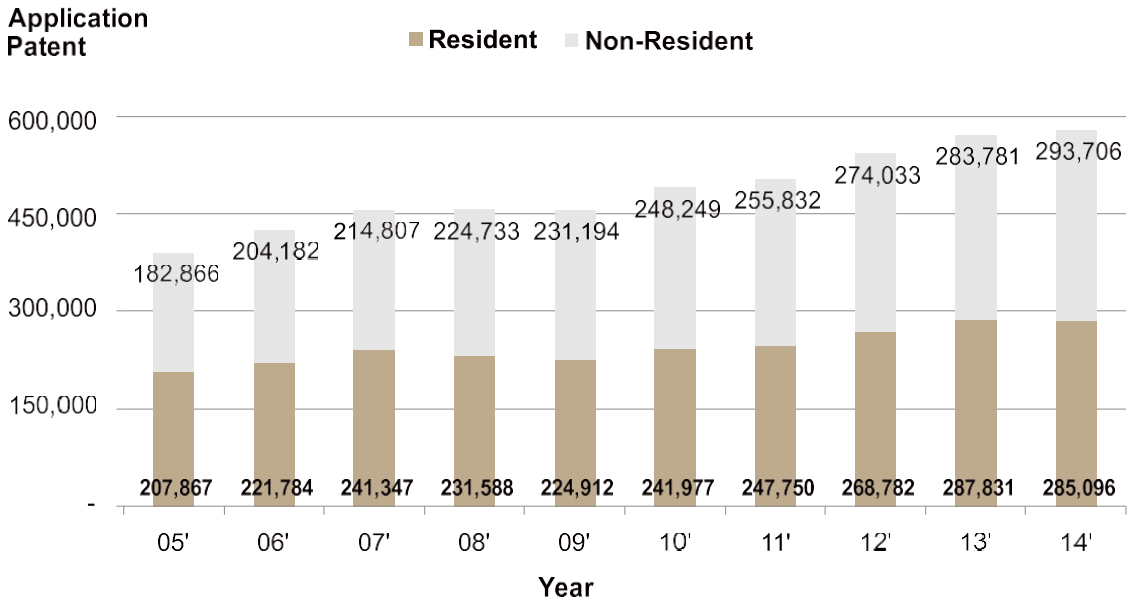


Figure 9. Status of Application by Resident/Non-Resident per Year (United States, Patent)
<Source: WIPO IP Statistics Data Center>

- Over the last ten years, the number of patent applications filed in the US has shown a steady increase. Despite a slight halt in the increase between 2008 and 2010, the years following showed a steady upward trend. The ratio of applications to residents in 2005 and 2014 are 53% and 49%, respectively, showing an approximately 4% drop. Applications by residents throughout the past 10 years are approximately 50%, meaning that the ratio of applications by non-residents is higher than in China; Japan; and Korea.

(2) Status of Registration by Resident/Non-Resident per Year

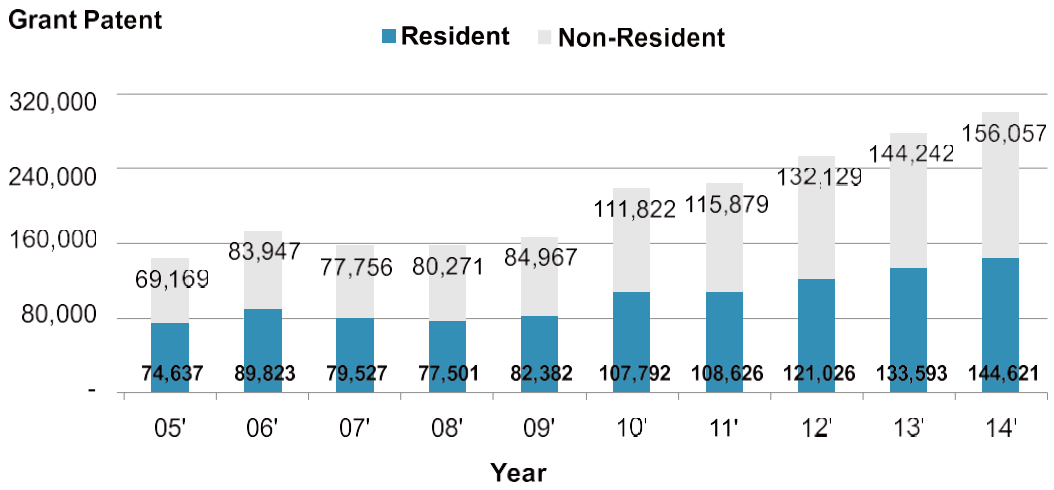


Figure 10. Status of Registration by Resident/Non-Resident per Year (United States, Patent)
<Source: WIPO IP Statistics Data Center>

- During the last ten years, the number of patent registrations in the US decreased slightly in 2007, after which the number of registrations continued to rise for those filed by both residents and non-residents. The increase rate for residents is much higher.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

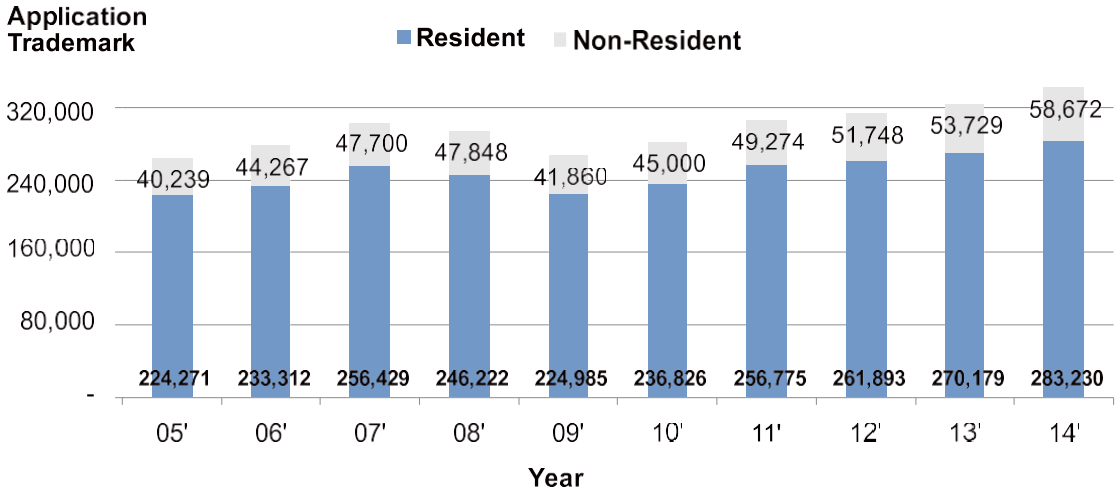


Figure 11. Status of Application by Resident/Non-Resident per Year (United States, Trademark)
<Source: WIPO IP Statistics Data Center>

- The number of trademark applications in the US showed a temporary decrease around 2009 but picked up again in 2010. The increase rate of applications by non-residents is much higher than that of residents. The ratio of trademark applications by residents in the past 10 years is approximately 83%, which is higher than in most other member economies.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

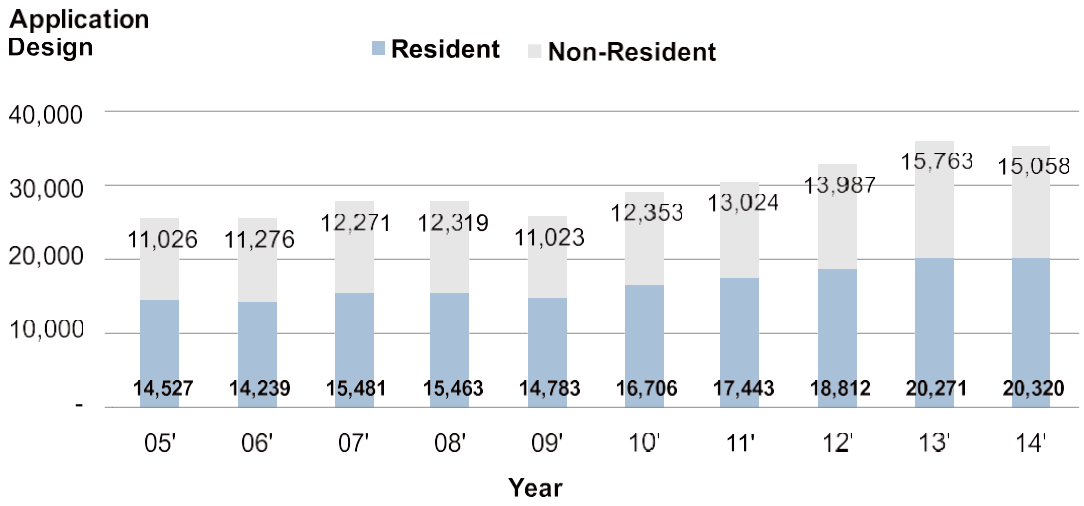


Figure 12. Status of Application by Resident/Non-Resident per Year (United States, Design)
<Source: WIPO IP Statistics Data Center>

- The number of design applications in the US dropped slightly in 2009, similar to patent applications, followed by a continuous upward trend after 2009. Compared to the application volume in 2005, the increase rate of design applications made by residents and non-residents in 2014 both show an approximately 1.4 times increase. The ratio of applications made by residents in the past 10 years is approximately 56%, which is relatively lower than in other member economies.

4.3.2. Guide to IP Creation Policy and Program

1) Pro Bono Program[10)]

- There are two ways to apply for pro bono assistance. First, you may apply directly with the regional Patent Pro Bono Program in the state where you live. Alternatively, you may apply through an online portal known as the National Clearinghouse, which is operated by the Federal Circuit Bar Association. The National Clearinghouse portal will require you to provide contact information and answer a few questions. It also will require you to provide basic information about your invention, including a brief description, to help in the referral process. Should your application pass the first level of screening at the National Clearinghouse, it will be forwarded to the appropriate regional program. All following correspondence will generally come from the regional Pro Bono Program.

- The National Clearinghouse will not perform any substantive screening on applications. Rather, the National Clearinghouse serves as a conduit to transfer requests for assistance to the appropriate regional program, based upon where the inventor is located or has a business. The National Clearinghouse will make certain that the inventor is either a resident of the US or is otherwise legally permitted to be in the US.

2) Law School Clinic Certification Program[11)]

- Law School Clinic Certification Program provides support to financially vulnerable small businesses and individual inventors in patent and trademark application.

- Students of law schools in partnership with the USPTO (US Patent & Trademark Office) take part in the patent and trademark application process under professors' supervision. A total of 46 law schools are participating in this program, through which students are given on-the-job training. Small businesses and individual inventors wishing to apply for patent and trademark can make inquiries to a law school for help.

10) https://www.uspto.gov/patents-getting-started/using-legal-services/pro-bono/patent-pro-bono-program
11) http://www.uspto.gov/learning-and-resources/ip-policy/public-information-about-practitioners/law-school-clinic-1

3) Patent Pro Se Assistant program[12)]

- Patent Pro Se Assistant program aims to support inventors and small businesses with weak financial capabilities.

- Inventors and small businesses can use this program to proceed with the patent application process without appointing an attorney. USPTO puts together an exclusive team to provide fast feedback to the applicant to ensure that the applicant can go through the application process autonomously.

4.3.3. Guide to IP Utilization Policy and Program

1) NASA's Technology Transfer Program[13)]

- NASA (National Aeronautics and Space Administration) offers free patent licenses to support start-ups that cannot access IP due to financial constraint with new products and service creation opportunities.

- NASA offers free, non-exclusive license to the 1,200 patents it owns to start-ups in the US. Since NASA does not charge the initial licensing fee, the applicant is free from the burden of paying fees for a minimum of three years. In addition, NASA's technical personnel and equipment may be used. If the start-up is selling products, it must pay NASA a set amount of license fee, which is used for the technological enrichment and technological transfer activity of the technology's initial inventor and NASA.

12) http://www.uspto.gov/patents-getting-started/using-legal-services/pro-se-assistance-program
13) http://technology.nasa.gov/startup

2) SBIC (Small Business Investment Company) Program[14)]

- SBIC is a credit guarantee program for SMEs supported by the SBA (Small Business Administration) of the US.

- The program begins with the SBA designating a private venture capital as SBIC through screening. The SBIC program is a fund of funds, and SBICs support funding to new enterprises and SMEs through governmental funding support and guarantee. As the enterprise's own funds are invested as well, a joint investment of public and private funds is made possible.

- SBICs are able to invest in small businesses in the US, and the SBIC support funding is provisioned by issuing government bond. Innovative enterprises that the SBICs invest in can receive support in capital support and management and operation.

- Qualifying enterprises are those that cannot borrow on reasonable conditions (rate, period, etc.) without the Federal Government's support as defined by the Small Business Act. They are largely categorized into 1) nascent enterprise, 2) new enterprise (six months to one year after founding), 3) existing enterprise (1 year or more after founding). Real estate ventures, gambling-related enterprises, and NPOs (non-profit organizations) are excluded.

14) https://www.sba.gov/sbic

4.4. Japan

4.4.1. IP Status

1) Patent (Including Utility Models)

(1) Status of Application by Resident/Non-Resident per Year

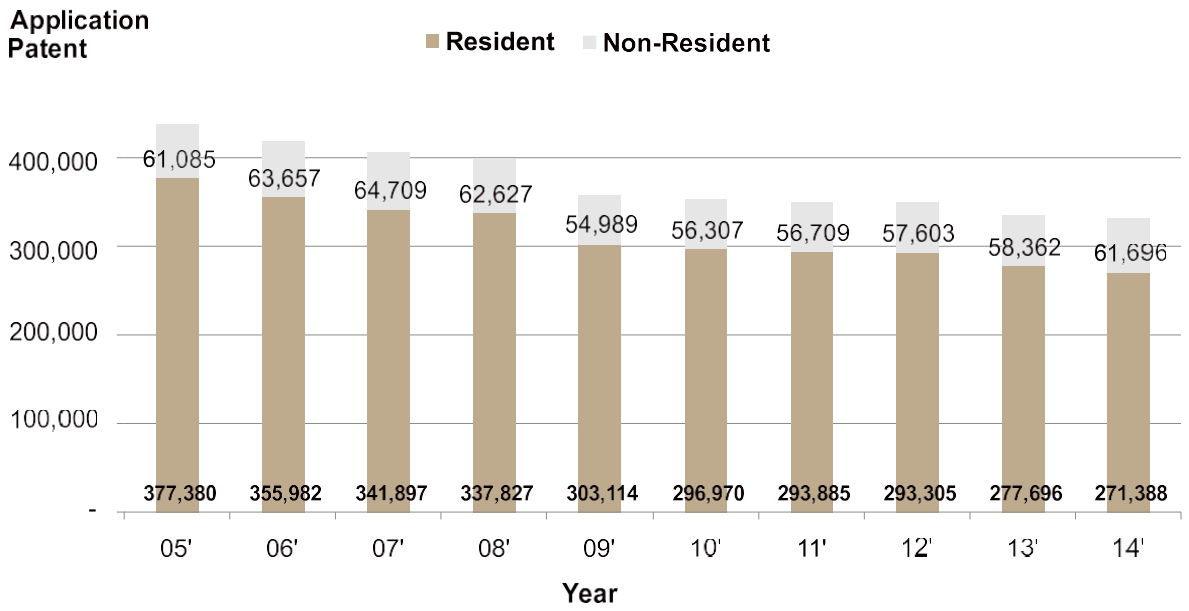


Figure 13. Status of Application by Resident/Non-Resident per Year (Japan, Patent)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, the number of patent applications in Japan is showing a downward trend, which is observed to be due to the impact of the decrease of applications by residents, rather than by non-residents. In fact, the number of applications by residents decreased by approximately 28% from 2005 to 2014. In contrast, applications by non-residents increased by approximately 1%. The ratio of patent applications by residents in Japan in the past 10 years is approximately 84%, which is relatively higher than in other member economies.

(2) Status of Application by Resident/Non-Resident per Year

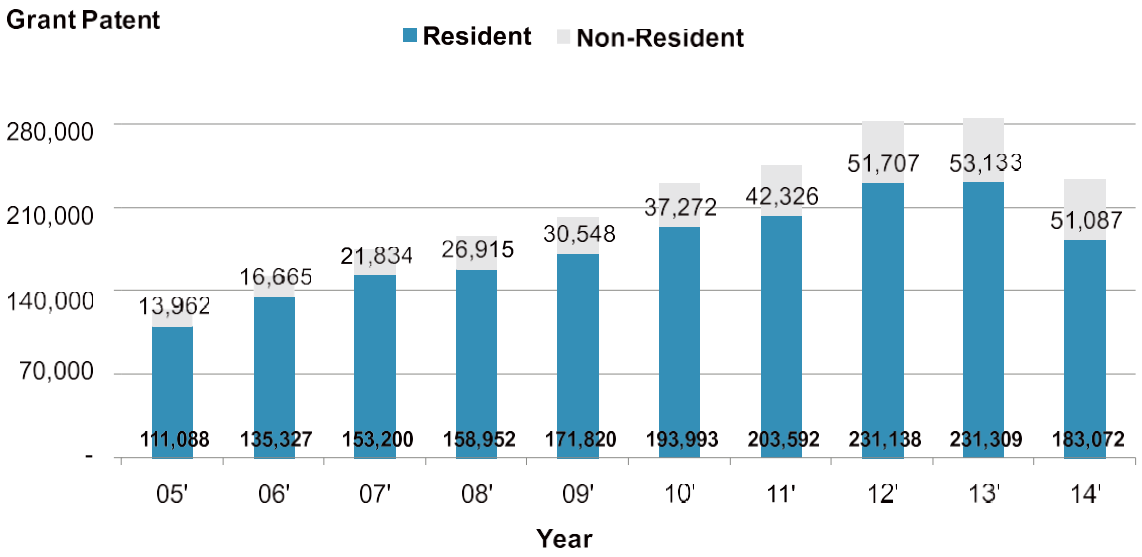


Figure 14. Status of Registration by Resident/Non-Resident per Year (Japan, Patent)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, patent registration in Japan increased steadily up to 2013 and fell sharply in 2014. The number of registrations by non-residents increases approximately 3.7 times from 2005 to 2014, while those by residents increased approximately 1.6 times.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

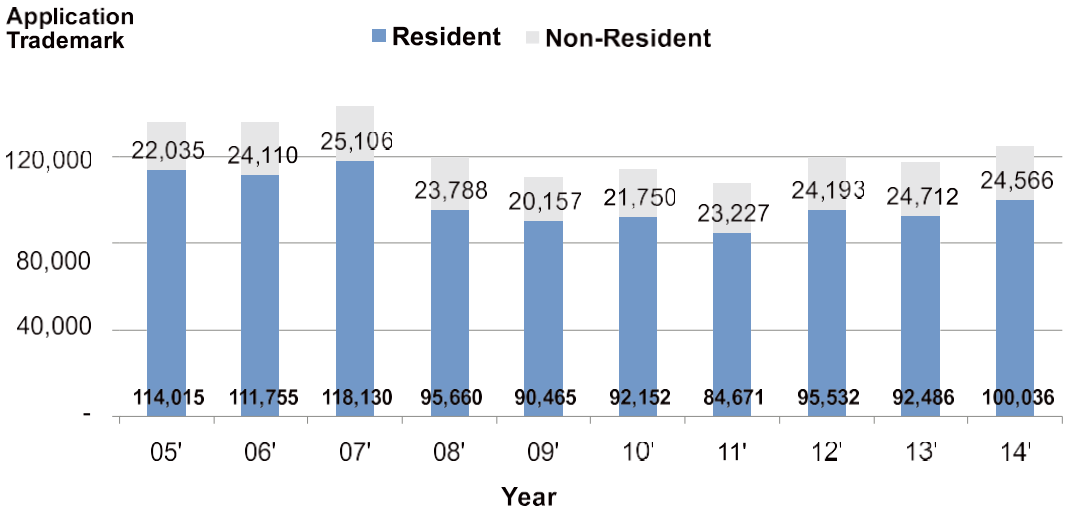


Figure 15. Status of Application by Resident/Non-Resident per Year (Japan, Trademark)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, trademark applications in Japan showed a downward trend until the late 2000s. In the early 2010s, there was a slight increase. The number of trademark applications by residents decreased by approximately 13% from 2005 to 2014, while those by non-residents increased by approximately 11% in the same period. The ratio of trademark applications by residents in the past 10 years is approximately 80%, which is slightly higher than in other member economies.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

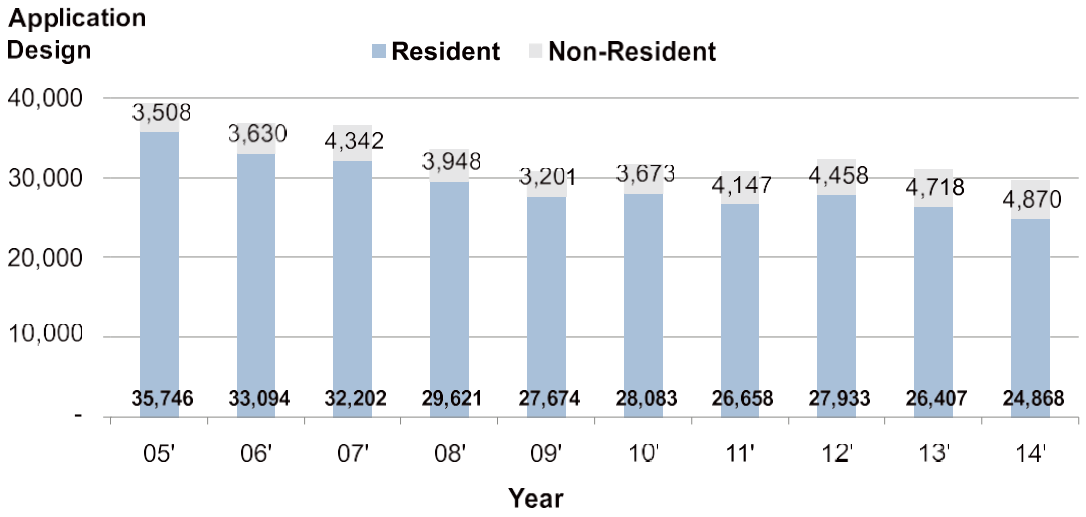


Figure 16. Status of Application by Resident/Non-Resident per Year (Japan, Design)
<Source: WIPO IP Statistics Data Center>

- During the past 10 years, the design application trend in Japan has been showing a downward slope, which is similar to its patent application trend. The decreasing trend was greatly impacted by the fall of the number of applications by residents, as shown in the approximately 30% decrease from 2005 to 2014. In contrast, design applications by non-residents increased by approximately 39%. In the past 10 years, the rate of design applications by residents was 87%, which is slightly higher than in other member economies.

4.4.2. Guide to IP Creation Policy and Program

1) IP Comprehensive Support Counter[15)]

- Japan Patent Office has set up and is operating IP comprehensive support counters in each province, region, and district to provide IPR-related services to SMEs. This counter unitarily receives inquiries on SMEs' challenges and concerns regarding IPR from the idea incubation stage to commercialization.

- The IP comprehensive support counter provides a one-stop service that solves SMEs' issues and challenges on the spot, under cooperation with a diverse range of specialists and supporting agencies in the field. IPR-related support is provided from the stage before IPR acquisition to the utilization stage.

2) Support for Analyzing and Utilizing Patent Information (Utilization of Patent Information for Business)[16)]

- Support for Analyzing and Utilizing Patent Information offers help in analyzing patent information such as prior art research, which may incur burdensome expenses for SMEs.

- The support is provided according to need to SMEs at each stage of IP activities, from R&D to filing applications requesting for examination, in order to promote effective utilization of patent information at the enterprise level. By utilizing patent information, SMEs develop R&D strategies, promote effective R&D investment, and design open & close strategy.

3) Global IP Strategy Producer[17)]

- In order to support IP management in terms of overseas business development, the JPO and the INPIT provide support for SMEs via IP strategy experts, called "Global IP Strategy Producers", who have experience in working for overseas branches of private enterprises.

- Specifically, Global IP Strategy Producers advise enterprises that are planning on developing business overseas on intellectual property risks, IPR acquisition method, and utilization of intellectual property in accordance with the business development of each enterprise.

15) http://chizai-portal.jp/index.html
16) http://ip-bunseki.go.jp/
17) http://www.inpit.go.jp/katsuyo/gippd/gippd/index.html

4.4.3. Guide to IP Utilization Policy and Program

1) IP Finance (Promoting IP-based Financing)

- SMEs have a hard time getting funding from financial institutions using the IPR that they have because financial institutions lack the personnel to valuate technological contents such as patents and it is difficult to consider the value of IP when reviewing clients for loans.

- Japan Patent Office provides support for evaluating the reports of IP-based businesses, in which experts from a third party assess the marketability and other elements of businesses that utilize intellectual property. Based on this report, financial institutions make decisions regarding the provision of funds to SMEs. In addition, symposiums, seminars, etc. are held to distribute and promote the program to financial institutions.

2) 'IP Future Company' Certification Program[18)]

- Yokohama, Japan in partnership with Shoko Chukin Bank Central Vault certifies SMEs as 'Yokohama IP Future Company' and lends out equipment and operation fund at a low interest rate.

- The city of Yokohama grants the 'IP Future Company' certification to SMEs that make use of IP in a meaningful way based on unique technologies or services. Loan amount is within 50 million JPY (5 years) for operation fund and within 100 million JPY (10 years) for equipment fund. Other than loan support, Yokohama also offers help in procuring IPR consulting expenses and opening up new markets using IPR.

3) Chizai Business Matching[19)]

- Kinki Ministry of Economy, Trade, and Industry is running the 'Chizai Business Matching' program so that open licenses owned by large companies can be used by SMEs and ventures in product development. Financial institutions in the Kansai region, together with patent law firms, help the patent application and IP strategy establishment of SMEs and ventures while supporting new projects and technological development by introducing open licenses owned by large firms. In addition, firms' growth potential is assessed based on the IP and applied to loan and business matching.

18) http://www.city.yokohama.lg.jp/keizai/happyou/h27/20150416163827.html
19) http://seeds-matching.go.jp/

4) MoTTO PLUS Program[20)]

- Osaka Chamber of Commerce, along with East Osaka Chamber of Commerce, Yao Chamber of Commerce, Osaka City Shinkin Bank, support the MoTTo PLUS program, which helps SMEs make up of technologies (open licenses) owned by large companies to promote new business in their own brands, while large companies can utilize their otherwise unused patents in a meaningful way.

- Unlike the existing large firm-SME matching programs, this program lets SMEs use open licenses to launch new projects under their own brand, while large companies do not let their unused patents go to waste. Osaka Chamber of Commerce selects SMEs based on technology and focus area, and the selected firm proposes a business plan using patented technology. This proposal is reviewed by technicians at the large firm and is commercialized.

[20)] http://www.osaka.cci.or.jp/Chousa_Kenkyuu_Iken/press/260911motto.pdf

4.5. China

4.5.1. IP Status

1) Patent (Including Utility Models)

(1) Status of Application by Resident/Non-Resident per Year

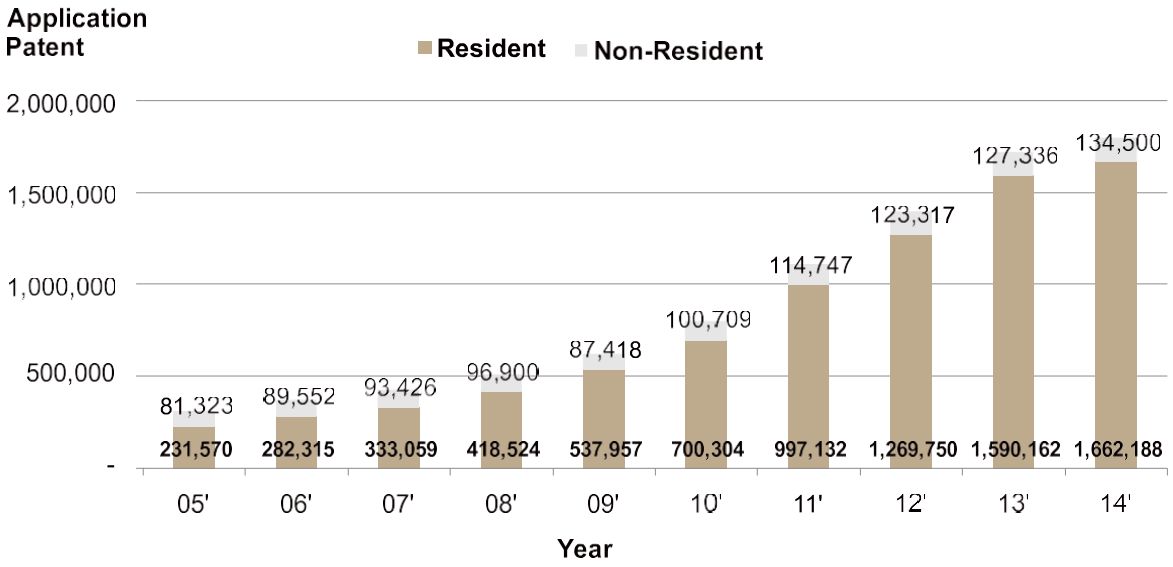


Figure 17. Status of Application by Resident/Non-Resident per Year (China, Patent)
<Source: WIPO IP Statistics Data Center>

- China's patent application trend has been showing an upward slope for the past 10 years, with a higher increase rate than other member economies. In particular, the increase rate of applications by residents is steeper in comparison to that by non-residents. The number of patent applications by residents increased approximately sevenfold from 2005 to 2014, while those by non-residents increased by more than 1.6 times in the same period. In the past 10 years, the rate of patent applications by residents in China is 84%, which is much higher than in other member economies.

(1) Status of Registration by Resident/Non-Resident per Year

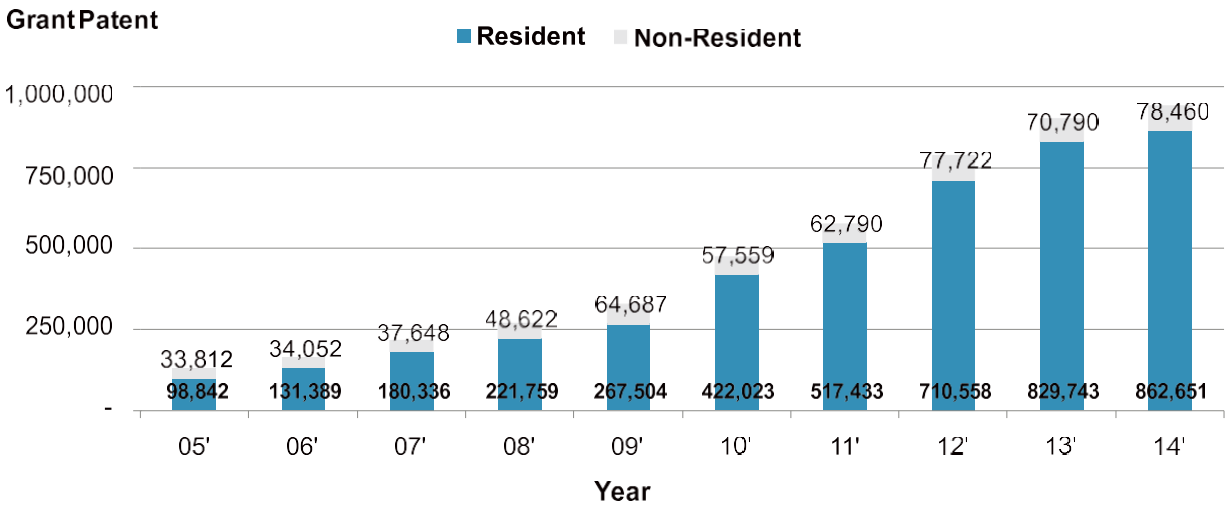


Figure 18. Status of Registration by Resident/Non-Resident per Year (China, Patent)
<Source: WIPO IP Statistics Data Center>

- Patent registrations in China have been increasing rapidly for the past 10 years, largely due to the increase of registrations by residents. In particular, the number of patent registrations by residents increased by approximately 7.8 times from 2005 to 2014.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

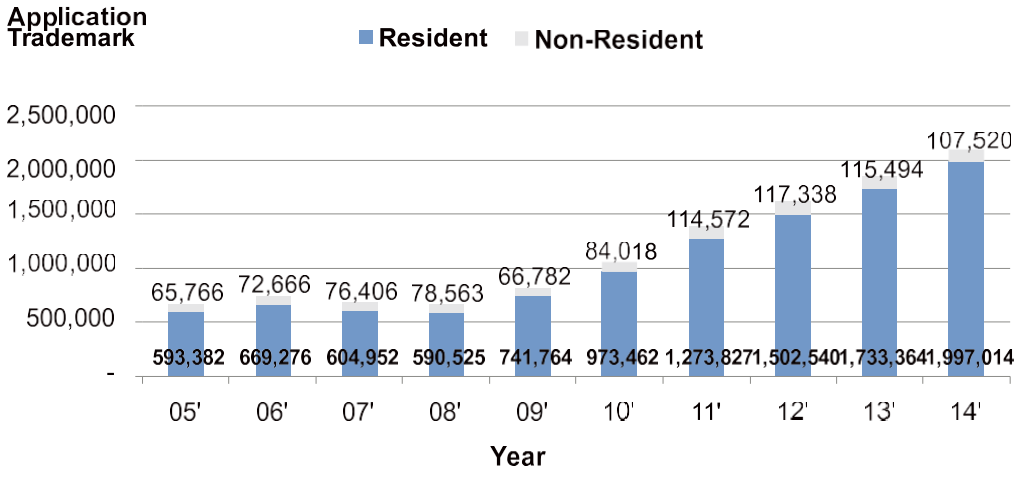


Figure 19. Status of Application by Resident/Non-Resident per Year (China, Trademark)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, the number of trademark applications in China has been increasing since 2008, largely due to the increase of applications by residents. Both applications by residents and non-residents are increasing in volume. The number of trademark applications by non-residents increased by 1.6 times and 3.4 times for residents from 2005 to 2014. The rate of Chinese residents' trademark application rate over the past 10 years is approximately 91%, which is regarded as extremely high in comparison to other member economies. The rate of applications by residents is progressively increasing.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

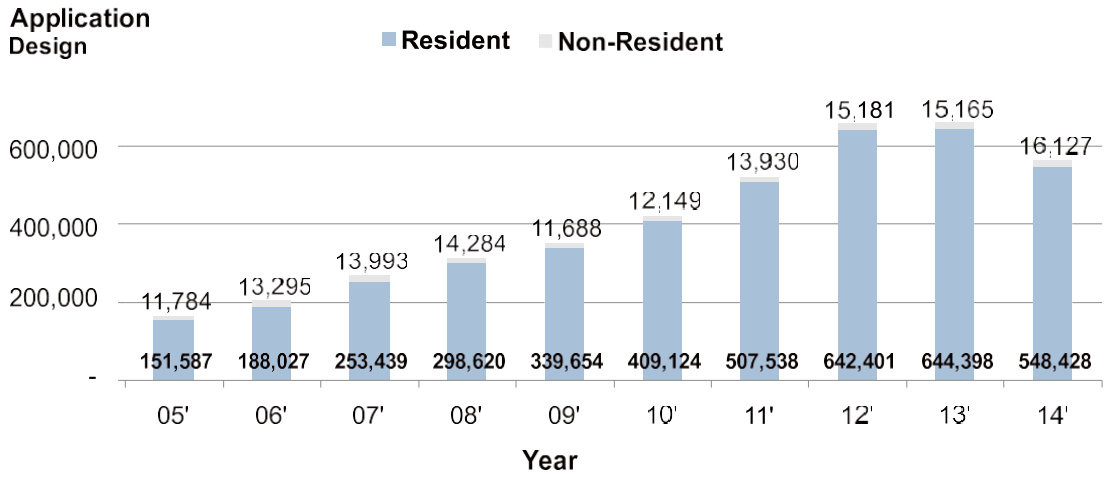


Figure 20. Status of Application by Resident/Non-Resident per Year (China, Design)
<Source: WIPO IP Statistics Data Center>

- Over the past 10 years, design applications in China increased up until 2012, after which the number decreased slightly. The increase rate of applications by residents in higher than for non-residents. In fact, the number of design applications in China from 2005 to 2014 increased by approximately 3.6 times for residents and approximately 1.4 times for non-residents. Chinese residents' design application rate over the past 10 years is approximately 96%, which is extremely high in comparison to other member economies.

4.5.2. Guide to IP Creation Policy and Program

1) Exemption of Patent Expenses

- In order to expedite the growth of patents and mitigate the burden of patent application, maintenance, and protection on enterprises and individuals, China's Ministry of Finance and NDRC (National Development and Reform Commission) have enacted an exemption policy as per the relevant policy in the 'Implementing Regulations of the Patent Act of the People's Republic of China.'

- According to this policy, the fees incurred in the patent application process and patent maintenance expenses can be exempted. Applicants or patent holders subject to exemption can benefit for up to 6 years from the date the patent right was granted.

2) Guozhi Intelligence Intellectual Property Fund[21)]

- Guozhi Patent Warning Consulting Center[22)] in Beijing, China was founded by Beijing Patent Examination Cooperation Center[23)] under the patent office of the State Intellectual Property Office. This center is the first of its kind in China to provide patent warning consultation and has set up the Guozhi Intelligence Intellectual Property Fund to promote innovation and entrepreneurship by strengthening IPR competency.

- With initial capital of 100 million CNY, the fund is targeted at SMEs set to list on the New Third Board [24)]. It will be used to discover and develop corporate IPR and support enterprises in acquiring patent for core technologies. The Third Board's IPR Index will be announced regularly to uncover enterprises with potential for growth and innovation. The center expects that founding the fund with social capital will contribute directly to expanding China's GDP and corporate innovation even with small government funding.

21) http://english.sipo.gov.cn/news/ChinaIPNews/2015/201511/P020151118400254161836.pdf
22) Institution providing patent warning consultation service in China
23) As patent applications increase sharply in China, followed by increased work demand for patent screening, China's SIPO established patent examination cooperation centers in major regions to disperse the workload concentrated in SIPO to maximize efficiency
24) Over-the-counter market for Chinese SMEs

3) SME IPR Management Support System

- To help SMEs that are technologically capable but lack IPR management competency, the State Intellectual Property Office and MIIT of China have an IPR support program in place.

- The SME IPR management support system provides professional consulting on corporate IPR. Also, IPR training is offered along with support on IP registration like patents and trademarks. In addition, the program supports brand protection and realization of economic value through IPR monitoring, rights infringement warning, collecting evidence, and IP protection.

4.5.3. Guide to IP Utilization Policy and Program

1) 5 in 1 IPR Financing Service

- The State Intellectual Property Office provides the 5 in 1 IPR Financing Service, a new concept of finance service to SMEs with scientific technology faced with funding difficulties. The 5 in 1 IPR Financing Service covers assessment, guarantee, loan, investment, and trade all in one based on the 'Patent Valuation Indication System.'

- To this end, the State Intellectual Property Office has established an alliance of IP valuation enterprise, collateral loan enterprise with registered capital of 200 million CNY, bond investment fund, fund with registered capital of 500 million CNY, and Internet platform of IPR and equity trading. This service uses financial means such as bank loan, trust, small loan, factoring, and P2P to help in understanding the value of IPR and identifying the investment value of enterprises.

- This service aims to promote the understanding of IP value, support the identification of investment value in enterprises with scientific technology, and establish a risk analysis system so that financial support and IPR utilization can be realized for enterprises with scientific technology.

2) IPR-secured Loan Risk Compensation Fund

- As a solution to the financial constraint faced by SMEs focusing on scientific technology, the State Intellectual Property Office set up an IPR-secured loan risk compensation fund. The fund was established under cooperation between the Shandong Province Science and Technology Office, Shandong Province Intellectual Property Office, Shandong Province Finance Office and the Shandong Branches of Qilu Bank and Bank of Communications. Through the foundation of this fund, Shandong Province Intellectual Property Office promoted the innovative entrepreneurial growth of Shandong Province and strengthened the banks' competency in providing loan service to SMEs.

- Insolvent securities secured by IPR owned by SMEs in Shandong Province are subject to compensation. Up to 40% of credit loss can be compensated.

- Shandong Province Intellectual Property Office expects that the fund will expand IPR-secured loan service opportunities to SMEs that had had a hard time getting loans.

3) Zilongbao

- IPR increases the risk burden on banks because they are not easy to valuate, dispose of, or liquidate, due to which SMEs focusing on scientific technology characterized by small capital and high level of investment and risk found it difficult to get loans from banks with IPR as collateral. To solve this issue, Beijing Intellectual Property Management Co Ltd[25], along with the Zhongguancun Branch of China Construction Bank, launched 'Zilongbao', a loan product collateralized by IPR.

- Zilongbao is the first of its kind in China to offer credit to enterprises with only IPR as collateral and no additional conditions. The defining characteristic of Zilongbao is the IPR is the only collateral and the enterprise's other asset or credit are not used to secure the loan.

- Using the quick loan approval system for amounts within 5 million CNY, it takes 15 days to receive approval on the loan. Enterprises in the Haidian District of Beijing can receive up to 50% of financial expenses as a subsidy, within the limit of 1million CNY.

4) Focus Industry IPR Operation Fund

- Beijing Intellectual Property Office and Beijing Finance Office established an operation fund for IPR in focus industries. This fund is used to encourage continuous social capital participation and realize valid links between capital and focus industries. Through this, it is expected that the market competitiveness of core IPR-holding enterprises will be enhanced in the focus industries, on top of which innovative efficiency will be expanded.

- The fund takes the form of limited partnership, amounting to 1 billion CNY over a 10 year period. The central government and the city of Beijing invested 95 million CNY of government funding. Enterprises and IPR service agencies invested 350 million CNY, already making the sum 400 million CNY.

[25] State-owned enterprise founded with Chinese government's investment, specializing in IPR management

- The fund is used for the telecommunications and biomedical industries, focusing investment on core patents owned by enterprises and high added value patent portfolios. Also, it is used for enterprises with great growth potential in its beginning stage, growing enterprises, and institutions operating unique IPR in its relevant field. Beijing Intellectual Property Office announced that the fund will be expanded from time to time in the form of equity investment.

4.6. Singapore

4.6.1. IP Status

1) Patent (Including Utility Model)

(1) Status of Application by Resident/Non-Resident per Year

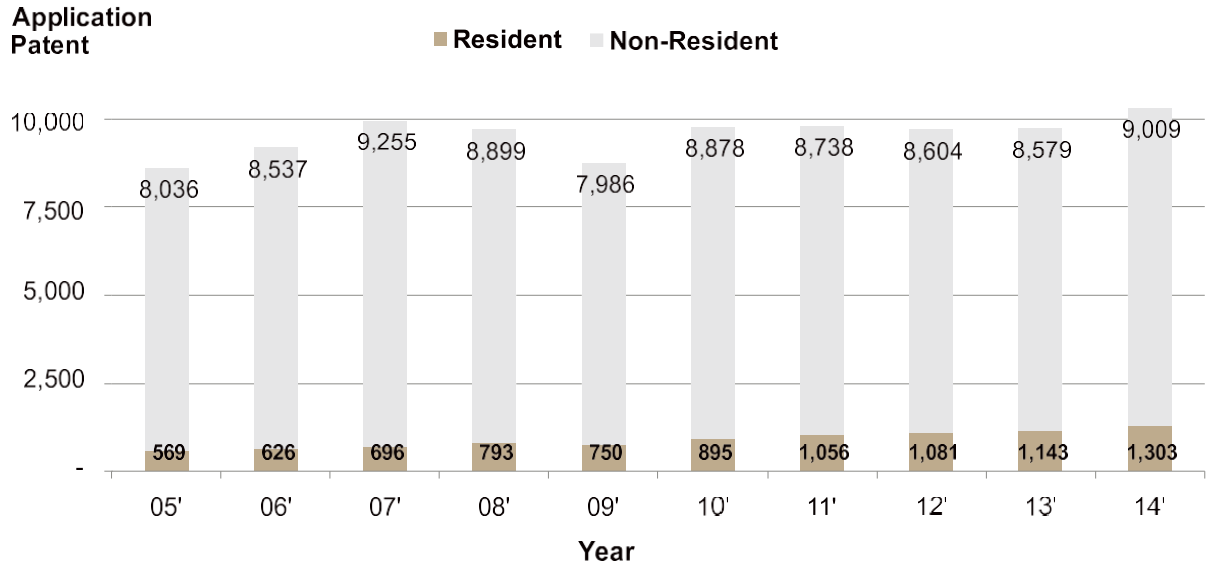


Figure 21. Status of Application by Resident/Non-Resident per Year (Singapore, Patent)
<Source: WIPO IP Statistics Data Center>

- Patent applications in Singapore continued to increase up until 2007, after which there was a slight decrease until 2009, mainly due to foreigners rather than residents. There was no big change in number since 2010, with a slight increase in 2014. The number of applications by residents is steadily increasing, along with the rate of applications by residents. The rate of patent applications by residents in Singapore compared to those by non-residents in 2014 is approximately 13%. Singaporean residents' patent application rate over the past 10 years is approximately 9%, which is extremely low in comparison to other member economies.

(2) Status of Registration by Resident/Non-Resident per Year

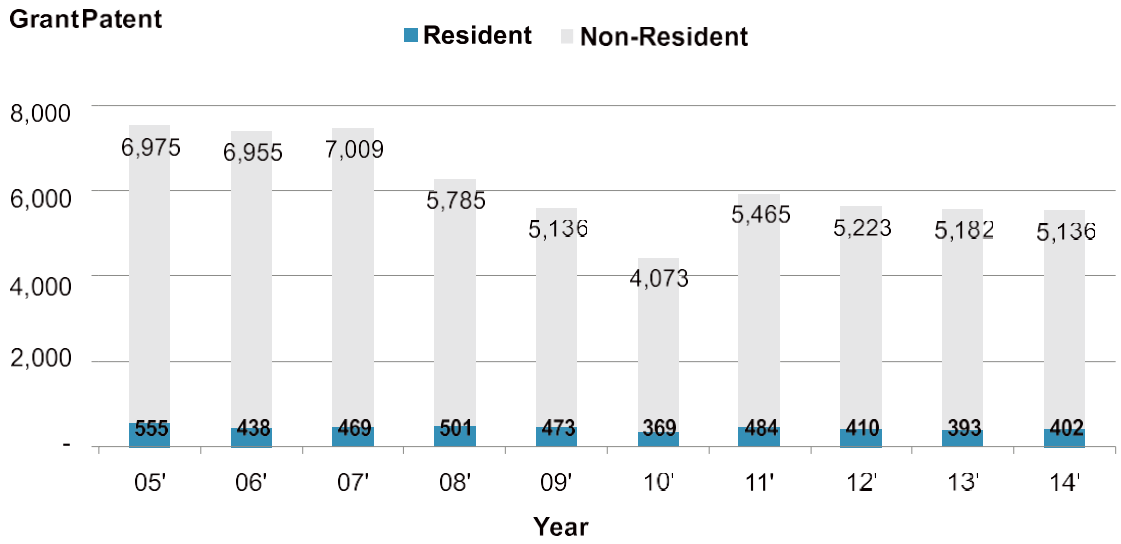


Figure 22. Status of Registration by Resident/Non-Resident per Year (Singapore, Patent)
<Source: WIPO IP Statistics Data Center>

- Patent registrations in Singapore decreased up until 2010, followed by an increase and stabilization post-2012. The trend is largely impacted by non-residents' registration.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

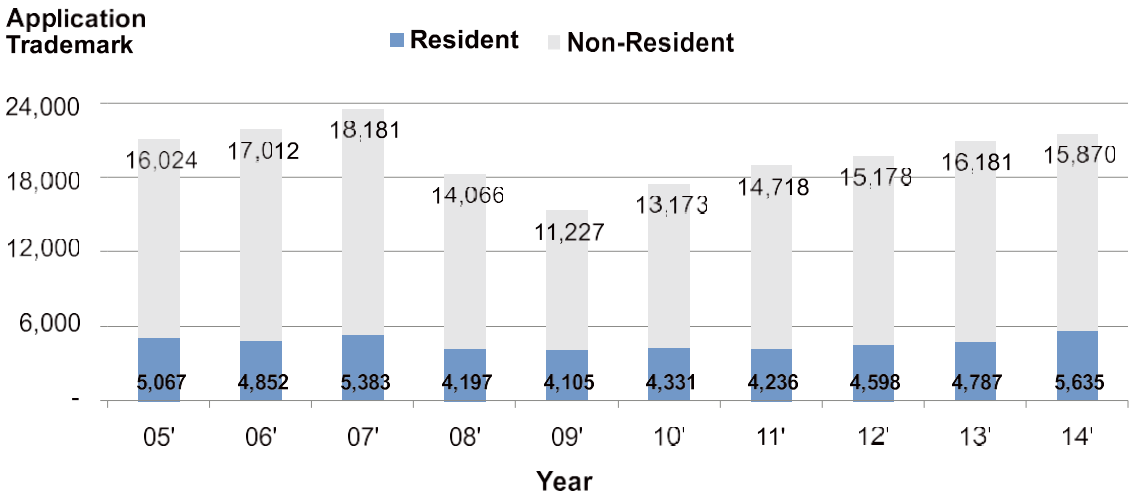


Figure 23. Status of Application by Resident/Non-Resident per Year (Singapore, Trademark)
<Source: WIPO IP Statistics Data Center>

- Trademark application in Singapore increased from 2005 to 2007, followed by a decrease starting in 2009, after which the number was recovered until 2014. Looking at the trend over the past 10 years, there were greater fluctuations in the applications by non-residents than for residents. Singaporean residents' trademark registration rate over the past 10 years is approximately 24%, which is extremely low compared to other member economies.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

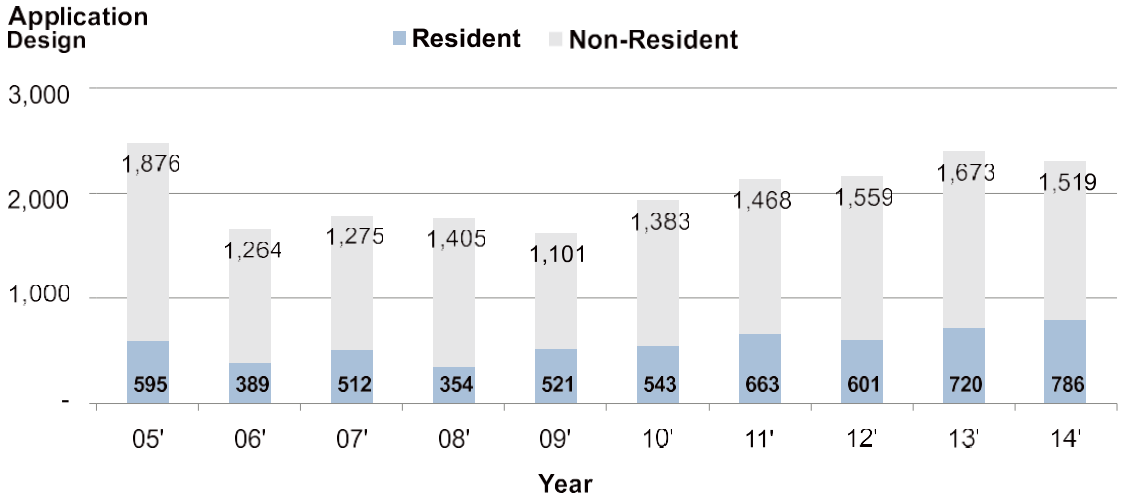


Figure 24. Status of Application by Resident/Non-Resident per Year (Singapore, Design)
<Source: WIPO IP Statistics Data Center>

- Design applications in Singapore decrease around 2006 and 2009. The numbers picked up in 2010 but decreased slightly in 2014. The number of applications by residents increased by approximately 32% from 2005 to 2014, while there was approximately 20% decrease for non-residents. Singaporean residents' design registration rate over the past 10 years is 9%, which is extremely low compared to other member economies.

4.6.2. Guide to IP Creation Policy and Program

1) IP Competency Framework Certified Professionals (IPCF)[26)]

- IP Competency Framework Certified Professionals (IPCF) is a core program that enables the IP-HUB Masterplan[27)], through which experienced IP experts provide IP-related support to enterprises and individuals.

- The IPM Consultant established strategies to protect and maximize the value of IP using IP program strategies. The IP Technology Consultant analyzes new technologies from home and abroad to provide advice to enterprises on IP asset protection and development, while also formulating strategies to commercialize IP from a technological perspective and create value.

4.6.3. Guide to IP Utilization Policy and Program

1) Productivity and Innovation Credit Scheme(PIC)[28)]

- This program provides monetary support for six activities as set out by IRAS (Inland Revenue Authority of Singapore) of Singapore. It offers cash support and tax exemption benefits for IP registration of patents, trademarks, designs, plant varieties, etc.

- The six PIC (Productivity and Innovation Credit Scheme) activities as set out by IRAS include the sale and rental of IT and automobile equipment, employee training, IPR license acquisition, registration fees for patent, trademark, design, and plant variety, R&D, and design project development.

- With regard to IP license acquisition, PIC benefit can be claimed by enterprises and cooperative relationships as defined in 19B (income tax regulation). The transferee must acquire the legal and economic title of IPR from the transferrer. As per PIC conditions, claims can be made for the costs incurred in using IP license for business or trade.

- The range of IPRs acknowledged by PIC includes patent copyright, trademark, registered design, geographical marking, the layout design of integrated circuit, trade secret or information having commercial value, and plant variety. Trademark is excluded. PIC benefit can be claimed for costs incurred in registering patent, trademark, design, and plant variety.

---

26) https://www.ipos.gov.sg/IPforYou/IPforProfessionals/MatchingyourIPCompetencytoyourIPcareer/IPCompetencyFrameworkIPCF.aspx
27) Master plan announced by Singapore to establish itself as the Asian center of global IP
28) https://www.iras.gov.sg/irashome/PIcredit.aspx

- As for design projects, PIC benefit can be claimed for costs incurred in producing a new product or industrial design. The project must be pre-approved by Design Singapore Council. The range of claimable costs for the self-designed project is the personnel expenses for experts with higher education qualification in industrial and product design, approved by Design Singapore Council. For outsourced design, the claimable limit is up to 60% of the total payment to approved service provider. consulting the program tips in the guidebook.

2) Intellectual Property Financing Scheme (IPFS)[29)]

- Through the Intellectual Property Financing Scheme, IP ValueLab [30)] affiliates with the financial sector to lend out loans secured by patent, trademark, and copyright to Singaporean enterprises. Qualified subjects are enterprises registered in Singapore and must form part of the loan collateral with registered patent and trademark and/or commercially usable copyright. The three stages to get this loan are 1) pre-assessment by relevant financial institution, 2) IPR valuation of portfolio by valuation agency, 3) submission of application to relevant financial institution.
- The financial institutions participating in IPFS are AFC Merchant Bank, DBS Bank Ltd, Oversea-Chinese Banking Corporation (OCBC) Ltd, and United Overseas Bank (UOB) Ltd. Private valuation agencies designated by the IPOS (Intellectual Property Office of Singapore) are Panel of Valuers, Baker & McKenzie.Wong & Leow, CONSOR Intellectual Asset Management, Deloitte & Touche Financial Advisory Services Pte Ltd, Duff & Phelps Singapore Pte Ltd, Ernst & Young Solutions LLP, KPMG Services Pte Ltd, and PricewaterhouseCoopers Advisory Services Pte Ltd.

3) Global Company Partnership (GCP)[31)]

- Singaporean enterprises can receive subsidy for overseas market expansion and IPR management strategy development through Capacity Building[32)], one of the Global Company Partnership programs offered by IE Singapore (International Enterprise Singapore)[33)]

- To qualify for Capacity Building, the enterprise must be based in Singapore with its global headquarters located in Singapore. Also, the latest audit report must show that its yearly sales revenue is at least 500,000 SGD with a minimum paid-in capital of 50,000 SGD. The subsidy supports the expenses used to strengthen the following six areas: internationalization strategy, brand strategy, IPR management, digital strategy, franchising and licensing, and distribution network management. Regarding these expenses, SME can receive up to 70% and non-SME can receive up to 50% of the total expenses.

4.7.
The United Kingdom

4.7.1. IP Status

1) Patent (Including Utility Model)

(1) Status of Application by Resident/Non-Resident per Year

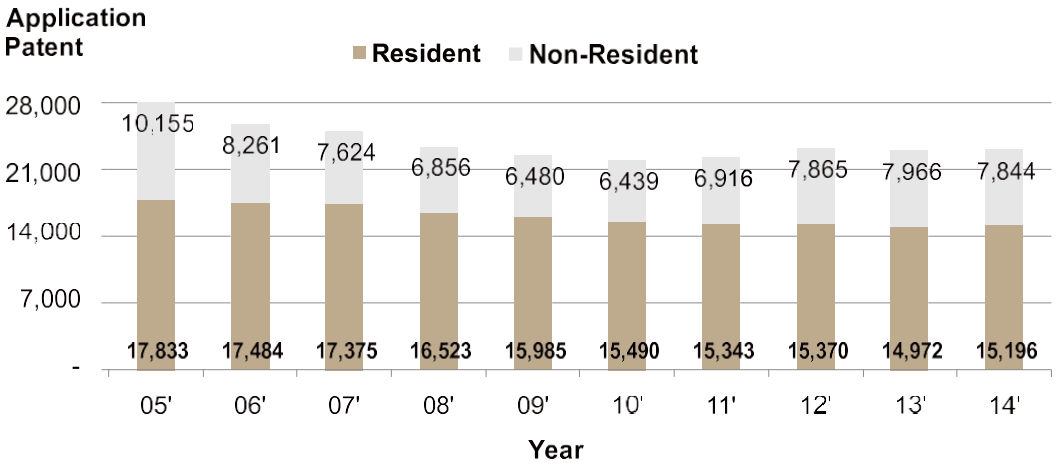


Figure 25. Status of Application by Resident/Non-Resident per Year (The United Kingdom, Patent)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, patent applications decreased up until 2009 in the UK, followed by an insignificant upward trend. The fluctuations in number are greater for non-residents than for residents. Compared to 2005, the number of applications was decreased by approximately 18% in 2014, with greater decrease among non-residents than residents. UK residents' patent application rate over the past 10 years is approximately 68%, which is high compared to other member economies.

29) https://www.ipos.gov.sg/IPforYou/IPforBusinesses/IPFinancingScheme.aspx
30) management and strategy research lab run by IPOS of Singapore, which helps firms and inventors securitize their IPR value and provide commercialization platform
31) http://www.iesingapore.gov.sg/Assistance/Global-Company-Partnership
32) http://www.iesingapore.gov.sg/Assistance/Global-Company-Partnership/Capability-Building/Capability-Building
33) Singaporean government institution that encourages international trade and helps Singaporean enterprises expand into the global market

(2) Status of Registration by Resident/Non-Resident per Year

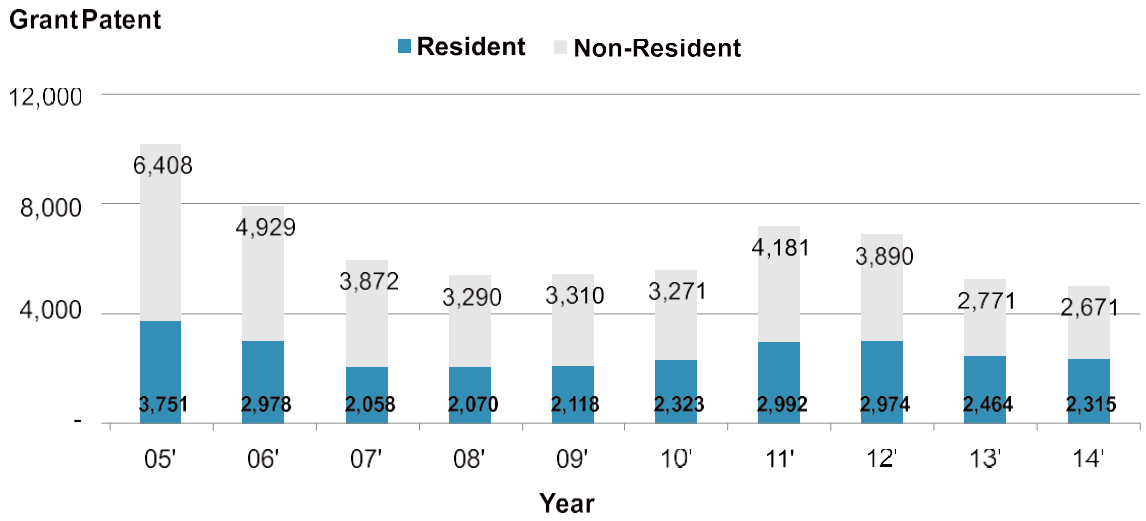


Figure 26. Status of Registration by Resident/Non-Resident per Year (The United Kingdom, Patent)
<Source: WIPO IP Statistics Data Center>

- Patent registration in the UK decreased greatly from 2005 to 2009, followed by an increase up until 2011 but the numbers fell again starting 2012. The fluctuations are more largely impacted by non-residents than by residents.

2) Trademark

(1) Status of Application by Resident/Non-Resident per Year

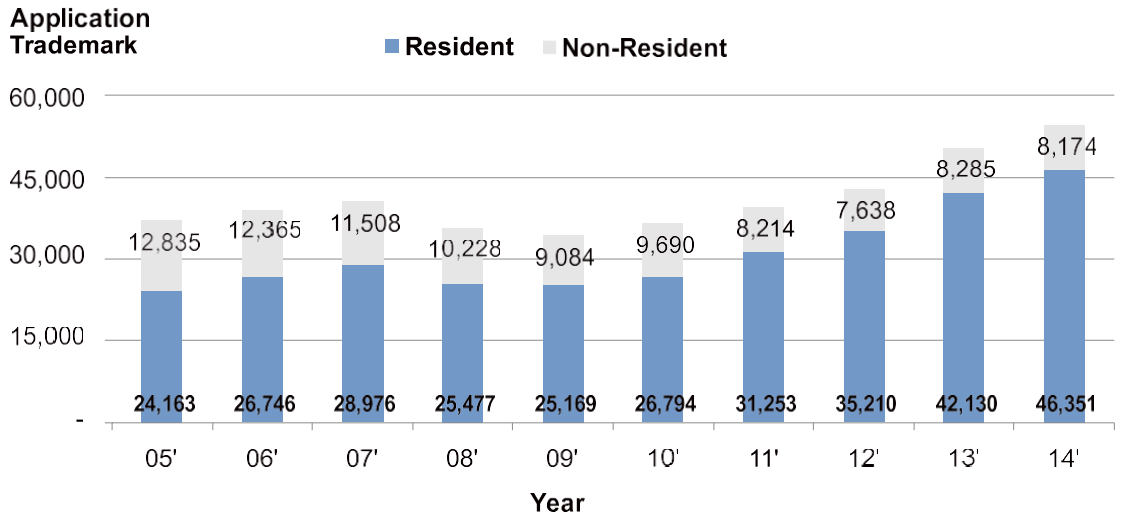


Figure 27. Status of Application by Resident/Non-Resident per Year (The United Kingdom, Trademark)
<Source: WIPO IP Statistics Data Center>

- Looking at the past 10 years, trademark applications in the UK decreased slightly around 2009, after which the numbers picked up greatly. Around 2009, applications by non-residents were decreased slightly, and the rate of trademark applications by residents compared to foreigners over the past 10 years is approximately 75%. The rate of applications by residents is progressively increasing.

3) Design

(1) Status of Application by Resident/Non-Resident per Year

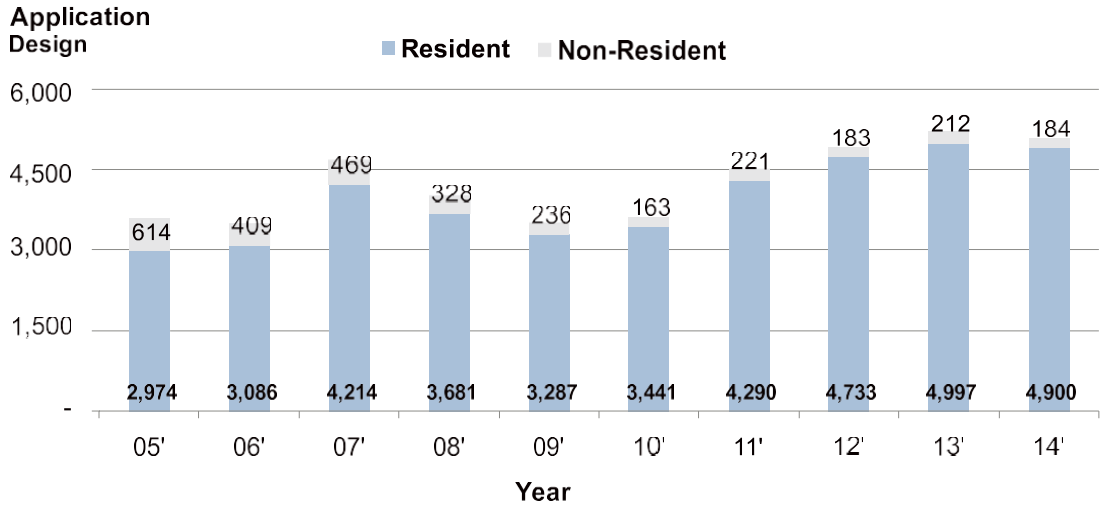


Figure 28. Status of Application by Resident/Non-Resident per Year (The United Kingdom, Design)
<Source: WIPO IP Statistics Data Center>

- The UK's overall design application trend over 10 years is similar to its trademark application trend. The number of design applications fell greatly in 2009. In 2010, the rate of applications by residents was decreased by approximately 50% from 2008. The rate of design applications by UK residents over the past 10 years is approximately 93%, which is regarded as high.

4.7.2. Guide to IP Utilization Policy and Program

1) IP Finance toolkit

- Institutions that issue IPR-secured loans tend to devalue IPRs owned by enterprises. 'IP Finance toolkit' helps SMEs in need of funding so that financial institutions can recognize and acknowledge the value of IP.

- IIP Finance toolkit proposes a guideline so that SME can prove the asset value of its IP on documentation before it applies for a loan at a financial institution. In addition, the toolkit suggests strategies to manage and commercialize IP in a more efficient manner and proposes various ways of funding for IP-rich enterprises

2) Fund R&D projects and feasibility studies[34)]

- SMART[35)] is a policy of Scottish Enterprise[36)] that provides subsidy to SMEs based in Scotland. Subsidies support the expenses of a feasibility study and R&D business needed for the commercialization of technology.

- As for the feasibility study, it is conducted in the beginning stage of R&D process to check whether a new product or process actually works. Small businesses and medium-sized businesses are provided up to 60% and 70% of the expenses, respectively. Research takes from six to 18 months, and the maximum subsidy amount is 100 thousand GBP.

- As for the R&D project, it provides subsidy to enterprises with the objective of developing a new product or prototype. Beneficiary enterprise can use up to 35% of the project expenses. The project takes from six to 18 months, and the maximum subsidy amount is 600 thousand GBP.

- To qualify for application, the SME must have 50 to 250 employees with yearly revenue of 50 million EUR or less. Also, the enterprise must own or have the right to use the IP of the technology to be commercialized. All IP developed through the project is owned by the subsidized enterprise.

34) https://www.scottish-enterprise.com/services/develop-new-products-and-services/smart-scotland/overview
35) Subsidy program for SMEs in Scotland
36) Financial development institution in Scotland

5.
Selection of Featured Programs

5.1.
Featured Program Selection Process

- In order to select the programs to be featured in the guidebook, the IP policies and programs of the IP leaders (APEC members and non-members) were first investigated. The investigated programs were first categorized into creation and utilization, within which they were divided again by purpose, target, and effect. The categorized programs were divided once again by development condition, considering the difficulty level of each program. Of these programs, the programs deemed to be highly useful in APEC members were selected.

- Regarding the selected programs, online and offline demand surveys were conducted on APEC members, the result of which was used to finalized the programs to be featured in this guidebook.

- During the visits to member economies for the offline demand survey, the opinions of the members on the draft of the guidebook structure and its main topics were collected.

5.2.
Demand Survey on Featured Programs in APEC Member Economies

5.2.1. Online Demand Survey

1) Subject

- 21 APEC member economies were surveyed online on the demand for featured programs.

- Surveyed members: Australia; Brunei Darussalam; Canada; Chile; China; Hong Kong, China; Indonesia; Japan; Korea; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; Philippines; Russia; Singapore; Chinese Taipei; Thailand; US; Viet Nam

2) Duration and Method

(1) First Online Survey

- The first online survey was conducted from 19 July 2016 (Tues) to 29 July 2016 (Fri) in the member economies visited for an offline survey. The purpose of the first survey was to identify the demand in the members to be visited in advance and set the direction of discussion points for the visit.

- The four members visited for the first survey are Mexico; Philippines; Singapore; and Viet Nam.

(2) Second Online Survey

- The second online survey was conducted from 8 August 2016 (Mon) to 9 September 2016 (Fri) in member economies. Reflecting the result of the first online survey and the offline survey, the second online survey was composed of short questions that would render simple answers, so that survey results from a large number of respondents could be collected.

- The respondents selected for the second online survey were the persons in charge of public institutions, service providing entities, and SMEs in APEC member economies, each represented by person in charge of IP creation/utilization policy, person in charge of private enterprise specializing in IP, and CEO or IP representative of major SME, respectively.

- In the second online survey, respondents were asked about the programs that were introduced and executed in each member economy and the programs that they wish to provide, of the seven IP creation programs and 9 IP utilization programs that had been selected. The list of IP creation and utilization projects in the survey is shown below.

Table 1. A list of IP creation programs

A list of IP creation programs
A1. Application fee reduction and exemption - A reduction or exemption of IP application fees - Establishing applicable subjects for fee reduction and exemption - Establishing the process for the application fee reduction and exemption project
A2. Public Patent Attorney Project - Providing free patent attorney services including IP consultation, application, prosecution, and litigation for public policy reasons
A3. Employee Inventor Compensation Project - Employees who created patentable inventions may be entitled compensation if the enterprise is assigned the IP rights. The government will educate and encourage enterprises to adopt the employee inventor compensation system.
A4. Supporting prior art search and report - Providing support to prior for requested technology - Analyzing the patentability of the requested technology
A5. Supporting the Acquisition of IP Rights - Providing consultation on acquiring domestic and foreign IP rights, and further financially supporting the needed application fee
A6. Patent Map Analysis - Analyzing technological trend and the legal relationship between relative patents in a particular technical field - Visualize the result of the analysis through various means including diagrams to ensure non-experts understand the analysis
A7. Dispatching a Patent Management Specialist - Dispatching a patent management specialist to universities or public research institutions for a certain period to aid in developing the infrastructure for managing, commercializing and transferring IP rights.

Table 2. A list of IP Utilization Programs

Table 2. A list of IP Utilization Programs

B1. Manufacturing an IP prototype
- To support the commercialization of newly incorporated enterprises' IP, assist in Manufacturing an IP prototype
- Connect the enterprise and a prototype manufacturing business and provide financial support

B2. Assisting the Preferential purchase of an invention
- The government agency evaluates an enterprise's invention consisting of patented technology and recommends to prioritize the purchase of the invention to other government and public agencies based on the evaluation

B3. Managing State-Owned Patent Rights
- Seek to utilize state-owned patents by compensating government employee inventors and transferring state-owned patents

B4. IP Transaction Market
- Developing and operating an IP transaction market
- Valuating technology and providing technology transfer consultation

B5. Patent Transaction Specialist
- Patent transaction specialists providing the medium for individual inventors and SMEs to actively transfer patents

B6. IP Transaction Consultation Service
- Providing consultation to individuals and SMEs on transacting IP and financially supporting the expense needed

B7. Grading an Invention
- grading an invention as an evaluation factor to determine whether the inventor or the SMEs who hold the right of the invention is suitable for receiving supports or funds

B8. Supporting the Valuation of an Invention
- A valuation organization evaluates a patent's technology, right, marketability, business value etc. and produces a valuation report

B9. IP Finance through IP Valuation
- The government provides financial support for an SME to obtain IP valuation, through which an SME can utilize to secure a loan, investment or a surety

3) Result

(1) Public Institution

- Public institutions in 11 member economies responded.

- Respondents: Australia; Chile; Hong Kong, China; Japan; Mexico; Peru; Philippines; Russia; Singapore; Chinese Taipei; Viet Nam

Past Implemented Programs[37)]

- With regard to IP creation programs, most public institutions had implemented prior art search, patent application costs exemption, and patent map programs, while not many had implemented employee inventor compensation project or patent management specialist dispatch programs.

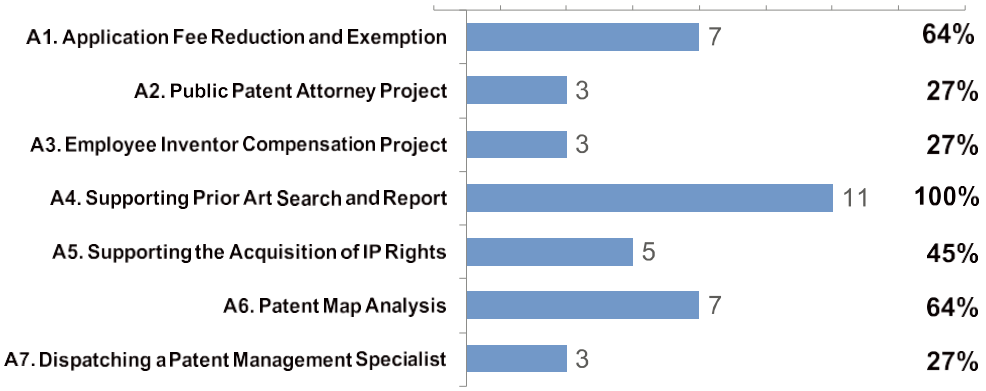


Figure 29. IP creation-related programs implemented by public institutions in the past

37) Programs that had been implemented and executed in the member economy

- With regard to IP utilization, some public institutions have experience in implementing IP transaction-related programs, other than which most public institutions are found not to have implemented IP utilization-related policies and programs.

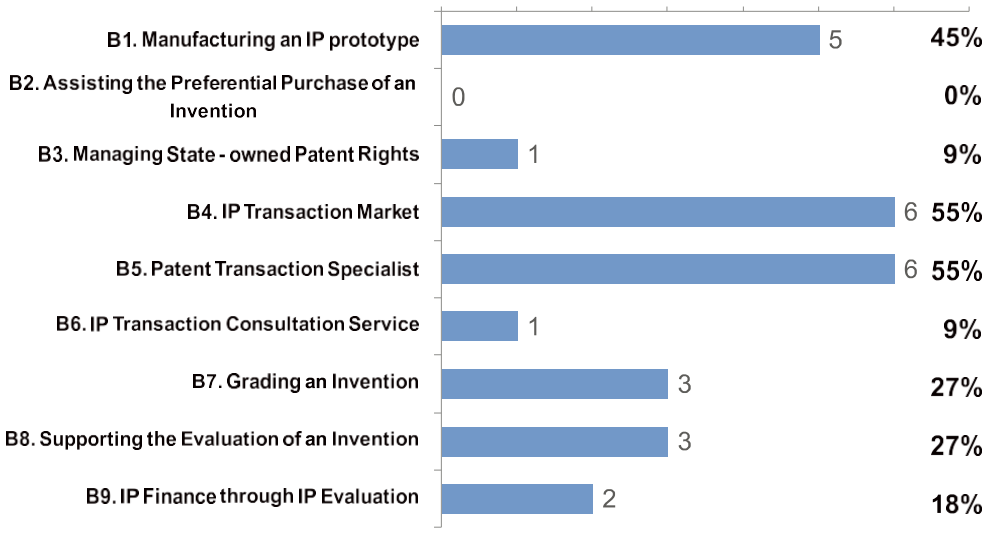


Figure 30. IP utilization-related programs implemented by public institutions in the past

- Each respondent's reply to the survey on past implemented programs is summarized in the table below.

Table 3. Each respondent's reply to the survey on past implemented programs

Respondent	Past Implemented Program(s)
Australia	Prior art search, Supporting the acquisition of IP right, Manufacturing an IP prototype, IP Transaction Market, Patent Transaction Specialist, Grading an invention, Supporting the Valuation of an Invention
Chile	Patent application fee reduction/exemption, Prior art search, Dispatching a Patent Management Specialist, IP Transaction Market, Patent map
Hong Kong, China	Prior art search, Supporting the acquisition of IP right, Patent map, Manufacturing an IP prototype, Grading an invention, Supporting the Valuation of an Invention
Japan	All IP creation programs & IP Transaction Market, Patent Transaction Specialist, IP finance through IP evaluation
Mexico	Patent application fee reduction/exemption, Prior art search, Supporting acquiring IP right, Manufacturing an IP prototype, dispatching a Patent Management Specialist, Grading an invention
Peru	Patent application fee reduction/exemption, Supporting prior art search and report
Philippines	Patent application fee reduction/exemption, Prior art search, Patent map, IP Transaction Market
Russia	Prior art search, Employee inventor compensation project, Patent map, Patent Transaction Specialist, Grading an invention
Singapore	Prior art search, Public patent attorney project, Patent map, Manufacturing an IP prototype, Patent Transaction Specialist, IP Transaction Consultation Service, IP finance through IP evaluation
Chinese Taipei	Prior art search, Patent map, IP Transaction Market, IP Transaction Consultation Service
Viet Nam	Public patent attorney project, Employee inventor compensation project, Prior art search, Manufacturing an IP prototype, Managing state-owned patent rights, dispatching a Patent Management Specialist

Programs of Interest

- Most of the IP creation programs selected by the developing agencies of this guidebook were confirmed to be programs of interest for public institutions. Of those, it was found that public institutions are mainly interested in programs that provide direct support to enterprises, such as prior art search, patent map support, supporting the acquisition of IP right, and dispatching a patent management specialist.

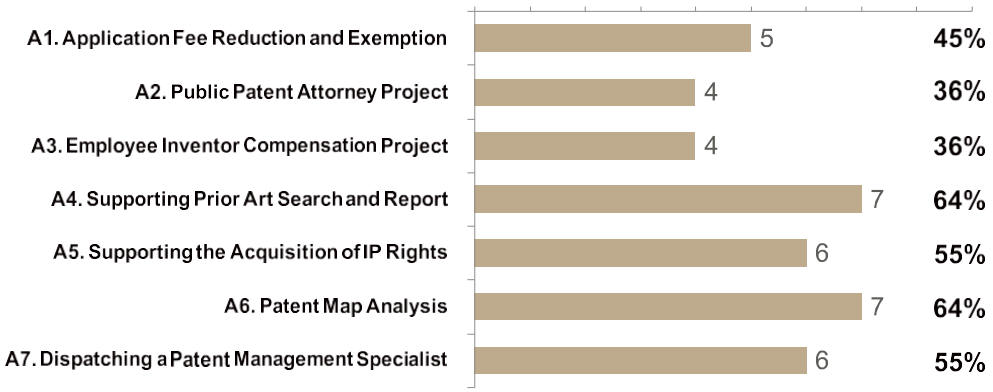


Figure 31. IP creation programs of interest for public institutions

- Most of the IP utilization programs selected by the developing agencies of this guidebook were confirmed to be programs of interest for public institutions. Of those, it was found that public institutions are mainly interested in supporting the evaluation of an invention and IP finance through IP evaluation.

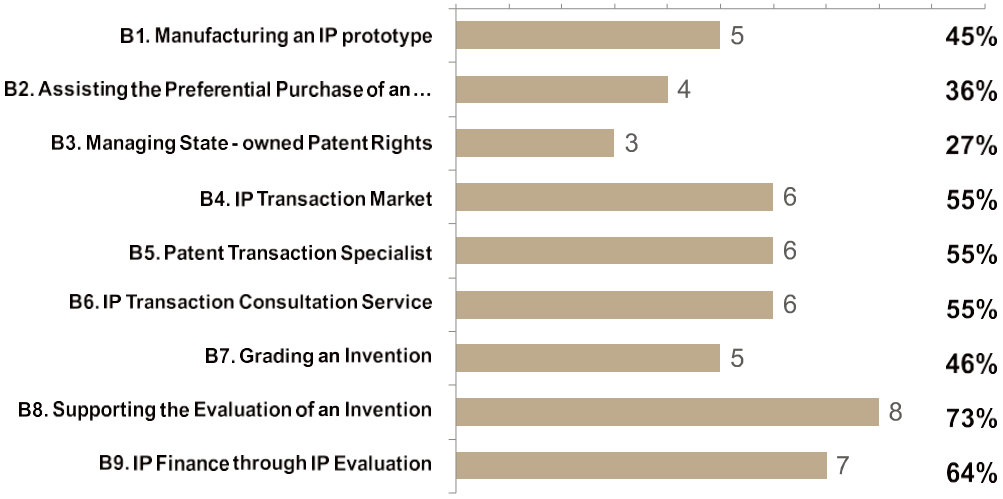


Figure 32. IP utilization programs of interest for public institutions

- Each respondent's reply to the survey on programs of interest is summarized in the table below.

Table 4. Each respondent's reply to the survey on programs of interest

Respondent	Program(s) of Interest
Australia	Prior art search, Supporting the acquisition of IP right, Patent map, Patent Transaction Specialist, Grading an invention, Supporting the Valuation of an
Chile	Prior art search, Manufacturing an IP prototype, Patent Transaction Specialist, IP Finance through IP Valuation
Hong Kong, China	All IP creation programs except Employee inventor compensation project & All IP utilization programs except Managing state-owned patent rights and Assisting the preferential purchase of an invention
Japan	All IP creation programs & IP Transaction Market, IP Finance through IP Valuation
Mexico	Public patent attorney project, Employee inventor compensation project, Patent map, dispatching a Patent Management Specialist, Manufacturing an IP prototype, IP Transaction Market, Patent Transaction Specialist, Supporting the Valuation of an Invention
Peru	Patent application fee reduction/exemption, Prior art search, dispatching a Patent Management Specialist, Manufacturing an IP prototype, IP Transaction Market, Patent Transaction Specialist, IP Transaction Consultation Service, Supporting the
Philippines	All IP creation programs except Prior art search & All IP utilization programs except IP Transaction Market
Russia	Assisting the preferential purchase of an invention, Managing state-owned patent rights, IP Transaction Market, IP Transaction Consultation Service, Supporting the
Singapore	Patent application fee reduction/exemption, Prior art search, Patent map, Employee inventor compensation project, Assisting the preferential purchase of an invention, Managing state-owned patent rights, IP Transaction Market, Grading an invention,
Chinese Taipei	Prior art search, Patent map, IP Transaction Market, IP Transaction Consultation Service
Viet Nam	Supporting the acquisition of IP right, Patent map, Assisting the preferential purchase of an invention, IP Transaction Market, Grading an invention, Supporting the Valuation of an Invention, IP Finance through IP Valuation

(2) Service Providing Entity

- 17 service providing entities from three member economies (Hong Kong, China; Mexico; Singapore) responded to the survey.

Past Implemented Programs[38)]

- With regard to IP creation programs, most service providing entities were found to have experience in implementing programs prior art search, patent application fee reduction/exemption, and supporting the acquisition of IP right. Unlike public institutions' survey result, not many services providing entities have implemented the patent map. Also, few have experience with the employee inventor compensation project system or dispatching a patent management specialist.

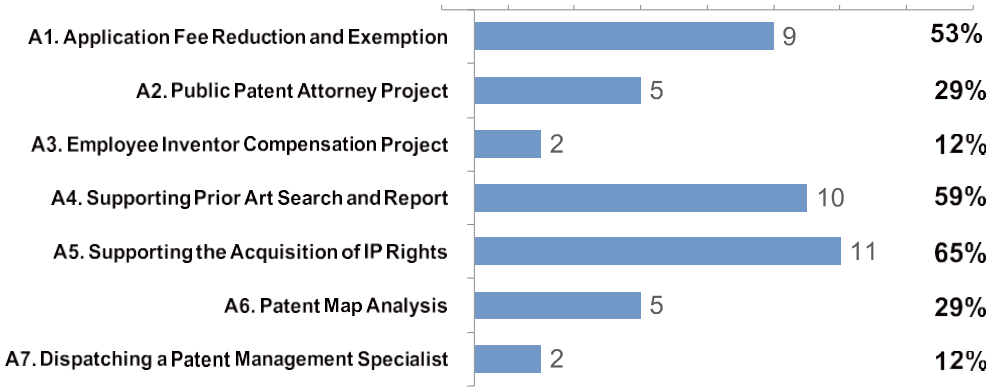


Figure 33. IP creation-related programs implemented by service providing entities in the past

- With regard to IP utilization programs, most service providing entities were found to have little experience. Some have experience in implementing IP transaction-related programs.

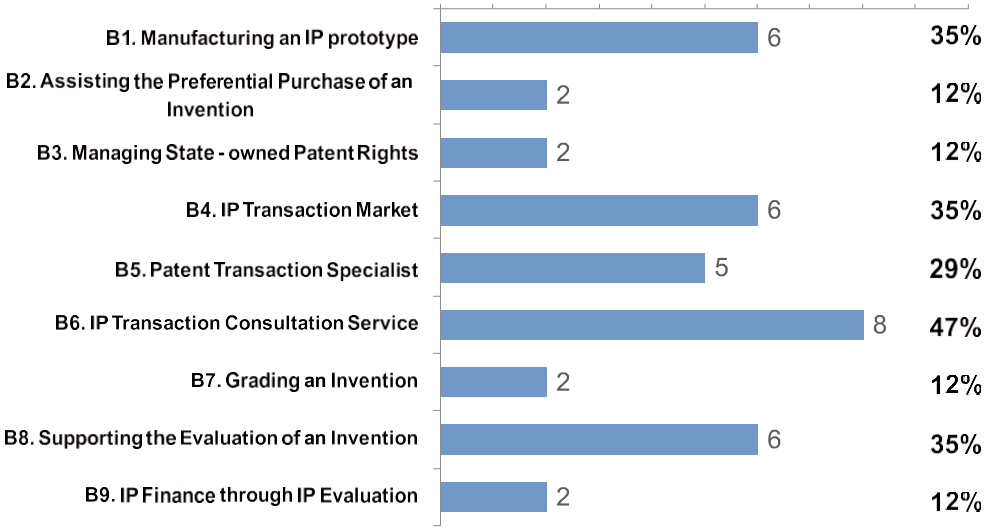


Figure 34. IP utilization-related programs implemented by service providing entities in the past

38) Programs that had been implemented by service providing entity

- Each respondent's reply to the survey on past implemented programs is summarized in the table below.

Table 5. Each repondent's reply to the survey on past implement programs

Respondent	Past Implemented Program(s)
Hong Kong, China	Patent application fee reduction/exemption, Prior art search, Supporting acquiring IP right, Patent map, Manufacturing an IP prototype, Supporting the Valuation of an Invention, Grading an invention
Mexico	Patent application fee reduction/exemption, Prior art search, Supporting the acquisition of IP right, Manufacturing an IP prototype, IP Transaction Market, IP Transaction Consultation Service
Singapore	Patent application fee reduction/exemption, Public patent attorney project, Prior art search, Patent map, Patent Transaction Specialist, IP Transaction Consultation Service, Grading an invention, Supporting the Valuation of an

Programs of Interest

- Service providing entities were most interested in projects directly linked to IP application, such as prior art search, supporting the acquisition of IP right, and IP application fee reduction/exemption.

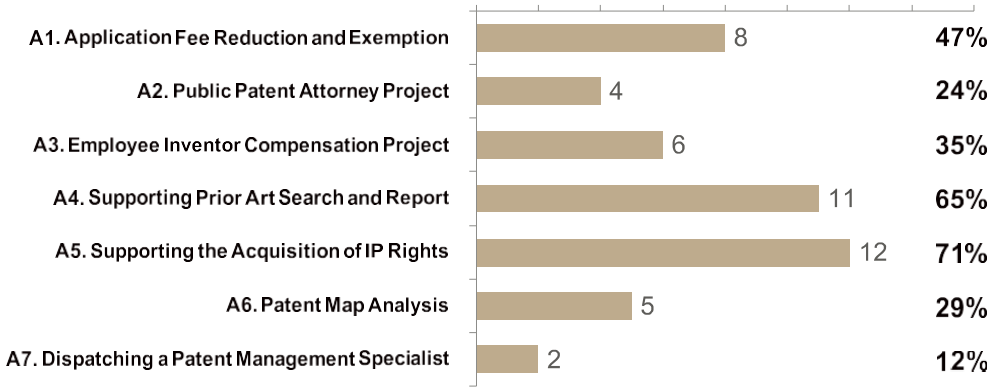


Figure 35. IP creation-related programs of interest for service providing entities

- Service providing entities were found to be most interested in manufacturing an IP prototype, followed by supporting the evaluation of inventions.

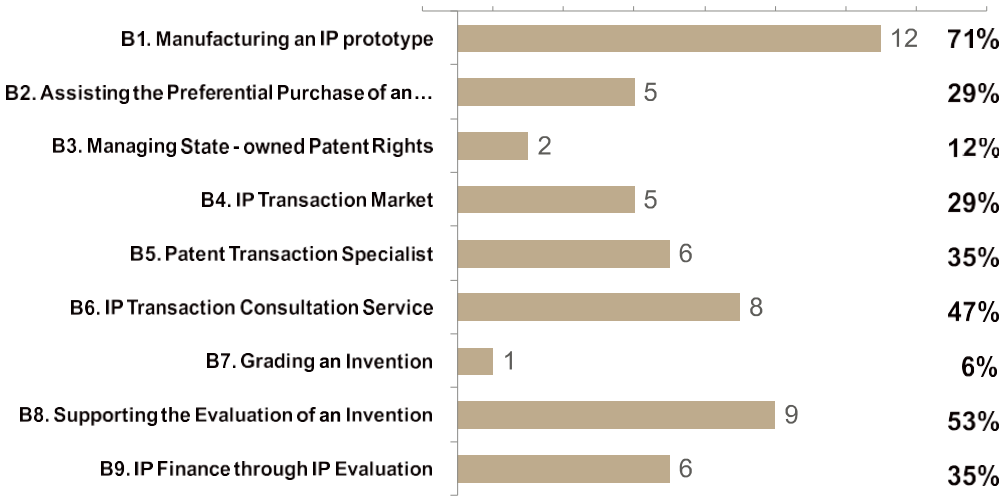


Figure 36. IP utilization-related programs of interest for service providing entities

- Each respondent's reply to the survey on programs of interest is summarized in the table below.

Table 6. Each repondent's reply to the survey on programs of interest

Respondent	Program(s) of Interest
Hong Kong, China	All IP creation programs & All IP utilization programs except Assisting the Preferential purchase of an invention, Managing state-owned patent rights
Mexico	Supporting the acquisition of IP right, Prior art search, Patent application fee reduction/exemption, Manufacturing an IP prototype, IP Transaction Consultation Service, Supporting the Valuation of an Invention
Singapore	Prior art search, Manufacturing an IP prototype, IP Transaction Consultation Service, Supporting the Valuation of an Invention, IP Finance through IP Valuation

(3) SME

Past Implemented Programs[39)]

- Of the IP creation programs, SMEs were found to have experience participating in programs for prior art search, application fee reduction and exemption, supporting acquiring IP right, and patent map, but no experience in employee inventor compensation project or dispatching a patent management specialist

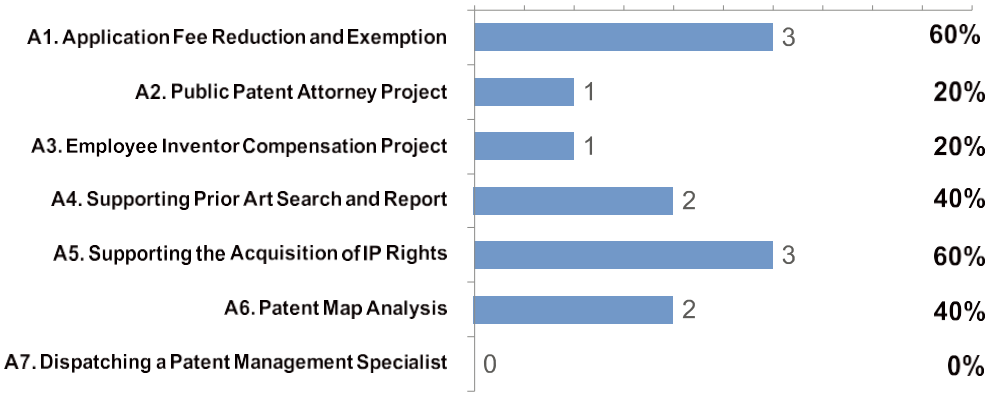


Figure 37. IP creation-related programs in which SMEs have participated in the past

- Of the IP utilization programs, all SMEs were found to have experience in manufacturing an IP prototype. Also, some enterprises had received IP transaction-related consulting. Most enterprises have little experience in IP utilization-related policies and programs.

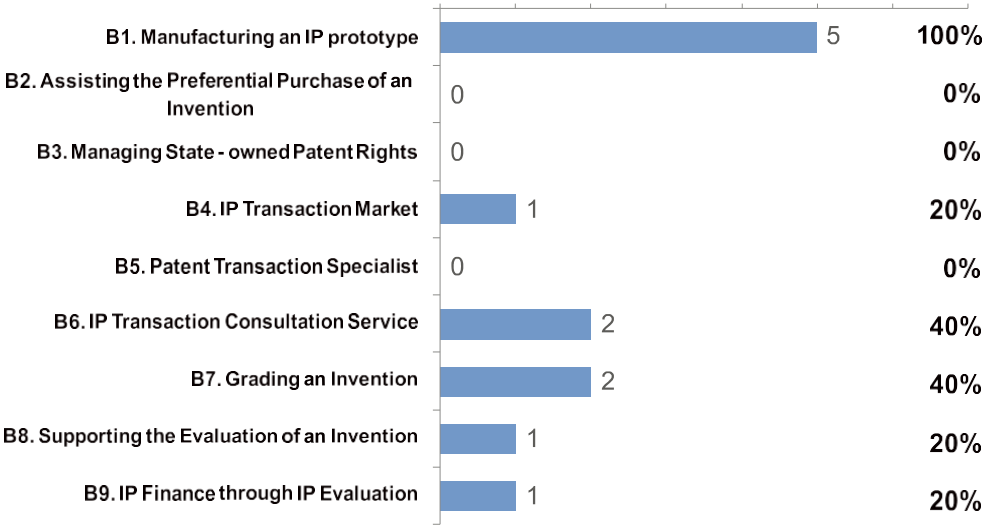


Figure 38. IP utilization-related programs in which SMEs have participated in the past

[39)] Programs in which SME has participated in the past

- Each respondent's reply to the survey on past participated programs is summarized in the table below.

Table 7. Each respondent's reply to the survey on past participated programs

Respondent	Past Participated Program(s)
Hong Kong, China	Prior art search, Supporting the acquisition of IP right, Patent map, Manufacturing an IP prototype, Supporting the Valuation of an Invention, IP Transaction Market, IP Transaction Consultation Service
Mexico	Employee inventor compensation project, Prior art search, Supporting the acquisition of IP right, Manufacturing an IP prototype, IP Transaction Consultation Service
Philippines	Patent application fee reduction/exemption, Public patent attorney project, Manufacturing an IP prototype, Grading an invention, Supporting the Valuation of an Invention, IP Finance through IP Valuation

Programs of Interest

- SMEs were found to show interest mainly in programs that offered the necessary support for areas related to acquiring IP rights such as the patent application fee reduction and Supporting acquiring IP right support programs.

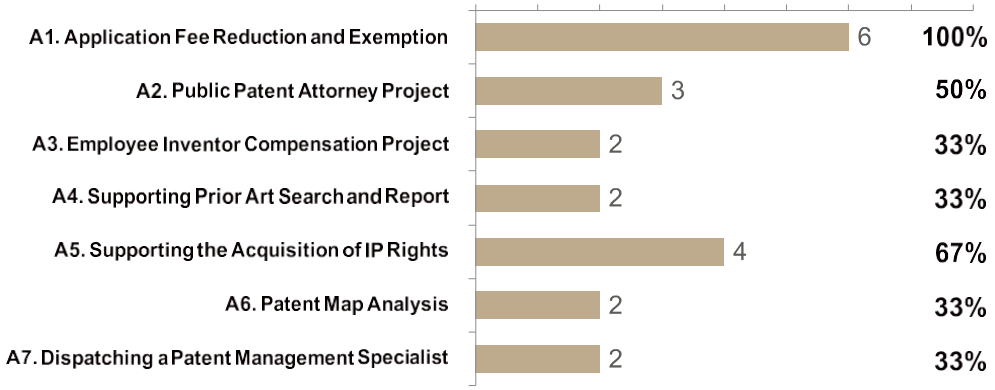


Figure 39. IP creation-related programs of interest for SMEs

- SMEs were found to show great interest in the manufacturing an IP prototype, but also in IP finance through transaction and evaluation.

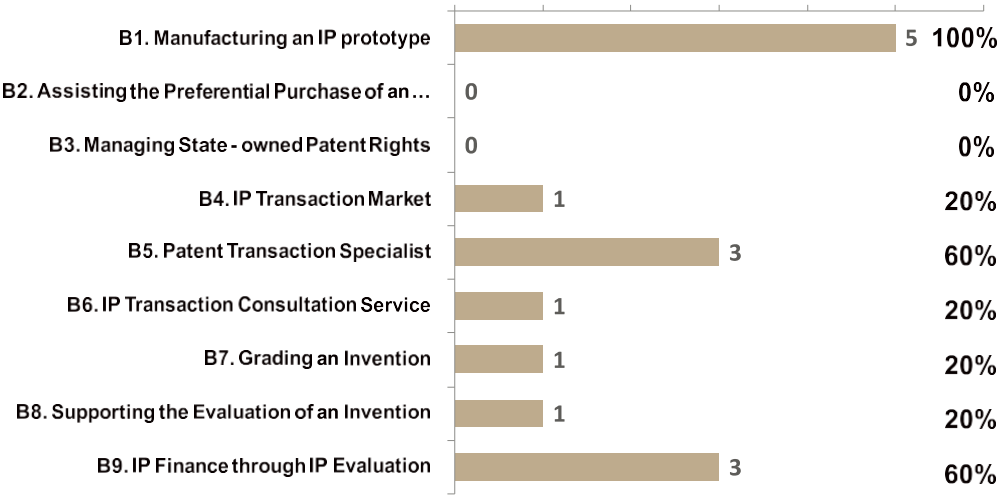


Figure 40. IP utilization-related programs of interest for SMEs

- Each respondent's reply to the survey on programs of interest is summarized in the table below.

Table 8. Each respondent's reply to the survey on programs of interest

Respondent	Program(s) of Interest
Hong Kong, China	All IP creation programs & IP prototype manufacturing, Transaction market specializing in patent, IP transaction consulting, IP finance through evaluation
Mexico	Patent application fee reduction/exemption, Employee inventor compensation project, Prior art search, Supporting acquiring IP right, Manufacturing an IP prototype, IP Transaction Consultation Service, Patent Transaction Specialist, IP Finance through IP Valuation
Philippines	Patent application fee reduction/exemption, Public patent attorney project, Manufacturing an IP prototype, Grading an invention, Supporting the Valuation of an Invention, IP Finance through IP Valuation

(4) Result of Online Demand Survey

- The online demand survey result showed that the main IP creation and utilization programs of interest are as in the table below.

Table 9. The online demand survey result

	Public Institution	Service Providing Entity	SME
IP Creation	Prior art search	Prior art search	Prior art search
	Patent map	Supporting the acquisition of IP right	Supporting the acquisition of IP right
	Supporting the acquisition of IP right	Patent application fee reduction/exemption	Public patent attorney project
	Dispatching a patent management specialist		
IP Utilization	IP transaction market	Manufacturing an IP prototype	Manufacturing an IP prototype
	Supporting the Valuation of an Invention	Supporting the Valuation of an Invention	Patent Transaction Specialist
	IP transaction consultation service	IP transaction consultation service	IP finance through evaluation
	IP finance through evaluation		

5.2.2. Offline Demand Survey

1) Overview of Offline Demand Survey

- Offline demand survey was conducted in 4 APEC member economies (Mexico; Philippines; Singapore; Viet Nam) through consultation with respective persons in charge to research the materials necessary for the creation of this guidebook and to collect opinion on its review.

- The first round of offline demand survey was conducted in the Philippines; Singapore; and Viet Nam in July 2016, followed by Mexico in August 2016. Persons in charge of public institutions, service providing entities, and SMEs were interviewed.

2) Selection of Subjects for Offline Demand Survey

- Singapore, which ranks high in GDP, the number of patent applications compared to the number of SMEs, and International Intellectual Property Index, was selected along with Mexico; the Philippines; and Viet Nam, which do not rank high in those indicators but show great interest in this guidebook as offline demand survey subjects.

3) Scope

- Persons in charge of public institutions, service providing entities, and SMEs in APEC member economies were surveyed on the progress of IP creation and utilization support policies (programs) and the difficulties involved.

- Persons in charge of public institutions, service providing entities, and SMEs in APEC member economies were surveyed on the demand for and progress of the abovementioned policies and the difficulties to be expected should a new policy be introduced.

- Persons in charge of public institutions, service providing entities, and SMEs in APEC member economies (prospective users) were asked their opinions after reviewing the draft plan of this guidebook.

4) IP Program-related Environment of Surveyed Members and Opinion

(1) Progress of IP Creation/Utilization Support Policies (Programs)

- All three members have a small number of IPR applications with a high rate of applications by foreigners. For quantitative expansion of applications by residents, the policy focus has been on raising awareness of IP and providing support for relevant training and education.

- In Singapore, a government-level master plan has been set up to establish the IP-Hub of Asia in Singapore, for which various policies and support programs are underway to build the foundations for IP creation. With regard to IP utilization, in particular, advanced policies such as IP evaluation and finance have been in place since 2014.

- Both the Philippines and Viet Nam recognize the importance of IP utilization but have difficulty in actively engaging in support programs due to financial constraint, but are instead focusing their resources on building IP infrastructure for the expansion of IPR creation.

(2) Difficulties in IP Creation/Utilization Support Policies (Programs)

- Since multiple government ministries are executing IP-related programs, the patent office's work territory is not very significant, on top of which securing the budget for policy implementation is deemed to be difficult.

- In all three members, the patent office is more or less the main entity in charge of IP policy planning, but the implementation and operation of policies (or programs) is done in cooperation with the Ministry of Industry, Ministry of Science and Technology, and the Ministry of Justice depending on the relevant area (SME, local R&D support, etc.).

(3) Demand for New Policies and Programs in the Visited Member Economies

- The policymakers in the visited member economies were most interested in the programs in the table below.

Table 10. Demand for New Policies and Programs in the Visited Member Economies

Category	Support Program	Interest			
		Mexico	Philippines	Singapore	Viet Nam
IP Creation	Dispatching IP specialist	●	●	-	●
	Patent map	●	-	●	●
IP Utilization	Patent evaluation	●	●	●	●
	IP prototype manufacturing	●	●	-	-

- While SMEs in the visited member economies found support for IP creation to be important, there were many requests for policy-level support for IP utilization, like funding IP prototype manufacturing costs, supporting product marketing (i.e. patented product certification), and investment through patent evaluation.

(4) Comments from Visited Member Economies on the Draft Plan of Guidebook

- Persons in charge in the visited member economies were all highly interested in the guidebook's production and commented that the policy/program Tree Map[40] per stage, tables, and diagrams included in the guidebook plan provided before the visit were helpful in understanding the policy direction, participation process, and other contents.

[40] Map at the end of the Introduction of this guidebook, showing the featured programs by the nature of policy and the level of program

- Viet Nam raised the point that the guidebook needs to be translated into Vietnamese for circulation for local SMEs to reference it.

- Since most member economies lack IP competitiveness, they requested for the guidebook to be kept detailed and easy to understand, with a focus on Phase I programs[41] in the Policy/Program Tree Map, in which the rising economies show great interest as they can implement them relatively easily.

(5) Result of Offline Demand Survey

- While it is important to introduce IP creation policies and programs, it was identified that there is much higher demand for IP utilization policies and programs that can be of direct support to SMEs.

- It was confirmed that the guidebook's purpose, how-to-use guide, glossary, and FAQ should be added and the contents should be written in narrative form rather than in point form, for easier understanding.

- It was confirmed that words that have multiple meanings should be avoided and sentences kept short and detailed, since many of the APEC members are non-English speaking, thus the possibility of translation into local languages.

- There would be high demand for Phase 1-2[42] Programs since many members that are lacking in IP infrastructure establishment can implement them.

- It was confirmed that a self-check tool should be included in this guidebook so that the reader can autonomously check the IP base of his/her economy and implement relevant program(s) in line with its IP infrastructure.

- For members lacking IP infrastructure to be able to prepare and implement Phase 2-3 programs in the Tree Map, preconditions (i.e. establishing a patent DB for patent map production support) should be added so that preparation can take place for 3-5 years beforehand.

- Since Phase 3 programs in the Tree Map are difficult to implement by only referencing this guidebook, the guidebook will only go as far as introducing those programs.

- Lastly, it was found that this guidebook needs to be re-translated into the languages of non-English speaking member economies, regarding which APEC's support is required.

41) The most basic and mandatory programs to be implemented, in each group (i.e. private sector IP creation) of final featured programs

42) The most basic and fundamental programs in each group final featured programs

5.3.
Result of Featured Program Selection

- As result of the online and offline demand surveys, the policies and programs to be introduced in this guidebook were selected as in the chart below. The below chart is a Tree Map depicting the relationship between the basic programs at the starting point of policies and the derivative programs that are developed from the basic programs. The programs that make up IP creation and utilization policies were categorized from Phase 1 to 3 depending on the difficulty level of program implementation.

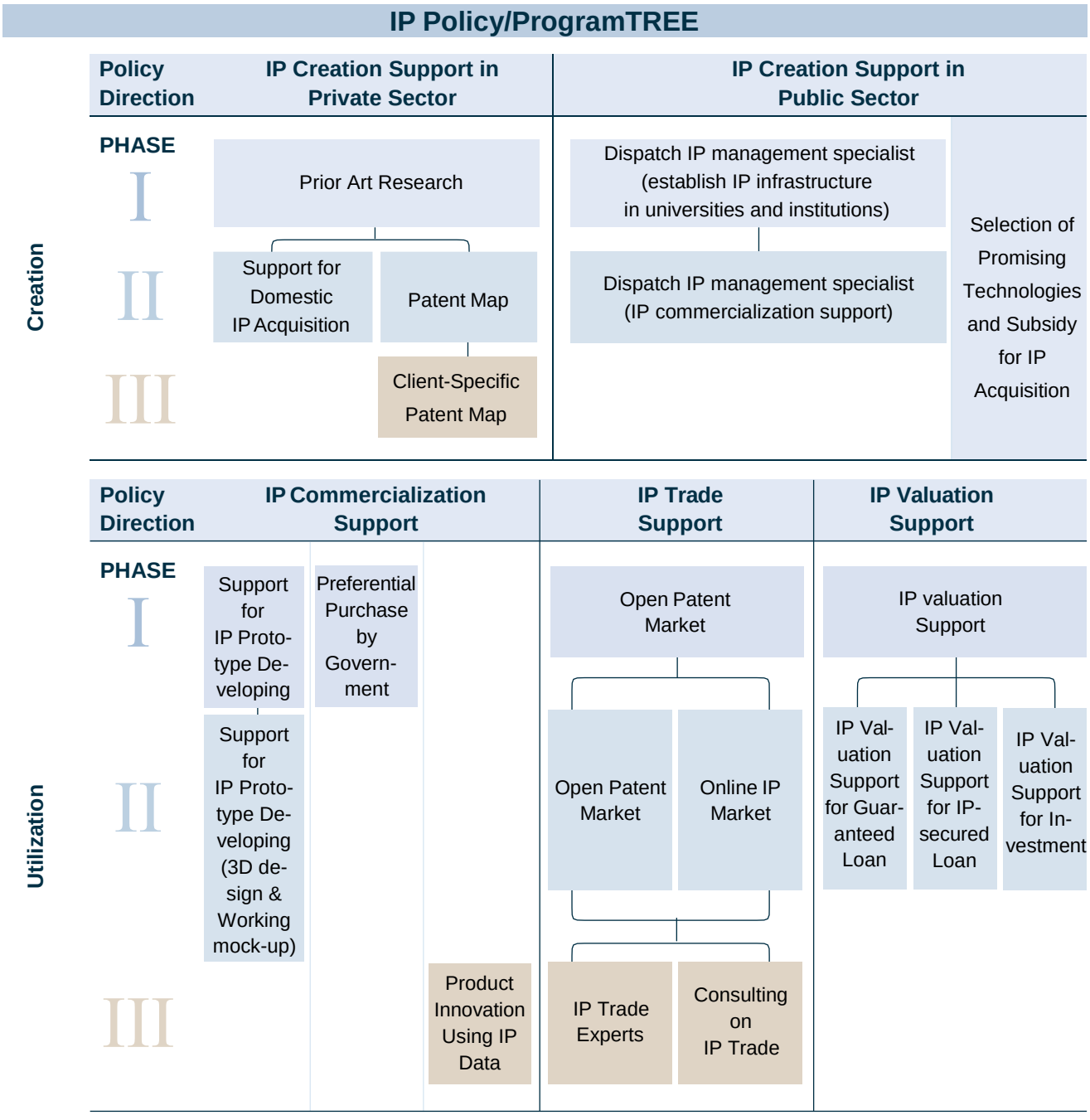


Figure 41. IP Policy/Program TREE

- Considering that many APEC members show high demand and need for IP utilization, more policies and programs were selected for IP utilization than for IP creation. Also, programs range from Phase 1 to 3 so that APEC members can use this guidebook effectively in the given conditions in their respective economies, depending on the level of IP infrastructure.

- Once an APEC member's IP infrastructure is established from implementing Phase 1 programs, it is to be followed by derivative programs in Phase 2 and 3.

Guidebook for SMEs' IP-Business Cycle

II. IP Creation Policy and Program

1.
Support for IP Creation in the Private Sector

1.1.
Overview of Support Policy and Program Group

- Intellectual Property (IP) refers to the creations of the intellect such as information and technology, expression of human thoughts and emotions, business or product marks, biological species, genetic materials, or other intangible assets.

- With the advent of the knowledge-based society, intellectual property is gaining more significance than ever. While the 20th century centered mostly on manufacturing and process industries, the 21st century brought about a rise in the bio and IT industries.

- The global economy is also shifting towards one that is heavily based on knowledge-based industries, which are becoming a major source of added value in today's world. The service industry is now contributing more to GDP than manufacturing in the advanced economies. This illustrates how IP creation is becoming an essential factor in enhancing the competitiveness of not only individual businesses, but economies as well.

- IP creation, therefore, helps acquire exclusive rights to core technologies owned by an entity, thereby supporting business stability, and ultimately serves as an indispensable step to utilizing intellectual property for the development of the industry.

- As global players expand their areas of business at home and abroad, they are not only steadily amassing a variety of IP on core products and technologies, but also conducting prior art searches and patent analyses with the purpose of creating numerous high-quality IP assets. Small and medium-sized businesses, in contrast, are less aware of the importance of IP and are faced with financial challenges, which hinder the active pursuit of IP creation activities. Governments in some economies are attempting to address this problem and encourage IP creation of SMEs by implementing IP creation programs. The Pro Bono program of the US, the Patent Information Analysis Utilization Support program of Japan, the Patent Fee Reduction System of China, and the Patent Map Support program of Korea are some examples. Despite slight differences, these programs share a common purpose of encouraging IP creation activities of SMEs.

- It has now become essential to support IP creation of SMEs with weaker technological and financial capabilities on the government level.

1.1.1. Implementation Stages of Program

[Introductory Phase] Establishment of Patent Information Search Infrastructure

- Patent search is a necessary, if not mandatory, step to creating IP. Some of the major forms of a patent search are as follows: the prior art search that assesses the patentability[43] of an invention, the basic patent search that researches similar patents within the specific technological field of the invention, and the invalidation search that aims to nullify the patent rights the invention may infringe on. Usually, enterprises conduct prior art search before initiating R&D projects or filing patent applications in order to shape the direction of R&D and examine the possibilities of obtaining patent protection.

- Some kinds of patent searches with simpler goals, like the prior art search, for example, can be completed within one to two days. There are, however, other kinds of patent searches such as the basic patent search and the invalidation search that can take up to several days and weeks. This is why implementation of patent search related programs requires patent search databases that can yield satisfactory results for clients as well as highly experienced experts.

- One can learn how to use a patent search database by consulting the database or reading the manual. It is to be noted, however, that the information provided in the databases are not alike and there can be differences. Another thing to take into account is that the quality of patent search will differ considerably depending on the level of experience and expertise of the researcher, and client satisfaction can also vary accordingly.

- Thus, the most basic yet fundamental infrastructure for implementing the patent search is first, the establishment of a patent search database and second, nurturing of patent search experts.

- Databases for patent search, especially, need to be established at the government level. While there are some global patent search databases, language barriers often hinder access to those databases in economies that do not speak English. Consequently, providing databases that support the mother tongue makes it easier for users to fully utilize the database. Governments around the world are already providing patent search databases for free. USPTO[44] of the US, IPDL[45] of Japan, KIPRIS[46] of Korea are websites where users can access patent search databases free ofcharge.

[43] Assesses whether there are new features (novelty) or improvements (non-obviousness) on the invention
[44] https://www.uspto.gov/
[45] https://www.j-platpat.inpit.go.jp/web/all/top/BTmTopPage
[46] http://www.kipris.or.kr/khome/main.jsp

- It is recommended that education programs on patent search are operated both offline and online. Another method of nurturing patent search experts is by organizing a patent information search taskforce at the public institution. By assigning prior art search tasks to the team for patentability assessment by the Korean Intellectual Property Office, the team can gradually develop into a group of experienced patent search experts.

- For the successful implementation of patent search related programs, it is recommended that the programs concentrate on building the necessary infrastructure in its early stages, and set raising awareness of the importance of the patent search as the program's main goal.

[Expansionary Phase] Patent Analysis Based on Patent Search

- Patent search, in general, takes place within a limited technology field as its purpose in identifying pending inventions or similar prior art. Unlike patent search, patent analysis, for example, for patent mapping, is conducted over a broad area since the purpose of a patent analysis is to understand and analyze general patent trends in a certain technology field (i.e., semiconductors, IoT, etc.). This is precisely why patent analysis is sometimes conducted on hundreds to thousands of different patents to analyze recent patent trends.

- Implementing a patent search program in the introductory phase can lay the foundation for patent utilization policies by cultivating patent search experts.

- Patent analysis needs to be conducted on a broader field in order to utilize the patent search in a more sophisticated way. In addition, different patent analysis methodologies should be applied according to the field and purpose of utilization, and the analysis results need to be interpreted in order for their implications to help SMEs exploit the results.

- Therefore, two major parts of infrastructure for patent analysis are first, development of patent analysis methodologies, and second, cultivation of patent analysis experts.

- Patent methodologies are largely divided into quantitative and qualitative analyses. There are a variety of quantitative analysis methods, including analysis of overall patent trends, patent trends by economy, major assignee, and technology. In a quantitative analysis, vast amounts of patents are first researched and then are sorted in an Excel file to process the data and identify the results and the implications. Quantitative analysis is the basic method for analyzing patents.

- On the other hand, qualitative analysis focuses on patents in a narrower technology field that bear high resemblance to the invention being analyzed. Technology development chart analysis and analysis of major competitors are the methods used in a qualitative analysis.

- Each economy needs to develop a unique methodology for patent analysis tailored to its circumstances by benchmarking diverse methodologies employed in other economies.

- It is advisable to run patent search education programs for nurturing patent analysis experts on or offline. One strong advantage offline training can offer is that trainees can learn know-hows and skills from the instructor. Another way of sharing the experience and knowledge of patent analysis and strengthening capabilities of the experts is by opening contests or other forms of gatherings where the know-how of patent analysis experts can be shared.

- In member economies like Japan and Korea where patent analysis programs have been in use for a long time, the programs offer consulting services on building IP management[47] strategies and also provide support in establishing focused R&D investment strategies, patent filing strategies, IP diagnosis, and IP management. SMEs can obtain IP rights more systematically and strategically by having their IP rights diagnosed and gathering information on how to establish R&D directions from the IP perspective.

- There is also a program that grants financial support to financially vulnerable SMEs in order to encourage patent applications. Subsidy Grant for Patent Application can distinguish excellent technologies and cover the expenses arising from filing patents, thereby giving assistance to SMEs that own promising technologies and encouraging their IP creation activities.

47) Refers to all kinds of strategic activities pursued with the purpose of obtaining exclusive rights to R&D outcomes, thereby turning them into assets that can be utilized and promoted in order to create economic added value.

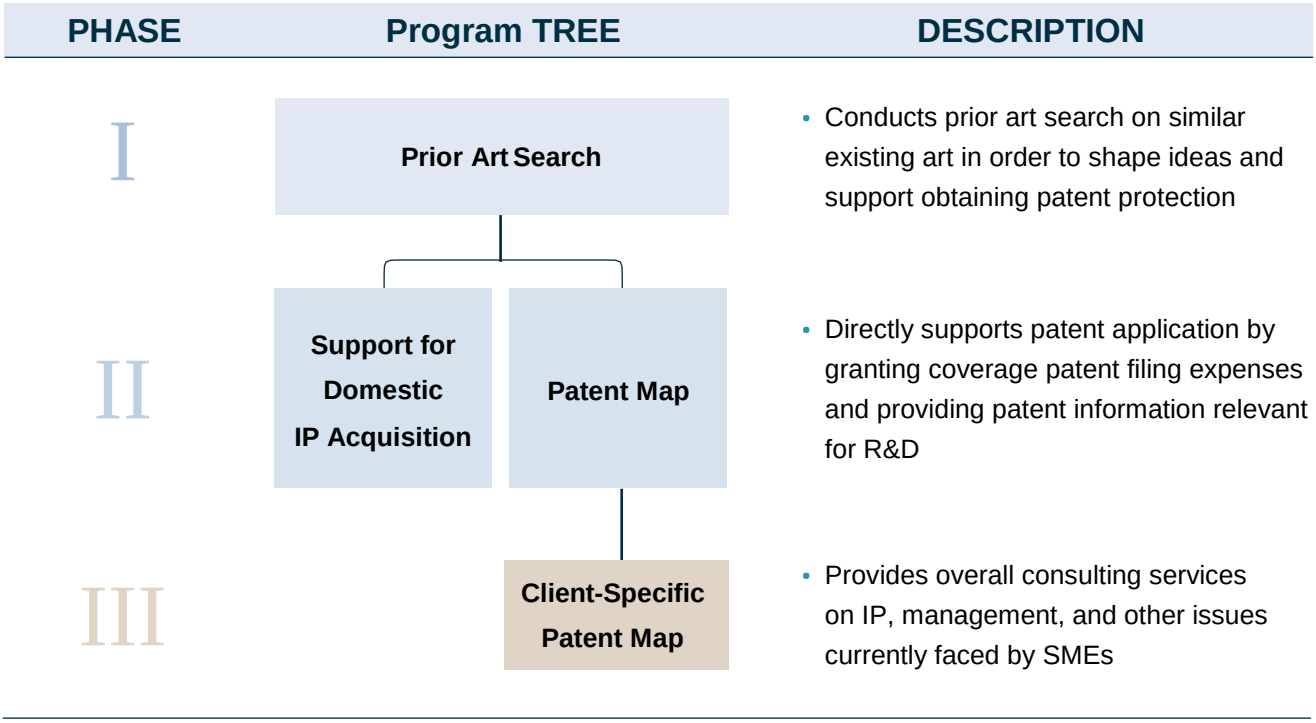


Figure 42. Program TREE (Support for IP Creation in the Private Sector)

1.1.2. Self-Diagnosis for Program Implementation

- The IP Creation Support Group in the Private Sector is a mandatory IP creation program and is recommended to be implemented when the infrastructure for a patent search is in place.

- By running the phase matching flow chart below and by asking questions at each stage, an institution can find out whether the current circumstances are ripe enough to implement the Program Group for IP Creation in the Private Sector, and what complementary measures need to be taken.

- For example, if the answer to the question at stage S1 is ‘NO’, training programs to raise awareness for patent application along with promotion need to take place first. If the answer to the question at stage S2 or S3 is ‘NO’, the institution needs to establish a patent search DB and cultivate patent search experts first. If the answer is ‘YES’, ‘PHASE I’ can be implemented. If the answer to the question at stage S4 or S5 is ‘NO’, a budget for supporting the patent application expenses needs to be secured; at the same time, patent analysis methodologies and cultivation of patent experts need to be put in place. Likewise, if the answer is ‘YES’ at stages S4 and S5, ‘PHASE II’ can start. When an institution can answer all of the questions from S1 to S6 with a ‘YES’, then it has the sufficient infrastructure to start implementing ‘PHASE III’.

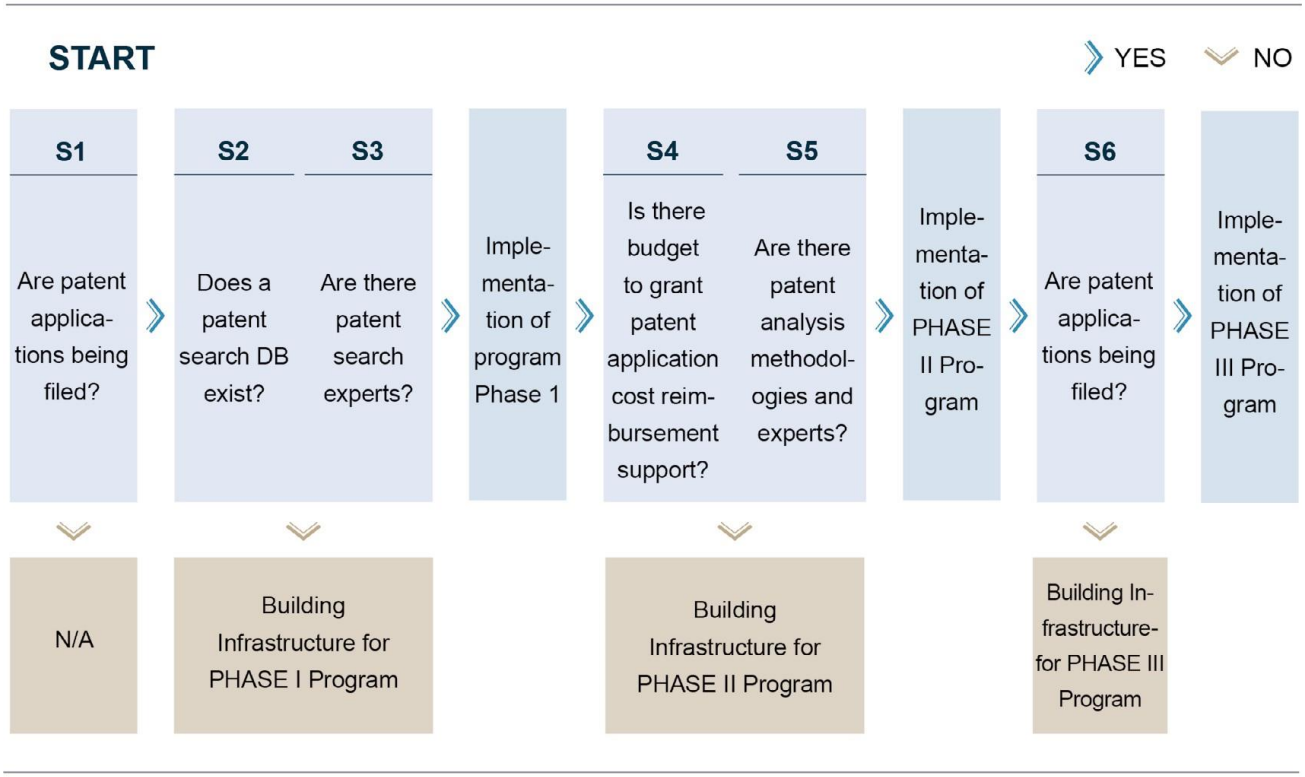


Figure 43. Phase Matching Flow Chart (Support for IP Creation in the Private Sector)

1.2. Prior Art Search

1.2.1. Program Overview

Prior Art Search supports SMEs in shaping, complementing, and ultimately obtaining patent protection for their invention by providing a timely analysis of existing art that might be barriers to patent application but in some cases also useful references for the SME's R&D activities.

- The goal of the Prior Art Search Program is to reduce unnecessary social expenditure by preventing duplicated R&D efforts and investment in already existing technologies. The program can greatly benefit SMEs as it can further shape its R&D path by determining whether a certain R&D project is worth pursuing and whether a particular invention is patentable before starting it or filing a patent application.

- In the US, a prior art search is mandatory when planning R&D under the SBIR program. Results of prior art searches on patent and non-patent literature are required as attachments to a research proposal in order to prove novelty.[48)]

[48)] NIST (2004), "ATP proposal Preparation Kit", p. 23 – touches upon patent and reference citations as in the following abstract: "Discuss why the proposed solution has not previously been attempted or accomplished. Show how the proposed solution is particularly innovative relative to alternative approaches being pursued by foreign and domestic competitors or elsewhere within the proposing team's organization(s). Cite relevant patents and the open literature to support this discussion. Ignoring state-of-the-art knowledge and ongoing work by others and within the proposing team's organization(s) may lead reviewers to assume that the proposer is not aware of existing work. Identifying existing efforts helps to ensure that the proposed work does not duplicate these efforts. Discuss the expected state of the proposed technology at the end of the ATP project relative to competitors' expected capabilities at that time, if the project is successful."

[49)] EC (2000), "SME Specific Measures Exploratory Awards (Step 1)", p. 2 - SME Specific Measures touches upon the topic of prior art search in: "Novelty verification – Including a mandatory world-wide patent search", "The Commission has developed an effective tool for undertaking world-wide patent and technical database searches to determine the novelty and state-of-the-art of a project proposal (Quick Scan). It is strongly recommended that participants perform a novelty and state-of-the-art search within their Exploratory Award, preferably by the European or National Patent Offices or any other professional search organization. The costs of a Quick Scan search may vary from 500 to 1000 euro. More information on Quick Scan, which can also be helpful to find RTD partners and determine the competitive position of the proposal, is available at the SME website (http://ec.europa.eu/research/sme-techweb)."

- In Europe, SME Specific Measures stipulate that final research proposals should include results from worldwide patent literature and technical database searches as proof of novelty. SMEs are recommended to contact the European Patent Office or other patent offices in each member economy or professional search organizations for patent search.[49)]

- Since the 37th meeting of the Council for Science, Technology and Innovation conference (‘04. 5), Japan has put in efforts to raise the awareness for the importance of performing patent search ahead of R&D in order to prevent duplication of research and patent infringements. Patent Information Analysis and Utilization Support Program provides patent information analysis and prior art search services to SMEs at different stages of obtaining patent - R&D, patent application, and request for examination.[50)]

- Prior Art Search Program mainly aims to provide SMEs with prior art search services needed before undertaking R&D or applying for patent protection.

- The program is operated in the following order: first, interested SMEs submit applications to the public institution[51)] in charge of the program to receive support. The application should include technical details of the invention which are necessary for the search. After SMEs have applied, the public institution solicits service providers that can implement prior art search. The public institution delivers the technical details of the inventions to the selected service providers and supervises the execution of prior art search and final delivery of search results. Once the reports by service providers are submitted to the public institution, the public institution delivers the completed reports to the SMEs.

- There are two types of prior art search support: a patentability search and a technical information search. A patentability search is used to gauge patentability before patent application by searching for existing art related to the invention. Technical information search, on the other hand, aims to provide information on prior art that can serve as references when SMEs are developing new technologies and products.

- The public institution is in charge of managing and supervising the program, whose duties include selecting SMEs and service providers, assigning and managing a budget, planning the program, establishing support directions, receiving and processing SME applications, setting report deadlines and evaluating validity and relevance of the final reports.

- An application should include a company’s information. Technical data that explains the invention should also be submitted in the form of either a document or patent specification along with the application. Upon receiving these documents from SMEs through the public institution, service providers should contact SMEs via interview, telephone or email to make sure they have understood the invention thoroughly. After communicating with SMEs, service providers start undertaking prior art search and writing reports.

50) Japan Institute of Invention and Innovation (2016), “特許情報を経営に活用しませんか?”, p. 1~3
51) Government or public institution that operates and manages the program

- It is the responsibility of the public institution to assess the validity of search reports. Once assessed as valid, the reports are delivered to the enterprises. If assessed as inadequate, the reports are returned to search organizations for a renewed search to ensure the high quality of the report.

- A Prior Art Search Program can work hand in hand with a support program for patent application costs to maximize effectiveness. The program, for example, can selectively support SMEs participating in the Prior Art Search Program whose inventions were assessed as patentable[52] through prior art search results.

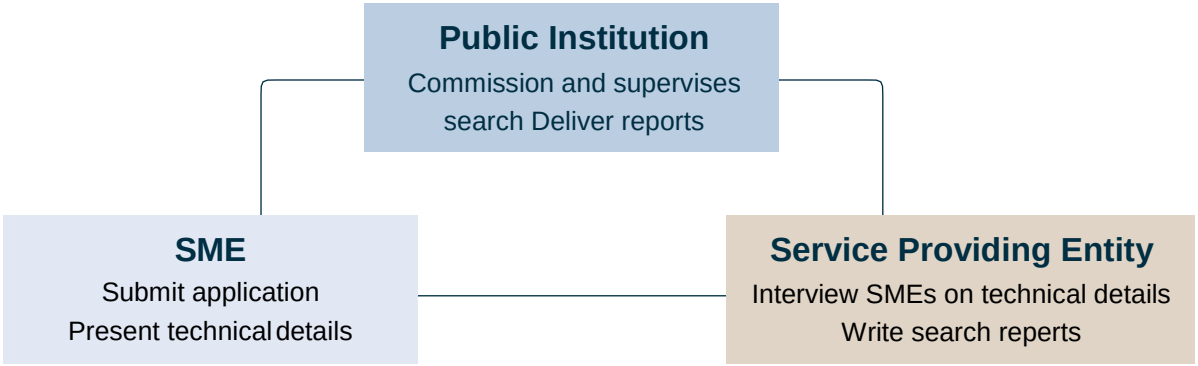


Figure 44. Program Framework (Prior Art Search)

1.2.2. Similar Programs of APEC Members

1) Prior Art Search Program (Korea)

- Korea Invention Promotion Association (KIPA)[53] is operating a Prior Art Search Program as a sub-program under the 'Regional Intellectual Property Creation Support Program'.

- The objective of KIPA's Prior Art Search Program is to provide SMEs with information relevant to their R&D projects and help them obtain patent rights.

- The Regional Intellectual Property Center, an affiliate organization of KIPA, delivers technical details of the invention submitted by enterprises and individuals to the service providers. The service provider, upon receiving the details, conducts search and analysis on identical or similar existing art. Based on the results, they produce analysis reports that help SMEs shape ideas, develop new technologies and products, or evaluate the patentability of the invention.

[52] Refers to a certain quality that enables an invention to gain status as a patent
[53] An organization in Korea that operates and manages IP-related programs

- Eligible for support under this program are entities, both SMEs and individuals, who are from regions and industry fields where less than three works were registered as intellectual property over the last three years. Full grants are given up to three inventions per entity, provided each invention has not yet been filed for patent application.

2) Prior Art Search Program (Japan)

- Japan Institute for Promoting Invention and Innovation (JIII)[54] operates the 'Patent Information Analysis and Utilization Support Program' constituted of three steps – R&D, patent application and request for examination. The Prior Art Search Program provides search service to companies that have completed the first two stages and stand at the request for examination stage.

- The goal of the Prior Art Search Program of JIII is to prevent examination requests for inventions that are highly unlikely to be patented.

- Applicants can choose patent information firms from the list JIII provides, and ten claims they wish to have searched and analyzed. Upon request, the firms conduct search and analysis of identical or similar prior art and produce search reports. The fee per search is 75,600 JPY, from which the applicant covers 10,800 JPY and the Japanese Patent Office covers the rest (64,800 JPY).

- Applicants can only request grants for inventions that have already been filed for patent application but not yet for examination (which is within three years from the filing date) and need to pay for roughly 15% of the cost.

[54] http://www.jiii.or.jp/

1.2.3. Procedures and Details of the Program

1) Target of Support

- SMEs that need to have prior art searched before pursuing R&D or patent application

2) Program Process

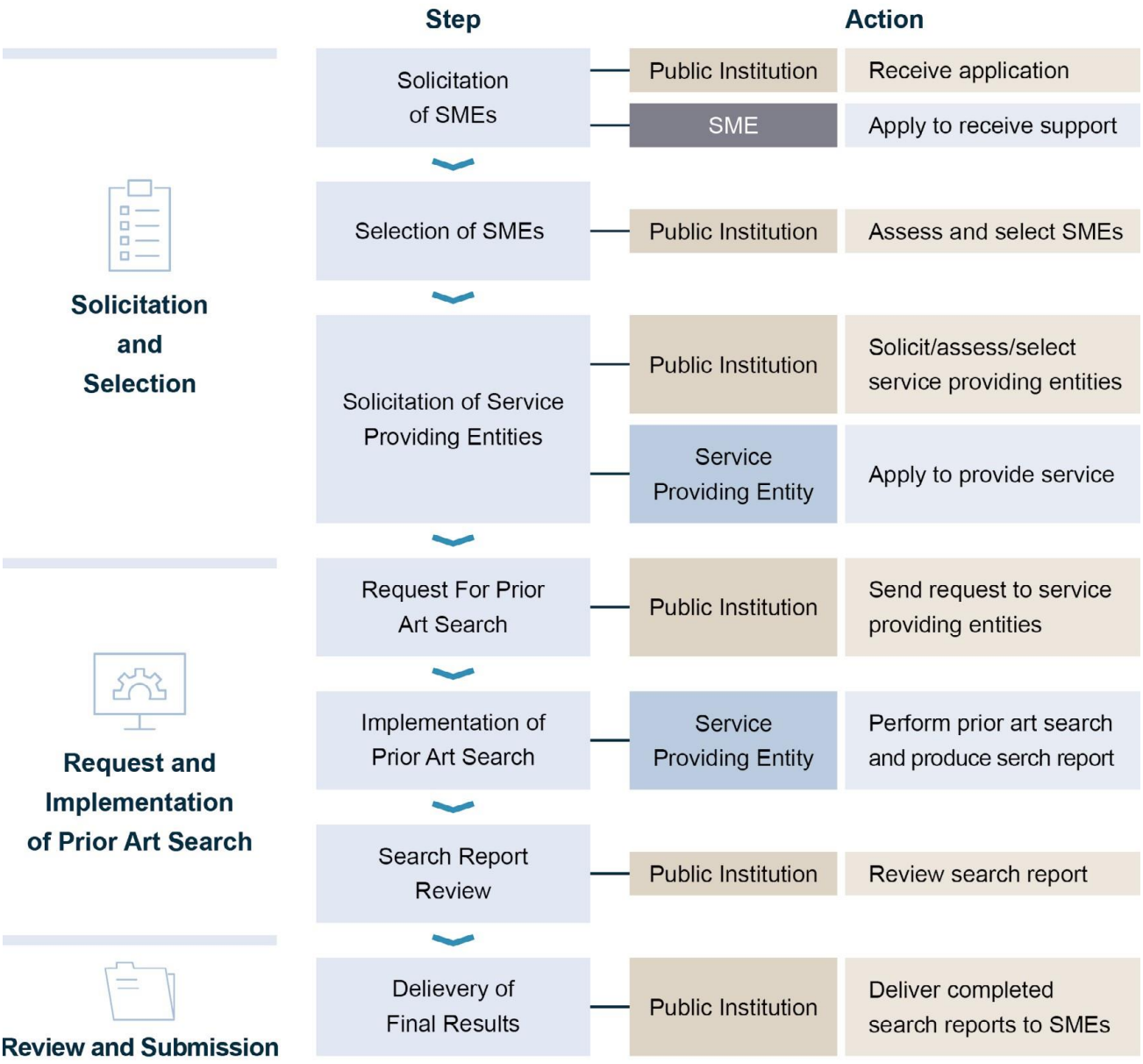


Figure 45. Program Process (Prior Art Search)

- The process of the prior art search program consists of the following steps: participant solicitation and selection stage, search request and implementation stage, and report review and submission stage.

- At the participation solicitation and selection stage, the public institution publishes an announcement to recruit SMEs. After receiving applications, the public institution selects SMEs that will receive support through evaluation of submitted applications. The public institution also solicits and selects search providers that will carry out search tasks.

- In exceptional cases where prior art search is urgently needed, soliciting service providers before SMEs and requesting search upon selection of SMEs is also acceptable.

- Once the solicitation and selection process is over, the public institution sends prior art search requests to the selected service providers. The service providers perform prior art search and produce search reports.

- The finished reports are reviewed by the public institution. If the public institution decides during the review period that modifications should be made, the service provider makes necessary corrections and completes a final report. Final reports are submitted to the SMEs either as booklets or electronic documents.

3) Scope and Conditions of Support

- To ensure SMEs are given equal opportunities to receive support, each SME can only receive support for a maximum of three inventions per year. Two types of searches are available – one to help shape ideas and develop new technologies and products, and the other to assess patentability before application. One type is chosen for each request based on the applications by SMEs.

1.2.4. Guide Map for Participating Entities

Table 11. Guide Map for Participating Entities (Prior Art Search)

Entity	Pre paration	Program Process (Phase)							Follow-up Manage ment
		1	2	3	4	5	6	7	
Public Institution	Design pro-gram	Solicit SME		Select service providers	Request prior art search			Grant reimburse ment	
Service Providing Entity			Submit proposal		Interview the inventor and understand technical details	Conduct prior art search Write report	Report results	Request reimburse ment of expen diture	
SME			Submit appli cation		Provide additional explanation on technical details			Start patent appli cation process	

- Guide Map for Participating Entities is a chart that allows for a general overview of the entire process of the program from the designing stage to follow-up management. It is a general guide map that informs entities of what they should do from the very start to the end of the program.

- The guide map provides a summary of tasks for each entity at different stages for the public institution, service providers, and SMEs. The different tasks are described stage-wise in further detail in the immediately following *1.2.4 Detailed Guidelines for Participating Entities.*

1.2.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Establish a program operation plan including schedule, sum of grant and the total number of inventions to support (for example, 30 SMEs, 10 patent applications)
2. Organize a service provider selection committee in order to select capable organizations
3. Promote the program and encourage application from SMEs in each region
4. Manage and supervise the schedule of service providers to make sure results are produced within a set period of time

(1) Program Announcement and Solicitation of Applications

- **[Program Announcement]** The public institution publishes announcements about the prior art search support program in each region and receives applications from SMEs.

- **[Solicitation of Applications]** The public institution receives enterprise information and details about the enterprise's invention in an application. Enterprise information includes the name of the enterprise, representative, location, classification by industry, and the person in charge. Details about the invention include existing technologies and problems they present, purpose and technical details of the invention, expected effects, and assembly drawings.

Example

Table 12. Application Form

Prior Art Search Program Implementation (Utilization) Plan			
Name of the Enterprise		**Business License Number**	
Type	□ Patent □ Utility Model		
Title of the Invention			
Objective			
Utilization Plan			
Technical Details			
Assembly Drawing and Sample			

- **[Guidelines on Writing]** The public institution should include a brief explanation in each field on how to fill out the form correctly for SMEs.
  - Objective: Reasons for applying for this program (e.g. current status of the company, plans to launch new products, R&D plans)
  - Objective: Reasons for applying for this program (e.g. current status of the company, plans to launch new products, R&D plans)
  - Utilization Plan: Plans on how the SME intends to utilize the prior art search results (e.g. furthering R&D in the future)
  - Technical Details: Detailed explanation of invention (e.g. description of the invention, unique features that existing art do not have, technical mechanism, constituent parts, new expected effects)
  - Assembly drawing and sample: Assembly drawings, design concepts or photographs of product samples(e.g. flowchart of the invention, examples, photographs of the product, system diagrams, chemical formulae) If no assembly drawing or sample is available, a brief explanation should be added instead.

(2) Selection of Service Providing Entities and SMEs

- **[Selection of Service Providing Entities]** Prior art service providers should be selected before selecting SMEs. A service provider qualifies for selection by being capable of performing patentability assessment. It is recommendable to select multiple providers to allow for cases in which there are more prior art search requests than estimated, or the search takes more time than originally expected.

- **[Solicitation of Proposals]** The public institution publishes solicitation announcements and receives proposals from multiple applicants. Criteria for selection should be made clear prior to selection to make sure the selection process is fair and transparent. Proposals are evaluated against the following assessment criteria.

Example

Table 13. Assessment Criteria for Selection of Service Providing Entities

Assessment Type	Criteria	Details	Score
Qualitative Assessment (80)	Program implementation capabilities (50)	Understanding of the program (how well the service provider understands the program and task requests)	10
		Thoroughness of preliminary search (how thoroughly the service provider conducted the preliminary search for the task)	10
		Task performing capabilities (how well the range of services and task performance capabilities being offered can deliver desired outcomes)	20
		Strategy uniqueness (how creative and distinct the task strategies of the service provider are)	10
	Program management capabilities (50)	Researcher capabilities (how well the team, task division, expertise and experiences of researchers in the team can deliver desired outcomes)	20
		Follow-up management (how consistent and adequate the organization's follow-up management is)	10
Quantitative Assessment (20)	Past performances (20)	Ratio of the revenue from similar projects during the last three years up to the RFP bidding date to this program	20

- **[Assessment and Selection of Service Providing Entities]** Service providers undergo first stage document evaluation, and then second stage presentation evaluation. First, the public institution checks whether the proposal and other attached documents fulfill the formality requirements. Later, a follow-up presentation session takes place with a management committee present. The committee evaluates the service providers on task strategies and implementation capabilities based on evaluation criteria.

  - The management committee is formed by selecting three to five constituting members from a wide expert pool of patent attorneys, Ph.D. experts from various technical fields, chairs of research organizations and other external experts.

- **[Assessment and Selection of SMEs]** SMEs are selected based on the proposal and the utilization plan describing how they will utilize prior art search reports. After document and if necessary, field evaluation, the public institution holds a management committee that will select SMEs. While criteria for document evaluation include enterprise capabilities, intellectual property capabilities, and capability to create and protect intellectual property, the management committee looks the degree of commitment, urgency, and potential directions of utilizing program results.

- **[Direct Selection of SMEs]** If the public institution confirms that an SME needs urgent support, the person in charge at the public institution may select the enterprise for the program without consulting with the management committee.

(3) Program Management and Operation

- **[Standard Document Format for Search Reports]** In order to prevent service providers from submitting reports in different styles and formats, it is a better idea to provide a standard document form. Having a standard format for search writers to follow will help prevent the evaluation process from becoming overly complex.

Example

Table 14. Prior Art Search Report Form

Search Report					
1. Task Information					
Request Number		Date Received		Requested By	
Search Undertaken By		Researcher		Phone Number	
		Reviewer		Phone Number	
2. Details of Consultation					
SME		Date			
Consultant		Mode of Consultatioon		**Phone**, E-mail, Fax, Visit	
Content	□ **Purpose of prior art search** - Example: confirm the existence of prior art before filing an application □ **Technical details and constituent parts** □ **Search directions (core keywords)** □ **Remarks**				
3. Invention / Technology					
Title of Invention					
Constituent Parts of Invention	1				
	2				
	3				
Assembly Drawing					
4. Search Results					
Similar Art Identified	□ Yes ■ None				
Patentability	□ High ■ Moderate □ Low		Patentability per Technical Detail	High	-
				Moderate	1,2
				Low	3
5. Overall Review and Assessment					
Analysis Results	Relation	References			
	X				
	Y	JP2772xxx, KR221xxx, KR2006-0082xxx, KR359xxx			
	A	KR424xxx, KR424xxx, US6824xxx			
* Relation: X – closely related, Y – moderately related, A – should be referred to as references although not directly related * X, Y – primary prior art, A – secondary prior art					
Review of Assessment of	□ Constituent 1 □ Constituent 2 □ Constituent 3 □ Conclusion				
Patentability Enhance-ment Solution	□				

- **[Prior Art Search Request]** After preparing a standard document format for search reports, the public institution sends out requests to service providers and forwards applications and technical details of SMEs to them. The public institution gives approximately a two-week deadline for completing the report to make sure reports are submitted within a set time frame.

  - Notes regarding requests to service providers: At this stage, the public institution should request service providers to form an accurate understanding of the technical details and confirm with the assignee or the inventor whether their understanding is correct.

- **[Review and Revisions]** Once the draft for the search report is prepared, it is sent to the public institution to be reviewed by the person in charge for contents and formality requirements. If approved, a request is sent to submit the report to the public institution. In other cases, the public institution should request necessary changes to be made and receive a revised version of the report.

- **[Report Delivery and Explanation]** The public institution sends the completed report it received from service providers to SMEs. Should questions or requests for a detailed explanation concerning the reports arise, the person at the public institution in charge of report examination may respond to the requests or help them contact persons in charge at each service provider.

- **[Completion of Program and Reimbursement]** Once the final search reports are completed and delivered to the SMEs, the public institution requests the list of prior art search cases along with the bills and other cost calculation data sent to them. After carefully cross-checking the numbers and data with information collected at the public institution, the public institution pays for the reimbursement of expenditures.

2) Guidelines for Service Providing Entities

Key Activities

1. Communicate with SMEs to fully understand their inventions
2. Search similar prior art and analyze how they are relevant
3. Produce search report and make it easy for SMEs to understand

(1) Selection of Service Providing Entities

- **[Writing and Submitting Proposal]** The following are key items that should be addressed in a proposal.

- Proposal summary: A proposal summary should articulate the goal and the background of each search organization based on the understanding of the program, and it should also state the scope of work regarding the prior art search program.
- General Information about the Service Provider: This section should give a brief overview of each service provider's current status. It includes enterprise history, organizational structure, information about its prior art search task force, gross sales, sales from prior art search and related services, and the service provider's major programs.
- Program Implementation Strategies and Methods: This is where a service provider should be able to provide qualities that set it apart from others in the planning and performing stages of the prior art search program. At the same time, it should also clearly spell out details of the prior art search it will conduct at each stage, and provide a model for the end results report. It is highly recommended that how the prior art search taskforce will work is stated; for example, the task performing system of the person in charge and other team members, specific roles they play, and the deadlines for each search project.
- Human resources/Expert profile: Service providers should present an overview of the participating taskforce members with a list, and elaborate on their prior art search experience and relevant past background in as much detail as possible.
- Additional support: Service providers should be able to offer what kind of additional support it can provide to ensure the program runs smoothly, and also its follow-up management plans after the completion of the program.

Example

<Items to Include in a Proposal>

1. Proposal Summary
   1-1. Purpose and Background of Proposal
   1-2. Scope of Work

2. General Description
   2-1. Current Status (History, Structure, Revenue, Primary Services)
   2-2. Primary Services and Past Performances
   2-3. Strengths and Advantages

3. Program Implementation Strategies and Methods
   3-1. Goals and Directions
   3-2. Details of Program Implementation
   3-3. Implementation Structure
   3-4. Schedule
   3-5. Follow-Up Management and Expected Effects

4. Taskforce Profile
   4-1. Taskforce Status
   4-2. Individual Credentials of Taskforce Members

5. Additional Support

(2) Conducting Prior Art Search

- **[Understanding Traits of the Invention]** Based on a solid understanding of the invention proposed by each SME, the service provider analyzes the technological traits and how the invention attempts to solve the problems existing technologies have.

- **[Identifying Technical Details and Setting Directions]** Based on the technological features of the technical details, a service provider identifies the technical details that constitute the invention and establishes the direction for each prior art search.

  - Identification of technical details: Two to four technical details should be identified per invention for an efficient search. Each technical detail should be followed by a description of its unique technological features.
  - Communication with SMEs: After setting the directions for search based on the identified technical details and their technological features, service providers should contact the assignee or the inventors to confirm whether the identified technical details reflect the aspects of the invention effectively. If necessary, service providers should request further explanations to make sure the technical details are an accurate and effective reflection of the invention.

Example

Table 15. Technical Detail Identification

Title of Invention	Variable Multifunctional Furniture [Wardrobe]	
Technical Details	1	**Hinges** with ball bearings at both ends
	2	**Rails** at both ends of the furniture can provide the path for the movement of the hinges from the corners
	3	**Drawers** that are connected to a hinge on one corner, move along the rail and have openable doors on the front and rear sides

- **[Establishing Keywords and Search Formulas]** Service provider identifies keywords for prior art search for each technical details, expands the search to include the identified keywords and their synonyms, creates search formulas by combining search operators with keywords, and establishes search formulas by applying multiple search angles to prevent any relevant prior art from going undetected during the search process.

  - Keyword Expansion: Keywords can be expanded by identifying their lexical synonyms or other terminologies used in existing patent literature to describe inventions.
  - Diversification of Search Formulas: Search formulas are diversified by combining 'AND' operators with keyword clusters in different ways or by combining IPC (International Patent Classification) or F-terms and CPC, which are patent classification systems on the member economy level.

Example

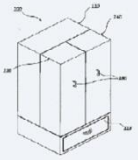
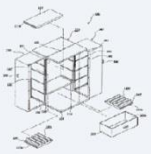
Table 16. Keywords and Search Formulae

Search Keywords	cabinet, furniture, wardrobe, clothes chest
	hinge, front, rear, double side, open
	rail, guide
	bearing
Search Formulae	- (cabinet* furniture* wardrobe* (clothes adj chest)) and (hinge*) and (rail* guide*) - (cabinet* furniture* wardrobe* (clothes adj chest)) and (hinge*) and (rail* guide*) and (bearing*) - (hinge*) and (rail* guide*) and (bearing*) and (A47B*).ipc. - (cabinet* furniture* wardrobe (clothes adj chest)) and (hinge*) and ((front adj2 rear) (double adj side)) and (open*) - ((A47B*).ipc. or (4D059 4G078).tc.) and (hinge*) and ((front adj2 rear) (double adj side)) and (open*)

- **[Analyzing Similar Patents]** Identify four to five existing patents that are the most similar to the proposed technology and establish them as major literature for search. Analyze the key technological concepts in each major document, and compare them with the proposed invention for similarities and differences.

Example

Table 17. Analysis of Similar Patent

7. Comparison of Technical Details				
Relation	Y	Title of Invention	Centrifugal Dehydrator for Sludge	
Reference Number	2005-OOOOOOO		Filed in Application	Republic of Korea
Filing Date	2003. 10. 31		Legal Status	Published(rejected)
Assignee	Choi			
Prior Art Summary				
The invention is a multifunctional drawer closet that can store items inside the covers of the wardrobe. The main wardrobe body and multiple wardrobe covers are connected with hinges in order to fold and unfold in horizontal directions. Between the body and the covers of the wardrobe, there is room formed that is open in one direction. In this formed space, two guide holes are situated in a parallel way in certain distances. The both ends of the support slides sustaining guide holes are fixed. On the wardrobe body and the covers are magnet pieces that are drawn to each other.				
Comparison of Invention and Prior Art				
Constituents of the New Invention	Reference Citations from Primary Literature		Assembly Drawings	
1	□ Hinges(120) that are connected in a manner so that the wardrobe body(110) and multiple wardrobe lids(130,140) are folded and unfolded in horizontal directions (Claims 1, 2page)			
3	□ Wardrobe Lids(130,140) produced in the shape of a box with half the width of the wardrobe body(110) and is folded and unfolded, with inner space(131,141) that is open in one (Claims1, 2page)			

- **[Writing an Overall Review and Assessment]** Based on the analysis of relevant patents, the invention is assessed for its patentability in the overall review and assessment. Service providing entities should also suggest how the chances of receiving a patent can be improved, how the potential invention might infringe on prior art, how the SME could design around existing patents, and provide a conclusion.

  - Review and Assessment of Patentability: A general assessment through comparison of each technical constituent of the invention with similar patents is provided, along with a conclusion on how to enhance the possibilities of acquiring patent protection.
  - Solutions for Enhancing Patentability: The solutions suggest specific ways to set the invention apart from similar patents identified through prior art search in order to enhance the possibilities of obtaining a patent.

Example

Table 18. Writing an Integrated Reviewed Opinion

5. Overall Review and Assessment		
Analysis Results	Relation	References
	X	-
	Y	KR2005-0041XXX, KR2002-0026XXX, US7,907,XXX
	A	KR1,217,XXX, KR353,XXX, KR907,XXX, KR2008-0054XXX, JP2006-0015XXX, JP3,052,XXX, JP3,582,XXX, JP1998-0165XXX

* Relation: X – closely related, Y – moderately related, A – should be referred to as references although not directly related
* X, Y – central reference, A – peripheral reference

Review and Assessment of Patentability	□ **Constituent 1** Constituent 1 of the invention is about the **hinges** that are connected with ball bearings at the both ends. Regarding this, major prior art 2 (utility model 385,XXX) mentions a sliding-type hinge capable of moving along the guide rails of the main body and is constituted of at least two steel or plastic rollers or bearings. Since the hinges of the new invention use bearings in order to be able to move along the rail, **constituent 1 is deemed as already articulated in major prior art 2.** □ Constituent 2 Constituent 2 is about…… Major prior art 2(utility model 385,XXX) has □ Constituent 3 Constituent 3 is about…… Major prior art 1(utility model 206,XXX) has □ Conclusion Although constituent 1 is already articulated in major prior art references, constituents 2 and 3 differ from the existing art. As combining prior arts will not achieve the same effect of forming storage space, the 'variable multifunctional furniture [wardrobe]' has the potential to obtain patent protection.
Patentability Enhancement Strategy	□ It is recommendable to complement the patent with technical details on reinforcing the strength of hinges or the rail structure, as the invention allows for free location and movement and might place excessive weight on the hinges and the rails. □ A clearer assembly drawing of hinges connected with ball bearings and the connection structure to the wardrobe with a more detailed explanation attached will improve patentability.

3) Guidelines for SMEs

Key Activities

1. Make sure the key concepts and characteristics of the proposed technology are clearly explained in the application
2. Provide a clear explanation to service providers to help them understand the characteristics of the invention well and examine the search direction
3. Review the submitted report and request further explanation if necessary

(1) Writing Program Application

- **[Application for Program]** SMEs should be as detailed and descriptive as possible in filling out each item on the application form. An application should include general information about the enterprise, current enterprise status and the invention on their applications. Patentability of the invention will determine whether an enterprise will receive subsidy grant for patent application. Therefore, it is recommended to stay focused on the patentability of the invention when writing an application for the program.

(2) Review of Search Directions and Explanation of Technical Details

- **[Review of Search Directions]** During interviews via email or phone with the objective to confirm technical details or constituents of the proposed technology, SMEs, on their part, should ask search providers to provide an explanation for the patent search directions and check whether the patent search strategy suits the concept of each invention. Confirmation at this stage is crucial as a lack of understanding of the concept of the proposed technology may lead to missing the point during the actual prior art search process and may result in follow-up search requests and claims. If the service provider misunderstands the purpose and background of the invention, the prior art search will be inaccurate and later lead to problems such as requests for re-investigation and other similar claims.

- **[Explanation of Technical Details]** SMEs have the obligation to make sure their service providers have a correct understanding of the concept of the invention by providing explanations and essential technological background information. Only when the unique features of the invention that are missing in the prior art and the effects they can bring are articulated in detail can the service providers fully grasp what kind of an invention they are dealing with, especially if these features were not spelled out in the submitted application.

(3) Report Review and Request for Explanation

- **[Report Review]** SMEs should check whether the provided keyword list is exhaustive enough to cover the unique aspects of the proposed technology. It is also recommended that SMEs check whether the comparative study of similarities and differences between the invention and its relevant prior art is thorough, and pay attention to the conclusion of the report.

- **[Request for Explanation]** As much effort as service providers put into the patent search reports to keep them easy to understand by using general terms, there might still be patent-related jargon and legal terminologies in the report that SMEs are not familiar with. If it is necessary, SMEs should ask for a simpler explanation to ensure that they understand the report.

1.2.6. Program Tips

1) Program Tips for Public Institutions

- The public institution has the obligation to ensure that SMEs clearly state essential information including fields of their invention and technical details in their applications, as prior art searches are mainly conducted in order to evaluate patentability of an invention.

- Apart from the field of the invention and technical details, SMEs should also submit other documents in order to apply for the program. In the case of Korea, the documents may include a copy of a certificate of business registration, program promotion and utilization plan, proof of SME status, other required documents of proof and a certified copy of corporate registration. The documents required for application in other member economies may vary.

- **[Selection of Service Providers]** A service provider should have paid patent databases to be accessed for prior art search and capacity to perform patentability evaluation qualifies for the program.

- **[Search Request]** It is recommended to notify service providers of the individual search report deadlines of each search project when requesting prior art searches. Making a list of every project and keeping a record of their individual deadlines and report completion dates will prove useful for calculation of costs at a later date.

- **[Objections and Claims]** If a complaint is submitted by an SME regarding search reports, the public institution is not in the position to effectively respond as it is not the public institution that produces reports. Therefore, the public institution should listen to the complaints coming from SMEs and ask for sufficient time so that the service providers can provide a more adequate and detailed explanation on the matter to the SME.

2) Program Tips for Service Providing Entities

- **[Prior Art Search]** A prior art search entails undertaking searches to identify any similar and relevant patents that are already registered, assessing an invention's patentability based on the search results, and producing a patent report. Problems can arise, however, when an invention is evaluated as not patentable by the service provider and the SME is not willing to accept that the invention is overly similar to existing prior art. This is why it is essential for patent searchers to confirm the features of the invention with the applicant before undertaking the actual patent search – diving into the search process without a full understanding of the invention can complicate things and lead to problems later on. Service providers, therefore, should confirm through communication with the applicant the difference of the invention from existing patents and the core features of the invention in order to minimize the possibility of potential complaints. In some cases, the applicants might not have adequate knowledge to acknowledge that the invention lacks patentability, which should be resolved by providing an explanation that is as detailed and easy to understand as possible.

3) Program Tips for SMEs

- **[Writing Application]** SMEs are responsible for making their technical details as detailed and easy to understand as possible when applying for prior art search support. Neglecting to do so may result in less than accurate prior art search results. Describing an invention in terms that are too broad or too general can also make it difficult to obtain a patent. An invention needs to be explained in detail if a patent is to be obtained. Another factor to consider is that the technical details should be written in a way that is easy for the service providers to understand. Enough emphasis should be given to how the invention differentiates itself from existing prior art and what novel objective and functions the new technology is seeking to serve.

1.2.7. Successful Cases of Program Implementation

(1) Enterprise I - Micro drill bit manufacturer

- Enterprise I is a manufacturing company that invented drills capable of drilling micro holes less than 100 ㎛ in diameter on a PCB(printed circuit board). While the enterprise was in the process of inventing the re-sharpener with which drill bits can be recycled, it only had limited information about its competitors. The enterprise also did not have enough insight on how relevant competitors' technology was to its own product and technologies.

- **[Effect]** Through a prior art search, a patent that was identical in features, components and patent scope was found to have been previously issued overseas. This helped Enterprise I analyze relevant patents overseas for possible infringement issues, review its own technologies, and re-establish future R&D and intellectual property acquisition strategies.

(2) Enterprise D - Automotive painting equipment manufacturer

- The enterprise was making attempts to expand into the LED lighting industry and was in urgent need of a patent portfolio since it only possessed one relevant patent. Under the program, the enterprise was advised to have prior art searches performed for each individual item in its secondary business branches in order to identify technology fields with technical potential or patentability. It was recommended that once such fields are identified, the enterprise should concentrate on implementing R&D and obtaining patent protection in those fields.

- **[Effect]** Enterprise D was able to identify items with a high possibility of obtaining patent protection through prior art search. Moreover, the enterprise applied for two complementary patents. This enabled them to build a more robust patent portfolio in the LED lighting branch.

1.3. Support for Domestic IP Acquisition

1.3.1. Program Overview

Support for Domestic IP Acquisition Program aims to support the creation of industrial property rights (such as patents and design rights) by SMEs who, despite their brilliant technologies and creative designs, find it difficult to acquire domestic IP rights due to limited financial capabilities.

- SMEs with brilliant technologies and creative ideas often lack the financial capacity to obtain legal protection for their ideas. This can spell real problems in worse cases where SMEs doing business without legal protection cannot exercise exclusive rights on the idea they developed even if it is their original idea that competitors are copying to make profits.

- There are two types of programs with the goal to support SMEs to obtain IP protection, such as patent and design rights, to prevent the aforementioned problems. The first type of program provides grants to SMEs with excellent technologies to cover patent application fees. The second type gives reduction or waiver of patent fees[55] for SMEs. The Implementation of Support for Domestic IP Acquisition Program, unlike other support programs involving a prior art search, patent mapping, IP transaction and evaluation, largely depends on related government legislations and policies. Based on these legislations and policies, the public institution in charge of the program can give SMEs financial assistance for patent application fees using a government budget, and the patent office[56] can grant a reduction or waive the patent fees.

- In general, implementation of the Support for Domestic IP Acquisition Program requires allocation of government budget equivalent to financial assistance that can be granted to SMEs for a year, and creation of regulations and policies specifically for reduction and exemption of patent fees.

- Subsidy Grants for Patent Application provides a subsidy for technologies selected through prior art search and other kinds of patentability evaluation[57]. On the other hand, SMEs can receive a reduction or exemption of patent fees only when they meet the requirements stipulated by regulations and policies. In short, SMEs can receive reduction and exemption of patent fees by submitting documents required by the regulations and policies to certify they meet the stipulated requirements, whereas patentability evaluation for assessing novelty and non-obviousness is required if SMEs wish to receive subsidy grants for patent application fees

[55] Expenses involved in filing and maintaining a patent, such as patent filing fee, examination fee, registration fee, and maintenance fee.
[56] Organization with control over patent related issues, such as examination of patents, utility models, designs and trademarks.
[57] Evaluation of new features (novelty) and improvements (non-obviousness) of an invention compared to prior art

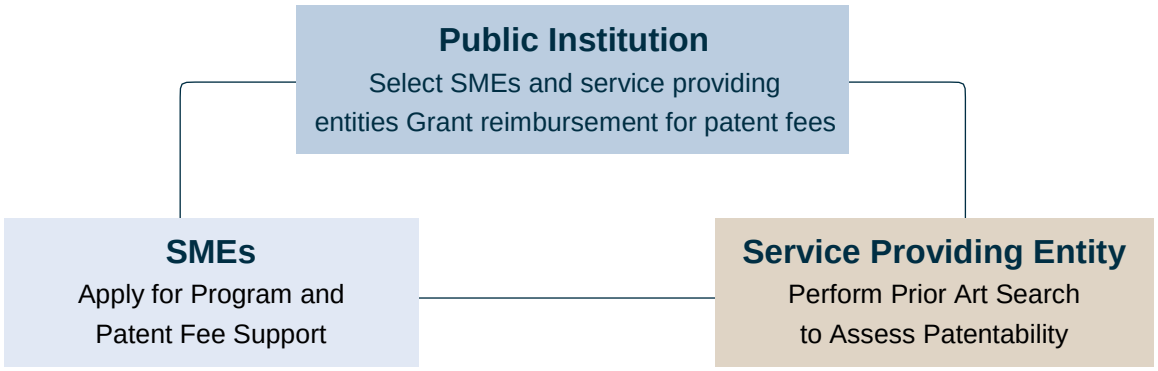


Figure 46. Program Framework (Support for Domestic IP Acquisition)

1.3.2. Similar Programs of APEC Members

1) Patent Application Support, Patent Fee Reduction and Exemption System (Japan)

- Japan Patent Attorneys Association and financial institutions (banks) are providing support to cover expenses for prior art searches and attorney services.
- Japan is actively granting reductions and exemptions of patent filing and examination fees to small businesses, R&D oriented SMEs and independent inventors through solid policy support.

2) Patent Application Support Program, Patent Fee Reduction and Exemption System (Korea)

- The program covers a certain percentage of official fees required for the patent application and costs for hiring representatives (except for additional tax) to SMEs.
- The Korean Intellectual Property Office also offers a patent fee exemption to students and persons with disabilities, as well as reduction benefits to SMEs and individual inventors for various fees, including patent annuities.

3) Patent Fee Reduction System (United States)

- The US offers benefits of patent fee reductions depending on the size of the business to small businesses and individual inventors with weaker financial capabilities.

4) Patent Fee Reduction System (China)

- China provides reductions on patent fees and annuities to small businesses, research organizations and individual inventors with weaker financial capabilities.

5) Patent Application Grant Scheme(Hong Kong, China)

- The Grant provides funding support to domestic companies and individual inventors with an aim of encouraging them to capitalize their intellectual work through patent registration. All applications for functional patents and inventions with technology elements and susceptible of industrial application are eligible.

1.3.3. Procedures and Details of the Program

1) Target of Support

- SMEs aiming to obtain protection on advanced technologies they developed by receiving support for patent application expenses

2) Program Process (Subsidy Grants for Patent Application)

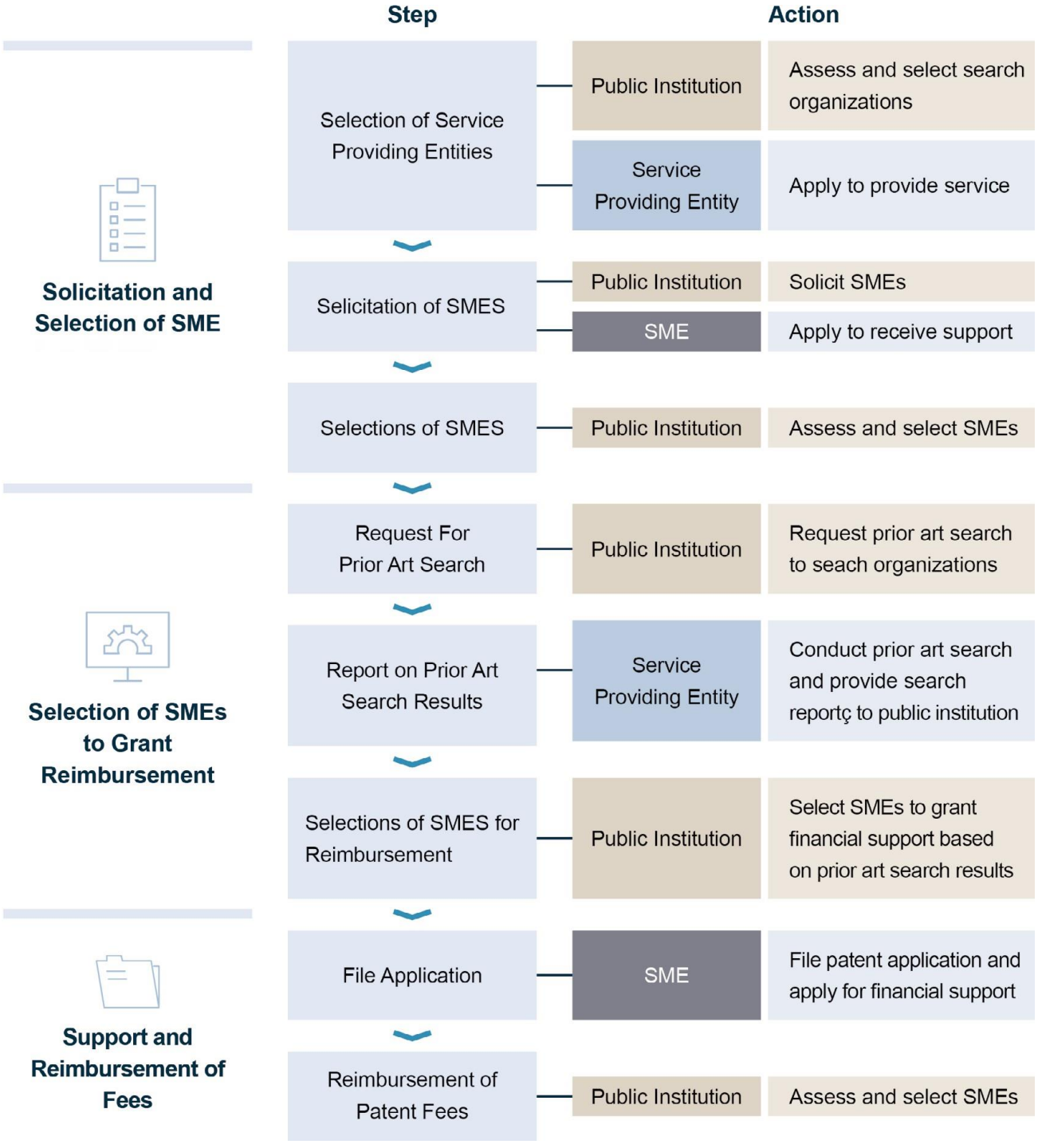


Figure 47. Program Process (Support for Domestic IP Acquisition)

- Subsidy for patent application can be granted after the SME's technology is evaluated for patentability, business potential, and marketability through the Support for Domestic IP Acquisition Program.

- On the other hand, patent fee reduction and exemption benefits are granted based on the judgment of whether an enterprise qualifies for the benefits.

- The Support for Domestic IP Acquisition program should preferably be implemented in connection with a prior art search program in order to evaluate patentability and other aspects of the invention in advance. If, however, the public institution is capable of performing patentability evaluation internally, the public institution can select SMEs without completing a prior art search program.

3) Scope and Conditions of Support

- Subsidy Grants for Patent Application grants reimbursement of patent application expenses for the technologies of SMEs based on the patentability evaluation.

- Reductions and exemptions of patent fee are granted in cases where the SME qualifies for the benefits.

- For further information, refer to *1.3.5 Detailed Guidelines for Participating Entities.*

1.3.4. Guide Map for Participating Entities

Table 19. Guide Map for Participating Entities (Support for Domestic IP Acquisition)

Entity	Pre paration	Program Process (Phase)								Fol-low-up Manage ment
		1	2	3	4	5	6	7	8	
Public Institution	Design program	Select service providers Select SMEs	Request prior art search			Select SMEs for subsidy grants for patent application			Grant subsidy for patent application	
Service Provider Entity		Apply for program		Conduct prior art search	Report results				Request reimburse ment of expen diture	
SME		Apply for program					File patent application	Request reimbur sement		

- Guide Map for Participating Entities is a chart that allows for a general overview of the overall process of the program from the designing stage to follow-up management.

- The usual timeframe for the Patent Application Expense Support Program under the Domestic IPR Acquisition Support Program is two months, which may vary depending on the circumstances and infrastructure of the economy of implementation.

- Guide Map for Participating Entities provides a summary of the tasks to be carried out by the public institution[58], Service Providers Entity[59], and SMEs at each stage. Detailed information regarding each stage is described in *1.3.5 Detailed Guidelines for Participating Entities below.*

[58] Public organization, for example a governmental organization, in charge of running and managing this program

[59] Entities that perform prior art search

1.3.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Design the Patent Application Expense Support Program
2. Prepare the legal grounds and relevant ordinances regarding reduction and exemption of patent fees as references

(1) Subsidy Grants for Patent Application[60)]

- **[Solicitation of Applications]** The public institution promotes the subsidy grant program through both online and offline channels and solicits applications from SMEs that include enterprise information and technical details of the technology. Company information includes the title of the enterprise, representative, location, classification by industry, and the person in charge. Technical details of the technology, on the other hand, include existing prior art and the problems they present, the purpose of the invention, technology elements of the invention, expected effects, and assembly drawings.

- **[Selection of Service Providers]** The public institution should select service providers that will perform prior art search on the technologies of the selected SMEs. A service provider qualifies for the program if it can perform patentability (novelty and non-obviousness) evaluation. It is recommendable to solicit multiple service providers to allow for cases in which there are more prior art search requests than estimated, or the search takes more time than originally expected.

- **[Standard Document Format for Search Reports]** In order to prevent service providers from submitting reports in their own different styles and formats, it is a better idea to provide a standard document form when the public institution makes prior search requests. Unless there is only one service provider for the program, each provider will have a distinctive style different from others. Having a standard format for writers to follow will help prevent the evaluation process from becoming confusing and complex.

- **[Selection of SMEs for Subsidy Grants for Patent Application]** Based on prior art search reports, SMEs are selected to receive patent application expense support. During this process, search reports should be reviewed by experts such as patent attorneys, for example, who are capable of evaluating patentability (novelty, non-obviousness), marketability and business potential of each invention .

60) A program that grants financial support to SMEs to cover patent fees under the Domestic IP Acquisition Support Program. The term does not include patent fee reduction and exemption programs.

- **[Grant of Reimbursement]** A public institution covers the patent filing expenses of an eligible SME that has filed its patent application. A patent application expense support application should include assignee information, the person in charge, proof of application, information of the representative, costs incurred, and bank account information.

- Depending on the budget and circumstances, each economy of implementation can decide to offer either full coverage of expenditures or share the burden with the assignee so that the assignee covers part of the costs.

- A service provider in charge of prior art search for an SME does not necessarily have to be its patent agency as well. It is recommended that the public institution select search organizations, and SMEs select their own patent agencies.

Note

- One advantage partial coverage of expenses has over full coverage is that the public institution can support more SMEs at the same time and that it can motivate SMEs to engage themselves in the program more actively.

Note

- **Reimbursement cannot be granted in the following cases:**
  - Domestic patent application for an invention that has already been completed
  - An application for subsidy for an invention that was withdrawn, abandoned or dismissed within one month of the application date
  - Support was granted for the same invention from other organizations
  - Invention was not filed for application through a representative
  - For contingency fees (success fees) to be paid to the representative or the patent attorney
  - For expenditures related to registration, such as registration fees and patent annuities

- **Reimbursements can only be granted if applications by corporations are filed in the name of a corporation, and applications by sole traders are filed in the name of a representative.**

- **Policy support other than patent application expense support program can beimplemented according to the circumstances of each economy.**

Patent Application Expense Support Programs in Japan

- Japan Patent Attorneys Association, IP-related organizations and businesses such as Fujitsu are providing support to encourage patent applications from SMEs.

- The Momiji Bank announced that it will provide full coverage of patent attorney costs to SMEs in Hiroshima Prefecture looking to file patent applications.

Example

[Patent Application Support of Japan Patent Attorneys Association (JPAA)]

- JPAA provides prior art search and patent application services by sending two patent attorneys to each eligible enterprise which are about five years in business.
  - Patent filing expenses of up to three hundred thousand yen can be supported.

[Patent Application Support from the Bank of Japan]

- The program provides support through the partnership between financial institutions and patent attorneys. The first of its kind was implemented in Chugoku region in Japan with the help of cooperation between Chugoku Branch of JPAA and Chugoku Intellectual Property Strategic Program Promotion Network.
  - The purpose of this program is to raise IP awareness of SMEs in Hiroshima Prefecture.
  - This program is based on the partnership between financial institutions and patent attorneys and is subsidized by Chugoku Bureau of Economy, Trade and Industry under Ministry of Economy, Trade and Industry of Japan. Under this program, patent attorney services for prior art search and patent application are provided free of cost to SMEs that have not yet filed a patent application.

(2) Patent Fee Reduction and Exemption System

- Patent fee refers not only to registration and annual maintenance fees, but also patent filing and examination fees paid when a patent application is submitted and examined, respectively.

- Patent fees have undergone revisions just as economic and political circumstances in an economy have changed. Eligibility criteria for reduction and exemption of patent fees, along with the patent fee schedule, are changing accordingly as well.

- Unlike under the Subsidy Grants for Patent Application, Patent Fee Reduction and Exemption System assesses whether an entity is eligible for reduction and exemption of patent fees in providing benefits.

- The following shows reduction and exemption programs of patent fees in several APEC member economies.

Example

[Conditions for Patent Fee Reduction and Exemption in Korea]

1. Reduction on Patent Fees

① Reduction on the Following Fees

- Patent application fees (divisional application fees and converting application fees included) and examination fees
- Registration fees for the first three years
- Maintenance fees for four to six years
- Costs arising from aggressive assertion of patent rights through litigation

*Reduced fees do not apply to trademarks

② Eligibility (Example)

Table 20. Eligibility (Reduction on Patent Fees)

Reduction Rate	Eligible Entities
100% Reduction (Exemption)	• Recipient of medical care assistance according to National Basic Living Security Act • Persons of distinguished service to the Republic of Korea who have made a sacrifice or contribution to the Republic of Korea, and their bereaved families or families • Physically challenged persons registered under the Welfare of Disabled Persons Act • Student(enrolled at elementary/middle/high school) • Person under 19 years of age • Enlisted soldiers in military service
85% Reduction	• Person 19 years of age or older and younger than 30 years of age, or 65 years of age or older, and is both an assignee and inventor at the same time
70% Reduction	• Independent inventors (eligible only if both assignee and inventor at the same time), small and medium-sized enterprises

2. Reduction on Annuities

① Eligibility and Reduction Rate

- Aims to reduce the financial burden of SMEs in maintaining patents

Table 21. Eligibility and Reduction Rate (Reduction on Annuities)

Description	Reduction Rate
Up to the 3rd Year	● Independent inventors and SMEs: 70% ● Public search organization: 50% ● Established enterprises: 30%
Due at 4 Years	● Independent inventors, SMEs, public search organizations, established enterprises: 30%
Due at 7 Years	● Independent inventors, SMEs, public search organizations, established enterprises: 30%

Example

[Patent Fee Reduction United States][61)]

1. The US provides discounts on filing fees in order to support smaller businesses and individual inventors with weaker financial capabilities.
   - Assignees that qualify as small entities or micro entities are eligible for discounts of 50% and 75%, respectively, on official fees.
   - Individuals, small business concerns (SBCs), and nonprofit organizations qualify as small entities.
   - Micro entities should qualify as USPTO-defined small entities and fulfill the requirements below.

① Inventor or assignee is an institution of higher education.

② Inventor or assignee should not have a gross income of more than threefold the median household income of the US in the year or the previous year from when patent is filed, and should not be named on more than four previously filed applications filed in the US.

61) https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule

Example

[Patent Fee Reduction and Requirements in Japan]

Table 22. Patent Filing and Examination Fees (Japan)

Entity		Reduction Rate
Venture capital firm and SME	a. Small-sized sole proprietor (with under 20 employees (under five for trade or service industry)) b. Sole proprietor in business for fewer than 10 years c. Small corporations with under 20 employees (under five for trade or service industry) d. Corporations with less than 3 million JPY in capital after ten years of operation	<Patent> Examination fee: 1/3 reduction Patent annuities (to be paid from the first to the tenth year): 1/3 reduction Examination fee, postal fee: 1/3 reduction Preliminary examination fee: 1/3 reduction
R&D oriented SME	1) SME requirements 2) R&D requirements - Expenses related to testing and research should take up more than three percent of the total expenses, or - Patent applications based on certification businesses such as under the Act for the Promotion of New Business Activities by Small and Medium-Sized Enterprises (law to support SMEs)	<Patent> Examination fee: 50% reduction Patent annuities (from the first to the tenth year): 50% reduction
R&D oriented SME (Act for Promotion of Japan as an Asian Business Center)	1) SME requirements 2) Service invention requirements - Invention should be a service invention, and the employer (or the company) is the legal successor to the inventor. 3) Certification Research and Development Business Plans requirements - Invention should be the outcome of R&D project implemented according to Certification Research and Development Business Plans	<Patent> Examination fee: 50% reduction Patent annuities (from the first to the tenth year): 50% Reduction

Individual Inventor (tax-exempt individuals, etc.)	a. Recipients of Livelihood Protection b. Individual exempt from regional tax c. Individual exempt from income tax d. Sole proprietor exempt from business tax e. Sole proprietor in business for fewer than 10 years	<Patent> Examination fee: waiver or 50% reduction Patent annuities (from the first to the third year): waiver or 50% reduction Patent annuities (from the fourth to the tenth year): 50% reduction <Utility Model> Technical assessment fee: waiver or 50% reduction Patent annuities (from the first to the third year): waiver or three-year grace period
Corporate body (tax-exempt corporations, etc.)	Corporate bodies with less than 3 hundred million JPY in capital: a. Company (corporation, etc.) b. Co-op (with share capital) c. Corporations without share capital (incorporated foundation, aggregate corporations, etc.)	<Patent> Examination Fee: 50% Reduction Patent annuities (from the first to the tenth year): 50% reduction

Example

[Patent Fee Reduction in China]

- Only reductions, but not exemptions, of patent fees are provided in China.

Table 23. Patent Fee Reduction in China

Aspects of Reduction	Description
Fees Subject to Reduction	Patent filing fees, substantive examination fees, patent annuities (from the year of obtaining patent to the sixth year), official fees
Eligibility	If assignee or patentee meets one or more requirements below, he or she can apply for patent fee reduction at the State Intellectual Property Office (SIPO). • Individual with average monthly income of 3,500 CNY (gross annual income of 42,000 CNY) or less in the previous year • Company with taxable income of three hundred thousand yuan or less in the previous year • Non-profit organizations, social groups (private organizations), non-profit scientific research bodies
Reduction Rate	Different reduction methods apply according to the type of assignee or patentee • Single patent – 85% reduction if assignee or patentee is an individual or an organization • Joint patent – 70% reduction for joint assignees or patentees of two or more persons
Application Period for Reduction on Fees	Assignee or patentee needs to apply for reduction before the payment period • Patent filing fees – the application period for filing fee reduction starts at the same time with patent application • Other costs – assignee or patentee can apply for a reduction of other fees when filing a patent application, or two and a half months prior to the fee payment deadline.

2) Guidelines for Service Providing Entities

Key Activities

1. Perform prior art search in order to examine patentability

(1) Conducting Prior Art Search for Patentability Examination

- As financial support is only granted for the technologies that are likely to be patented under the Subsidy Grants for Patent Application, the public institution should provide patentability assessment of the technologies and results thereof. In other words, the public institution should research the most similar prior art literature, analyze similarities and differences, and judge the patentability of the technologies.

- For more detailed guidelines on conducting prior art search, refer to the aforementioned guidelines under the Prior Art Search Program as they bear a high resemblance.

3) Guidelines for SMEs

Key Activities

1. Formulate the application in a way that makes the core features and characteristics of the technology stand out in order to highlight its patentability, and ultimately receive subsidy grant for patent filing costs

(1) Application for Subsidy Grants for Patent Application

- **[Application for program]** SMEs should fill out the application form provided by the public institution. The application should include general information about the enterprise and features of the invention. The application should highlight the unique features that set the invention apart from existing art, thereby illustrating that the functions and effects the invention offers are superior, since whether SMEs can receive financial support depends on the assessment of patentability, marketability and business potential of the said technology.

- **[Apply for Subsidy Grants for Patent Application]** After the patent application has been filed, a proof of application should be submitted to the public institution. A proof of application may include the following documents.

- Documents proving filing of application, patent application, bank transfer or acknowledgment statement, receipt for payment of filing fees and other documents of payment of costs.

(2) Programs for Reduction or Exemption of Patent Fees

- Programs for reduction or exemption of patent fees vary in their details according to the policies and systems of each economy. Therefore, it is essential to examine the requirements in order to receive the desired support.

1.3.6. Program Tips

1) Program Tips for Public Institutions

- **[Solicitation of Application]** The public institution can receive applications either online or offline, and can solicit applications offline if such a system for online submission is not in place. The public institution should require SMEs to include a brief enterprise profile (title of the enterprise, representative, location, date of enterprise establishment, type of business, past record of participation in support programs, etc.) and information about the person in charge (name, post, corporate title, email address, and contact information).

- An application should state the technology field and technical details of the invention as the information is necessary for conducting prior art search. The application should be submitted with other attachments such as program implementation and utilization plans and proof of SME status.

- Documents required for application can vary depending on the economy in which the program is implemented.

- **[Selection of Service Providers]** Selected service providers should have adequate capabilities and expertise to assess patentability of inventions.

- In order to prevent frauds at the reimbursement stage, the public institution should forego search in the patent information search system to find out whether identical or similar art has already been patented.

2) Program Tips for Service Providing Entities

- **[Conduct Prior Art Search]** Service providers perform research to find out whether there is any identical or similar prior art. Drawing on the results, they assess patentability of inventions and write search reports. Problems can, however, arise in some cases when the person in charge at an SME will not acknowledge the assessment results stating that the invention has low patentability. In order to prevent this, service providers should confirm the technical details of the invention with the person in charge at the SME, as failure to understand the core features of the invention might lead to prior art search results that miss the point. Checking with the SME on the unique and important features of the invention can reduce the possibility of dissatisfaction on the part of the SMEs. If poor understanding of the invention on the part of the service provider is not the cause of the problem, it is most likely that the reason is because the person in charge at the SME is not familiar with what makes an invention patentable. In this case, the service provider needs to provide further explanation to the SME so that they can acknowledge the results.

3) Program Tips for SMEs

- **[Writing Application]** When writing applications for patent application fee support, SMEs need to make the technical details of the invention as detailed and easy to understand as possible for service providers, as misunderstanding the invention can greatly reduce the accuracy of prior art search results. In order to highlight the patentability of the invention, descriptions need to be as specific and easy to understand as possible, especially for prior art searchers. The focus of the application should be differences from existing art, purpose of invention, expected effects and the features that distinguish the invention from prior art.

1.3.7. Successful Cases of Program Implementation

1) Enterprise P – Assembly machine manufacturer for engines and transmissions

- Enterprise P owned high-level technologies and specialized as an assembly machine manufacturer of engines and transmissions, automated equipment, and car washing equipment. Despite this high level of expertise, lack of patent information both home and abroad, and little information about overseas markets hindered the enterprise's chances of expansion into foreign markets.

- **[Effect]** Enterprise P was able to reinforce its marketing and gain inroads into markets abroad by receiving Support for Domestic IP Acquisition. The enterprise is now on its way to obtaining contracts in India, Malaysia, and China.

2) Enterprise B – Education system developer

- Enterprise B, a one person startup that develops education systems, was only able to obtain patents on parts of the overall system it developed in its early stages due to weak financial capabilities and was having difficulties building a patent portfolio that could enhance business stability.

- **[Effect]** With financial support for its patent application fees, Enterprise B successfully filed its applications for the technologies it owned. This enabled the enterprise to prevent competitors from entering the market early on and provided the enterprise with an opportunity to win an exclusive supply contract with a public institution.

1.4. Patent Map

1.4.1. Program Overview

The objective of the Patent Map Support program is to provide SMEs with R&D related patent information that will help set them in the right direction towards obtaining a patent.

- While SMEs may be able to conduct a prior art search for individual ideas, a comprehensive search on current patents in a particular area surrounding the invention is not something they can easily do alone. This is why SMEs need support in order to prevent duplication of R&D efforts and set the right directions for their R&D projects.

- At the same time, patent landscape analysis is also necessary as it serves as the very basis for comprehending the major development trends in the field of a certain invention or technology.

- The Patent Map Support Program aims to prevent duplication of R&D investment in order to fully utilize results from R&D projects, and help enhance R&D competitiveness by providing a comprehensive view into R&D trends, based on which the right R&D directions can be established.

- The program mainly targets SMEs lacking R&D planning capabilities with no established internal patent team or patent technology team.

- The program implements prior art searches from the technology perspective in order to identify similarities and differences between the existing prior art and the technology to be researched and developed. Moreover, the program offers a broad view of technology trends through an analysis of patent trends for each year and each technology. In addition, the program also provides a technology development map analysis of the invention that shows directions of technology development.

- The program further assists SMEs in drawing up effective R&D and patenting strategies by providing an analysis of business and patent application status, patent portfolios, and patented technologies of major competitors.

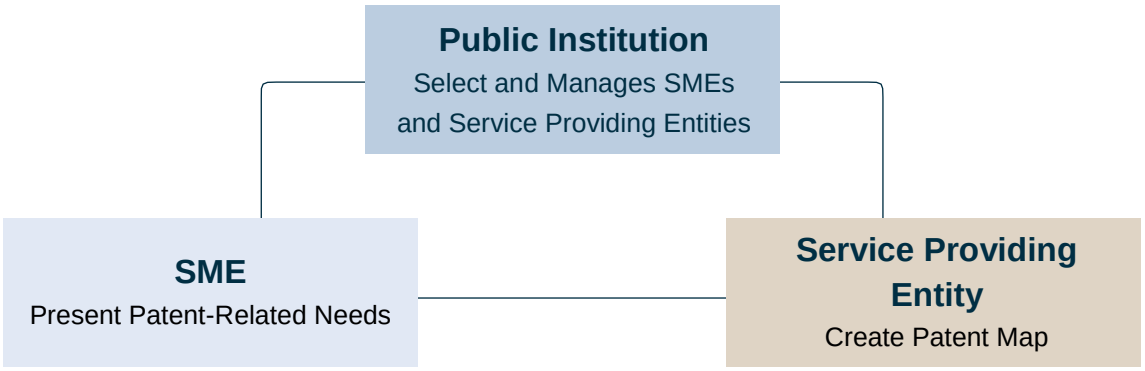


Figure 48. Program Framework (Patent Map)

1.4.2. Similar Programs of APEC Members

1) Support for Analyzing and Utilizing Patent Information (Japan)

- Japan Institute for Promoting Invention and Innovation[62] supports the program upon request from Japan Patent Office.
- The program provides support for patent information analysis SMEs need for their R&D and helps prioritize R&D and investment endeavors.
- The program targets SMEs and supports patent information analyses that are expensive and require a high degree of technological expertise.
- The program grants financial support of up to 1 million JPY.
- The support program focuses on determining R&D directions, preventing redundant R&D efforts and exploring new business fields.

Figure 49. Support for Analyzing and Utilizing Patent Information (Japan)

62) http://www.jiii.or.jp/

2) Smaller Scale Consulting Tasks (Korea)

- Regional Intellectual Property Center[63], an affiliation organization of Korea Invention Promotion Association[64], is in charge of the program.

- The program offers R&D directions for SMEs, helps to prevent duplication of R&D efforts and build roadmaps for patent utilization, and provides consulting services for commercialization strategies.

- Through research and analysis of patent trends with a focus on core and source technologies, the program provides a patent map that includes information on the new technological developments and business management trends both in Korea and overseas that can be effectively utilized by each selected SME in practice.

- The program grants financial support of up to 5.5 million KRW.

63) Regional Intellectual Property Center is an organization with a mandate to enhance awareness for intellectual property among citizens and smaller businesses in the region and to support intellectual property related programs.

64) Korea Invention Promotion Association operates and manages support programs related to intellectual property.

1.4.3. Procedures and Details of the Program

1) Target of Support

- SMEs seeking to identify patent trends in their own technological field and new developments coming from competitors are eligible for application

2) Program Process

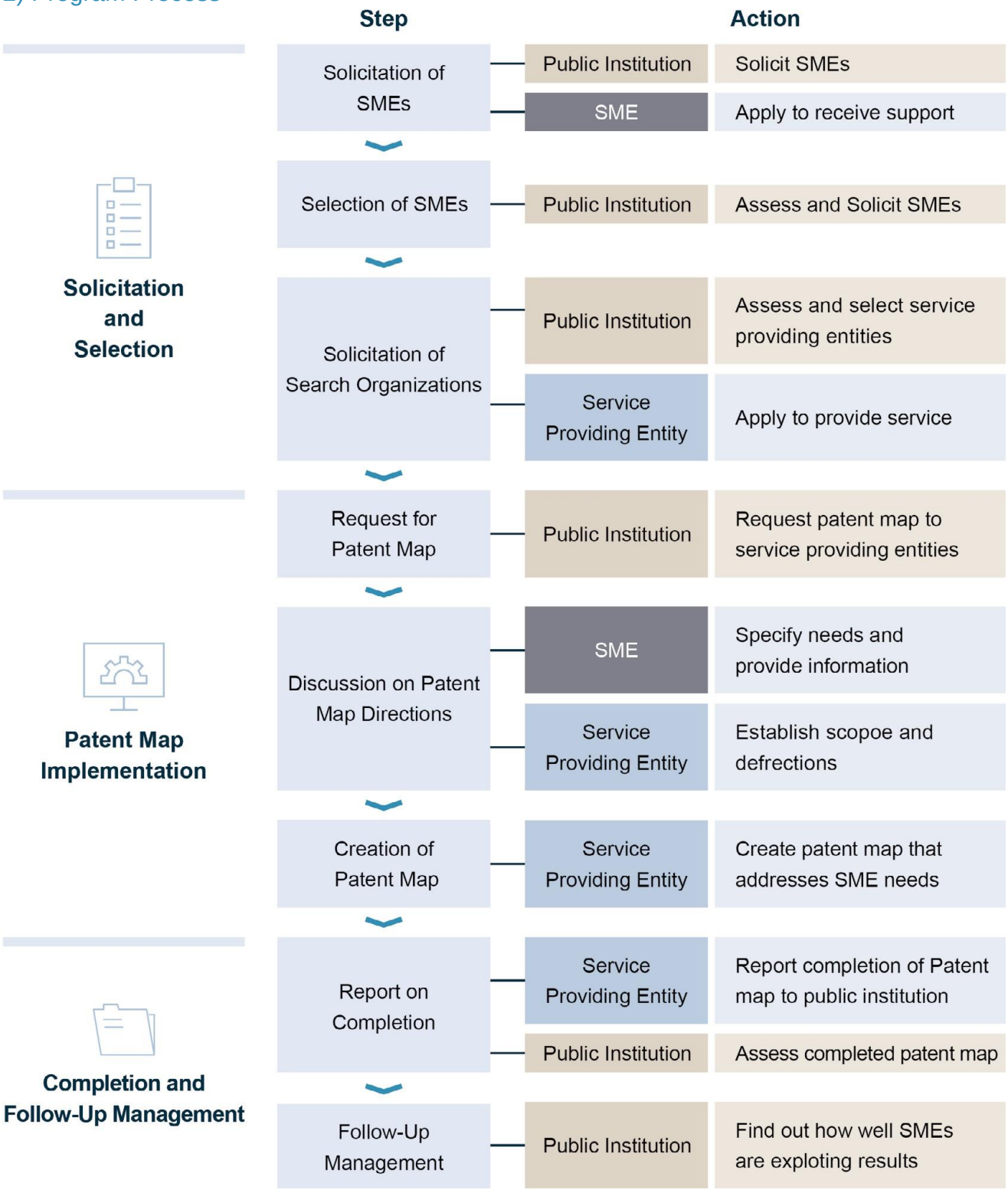


Figure 50. Program Process (Patent Map)

3) Scope and Conditions of Support

- As the program targets smaller enterprises with weaker fund mobilization capacities, it can cover from around 90% up to 100% of the total cost arising from patent analysis for each enterprise.
- Except for cases of full grants, the remaining amount (around 10%) is to be covered by the applicant.

1.4.4. Guide Map for Participating Entities

Table 24. Guide Map for Participating Entities (Patent Map)

Entity	Preparation	Program Process (Phase)						Follow-up Management
		1	2	3	4	5	6	
Public Institution	Design program	Select SMEs	Solicit service providers			Interim report	Assess completed report	Find out how well SMEs are utilizing results
Service Providing Entity	Prepare proposal		Apply for Program	Undertake patent search	Select patents to research	Conduct selective patent analysis	Complete, submit and present report	
SME		Apply for Program		Kickoff/ Provide Data		Interim meeting with service providing entity		Report on how well SMEs are exploiting results

- Guide Map for Participating Entities is a chart that allows a general overview of the entire process of the program from the program planning phase to follow-up management.

- The entire process is expected to take five months from the beginning to the end. However, changes to the schedule may occur due to multiple factors, such as the scope of the program, capabilities of the service providers, and costs involved.

- The chart summarizes the tasks the public institution[65], service providing entities[66], and SMEs should each perform at different phases of the process. More detailed information regarding each task can be found under *1.4.5 Detailed Guidelines for Participating Entities* below.

[65] Institution that operates and manages this program.
[66] Entities that provide create patent mapping service in this program.

1.4.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

1. Receive applications from interested SMEs
2. Assign patent mapping tasks to competent service providers
3. Ensure successful funding results through steady and stable program management
4. After the program is over, investigate how well the enterprises are exploiting the funded search results. Reflect on ways to improve the program

(1) Solicitation of SMEs

- A public institution receives applications from interested smaller businesses. After an application has been submitted, the institution conducts document evaluation and interviews to select enterprises that will receive the funding support.

  - The most important assessment criteria are how technologically competent and how promising the enterprise is in the relevant market sector so that the effects of the support program can be maximized.
  - Equally crucial, however, is whether the applicant has the adequate capabilities and infrastructure in order to fully exploit the benefits of the program. It is also essential that the CEO of the business shows engagement and enthusiasm because it is often the CEOs and executives who tend to make the most important decisions in smaller businesses.
  - While the public institution can look for the aforementioned aspects during the on-site inspection, it should also be ready to fact check documents in order to identify any false assertions by the applicant.

Note

- In its initial phase, there might be little interest in the program as smaller businesses tend to be less aware of the importance of intellectual property. Therefore, the public institution needs to put in promotion efforts early on. Highlighting why patent mapping is necessary and illustrating what achievements were made possible through the program might help garner interest. It might also be a good idea to utilize the networks of patent analysis organizations for advertising.

- Having a Project Manager (PM) with an extensive knowledge of particular technology fields and patent map analysis can help better manage analysis directions of service providers and improve the quality of analysis

- **[Submitting Documents]** After posting RFP announcements for the program, the public institution receives applications from SMEs in the required document format.

  - The RFP announcements should state the program objective and a summary of the program, followed by specific details that provide the necessary information to the applicants.

Example

[Example of Request for Proposal]

Ⅰ. Program Objective

Ⅱ. Program Summary
1. Program Title
2. Public Institution
3. Time Frame
4. Application Period
5. Eligibility Criteria
6. Budget

Ⅲ. Execution of the Program
1. Background
2. Contents of the Support
3. Scope and Scale of Funding Support

Ⅳ. Assessment Procedures and Selection Method
1. Implementation Schedule
2. Criteria for Selection

- **[Document Evaluation]** The public institution conducts a quantitative evaluation of the enterprise's capabilities that are illustrated in the utilization plan submitted by each enterprise, such as intellectual property capabilities.

  - Subsequently, the public institution should also check assertions made in the application and other attached documents by going through due diligence. It should also identify the enterprise's implementation plan and any special requests it might have.

Example

[Example of Utilization Plan]

Ⅰ. Introduction and Enterprise Profile
※ Major products, technologies, organizational structure and enterprise profile should be described in detail.

Ⅱ. Reason for Application and Why You Should Receive Support
※ Reasons for applying and why the applicant should be chosen for support should be described in detail.

Ⅲ. Company Visions and Intellectual Property Management
※ Visions the enterprise aspires to achieve through intellectual property management should be described in detail.

Ⅳ. Utilization Plan of the Support Program and Specific Implementation Strategies
※ Specific plans and strategies to be implemented in order to achieve intellectual property management should be described in detail.

※ Utilization plans of results gained through the program should be described in detail, with a focus on how they can enhance

- **[Presentation Assessment]** The public institution holds an evaluation committee in order to conduct a qualitative assessment on the SMEs' presentations. The committee evaluates each enterprise with a focus on the motivation, urgency of support and possibilities of support program utilization.

  - The evaluation committee should consist of technology, patent, market, and other various experts to bring diverse perspectives together and allow for a more balanced and objective assessment.

(2) Selection of Service Providing Entities

- After applications from SMEs have been submitted, the public institution solicits and selects service providing entities. Basically, service providing entities are selected through the same procedures used for SMEs – submission of application, document evaluation and presentation evaluation or interview.

  - Patent agencies or patent information research organizations qualify as service providing entities under this program. This is a crucial stage as the competency of service providing entities can ultimately determine how successful the program will be.
  - Selection of service providing entities follows similar procedures and formats as those for SMEs, as the selection processes are quite similar. Other formalities and requirements to be fulfilled are as follows.

Example

[Example of Proposal]

Ⅰ. Proposal Summary
  1. Objective of Proposal and Background
  2. Program Implementation Scope

Ⅱ. General Information about the Enterprise
  1. Enterprise Profile (history, organizational structure, sales)
  2. Major Activities/Programs and Achievements
  3. Distinct Features and Strengths of the Proposal

Ⅲ. Implementation Methods and Strategies for the Program
  1. Objectives and Implementation Directions of the Program
  2. Details of the Implementation Plan of the Program
  3. Implementation Structure of the Program
  4. Program Implementation Schedule
  5. Expected Outcomes

Ⅳ. Taskforce Profile
  1. Taskforce Manager
  2. Researchers

Note

- At the initial stage, the program may not be able to run smoothly if not enough capable service providers and analysis experts have applied. In such cases, the public institution can enhance the capabilities of service providers by taking the initiative – for example, by developing patent search methodologies and guidelines or by providing training programs to service providers.

- Institutions operating the program are recommended to design a patent analysis program tailored to the circumstances of each member economy by visiting member economies that have patent map support programs and benchmarking methodologies and guidelines already in use.

Example

Table 25. Assessment Criteria

Assessment Type			Criteria	Score
Total				100
Assessment of Technological Capabilities	Quantitative assessment	Researcher qualifications	Relevance of researcher credentials	2
			Expertise of researchers	3
		Services and capabilities	Achievements in similar service programs	3
			Revenue from similar service programs	2
	Qualitative assessment	Program implementation capabilities	Understanding of the program	10
			Thoroughness of preliminary search	10
			Task performing capabilities	20
			Strategy uniqueness	10
		Program management capabilities	Taskforce manager qualifications	15
			Follow-up management	5
Price Evaluation				20

(3) Keeping Schedule

- After service providers are selected, the support program officially starts. From this phase on, program management needs to take place using multiple methods.
  - Program management, specifically submission of progress reports, can occur both on and offline through multiple channels such as email, telephone, and face-to-face communication.

- **[Online Management]** Email and telephone are two major channels of online program management.

  - In general, emails are used for weekly reports. Email reports usually deal with issues coming up in the ongoing program, and have to be in a certain format and turned in every week.
  - Phone calls can be used as a complementary method when communication by email is not sufficient.

Note

- Having a Project Manager can help make sure that the actual outcomes of service providers match the quality they promised at the assessment phase. Project Managers with an extensive knowledge of particular technologies and patent map analysis can help better manage analysis directions of service providers and improve the quality of analysis results.

- **[Offline Management]** Offline management methods are used for the initial report, the interim report and the final report.

  - Initial reports report on the scope and the methodologies of program implementation determined through communication between search organizations and SMEs. They set the criteria for measuring how successful the program was afterward. If necessary, initial reports can be replaced by reports in the written form.
  - Interim reports are given while tasks are being performed. Interim reports usually take place upon the completion of the patent status analysis, and shows the progress and future directions.
  - Final reports come after every phase of the program is completed. It is recommended that final reports are given both in the written and face-to-face presentation form.

(4) Follow-Up Management

- The purpose of follow-up management is to find out whether research outcomes generated through the program are exploited fully, and if so, in what ways. Ideally, follow-up management takes place one to two years after the completion of the program.
  - Follow-up management not only contributes to development of each SME, but also plays as a key role in enabling continued improvement of the program by identifying issues that come up after the program is over.

- **[Utilization Check]** A utilization check is performed in order to find out whether the research outcomes of a program are reflected in the R&D endeavors of SMEs.
  - Even with the most excellent research outcomes, SMEs often have difficulties putting them to use due to a shortage of workforce and funds, which may be resolved if additional support is provided.

- **[Utilization Direction Check]** Utilization direction check is performed in order to find out the range and scope of program result utilization by each SME.
  - In the best cases, research outcomes are fully utilized and often serve as an essential step towards obtaining patent protection. Sometimes, they are also used as seeds for future R&D projects.
  - Utilization check can help evaluate whether the specific details of the program are relevant and effective. At the same time, it can also help assess the capabilities of each service providing entity.

2) Guidelines for Service Providing Entities

Key Activities

1. Prepare a proposal that fully illustrates an organization's strengths and capabilities
2. Establish the optimal scope of work and direction that maximizes the effect of utilization

- While accuracy of analysis and judgment of the invention is the key that will determine the success of the program, high quality results can only be guaranteed if the preliminary steps of establishing the optimal scope and directions for analysis are taken appropriately.

  - Building trust with the SME also plays a determining role in establishing the optimal scope and directions for analysis.

- **[Scope and Direction]** The scope and direction for analysis should be determined according to the characteristics and the development stage of each technology.

  - Generally, R&D projects undertaken by smaller businesses tend to cover relatively narrower fields. Keeping this in mind, the scope of analysis should not be either too broad or too narrow.
  - Furthermore, directions of analysis need to reflect the current level of development. It is a better choice to extract basic information and look at various sets of data when making decisions on a larger scale, e.g. when selecting R&D items. On the other hand, launching an in-depth analysis using specific information, rather than scanning all core patents67) in the field, will be better for overcoming certain R&D .

67) Patents that the new technology under development might infringe on, or bears much resemblance to.

(1) Technology-Focused Prior Art Search

Note

- While technology-focused prior art search might not be the optimal way to gain a general overview of technology trends, it can quickly and briefly provide the most up-to-date information and development trends in a particular core technology field.

- In general, prior art searches are performed from the patentability angle - in other words, the search attempts to find out whether a certain technology can be patented.

- This program, however, deals with a different kind of prior art search service that focuses on ‘technology’ rather than the usual patentability aspects. By focusing on technology, this kind of prior art search can benefit smaller enterprises that lack the data, resources, budget and time to prepare a patent map on their own.

- Prior art searches from the patentability angle compare an invention with the existing art, focusing on novelty and non-obviousness dimensions. In contrast, technology-focused prior art search is different in that it takes the characteristics of the new technology, looks at the development level of patented technologies already published, and ultimately analyzes the similarities and differences between the new invention and the existing art.

Example

[Comparison of Constituents]

	Constituent 1	Constituent 2	Relation
New Invention	Message Service Server	Message Creation App	A
Prior Art	O (Similar)	(Partly Similar)	

<Drawings>

Comparison with Similar Patents

[Technical Summary]

- Provides voice recorded message card services based on QR codes with Through Smartphone apps

[Constituent 1]

- (Claim 1, [0029])

- Management server for recorded messages that receive and save messages sent out from smart phones

[Constituent 2]

- (Summary, claim1, claim2, [0037])

- App that can save by matching recorded messages on QR codes

Table 26. Major Results of Prior Art Search

- The major results of prior art search above shows the results of the comparison between the technology being developed and similar prior art, through which the current level of development in the technology field and parts requiring further R&D can be identified.

- In addition, it also provides other existing technologies as references that may not bear much direct resemblance to the new technology but can potentially serve as seeds for additional R&D or R&D projects in other directions.

(2) Patent Status Analysis

Note

- Patent Status Analysis makes it easier for SMEs to understand current developments in each particular technology field relevant to their new inventions.

- Status analysis is to help understand the general trends in the technology field in question. Patent trends are analyzed by several standards including nationality, major applicants, and technological details.

- Such an analysis performed from multiple angles can help understand major recent developments surrounding a technology, and enables a comparative analysis of the R&D direction the SME is currently pursuing.

- One thing to be noted, however, is that the program is mainly targeted towards smaller enterprises with lacking infrastructure for such search. Therefore, the research undertaken in this program tends to be less of a highly advanced index analysis, and instead focuses more on helping SMEs get a brief and clear overview of general patent trends.

- Nonetheless, since the program deals with patent information analyses for smaller enterprises and not R&D projects on a larger, for example member economy, scale, it is essential to get the scope of the research right so that the results are to the point and can be exploited in practice.

Example

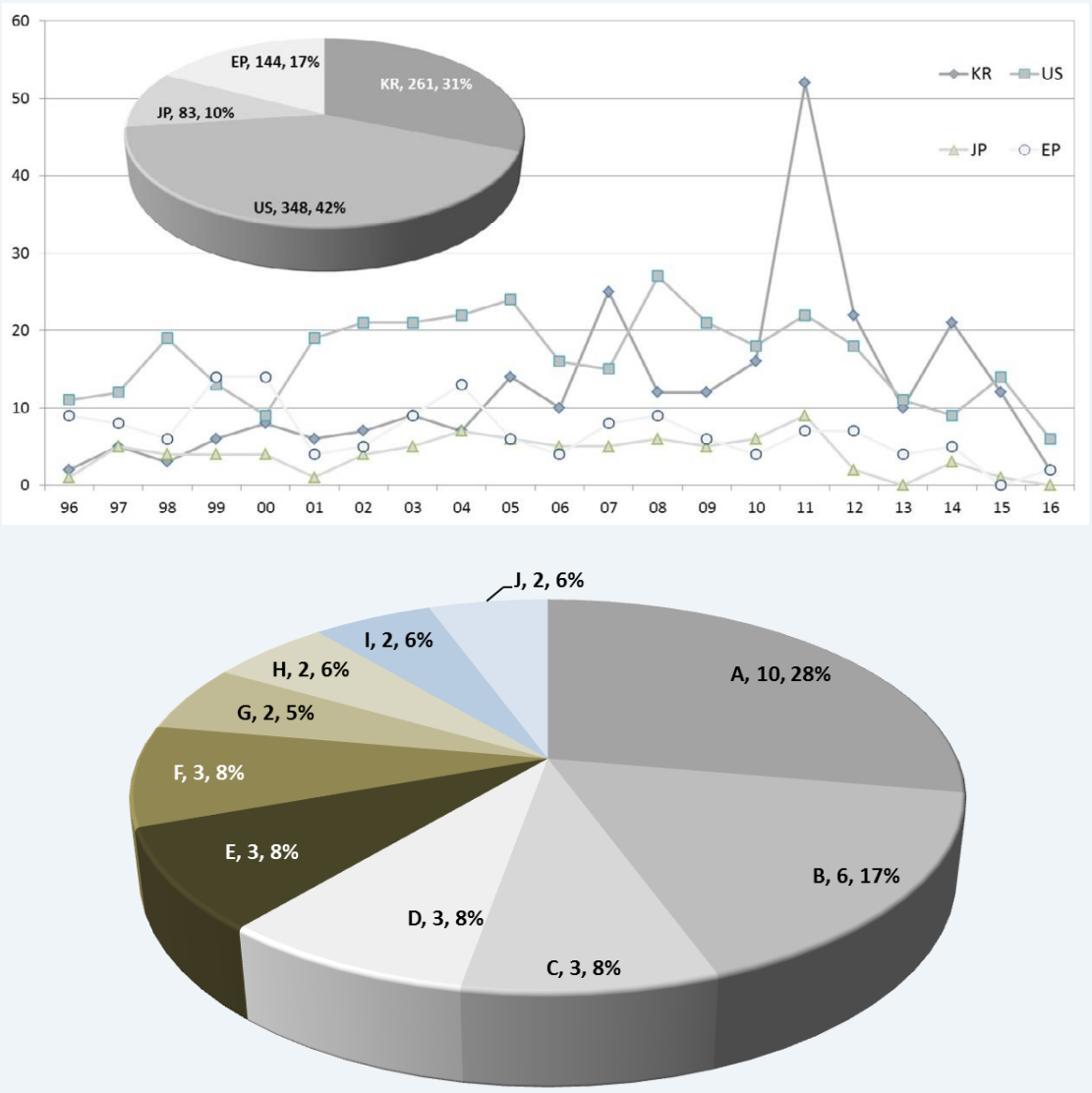


Figure 51. Results of Patent Status Analysis

(3) Technology Development Map Analysis

Note

- Technology Development Map Analysis diagnoses the degree and direction of technological development with the passing of time and predicts future developments.

- Technology development map analysis analyzes changes and developments of a certain technology field over time and enables SMEs to identify technological development trends.

- Normally, the year of application serves as the starting point, based on which time periods for analysis are set. Major patents[68] are selected for each time period, and their most significant technical characteristics are analyzed and presented.

- By integrating analysis results, researchers can diagnose the current stage and directions of technological development, and also predict where technological development will be headed in the future.

- The more diverse the technological details are, and the more patent applicants there are in the related field, the more obscure and complex technological development trends tend to appear. On the whole, however, technological development tends to follow the law of technological evolution. According to the law of technological evolution, the industry is mainly interested in enhancing the very basic functions in the initial stages of a new technology. At the intermediate stages, attention shifts to simplification of structures, cost reduction, improvement of user convenience and enhancing functions. Later on, these concerns are integrated into other various forms of technology that are applications of the original.

68) Primary prior art that is highly similar to the invention or invented by major assignees in a certain technology field

Example

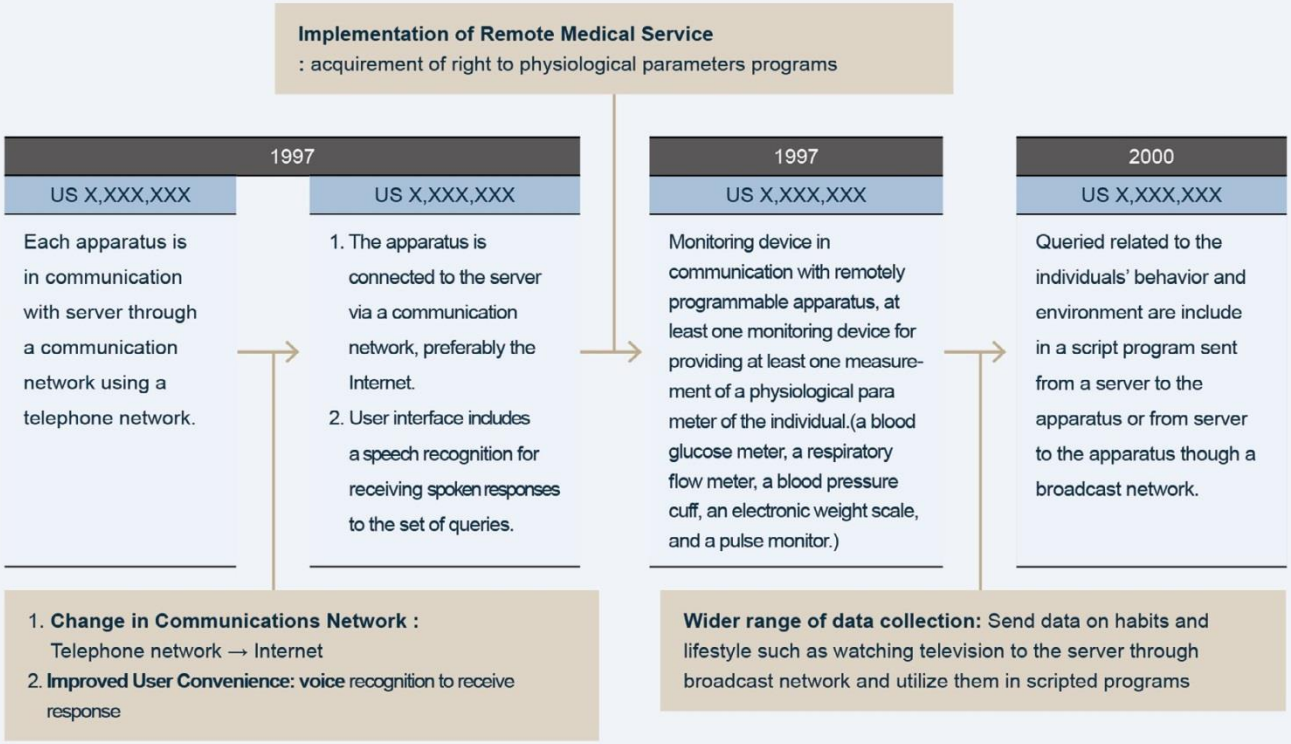


Figure 52. Example of Technology Development Map Analysis

(4) Competitor Analysis

Note

- Conducting patent analysis of major competitors allows enterprises to acquire information on the core technologies in the field, which can accelerate decision making for future R&D directions.

- Competitor analysis aims to analyze and understand R&D and patent strategies of competitors.

- Current status of patent applications, patent portfolio, and patents obtained by competitors are analyzed.

- Competitor analysis is usually about leaders of the field, whether from the patent perspective or the technology and market perspective. For smaller businesses, however, it can be more effective to look into competitors that are similar to them in company size, technology and business model, and who are actually in competition when it comes to bidding and delivery.

- Analysis of competitors and patent application status analyzes the basic framework of the businesses of competitors and related services and products, and then further analyzes the current state of patent applications in order to provide relevant strategies for obtaining patents.

Example

Information on General Patent Status of Competitors

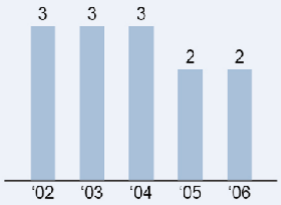
Products and Business	IP Status and Strategy
Products	
In-home medical equipment for ailments, for example cerebral stroke, that can treat scotoma and other symptoms	
Business	Growing business overseas using IP
- Delivery of …… based on doctor prescription -Generation of monthly profits from medical treatment services	-Number of applications filed in major economies for three technologies was … -Status of overseas expansion/entry into domestic market - …has X registered patents in…

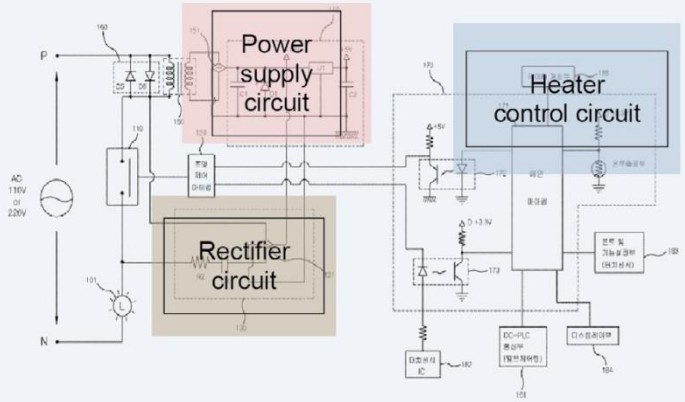
Figure 53. Patent Status Analysis

- Analysis of competitors and patent application status illustrated above helps gain a comprehensive understanding of major businesses and the current state of patents of competitors.
- The analysis can provide information on what concerns there might be and what patent strategies the competitors might have by helping understand the products and the business models of the competitors and comparing them to the current state of patents they have obtained.
- Patent portfolio analysis presents the current state of patents competitors hold in the fields of each technological detail relevant to the technology the applicant is trying to develop.
- This can shed light on which fields competitors are concentrating on, and what directions they are opting for their R&D projects.
- Patent portfolio analysis results are about each essential technology constituting the new technology developed by the applicant and provides information about the relevant patents competitors might have.
- By looking at the analysis results, SMEs will be able to understand technologies required for application of the technology. In addition, patent strategy analysis will help identify R&D directions of competitors.
- Competitor patent analysis analyzes the technical details and the scope of claims of the competitors' patents in order to help gain a deeper understanding of the patents competitors have.
- A comparative research of relevant patents can provide effective information that will be highly useful for R&D of SMEs.

Example

Title of Invention	**Integrated Controller for Lighting and Heating**		
Assignee	Corporation XXXXXXX		
Application Number (Filing Date)	KR0000-0000000 (0000.00.00)	istration Number (Registration Date)	KR0,000,000 (0000,00,00)

Assembly Drawing



Description

ectifier Circuit : … supplies to each circuit… through the connection to AC power supply…

Patent Status

■ Legal Status : Registered

■ Scope of Claims

- Relay which controls on/off of power supplied by lighting load
- Lighting controller Mycom which is connected to heater control circuit and controls the movements of the relay according to on/off input of power of the lighting load power source
- Rectificer circuit which provides full wave rectification to power supplied to lighting load when lighting load is off
- Power supply circuit which converts the full wave rectified voltage into primary voltage and supplies it to the relay, and converts the primary voltage into secondary voltage to supply it to the light controller Mycom

■ Utilization Plan (Overall Review and Assessment)

- should be reviewed if rectifier circuit structure… connected to AC supply is to be used

Figure 54. Competitor Patent Analysis Result

- Results of competitor patent analysis show an analysis of patents obtained by competitors from technology and patent right perspectives.
- First, technological characteristics of the invention are presented, followed by an analysis of the structure of claims built in order to obtain patent protection.
- Subsequently, review and assessment from patent experts on the patent are provided that can be utilized in R&D projects of SMEs.

3) Guidelines for SMEs

Key Activities

1. Express specific business needs and provide detailed technical and company data to service providers
2. Engage in active feedback giving process with the search organizations to get their message across.

- Service providers will often be comprised of researchers with diverse areas of expertise, although to varying degrees depending on their size and characteristics.

  - This, however, does not guarantee that they can immediately cover every technology field requested by the SMEs. More than often, service providers will have to perform analysis tasks while studying and learning about the field themselves at the same time.
  - Even with similar technology fields, SMEs are often in different positions in the market due to differing capabilities and strategies. That is why providing strategies tailored to the needs of each SME is crucial.
  - Therefore, the service provider as a patent expert and SMEs as technology experts engaging themselves, bringing in knowledge in diverse fields and cooperating with each other will be essential for a successful implementation of the program.

- **[Provide Specific Information]** The more specific the information SMEs provide, the more tangible results search organizations can yield.

  - R&D projects require different kinds of information depending on which stage they are in, be it planning, implementation, or completion stage. Consequently, search organizations will be able to provide more in-depth results when SMEs can provide more details, for example, regarding the scope of analysis and information exploitation plans.

- **[Active Feedback]** The more SMEs engage in and share their views with their counterparts during the program, the better the quality of results will be.

  - Giving feedback during the program helps service providers orient their analysis directions, which can eventually help yield results that are relevant and in line with the R&D directions of each SME.

1.4.6. Program Tips

1) Program Tips for Public Institutions

- The public institution plays a highly important role in the program, both as the supervisor of the program and mediator between SMEs and service providers.

  - The public institution contacts and manages the activities of the persons in charge at SMEs and service providers in a responsible way.
  - As decisions are often delayed and reversed by SMEs during the program, it is very important that an employee capable of making decisions at the public institution is part of the program.
  - The public institution should pay attention to problems that might not be addressed in online reports or are not directly related to the program by communicating with persons in charge and decision makers regularly.

- In the initial stage, SMEs might not know how the program can help. That is why the public institution needs to raise awareness by advertising the program and providing training. One of the ways to promote the program is to utilize the service provider network.

- Generally, different types of service providing entities have different strengths. Patent information companies are the better choice when it comes to analyzing competitors using patent information and giving advice on R&D directions, whereas patent agencies can provide a more in-depth analysis of each individual patent, including analysis of patent rights. Therefore, different service providers should be assigned to SMEs depending on what issues each SME has to deal with.

- Patent analysis programs and systems should also be in place in order for the program to run smoothly. Establishing patent analysis infrastructure can provide further momentum to the program.

- Analysis results deriving from Patent Map Program should be protected as confidential as they include sensitive information of the enterprise such as information on the current state of the enterprise, solutions, and business plans.

2) Program Tips for Service Providing Entities

- Building trust, though it may not be apparent on the surface, is the key to success of support programs in general.

  - SMEs may understandably hesitate to openly share their R&D data with the service provider. Sometimes, SMEs will not articulate the specific details of such information in the initial stages unless there is some trust built between them and the service provider
  - Furthermore, most SMEs do not have experience with patent map programs, and consequently, often do not know what information they should provide in what ways.
  - In order to build trust with SMEs, it is recommended to break the ice and build trust from the start by engaging in multiple meetings. It is also necessary that service providers play the role of the patent professional by providing the right information and opinions at the right time.

- Service providers should be aware of the fact that the final outcomes of the program and other ensuing information might fall under the category of trade secrets. They are bound by the non-disclosure duties with regards to SMEs' trade secrets, and the rights to final outcomes of the program and intellectual property belong to the SMEs.

3) Program Tips for SMEs

- Sometimes, SMEs will not have the capabilities to effectively respond to requests from service providing entities such as providing information and reviewing contents due to lack of internal infrastructure and capacities.

- As this can compromise the quality of the work, SMEs need to communicate with an attentive and responsive attitude. If certain circumstances render this difficult, discussions with the public institution and service providers to resolve the problems at hand need to take place.

- Co-work between SMEs as technology experts and service providers as patent experts is essential.

  - As service providers, by characteristic, tend to have an all-around knowledge in many fields rather than full expertise in one technology field, they will often lack the depth of technological knowledge that SMEs have. This calls for close cooperation between service providers and SMEs since integrating technological and patent related knowledge will be key to getting quality results.

1.5. Client-Specific Patent Map

1.5.1. Program Overview

This program provides a thorough map-like analysis of patent information that allows for a general overview of technological developments and trends, which SMEs can utilize in establishing their R&D and technological development directions.

- SMEs often do not have the human resources or intellectual property infrastructure for examining and analyzing the vast mine of information on patents and patent conflicts. Therefore, patent landscape analysis the program provides should be tailored to the needs of SMEs so that they can fully exploit the knowledge in practice.

- The goal of Client-Specific Patent Map Program is building IP infrastructure that SMEs can exploit to establish an R&D system and better utilize technologies they have developed. At the same time, information on a client-specific patent map will provide R&D directions that will enable small businesses to commercialize their patents.

- Service providers[69] should present directions for technological development and patent acquirement based on R&D analysis. They should also help SMEs fully utilize analysis results in establishing patent commercialization strategies, thereby building a system that encourages utilization of patent information by SMEs for commercialization purposes.

- The client-specific patent map helps SMEs transfer their patents for fair prices befitting the degree of technological sophistication, marketability, and business potential of the technology, and generate a new source of revenue.

- While Client-Specific Patent Map Program and Patent Map Program in the earlier pages both provide patent mapping services, the former is an upgraded version of the latter. Patent Map Program analyzes patents relevant to the SME's technology by multiple categories including economy, assignee, time period, and technology elements. Client-Specific Patent Map is a more refined service specifically catering to needs of each SME and offers a range of expert services to choose from, including R&D strategies, problem solutions and commercialization strategies.

69) Entities that offer client-specific patent mapping services in this program.

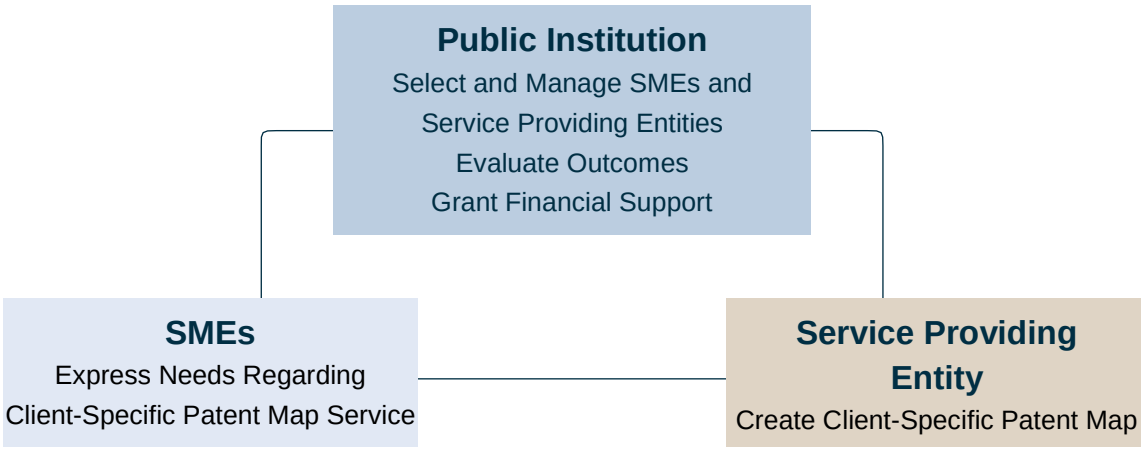


Figure 55. Program Framework (Client-Specific Patent Map)

1.5.2. Similar Programs of APEC Members

1) Support for Analyzing and Utilizing Patent Information (Japan)

- Commissioned by Japan Patent Office, Japan Institute for Promoting Invention and Innovation operates the program.
- The goal of the patent map program is to help SMEs' IP activities such as establishing R&D strategies and making patent-related decisions by providing different kinds of comprehensive patent information analysis at the R&D, application, and request for examination stages.
- Japanese government grants full expenditure coverage up to a certain amount as patent related costs can be a burden to SMEs.
- Patent map program in Japan provides information and analysis needed in the two important stages of R&D and patent application.
- At the R&D stage, the program sets R&D directions, prevents duplicated research efforts and evaluates the possibilities for new business opportunities.
- At the application stage, the program assesses the likelihood of obtaining patent protection, helps make stronger patents out of the technology, establishes open/close strategies and identifies potential infringement issues on patents of other companies.
- SMEs, sole traders, public research organizations and universities can apply.
- The program grants financial support of up to 1 million JPY.

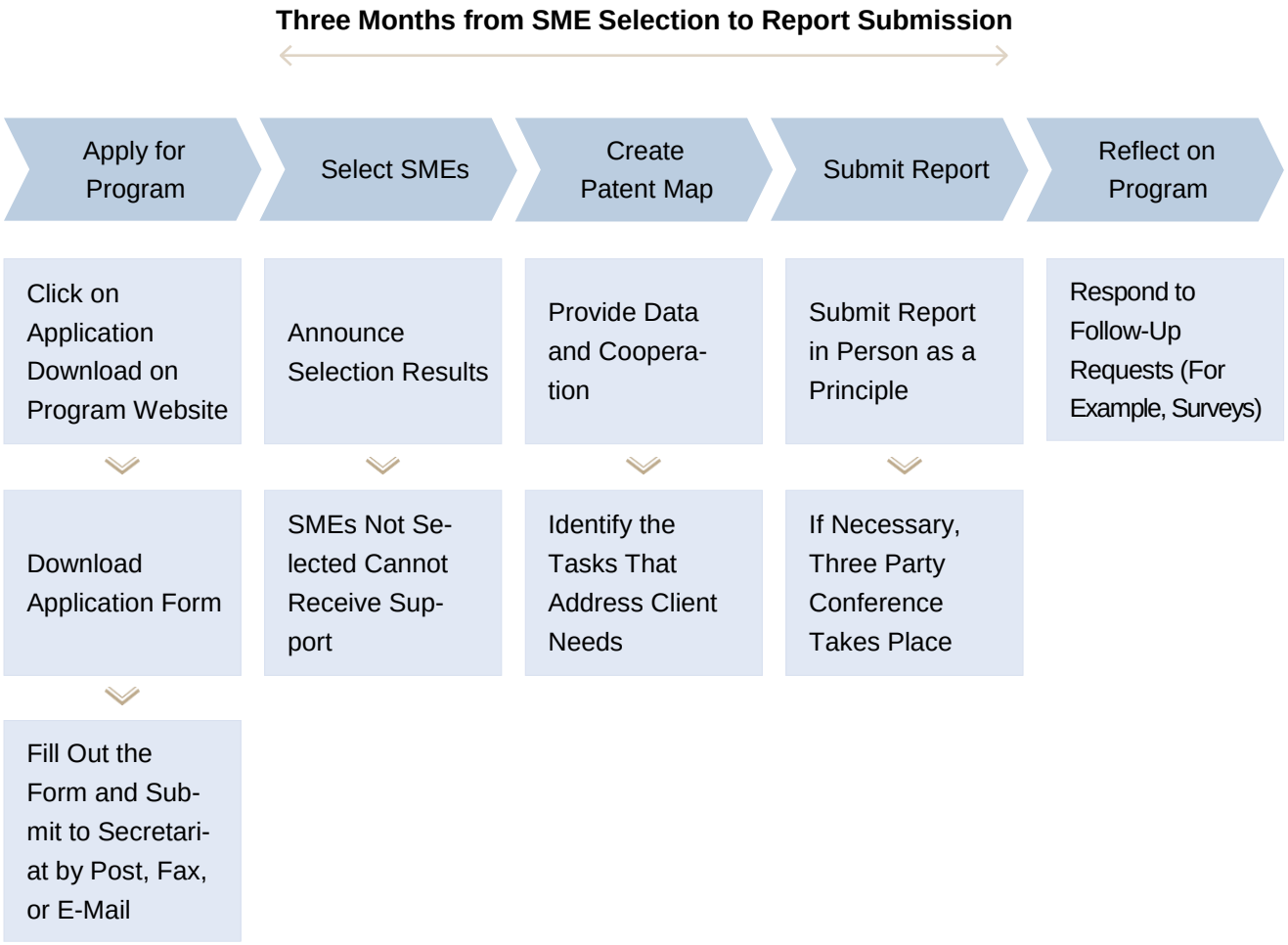


Figure 56. Support for Analyzing and Utilizing Patent Information (Japan)
(Source: https://ip-bunseki.go.jp/topNaviColumn_01/useofflow.html)
(Source: https://ip-bunseki.go.jp/)

1.5.3. Procedures and Details of the Program

1) Target of Support

- Main targets of the program are SMEs that need solutions to patent related issues, for example, monetizing technologies and establishing a patent network, in pursuing R&D and patent commercialization.

- Applicants must meet certain requirements in order to guarantee that support actually goes to SMEs that have real patent issues and need solutions. For example, the program can give priority to enterprises with more than three patent applications filed during the last three years, or those that have one patent or more that were registered during the same period.

2) Program Process

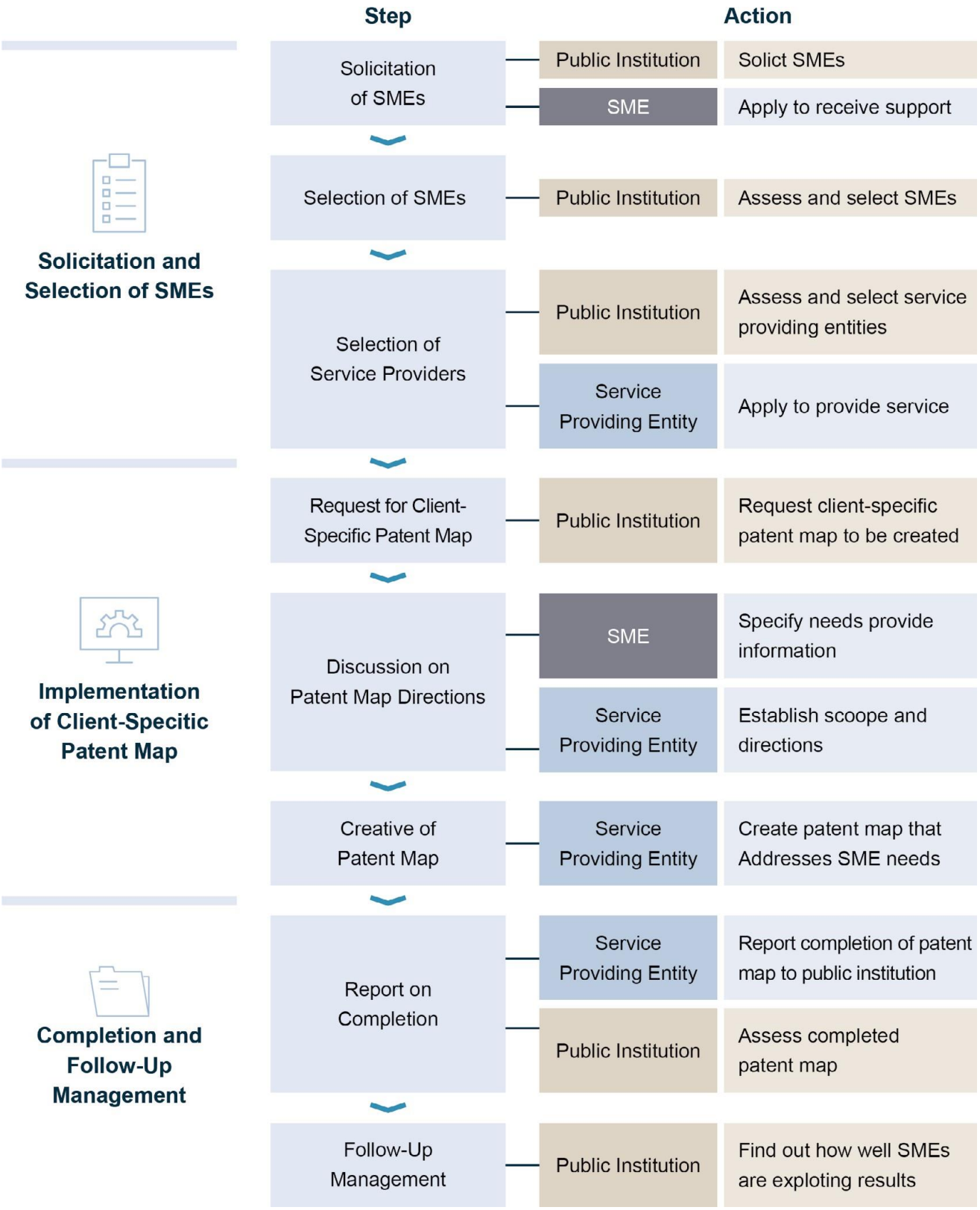


Figure 57. Program Process (Client-Specific Patent Map)

3) Scope and Conditions of Support

- The program produces and provides client-specific patent map reports with patent solutions that address the issues and concerns particular to each SME.

- The program provides client-specific patent map reports by using both common modules with which a patent landscape analysis is produced, and elective modules, which help establish specific utilization strategies SMEs need. Modules are described in detail in the following table.

Note

Table 27. Table of Principal Consulting Modules

Module type	Description	Selection	
		Applicable	N/A
Preliminary Training	(1) IP and IP management	**Mandatory**	
	(2) Introduction to program and scope of work		
Common Modules	(1) Background and purpose of analysis (2) Outline and issues of SME technologies (3) Scope and criteria of patent analysis (4) Patent landscape (from the statistical perspective)	**Mandatory**	
Elective Modules	(5) Establishing R&D strategies	**Optional (Choose two to four)**	
	(6) Technology problem-solving strategies		
	(7) Establishing exploitation strategies of SME IP rights		
	(8) Analysis of technology development of competitors		
	(9) Establishing global technology commercialization strategies		
	(10) Strategic technology transfer_ Technology provider module		
	(11) Strategic technology transfer_ Buyer module		
	* Elective Modules are flexible in the sense that new modules can be created or existing modules modified to meet the specific needs of SMEs.		
Common Modules	(13) Overall review and assessment (14) Attached data (patent application abstract list of major patents)	**Mandatory**	

1.5.4. Guide Map for Participating Entities

Table 28. Guide Map for Participating Entities (Client-Specific Patent Map)

Entity	Pre paration	Program Process (Phase)							Follow -Up Manag ement
		1	2	3	4	5	6	7	8
Public Institution	Design program	Select SME	Select service providers	Manage and operate program		Interim report	Manage and operate program	Final report	Reflect on the effec tiveness of the program
Service Providing Entity			Apply for program	Discuss SME needs and imple mentation direction	Create patent map	Interim report	Create patent map	Final report	
SME		Apply for program		Work and engage with service providing entity			Work and engage with service provider	Receive final outcomes	Exploit outcomes

- A Guide Map for Participating Entities is a chart that gives a general overview of the whole process from the designing stage to follow-up management.
- The timeframe for implementing the program is five months, which is subject to change depending on the scope of support, budget, and capabilities of patent map providers.
- The Guide Map for Participating Entities gives a task summary for the public institution[70], service providers, and SMEs at varying stages throughout the program. Principal tasks of each entity are described in further detail in the *1.5.5 Detailed Guidelines for Participating Entities below.*

[70] Public organization, for example a governmental organization, in charge of running and managing this program

1.5.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Select SMEs that need solutions for patent issues and patent map providers with the right expertise
2. Designate a PM (Project Manager) to run and operate the program to ensure the program turns out successful

(1) Selection of SMEs

- The public institution selects SMEs facing technology and patent-related problems, giving priority to businesses that have difficulties coming up with solutions on their own.

- Announcements can be posted on the website of the public institution for a certain period of time to notify potential applicants of the program. The announcements may request SMEs to submit management status, technology development status, patent related difficulties, and requests for consulting when applying.

- Based on the applications, the public institution selects suitable SMEs that meet the requirements.

Note

- Applications and other documents submitted by SMEs in the application stage, and evaluation thereof, should remain classified in order to protect essential technology information of the SMEs.

- If necessary, a selection committee of experts can be organized to evaluate SMEs. It is also possible to ask SMEs to give presentations and engage in a Q&A session to overcome the limitations of assessing only on the grounds of the submitted documents.

(2) Selection of Service Providing Entities

- **[Program Announcement]** Program announcement should stipulate the title, background, purpose, timeframe, price, and scope of work of the program in order to give service providers a good idea of what the program is about, so that they can organize a task team that suits the purpose and scope of work[71] of this program and apply with an adequately written program implementation plan.

[71] Scope of tasks that should be performed in a program

Example

<Example of Program Announcement>

- **Program Title:** Client-Specific Patent Map for SMEs

- **Background:** With growing awareness for intellectual property, SMEs need guidelines throughout the different phases of technology commercialization from R&D planning to monetization to make wise decisions. The guidelines should also provide high quality information that SMEs can exploit in practice.

- **Purpose:** The program aims to contribute to strategic management and operation by providing patent diagnosis/analysis and establishing business strategies. More specifically, the program is tailored to the IP concerns and needs of SMEs in order to build a firm system of core and source technologies and establish a multifaceted infrastructure for utilizing patent information. It also aims to give R&D directions, provide patent road maps and encourage patent commercialization.

- **Timeframe:** Five months from the date of which service providers are selected.

- **Range of Research**

- Economies: China; Europe; Japan; Korea; United States and other economies
- Literature: Patent literature, academic and business-related literature in major economies

- **Scope of Work**

- Help build SME establish technology infrastructure and commercialize technologies
- Matching between technology providers and buyers based on qualitative assessment on analysis objects (SME status, technology development status, market and competitor trends, patents owned by SME, relevant patent trends, degree of technological sophistication) and a comprehensive assessment of technology commercialization environment (assessment of technological degree and marketability)

- **Program Implementation Method**s

- Data collection: literature search, field inspection, interview and case analysis
- Analysis of industry policies of central and regional governments and exchange of ideas on how to make connections
- Steady communication with the person in charge in the public institution

- **[Scope of Work of Client-Specific Patent Map Program]** While client-specific patent maps can provide R&D directions and analysis of competitors to SMEs, they can also address management and IP-related concerns and issues. Each service provider should perform tailored consulting services according to the various needs of each individual SME.

- At the same time, the public institution has to set the scope of work to ensure effectiveness. Therefore, it is a good idea to categorize services into common modules that are mandatory for all SMEs and elective modules SMEs can choose from (please refer to Scope and Conditions of Support for principal consulting modules). Common modules and elective modules adopt quantitative and qualitative assessment methods respectively. Elective modules are what make client-specific patent maps unique. Elective modules can encompass any of the following subjects: R&D and IP utilization strategies, technology transaction and commercialization. The list above, however, is not exhaustive as there is no need to limit the services of patent map service providers to only those mentioned in the table.

- **[Selection of Service Providing Entities]** Public institution selects service providers capable of providing solutions tailored to the needs of SMEs that help them overcome patent-related difficulties SMEs face.

- In order to assess the capabilities of service providers, the public institution gives information on current issues, difficulties and technologies an SME has (that are safe enough for disclosure) and asks them to present adequate patent map directions based on the data in the proposal or in the plan to be submitted.

- Providers selected through the primary document evaluation are asked to give a presentation in the follow-up interview. Primary document evaluation checks whether they have the qualifications to provide service in this program, especially whether the service provider has performed similar tasks in the past and has patent analysis experts in the related technology field.

- Presentations are evaluated in both qualitative and quantitative ways. Qualitative evaluation is used for tasks and implementation strategies. Quantitative evaluation, on the other hand, is used for task capabilities and credentials. Scores from both methods are calculated together at the end to select entities that will provide patent mapping service. Below are the specific details of qualitative and quantitative evaluation.

Note

- It is recommendable to select service providers that have a solid understanding of the program, good communication skills, and capabilities to provide the most effective solutions to pending issues SMEs have.

- The public institution should pay attention so that management secrets, trade secrets and undisclosed technology are not disclosed by the program announcement. It is recommended to describe such information only in broad classifications and general terms (for example, ‘recharging technology for mobile devices’, ‘establish R&D directions’)

- As service providers will have access to internal business information of SMEs, they must be able to keep such information confidential at all times, preferably by signing a nondisclosure agreement.

Example

Table 29. Elements of Qualitative and Quantitative Evaluation

Classification	Evaluation Criteria	Details		
		Description	Weight	Score
Qualitative Evaluation	Task Performance	■ Data Collecting Abilities and Understanding of the Program - Understanding of Program Objectives and Goals - Knowledge of Technology Trends and Relevant Policies	10	
		■ Relevance of Analysis Scope and Subject - Relevance of Scope and Subject - Concrete Plans to Acquire Data for Analysis	15	
		■ Relevance of Analysis Contents - Effective Methodology for Each Module - Relevance of Analysis Subject Suggestions and Rationale	20	
	Implementation Strategies	■ Clear and Specific Structure for Program Implementation	15	
		■ Relevant and Valid Program Implementation Methods		
		■ Clear and Adequate Implementation Schedule of Each Stage	5	
		■ Information Collection and Analysis Plans	10	
		■ Future Outlook (Technology and Market Trends)		
Quantitative Evaluation	Experience and Capabilities	■ Experience and Credentials of Taskforce Manager	5	
		■ Experience and Credentials of Taskforce Researcher	5	
		■ Achievements in Similar Programs	5	
	Accessibility	■ Additional Points	5	

(3) Program Management and Operation

- **[Regular Meetings]** It is recommended that the public institution arranges regular meetings at which service providers can report the can report the needs and overall progress of the SMEs throughout the program. The regular meetings should be held offline around once every month, which translates into five meetings for a program with a five-month timeframe. Recommended schedules and agendas for such meetings are suggested in the table below. It is recommended to put a PM (Project Manager) at the public institution in charge of the regular meetings.

Example

<Schedule and Purpose of Regular Meetings>

- **Kick-off meeting**
  - When: After selection of patent map providers, as they are about to initiate program implementation
  - Purpose: Identify SME needs, discuss consulting directions
- **Second and third meeting**
  - When: Before interim reporting
  - Purpose: Report on progress, discuss consulting directions
- **Fourth and fifth meeting**
  - When: Before final reporting
  - Purpose: Report on progress, Report final outcomes and receive confirmation (check complementary revisions if necessary)

Note

- Having a Project Manager can help make sure that the actual outcomes of match the quality each service provider promised at the assessment phase. Project Managers with an extensive knowledge of particular technology fields and client-specific patent map analysis can help better manage directions and improve the quality of analysis results.

- The public institution should arrange regular meetings in a way that enables selected SMEs to make concrete requests on program outcomes. Failure to confirm SME needs and establish consulting directions through a mutual agreement in the early stages of the program may hinder task performance of service providers and eventually lead to SMEs' dissatisfaction with the program.

- In addition, the public institution should notify service providers and SMEs of program information and guidelines at regular meetings. Program information and guidelines include the scope of work, confidentiality compliance rules, and interim/final reports.

- **[Interim Report]** Interim reporting takes place halfway through the program in order for the public institution to check whether consulting services from the service providers are properly addressing the needs of SMEs receiving client-specific patent map support. Meetings for interim reporting enable the public institution to accurately evaluate whether the providers are providing quality consulting services. Although interim reporting meetings can be replaced by online reports, offline meetings are the better option. It is also a possibility to form an evaluation committee of internal and external experts to provide evaluation during meetings for interim reporting.

Note

- Items to be reviewed during the meeting should be submitted in advance in a standard report or presentation material format. Also, there should be a document length limit to make sure issues are effectively covered within given time.

- If necessary, the public institution should give feedback and suggestions for improvement to the service providers and SMEs so that outcomes to be reported at the final reporting can reflect the due changes.

- **[Final Report]** Final outcomes are evaluated with a focus on major issues identified during interim reporting and improvements on these issues. Public institution examines whether client-specific patent map reports provided meet the needs of SMEs, preferably through a final meeting for interim reporting rather than an online report. In cases where room for improvement is identified, the public institution can request final changes to be made by the providers after reviewing the outcomes of the program.

Note

- The public institution should put suggestions for improvement as separate items in the final report or presentation file for the efficiency of the review process.

- It is also recommended that public institution articulates the deadline and method for submitting written reports on improvement in order to make sure that necessary changes are actually made to the final report.

(4) Follow-Up Management

- **[Program Evaluation]** Opinions of the public institution, service providers, and SMEs on the program can be gathered in order to improve the program. Based on the amassed opinions, the public institution can evaluate how well the program was executed and incorporate the feedback to improve the next program. (PDCA* perspective)

- *PDCA: PLAN > DO > CHECK > ACT

2) Guidelines for Service Providing Entities

Key Activities

1. Identify needs of the SMEs and discuss consulting directions in order to provide solutions to IP related issues SMEs are facing

2. Select analysis modules that address the concerns of the SMEs, and discuss consulting directions and final outcomes by communicating with the SMEs regularly

(1) Apply for Program

- Upon reviewing the program announcement, service providers should submit a proposal based on the scope and requirements of the program.

- A proposal should be detailed and should focus on past achievements in similar programs, expertise of the task team, and program implementation strategies. Presentation materials should also be prepared in a way that can well convey the patent map service provider's capabilities to perform tasks required in the program.

(2) Identification of Needs and Discussion of Consulting Direction

- Service providing entities should visit the selected SMEs to discuss technologies SMEs own, IP related issues and concerns, potential fields where final outcomes can be utilized and other related topics in a meeting.

Note

- Service providers should have a clear understanding of what kind of outcomes the SMEs need, and should clearly state the outcomes and scope of consulting services that they are capable of delivering during the program.

- SMEs tend to be very rarely open and direct about the technologies they own, the current company status, and their current concerns from the first encounter. Service providers need to be aware of this and come up with plans to deepen the trust between them and the SMEs. Arranging extra meetings aside from regular ones, or communicating frequently online with the SMEs to familiarize with one another can help enhance the trust.

- As making changes to the consulting directions at the later phase of the program is difficult, it is a better idea to establish them based on the most urgent issues that need to be resolved quickly.

- Service providers can provide effective consulting service by generating conference proceedings from the results of the discussion with the SMEs and using them to confirm details with the SMEs during consulting.

(3) Creation of Client-Specific Patent Map

- **[Process of Creating Client-Specific Patent Map]** Creation of client-specific patent maps normally follows the process described below. Service providers can make necessary changes to the process to meet the specific needs of the SMEs.

- ①Service providers establish implementation directions and plans based on the discussions with the SMEs. The process can run smoothly only when clear plans are established in advance.

- ②Patent information research is a search conducted on relevant patents within a certain scope (technology field, economy) based on the implementation directions.

- ③Valid patents (patents that bear relevance to the technology as the subject of analysis) are deduced from the researched patent population (patents identified by searching with search formulas) and quantitative analysis (statistical analysis) is conducted on the patents.

- ④Select methodology for qualitative analysis and select patents to be analyzed.

- ⑤Analyze and present the final outcomes.

Example

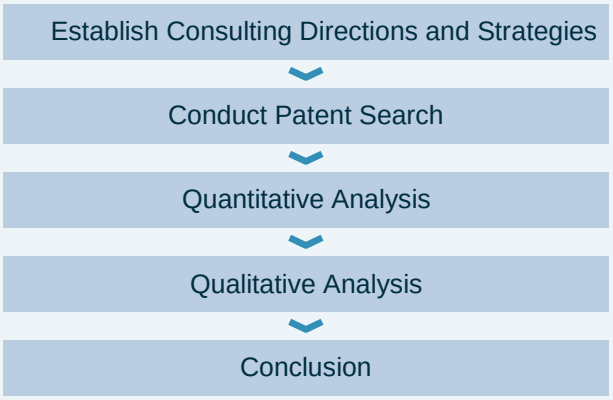


Figure 58. Process of Creating Client-Specific Patent Map

- The diagram illustrates patent information analysis methodologies developed by Japan Patent Office (JPO). While details of each process may vary depending on the purpose of analysis, the outlines of quantitative and qualitative analysis can serve as useful references.

Example

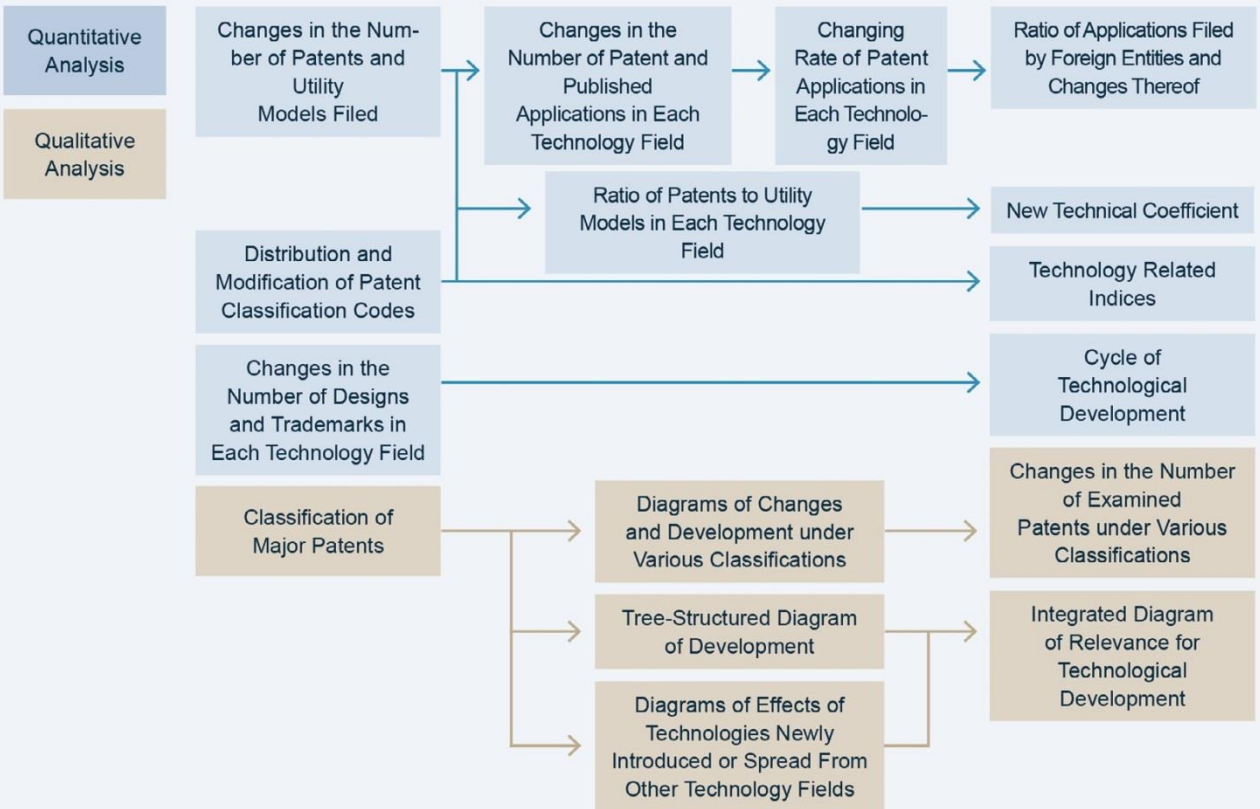


Figure 59. Quantitative and Qualitative Analysis Methods in Japan

- **[Items and Contents of Client-Specific Patent Map Report]** Service providers should make client-specific patent map reports easy for SMEs to exploit. A client-specific patent map report usually includes the following elements.

Example

<Example of Table of Contents of Report>

Chapter 1. Background and Purpose of Analysis
Chapter 2. Technical Outline and Needs
Chapter 3. Quantitative Analysis
Chapter 4. Qualitative Analysis
Chapter 5. Overall Review and Assessment

- **[Background and Purpose of Analysis]** Chapter 1. Background and Purpose of Analysis should inform SMEs of the purpose and the necessity of client-specific patent maps in order to enhance understanding and raise awareness.

- **[Technical Outline and Needs]** Chapter 2. Technical Outline and Needs should provide a clear description of the technology to be analyzed so that users of the report can understand the technology well. Research scope of client-specific patent maps is also delineated in this chapter. Chapter 2 also provides information on the technologies owned, the legal status of the technologies owned, specific technical information of the technology, trends in the technology field and other issues in order to enhance understanding of the implementation directions of client-specific patent maps. Furthermore, this chapter suggests the right implementation strategies that can address the needs of the SMEs in order to prepare the reader for information in the later chapters.

- **[Quantitative Analysis]** Chapter 3. Quantitative Analysis articulates the patent analysis scope and criteria, which include technology tree (specific technology elements of the technology of interest), search formulas, the number of valid patents and validity criteria, and the economy to be analyzed. Service providers also produce results of quantitative analysis by using the valid patents they researched. Quantitative analysis is conducted to analyze the developments and trends in the numbers of the researched valid patents, whose results are later visualized in the form of graphs or tables. Different kinds of quantitative analysis, patent trends by economy, assignee, and technology elements

Example

<Example of Quantitative Analysis: Table of Contents>

Chapter 3. Quantitative Analysis
1. Patent Filing Trends in Area X
(1) Overall Patent Filing Trends
(2) Patent Filing Trends by Economy
(3) Patent Filing Trends by Major Assignee

2. Patent Filing Trends per Technology Element
(1) Overall Patent Filing Trends per Technology
(2) Patent Filing Trends per Technology Element A1
(3) Patent Filing Trends per Technology Element A2

3. Patent Activities by Major Assignees per Technology Element
(1) Patent Activities of Major Assignee B1
(2) Patent Activities of Major Assignee B2
(3) Patent Activities of Major Assignee BY

4. Implications

- 1. Patent Filing Trends in Area X provides an analysis of overall patent filing trends and patent activities by economy and major assignees at a broader level.
- 2. Patent Filing Trends per Technology Element provides an analysis of overall patent filing trends and patent activities by major assignees at a more specific level.
- 3. Patent Activities by Major Assignees per Technology Element provides an analysis of nationalities (location) of major assignees, recent patent activities per field of technology element, and an outline of major patents owned by the assignees.
- 4. Implications provide a conclusion on issues of patent, R&D and competitive strategies based on the results of quantitative analysis.

- **[Qualitative Analysis]** As mentioned above, elective modules that can address the needs of SMEs are selected for qualitative analysis. The following is a sample analysis using elective modules R&D Strategies, Analysis of Technology Development of Competitors, and Global Technology Commercialization Strategies.

- The first module R&D Strategies analyzes development stages of specific elements in a particular technology and technology trends of leaders in the field, which will serve as basic data in establishing R&D goals and directions and mid to long term patent and technology strategies.

- 1. Technology Development Flowchart in Area X analyzes flowcharts at the level of specific technology elements and creates a visualization of trends in each technology element by using graphs and tables.

- 2. Analysis of Technologies Owned by Leading Company A analyzes the current IP portfolio of the SME in relation to the current and future business directions. Portfolio strengths and weakness along with IP capabilities are analyzed, and strategies for obtaining IP rights are provided.

- 3. Seed Technologies and Identification of Problem-Solving Technologies identifies seed technologies that can suggest strategic directions for designing R&D activities for the preparation of a new business or product, and problem solving technologies that can resolve difficulties arising from internal R&D efforts.

- 4. R&D Strategy Suggestions provides suggestions on directions for internal R&D endeavors and an introduction of external technologies by looking at technology development flowcharts, R&D trends of major players, R&D and IP capabilities of the SME, and industry convergence and taking seed technologies and potential problem-solving technologies into account.

Example

<Example of R&D Strategies for Technology X>

Chapter A. R&D Strategies for Technology X
1. Technology Development Flowchart in Area X
(1) Technology Development Flowchart for Technology Element A1
(2) Technology Development Flowchart for Technology Element A2
(3) Technology Development Flowchart for Technology Element A3

2. Analysis of Technologies Owned by Leading Company A (companies to be analyzed in separate sections)
(1) Patent Status of Leaders
(2) IP Portfolio
(3) Portfolio Strengths and Weaknesses

3. Seed Technologies and Identification of Problem Solving Technologies
(1) Status of New Business and Product Development and Necessity of Analysis
(2) Seed Technologies and Identification of Technologies as Potential Solutions
(3) Seed Technologies and Examination of Technologies as Potential Solutions

4. R&D Strategy Suggestions
(1) Possible Directions for Internal R&D Activities
(2) Possible Directions for Introducing External Technologies

Example

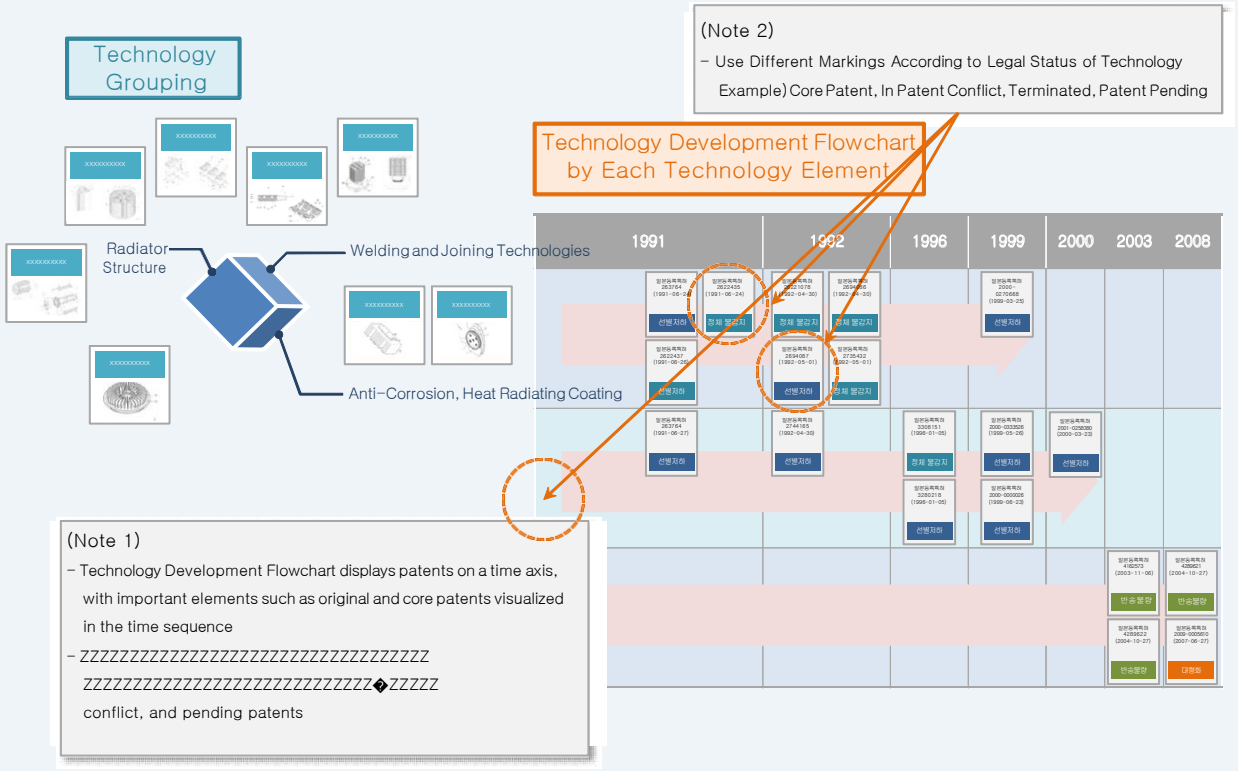


Figure 60. Example of Analysis of Technology Development Flowchart

- The second module Analysis of Technology Development of Competitors provides a comparative analysis of major technologies owned by competitors and the SME and make suggestions on how SMEs can strategically prepare to obtain stronger patents and strengthen their technological competitiveness.

Example

<Example of Analysis of Technology Development of Competitors>

Chapter B. Analysis of Technology Developments of Competitors

1. Analysis of Technology Developments of Benchmarkers
(1) Current Status of Benchmarkers
(2) Analysis of Technology Developments of Benchmarker C1
(3) Analysis of Technology Developments of Benchmarker C2

2. Analysis of Technology Developments of Competitors
(1) Current Status of Competitors
(2) Analysis of Technology Developments of Competitor D1
(3) Analysis of Technology Developments of Competitor D2

3. Analysis of Patent Competitiveness Against Competitors
(1) Analysis of Patent Characteristics of Competitors
(2) Analysis of Patent Strengths and Weaknesses Against Competitors
(3) Prediction of Potential Patent Conflicts

4. Suggestions for Enhancing Technological Competitiveness
(1) Plans to Enhance Technological Competitiveness
(2) Plans to Establish Foundation for Business

- 1. Analysis of Technology Developments of Benchmarkers[72] provides an analysis of R&D trends and major patent issues including filing patterns and IP conflicts of the domestic and global market and industry leaders.
- 2. Analysis of Technology Developments of Competitors provides an analysis of recent R&D trends and major patent issues such as patent filing trends, IP conflicts, activities of major inventors, joint applications of enterprises in direct competition with the SME in the industry and the market.
- 3. Analysis of Patent Competitiveness against Competitors identifies the differences between the SME and the competitors and analyzes characteristics of patents owned by each competitor to determine the comparative strengths and weaknesses of the SME. Based on this analysis, potential patent conflicts in the future are predicted.
- 4. Suggestions for Enhancing Technological Competitiveness give suggestions to the SME with a focus on mid to long term plans for enhancing technological competitiveness and establishing firm foundations for business activities.

[72] Leaders of an industry, market, or a technology field relevant for the selected SMEs

Example

Patent 1-1 owned by Competitor D1 (US0,000,000)	Patent A1 owned by the SME (US 0,000,000)	Analysis of Patent Competitiveness
Patent 1-2 owned by Competitor D1 (US0,000,000)	Patent A1 owned by the SME (US 0,000,000)	Analysis of Patent Competitiveness
Patent 2-1 owned by competitor D2 (US0,000,000)	Patent A2 owned by the SME (US 0,000,000)	Analysis of Patent Competitiveness
1. An LED light source comprising ; a body with a front surface and a rear surface, said front ~	1. Regarding an LED light source that includes a lighting body, LED, housing and optical light guides and housing fixed to the body by pocket insertion…	1. Differences : ~~~~~ 2. Unique features of Patent 2-1 by Competitor D2 : ~~~~~ 3. Strengths and Weaknesses of Patent 2-1 by Competitor D2 : ~~~~~ 4. Results of Patent Competitiveness Analysis(Patent 2-1 versus Patent A2) : ~~~~~
- Analysis of Patent Competitiveness analyzes differences, strengths, and weaknesses of patent technologies used in a product and their counterpart patents by competitors who are in direct competition with the SME home and abroad		

Figure 61. Analysis of Patent Competitiveness Against Competitors

- The third module Global Commercialization Strategies helps the SME to gain inroads into the global market by providing a market-specific patent analysis of the particular overseas market targeted by small and medium-sized counterparts in emerging economies such as China and Brazil and Southeast Asian economies.

- 1. Patent Trends Analysis by Economy of Interest provides economy-specific research and analysis of patents per technology field, industry and market, and technology trends in the economy the SME is conducting business in or attempting to expand into.

- 2. Identification of Major Enterprises in Economies of Interest provides an examination of potential enterprises that can facilitate the process of business expansion into the economy and help conduct business, and also competitors with whom the SME is likely to come into competition in that market. What kinds of enterprises the SME needs in that overseas market is identified, and strengths and weaknesses of the technologies owned by competitors are analyzed.

- 3. Acquisition of Strong IP Rights for Global Commercialization analyzes strengths and weaknesses of IP rights owned by the SME attempting to go abroad based on the patent trends, industry and market, and technology trends in the economy of interest. Drawing on the analysis, IP strategies that can help the SME in creating and expanding market are suggested.

Example

<Example of Global Commercialization Strategies>

Chapter C. Global Commercialization Support

1. Patent Trends Analysis by Economy of Interest
(1) Selection Criteria for Economy of Interest
(2) Analysis of Industry Trends by Economy
(3) Analysis of Industrial Technology Trends by Economy

2. Identification of Major Enterprises in Economies of Interest
(1) Identification of Major Facilitator Enterprises
(2) Analysis of Technology Needs of Each Facilitator Enterprise
(3) Identification of Major Competitors
(4) Analysis of Strengths and Weaknesses of Technologies Owned by Each Competitor

3. Acquisition of Strong IP Rights for Global Commercialization
(1) Review of Strengths and Weaknesses of IP Rights Owned by the SME
(2) Plans to Acquire Global IP Rights

Note

- New elective modules may be developed and implemented in place of already existing modules in order to address the specific needs and circumstances of the SMEs, such as management status, technology development stage, and commercialization status.

- **[Overall Review and Assessment]** Overall Review and Assessment provides a conclusion in the form of tailored patent technology trend analysis reflecting the needs, capabilities, technology and industry developments of each SME, and client-specific patent strategies.

- Analysis results should be formulated with tools such as graphs and tables so that SMEs can easily exploit the results.

(4) Interim and Final Report

- **[Interim Report]** Interim report should articulate the client-specific patent map implementation directions tailored to needs and current concerns of SMEs and expected final outcomes.

- Upon receiving feedback from the public institution after the interim report, the service provider should reflect this feedback in complementing the client-specific patent map. In the case of requests from the public institution that are highly unfeasible, the details of the request may be discussed between the both parties so that an agreement can be reached.

Note

- For the program to run free of obstacles, service providers should ask for feedback on the results produced offline and online throughout the program, even though the needs of the SME and the implementation directions for the client-specific patent map have been initially agreed upon. Only through steady communication with the SME will the service provider be able to produce satisfactory results for the SME.

- **[Final Report]** Service providers should reflect feedback from the public institution in the final report, and focus on how the final outcomes have addressed the needs and current concerns of the SMEs.

(5) Follow-Up Management

- **[Program Evaluation]** Service providers should actively engage in program evaluating process upon request of the public institution.

- **[Follow-Up Management]** Depending on the final outcome, service providers might be asked to modify or complement client-specific patent maps in certain cases, for example, when final outcomes of the program are not in line with the scope of work and direction initially stated, or when they have failed to solve the problems of the SMEs, or when they do not fulfill the needs of the SMEs.

3) Guidelines for SMEs

Key Activities

1. In order to obtain the desired results, SMEs should clearly define the patent issues they face and specific requests they might have in as much detail as possible.

2. SMEs should respond cooperatively to requests from patent map service providers and clearly express their views on the client-specific patent map results being produced throughout the program. Feedback may include whether they approve of the results, and what other needs and requests they would like to see integrated into the results.

(1) Application for Program

- SMEs can apply for the program by referring to the program announcement.

- SMEs are required to provide some essential company information when applying. Disclosure of sensitive information through the application, however, should be avoided.

Note

- It is recommended that the person in charge of applying for the program in the SME confirms with the person in charge at the public institution whether the applicant can leave out the parts from the application that may be confidential for the company, but are required in the announcement.

(2) Cooperative Engagement with Service Providing Entities

- SMEs should provide explanations of the technology of interest and relevant data to service providers through meetings. SMEs should provide the data needed for creating the patent map, save for confidential internal information. In cases where disclosure of confidential information or technical information pertaining to industrial property rights, it is recommended to do so by signing a non-disclosure agreement.

- SMEs should also clearly express the outcomes they wish in order to resolve the concerns and difficulties and fulfill their needs.

Note

- The service provider and the SME should keep track of, manage, and share the list of the individual items and the received date of information requested by the patent map service provider in order to protect the SME's company information

- It is recommended that the R&D director, researchers, and other entities who will be directly utilizing the results of the client-specific patent map report attend the regular meetings to confirm the progress and outcomes at each stage and directly share opinions.

- SMEs should clearly express their views on the directions of client-specific patent map creation, and items and format of the report in order to help produce results that will be useful in their decision-making processes in the future.

- After the final completion of a client-specific patent map, SMEs should consult service providers on the final outcomes and exploitation methods and make necessary inquiries.

(3) Follow-Up Management

- **[Program Evaluation]** SMEs should provide satisfaction feedback upon request of the public institution in an engaging way.

- **[Follow-Up Management]** SMEs should make suggestions and express opinions on how to manage the process that comes after the completion of the program, such as making inquiries, to the patent map service provider and the public institution in an adequate way.

1.5.6. Program Tips

1) Program Tips for Public Institutions

- In the initial stages, many SMEs may apply at the same time, which can be resolved by operating the program twice a year and dividing the applicants into groups that will receive client-specific patent map support either in the first or the second half of the year. Client-Specific Patent Map Program is operated on a timeline of three to five months in general, which means that SMEs service providers for the second term should already be selected before the program for the first term is completed. Once the program is into several years of operation and past its initial stages, once a year might be sufficient.

- There is a possibility that only a few applicants might apply in the very first year or after several years of program implementation, possibly because SMEs have already applied and received support under the program. With only a few applicants, the program might not run smoothly as desired, in which case further promotion, for example through the patent map service provider network, is needed that targets SMEs that have not yet received support.

- The significance of client-Specific Patent Map Program lies in providing services that cater to the needs of the SMEs who will be applying for the program. Therefore, new modules should be developed and built, reflecting the factors such as the industry and business sectors the SMEs belong to, provided in the guidelines. Modules, especially, should reflect the major industries of each APEC member for effective support.

- To ensure SMEs remain cooperative and engaged in the program, SMEs should be required to cover part (e.g. 10 to 20 percent) of the expenses arising from the program, as SMEs may engage themselves less when given a full grant.

- Applications and other documents submitted by SMEs in the application stage, and evaluation thereof, should remain classified in order to protect essential technology information.

2) Program Tips for Service Providing Entities

- In some cases, SMEs may request more than what is feasible from service providers when they are not familiar with the characteristics of a client-Specific patent map program, the scope of work, or the scope of support. In order to prevent this, service providers should provide enough information to SMEs on client-specific patent map program in advance. It is also recommended that service providers establish the scope of the patent map in line with the budget and timeframe of the program.

- Few SMEs will talk openly about the difficulties their companies are facing in the very first meeting with their service provider. Therefore, service providers should gain an understanding of the technology of the SMEs in advance, and identify the technological difficulties during consulting sessions.

- Steady communication and discussion, sometimes occurring in the form of confirmation of results and requests for information, can help build mutual trust and bring out engagement and cooperation from the SMEs.

- It is recommended to select the most urgent and current issue as the subject of patent mapping, as it is difficult to change the patent mapping directions once they are established.

3) Program Tips for SMEs

- SMEs should confirm with the person in charge at the public institution whether the submitted information will be published, and rewrite the application by removing anything that might be confidential from the application.

- How well an SME cooperates with its service provider is the very key to obtaining outcomes that truly address the needs of the SMEs. SMEs should provide information on the technologies and products the patent map will be about in order to make sure the service provider understand the contents. Moreover, SMEs should actively respond to the requests from service providers, which might include requests for data confirmation and review, views on the patent mapping directions, both online and offline in an engaging way. If the patent mapping progress is progressing in undesirable directions, SMEs should not hesitate to notify SMEs of this. The SMEs selected for the program should stay engaged and pay attention to how the client-specific patent map is progressing.

- If financial capacity allows, it is recommended that the patent map is updated every six months after the completion of the program by tracking relevant patent trends and incorporating the latest patent filing developments and competitor activities, which will prove to be helpful in developing new technologies and building patent networks.

1.5.7. Successful Cases of Program Implementation

1) Enterprise C – Utilization of client-specific patent map to reinforce its own technologies

- Enterprise C, while making efforts to develop new products to compete with other players, was having problems gaining inroads into foreign markets as it lacked information on patented technologies of potential competitors and the specific market of interest.

- **[Effect]** The patent map service enabled Enterprise C to enhance both the function and the price competitiveness of the technologies it owned. With the enhanced technology, Enterprise C participated at a global trade show for construction equipment and achieved an overseas sales figure of one hundred thousand USD thanks to its improved technological competitiveness.

2) Enterprise H – Utilization of client-specific patent map to establish R&D Directions

- Enterprise H is an enterprise exporting its own products to around four hundred retail stores around the world, Enterprise H needed to obtain a certain patent in order to maintain the stability of the business both home and abroad. Enterprise H also needed to establish R&D directions on manufacturing technologies of intestinal function enhancing foods.

- **[Effect]** Enterprise H was able to establish R&D directions utilizing its own client-specific patent map, and expand business areas through additional R&D endeavors. Moreover, the enterprise successfully enhanced the stability of the business and opened ten more retails abroad by acquiring domestic and foreign patent protection on the results of its R&D efforts.

2.
Support for IP Creation in the Public Sector

2.1.
Overview of Support Policy and Program Group

- The steady increase in R&D investment has given rise to greater research outcomes in recent years. Nevertheless, patent utilization by universities and public research institutions falls substantially short of that in the business circle. As such, the importance of efficiently managing and utilizing promising research outcomes is being highlighted.

- The low utilization of research outcomes by universities and public research institutions is largely attributable to the lack of professional capabilities in managing IP and insufficient infrastructure. Furthermore, communication between IP-specialized personnel and researchers, which is the very driving force behind IP creation and utilization, is stifled due to the inherent organizational structure of universities and public research institutions. Consequently, highly promising technologies developed by universities carry the risk of being abandoned, as universities often do not attempt to acquire patents owing to the high expenses entailed in acquiring a patent under the university's name and owning a large number of patents, or a lack of patent strategies.

- Collaborative programs between industry and academia for the creation and utilization of IPs on research outcomes developed by universities and public research institutions include Japan's IP advisor dispatch program, which is an industry-academia collaboration, Chinese Taipei's industry collaboration program, and Canada's National Research Council. The technology transfer department of Stanford University of the US is also applying for patents in its own name and is providing support for research into licensing.

- Strengthening the capabilities for the management of IP developed by universities and public research institutions, and maximizing the use of IP require, at a government level, establishing an infrastructure favorable for the creation and utilization of patents and support for nurturing experts who can refine the system and help it take root.

Selection of Promising Technologies and Subsidy for IP Acquisition

- Universities and public research institutions bear great potential for the creation of IP with high value added, as they engage in active research activities and pioneer technological innovation. However, patent utilization by these players is lagging behind as opposed to that by enterprises.

- The Selection of Promising Technologies and Subsidy for IP Acquisition is a program that aims to address this issue and provides opportunities to reduce the number of underutilized patents and increase the practical value of technologies. This is made possible by subjecting technologies to evaluation by experts from diverse sectors prior to patent acquisition, selecting a few promising technologies based on their practical value, and applying for patents only with regards to the selected technologies.

- The infrastructure necessary for the Selection of Promising Technologies and Subsidy for IP Acquisition includes 1) securing a pool of outside experts from various sectors, capable of identifying promising technologies; and 2) raising awareness among universities and public research institutions on the important role of outside experts.

- The goal of this program is to identify promising technologies developed by universities and public research institutions, and to commercialize them. Therefore, it is most important to secure a pool of experts; namely, a balanced group of outside experts in technology, IP and commercialization (with corporate experience) who can accurately gauge the practical value of a technology. Also important is to recruit experts from a number of technological sectors, as a wide range of sectors will be subject to evaluation.

- As outside experts select promising technologies from the viewpoint of “commercializing the patent,” their opinions may differ from the standpoint of researchers, triggering a conflict of opinion on what constitutes a promising technology. To prevent such a conflict, support for the development of research outcomes with high practical value should be provided through close communication between managers of the Selection of Promising Technologies and Subsidy for IP Acquisition program in universities and public research institutions, or point of contacts at TLOs, and researchers. On top of this, members of universities and public research institutions (professors, research fellows, etc.) should be open and willing to embrace criticism.

- By subjecting researchers’ invention reports to evaluation by outside experts prior to applying for patents, and submitting applications for only a selected number of promising inventions based on the results, submission of unnecessary patent applications may be minimized. Support will be provided in selecting, acquiring IPRs and, by extension, commercializing these selected technologies. Carrying out consultation based on objective information (prior art search, preliminary review of invention, information on technology market trends) provided by outside experts will greatly enhance R&D efficiency, facilitate patent creation and expedite technological transfers and commercialization, thereby generating even greater opportunities for R&D reinvestment.

Dispatch IP Management Specialist Program

- Whereas the Selection of Promising Technologies and Subsidy for IP Acquisition program provides support in selecting promising technologies for which to acquire patents, the Dispatch IP Management Specialist program is a program that ensures support for the comprehensive process of IP creation, management and utilization, including patent acquisition and technology transfers, by dispatching IP Management Specialists to universities or public research institutions.

- In the initial stage of this program, IP Management Specialists were regarded as those with expertise in technology and patents, and were mainly responsible for raising awareness on IP among universities and public research institutions and establishing the necessary infrastructure for IP creation. As such, their duties included conducting IP inspection, establishing a patent management system, selecting designated patent agencies, consulting researchers and holding seminars, enhancing employee invention regulations, and improving the IPR management process at the institution to which they are dispatched.

- However, as the importance of utilizing IP as well as creating and managing them has been drawing attention of late, the role of IP Management Specialists has been expanded to support the utilization of IP, such as the commercialization of technologies. This has led IP Management Specialists to focus more on utilizing IPs, adding upon their existing responsibility of establishing IP infrastructure in universities and public research institutions.

- Nevertheless, the role of IP Management Specialists is, in most cases, determined by accounting for the needs of universities and public research institutions.

- The most important, fundamental infrastructure for the Dispatch IP Management Specialist program is as follows: 1) higher awareness on IP Management Specialists among universities and public research institutions; and 2) recruitment and nurturance of IP Management Specialists.

- It is crucial that universities and public research institutions recognize the importance of patent experts in order to dispatch IP Management Specialists to them. Also, the regulatory framework that gives IP Management Specialists the authority to provide consultation for the IPs of universities and public research institutions must be in place. The difference of opinion between researchers in universities or public research institutions, and IP Management Specialists on what is more important may lead to disputes, which undermine constructive outcomes in the creation, management and utilization of IP. Therefore, better outcomes may be achieved through the participation of IP Management Specialists when universities and public research institutions are encouraged to establish a sound perception of IP Management Specialists, and when detailed plans are mapped out on desired outcomes that are to be achieved with the help of IP Management Specialists and how to utilize them.

- Generally, IP Management Specialists are hired as regular employees at public institutions. However, experts with extensive experience in diverse areas, such as patent attorneys or experts from in-house patent departments should be recruited as IP Management Specialists, as public institutions must be able to dispatch individuals most suitable for the needs of a certain institution when dispatching experts to the institution. After being hired by a public institution, IP Management Specialists have the opportunity of continuously developing their professional capabilities by learning from each other and engaging in knowledge sharing through seminars on best practices.

PHASE	Program TREE	DESCRIPTION
I	**Selection of Promising Technologies and Subsidy for IP Acquisition**	• Supporting patent acquisition and commercialization of promising technologies, by conducting internal and external expert's evaluation of the technology's quality, technological value and marketability in advance when applying for a patent
I	**Dispatch IP management specialist**	• Supporting universities and public institutions in establishing an efficient system for IP creation, management and utilization, and in enhancing IP capabilities by dispatching IP management specialists to these institutions • Phase I : Focus on raising awareness on and creating IP, and establishing infrastructure • Phase II : Expanding scope to IP utilization (technology transactions, etc.)
II	**Dispatch IP management specialist**	

Figure 62. Program TREE (Support for IP Creation in the Public Sector)

2.1.1. Self- Diagnosis for Program Implementation

- The program group for IP creation in the public sector provides comprehensive support for services involving IP, from IP creation to IP utilization by universities and public research institutions. It is most recommended in an environment where universities and public research institutions are making active efforts to create patents.

- The phase matching flow chart set out below may be used to self-evaluate the conditions of the environment in which to implement the program group by drawing answers to each of the questions, and identifying areas that require improvement.

- For instance, if the answer to the question for S1 of the chart below is 'NO,' greater awareness on IPs is required, and the fundamentals for IP creation activities should be enhanced. If the answers to questions for S2~S4 are 'NO,' efforts to raise awareness on outside experts and secure a pool of experts in patents, markets, and commercialization should be made. If all of the answers to S1~S4 are 'YES,' it means that PHASE I may be implemented, and if the answers to all stages (S1~S5) are 'YES,' it is deemed that all necessary conditions for PHASE II are in place, thus making the environment eligible for the implementation of PHASE II.

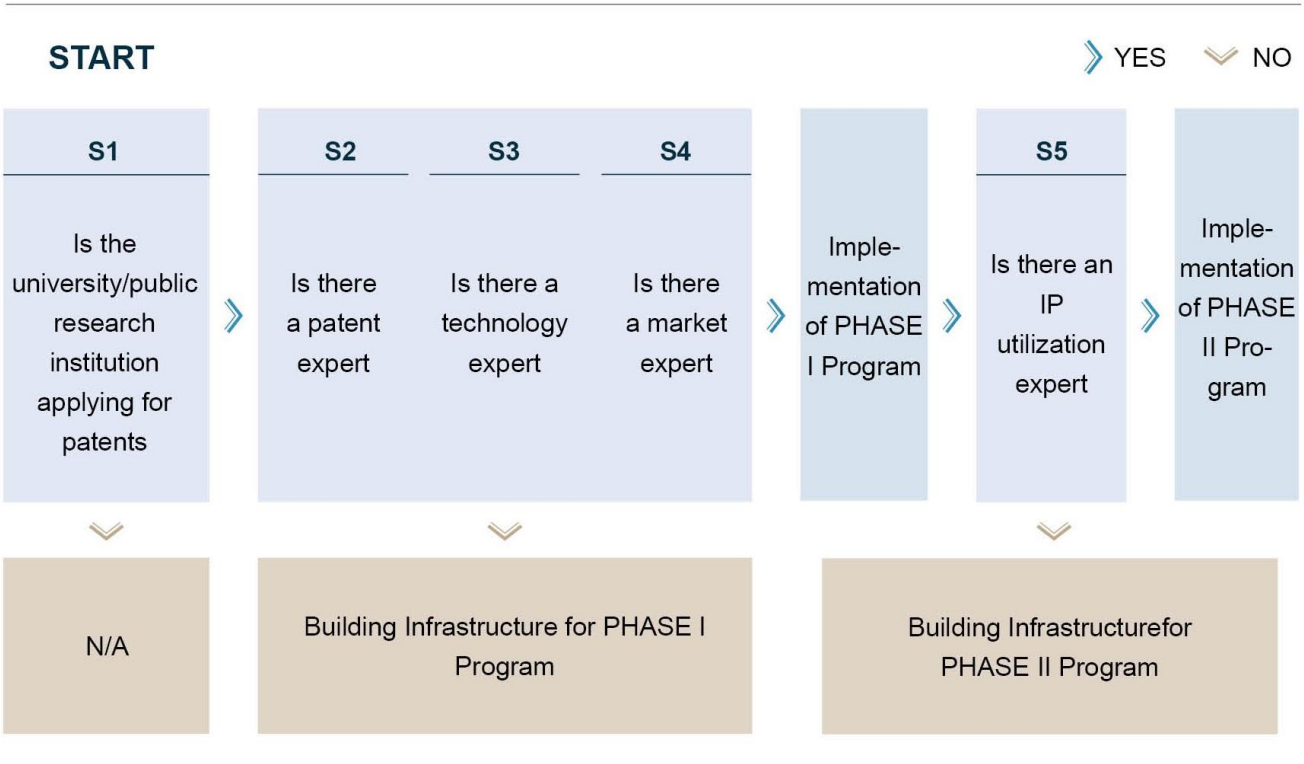


Figure 63. Phase Matching Flow Chart (Support for IP Creation in the Public Sector)

2.2.
Selection of Promising Technologies and Subsidy for IP Acquisition

2.2.1. Program Overview

Support will be provided for the selection of promising technologies for which to acquire patents by subjecting the research outcomes of universities and public research institutions to experts' evaluation of their patentability, technological value, and marketability prior to submitting patent applications.

- As universities and public research institutions place great importance on core R&D activities, their research outcomes are largely translated into theses and patent applications. However, it is rare that the marketability and commercial value of research outcomes are looked into prior to filing patent applications. This leads to higher costs incurred in managing patents, as an unnecessarily large number of applications are being submitted, giving rise to a significant number of underutilized patents.

- Through the Selection of Promising Technologies and Subsidy for IP Acquisition program, public institutions[73] may provide support in securing a pool of experts who can determine in advance whether it is necessary to acquire a patent for a given technology developed by universities or public research institutions. Universities and public research institutions, on their part, may support the patent application process upon identifying promising technologies and establish a system for the long-term management of acquired patents.

- In short, it is highly anticipated that this program will translate the acquisition of patents for promising technologies into commercialization (technology transfers and launch of new start-ups included). In order to operate the program in an efficient manner, public institutions should clarify a set of objective standards against which promising technologies will be selected and ensure impartial evaluation by including experts from diverse sectors in the selection committee. It is also important that universities and public research institutions have in place a long-term process that not only facilitates the acquisition of IP for promising technologies but also commercialization on the ground.

[73] Refers to public institutions which operate and manage the concerned program including government offices

Figure 64. Program Framework (Selection of Promising Technologies and Subsidy for IP Acquisition)

2.2.2. Similar Programs of APEC Members

1) Support Program for Invention and Public IP Utilization (Korea)

- In Korea, the Korea IP Service Center[74] is operating the support program for invention interviews and public IP utilization over a nine-month schedule.

- **[Objective]** Supporting the creation of high-quality IPs by universities and public research institutions by conducting invention interviews (invention evaluation system) prior to submitting patent applications, and facilitating the strategic commercialization of patented technologies by commercializing only a selected number of promising technologies with the greatest potential for utilization in the industry.

- **[Scope and Conditions of Support]** Consultation services and expenses will be provided in order to create promising IPs by conducting expert reviews and evaluations on reported new inventions prior to submitting patent applications.

- **[Requirements]** Universities and public research institutions should provide 50% of the total expenses of the program (private share).

- Private share may be paid in cash or in kind*, but the share of payments in kind should be limited to under 25% of the total expenses of the program.

- * Payments in kind may be calculated based on the labor cost of the university or public research institution’s participating personnel or the cost incurred by their exclusive working space, etc.

[74] A Korean institution specializing in support for IP strategy consultation (provides support for IP related programs for enterprises, universities and public research institutions)

2) Review Program Operated by NRC (Canada)

Figure 65. National Research Council (Canada)

- The IP center of Canada's National Research Council (NRC) is currently operating a review program to evaluate whether to disclose technologies developed by research offices under their authority and to maintain relevant patents. Among the various reviews conducted, the disclosure review bears the highest resemblance with the Selection of Promising Technologies and Subsidy for IP Acquisition program.

- **[Objective]** Determining whether to disclose inventions by research offices under the NRC, providing consultation on patent-related business strategies, and supporting appropriate protection and management of domestic inventions through patent lawsuits and management of licensees.

Table 30. Scope and Conditions of Support (National Research Council)

Category	Details
Project Review	■ Will participate in the planning stage of specific research projects of public research offices under the NRC and evaluate whether to continue the concerned project. - Will evaluate the possibility of patent acquisition for the expected research outcome of the project - If deemed possible, the value of the technology will be gauged against that of existing patents - If deemed possible, the marketability of the technology when brought to the market will be gauged ■ If the technology is deemed to have no value in the market, it will be recommended that the project be abandoned at the planning stage. ■ Support for certain research projects previously initiated may be withdrawn after a reevaluation if deemed to have limited potential in patent acquisition or commercialization. ■ The person in charge of the research project, patent experts, and experts in commercialization will take part in the deliberation process.
Disclosure Review	■ Upon completion of research projects, whether or not to disclose the research outcome will be determined based on the possibility of patent acquisition and commercialization. - Disclosure: patent application, publishing of theses, transforming it into an open source project, etc. ■ It is recommended to the concerned research office that the research outcomes be kept confidential, if not disclosing the outcomes better suits Canada's interests. ■ The research offices under NRC consider such evaluation and consultation an important form of support.
Portfolio Review	■ Upon conducting regular (annual) reevaluations on all patents owned by public research institution, whether to retain ownership of patents or to transfer (license) them will be determined. ■ The reevaluation will be conducted on all patents, in view of their maintenance cost and ownership value, and licensing to enterprises will be offered at an affordable cost.

3) The Office of Technology Licensing (OTL) at Stanford University (United States)

Figure 66. The Office of Technology Licensing (OTL) at Stanford University

- Stanford University has been operating the Office of Technology Licensing (OTL) since the 1970s, supporting the patent acquisition of on-campus researchers and licensing to enterprises.
- **[Objective]** Facilitating technology transfers in order to commercialize technologies developed by universities by giving them a social value.
- **[Scope and Conditions of Support]** Technologies developed by university researchers are subjected to preliminary evaluation (on the possibility of manufacture, novelty, the potential for further application and potential markets, etc.), and a preliminary licensing strategy is set up based on the results. It is also determined whether licensing and patent application will be carried out under the name of Stanford University.
- **[Eligibility]** Support is directed toward university researchers, who are entitled to support upon submitting a preliminary evaluation report on new inventions.

2.2.3. Procedures and Details of the Program

1) Target of Support

- Support will be provided to offices specializing in technology transfers under domestic public research institutions and non-profit research organizations such as universities and public research institutions, etc.

2) Program Process

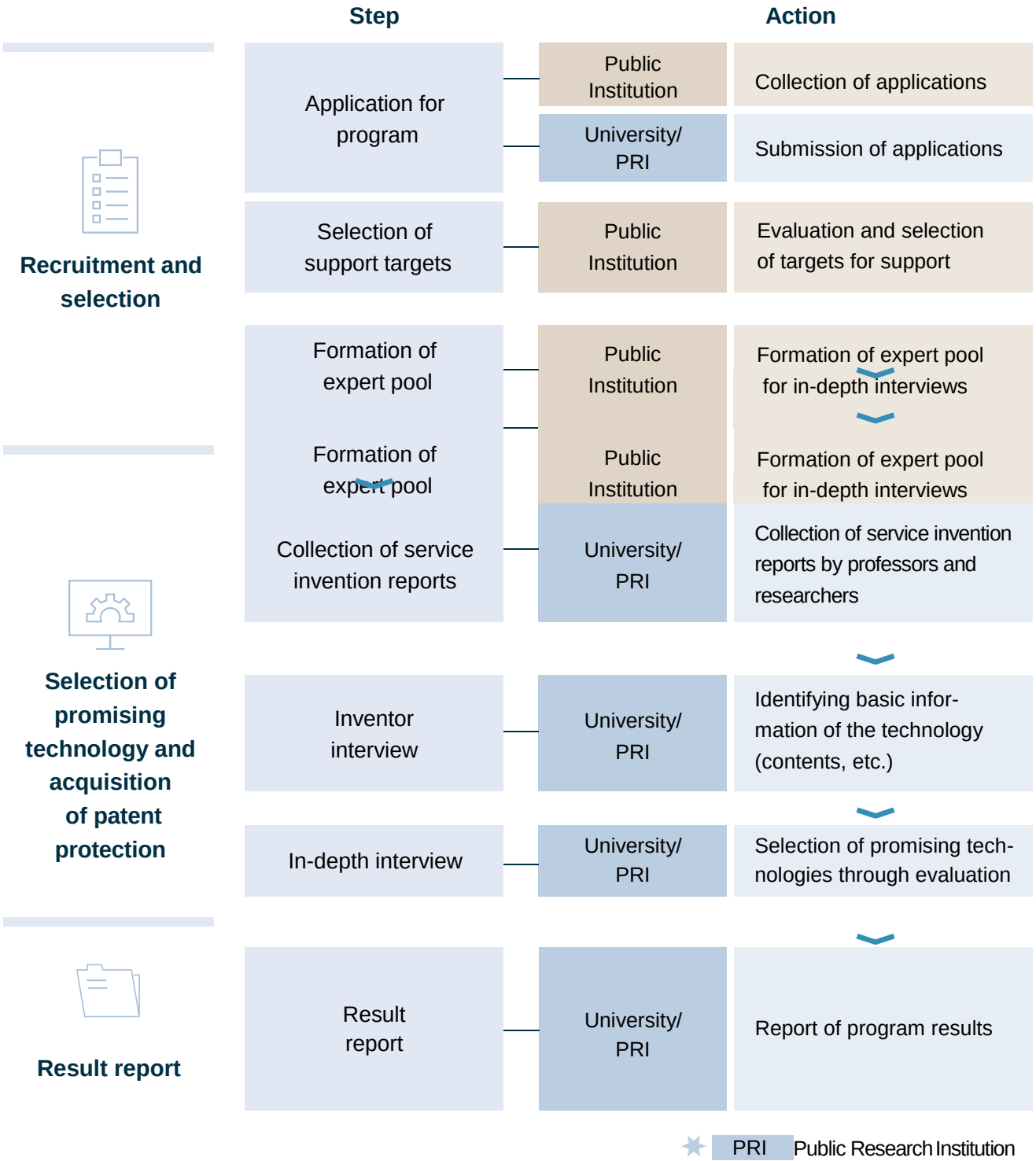


Figure 67. Program Process (Selection of Promising Technologies and Subsidy for IP Acquisition)

- **[Recruitment and selection]** Public institutions should post a notice regarding the selection of institutions to which the program will be implemented, and universities and public research institutions should apply by submitting a proposal and relevant documents within the deadline. Based on the submitted documents and presentations, public institutions will evaluate which institution will be most apt for the support program, and make the final selection.

- **[Selection of Promising Technologies and Subsidy for IP Acquisition]** Universities and public research institutions should conduct inventor interviews upon collecting employee invention reports of researchers and carry out in-depth interviews by establishing a selection and evaluation committee comprised of experts dispatched by public institutions. Based on the evaluations made through the in-depth interview, promising technologies for which support in patent acquisition will be provided will be selected.

- **[Report of results]** Universities and public research institutions will submit a final report on the program details and results to the public institution in the last month of the program and the public institution will determine the completion of the program upon reviewing the report and performance results

Note

- Quantitative and qualitative evaluations of the results carry little significance in this program, as it is operated based on each university or public research institution's own process.
- As such, public institutions may decide on account of their schedule whether to hold a meeting for a report of final results or to simply collect written reports.

3) Scope and Conditions of Support

- Both internal and external experts will review and evaluate new inventions reported from universities and public research institutions prior to patent application, and provide consultation and support for expenses to facilitate the creation of promising patents.

- **[Consultation]** Support will be provided in recruiting outside experts or securing a pool of experts for inventor interviews and in-depth interviews.

- **[Expenses]** Support will be provided for a partial amount of expenses incurred in the process of selecting promising technologies and conducting reviews.
  * Universities and public research institutions should be responsible for less than 50% of the amount provided by public institutions.

2.2.4. Guide Map for Participating Entities

Table 31. Guide Map for Participating Entities (Selection of Promising Technologies and Subsidy for IP Acquisition)

<table>
<tr><td rowspan="2">Entity</td><td rowspan="2">Preparation</td><td colspan="6">Program Process (Stages)</td><td rowspan="2">Follow-up Management</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td rowspan="2">Public institution</td><td>Design Program</td><td>Selection of university/public research institution</td><td></td><td colspan="3" rowspan="2">Support for program expenses</td><td rowspan="2">Report of final results and notification of review results</td><td>Education to nurture personnel specializing in technology transfers and commercialization</td></tr>
<tr><td>Announcement of program and selection/ evaluation</td><td>Formation of expert pool</td><td>Provision of expert pool</td><td>Discuss connection to technology commercialization programs</td></tr>
<tr><td rowspan="4">University/ public research institution</td><td rowspan="4">Support for program (submission of plans and documents)</td><td rowspan="4">Selection of program</td><td colspan="3">Collection of employee invention reports within the institution</td><td></td><td rowspan="3">Final report</td><td rowspan="4">Support for technology transfers and commercialization of promising technologies (researchers)</td></tr>
<tr><td rowspan="3"></td><td colspan="2">Inventor interviews (internally)</td></tr>
<tr><td colspan="2">In-depth interviews (selection and evaluation committee/expert pool)</td></tr>
<tr><td colspan="3">Selection of promising technologies
Support for patent acquisition</td></tr>
</table>

- The Guide-map for participating entities set forth above is a chart that encapsulates the end-to-end process of the program, from ex-ante preparation to follow-up management.
- The program will typically be conducted over a timeline of less than one year, but the timeline may be adjusted in accordance with the budget or other circumstances.
- The chart provides a summary of roles that are to be served by public institutions and universities or public research institutions in each stage of the process, the details regarding which are spelled out in the following section *2.2.5 Detailed Guidelines for Participating Entities.*

2.2.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Recruiting selection and evaluation committee members (experts) to evaluate promising technologies, and providing the pool of experts to universities and public research institutions
2. Supporting universities and public research institutions in introducing the Selection of Promising Technologies and Subsidy for IP Acquisition program.

(1) Selection of Universities and Public Research Institutions

- **[Program notice]** An implementation plan should be established and advertised on the website of public institutions, which includes the following details:
  - Contents: The objective of the program, potential applicants and eligibility, expected size of support and details, deadline and application method, evaluation and selection methods, other information relevant to the program

- **[Plan for selection and evaluation]** Public institutions must establish and implement a plan for evaluation, containing the general details of evaluation such as the evaluation schedule, criteria, and method. Furthermore, public institutions must put together an evaluation committee upon selecting evaluators, and disclose to the evaluators the program plan, evaluation criteria, presentation material and other information necessary for evaluation on the day the evaluation committee is held. Key criteria for evaluation are implementation capability, objective and detailed plans. For further details, refer to the selection and evaluation criteria below.

Example

Table 32. Example of Criteria for Selection and Evaluation

Category	Index	Notes	Range	Score
Implementation Capability (20 points)	IPR management capabilities	▪ Organizational structure of IP-specialized organizations ▪ Expertise of participating personnel ▪ Current status on invention reports, evaluation, patent application and registration	10 8 6 4 2 10 point	
	Public IP utilization capabilities	▪ Performance in IP utilization and case examples ▪ Performance in IP utilization relative to research expenses (of IPs owned)	10 8 6 4 2 10 point	
Objective (40 points)	Appropriateness of quantitative objectives	▪ Boldness of objectives regarding selection of promising technologies, IP acquisition and IP utilization in the public sector, relative to past performances	10 8 6 4 2 10 point	
	Clarity of qualitative objectives	▪ Concreteness and effectiveness of objectives regarding IP management system, raising awareness of inventors, securing promising IPs, establishing profit models, etc.	10 8 6 4 2 10 point	
	Possibility of achieving objectives	▪ Specific implementation plans for fulfilling objectives ▪ Determination of the applying institution	10 8 6 4 2 10 point	
Detailed Plans (30 points)	Effectiveness of implementation strategies	▪ Concreteness and effectiveness of program implementation strategies and methods (strategies in selecting promising technologies and linking promising patented items to IP creation in the public sector)	10 8 6 4 2 10 point	
	Appropriateness of implementation system	▪ ppropriateness of the system for selection of promising technologies and patent acquisition, and IP utilization in the public sector	10 8 6 4 2 10 point	
	Feasibility of implementation schedule	▪ Feasibility of the schedule for inventor interviews, invention evaluation, and utilization of IPs in the public sector	10 8 6 4 2 10 point	
Expenses (10 points)	Planning of program expenses	▪ ppropriateness of detailed plans for program expenses	10 8 6 4 2 10 point	
Final Score (out of 100 points)			**(points)**	

- **[Evaluation process for selection]** Public institutions will review application documents submitted by universities and public research institutions and evaluate them based on the criteria set out in the program notice. Over the process, public institutions may require additional literature other than those previously submitted, from universities and public research institutions. Evaluators will give each application a score of 1 to 100, and the final score will be calculated by averaging all scores aside from the highest and lowest scores of each evaluator.

Note

- Public institutions may launch field inspections when necessary, to affirm the determination of general managers at each university or public research institution in implementing the project, and whether the program for which universities or public research institutions have applied is suitable for them. When a field inspection is conducted, the inspection scores may be accounted for in scoring for the final selection.

- **[Evaluation results and notification]** Public institutions should categorize universities and public research institutions with a score of 60 or over as “eligible for support,” and those with a score under 60 as “not eligible for support,” and select universities and public research institutions with the highest overall scores among those “eligible for support” as the final targets for which support will be provided, and notify them.

(2) Management and Operation of Program

- **[Agreement and changes]** Public institutions should sign an agreement with the selected universities and public research institutions within one month of the notification of selection, and provide follow-up documents or change details necessary for the conclusion of the agreement.
  - Change of program objective, change of general manager or participating personnel, change of items of expenditure for program expenses, etc.

- **[Submission of documents and report of progress]** Public institutions should request a report of progress on the program developments to the general manager of universities and public research institutions in accordance with the timeline and schedule, and by extension, request relevant documents (progress report on the Selection of Promising Technologies and Subsidy for IP Acquisition, and performance report) in advance (or on a regular basis).

- **[Report of results]** Public institutions should request a report of result on the Selection of Promising Technologies and Subsidy for IP Acquisition to the general manager of universities and public research institution by the end date of the agreement for the support program.

- **[Planning of briefing on results]** Public institutions should formulate a plan for the briefing on results of the support program, containing details on evaluation such as the schedule, standards, method, criteria and operation of the evaluation committee.

- **[Briefing on results]** Evaluation should be conducted as follows, based on the scores given by each evaluator on the evaluation committee, and universities and public research institutions with a sub-standard score may be reported to the deliberation committee for corrective measures.

Note

- Universities and public research institutions evaluated as successful (excellent) may be selected as "a target of support upon being granted an exemption of evaluation process in the following year" following comprehensive reviews on the policy direction and budget for support.

  - Successful (excellent, average): Universities and public research institutions given a score of 60 or over for fulfilling the original objective and showing impressive performances should be deemed as "successful," and those with a score of 80 or over among them should be categorized as "successful (excellent)," whereas those with a score between 60 and 79 should be categorized as "successful (average)."
  - Failure (diligent, negligent): Institutions with a score below 60 for showing performance below original expectations should be deemed as a "failure," and will be categorized into either "diligent" or "negligent" depending on the attributable causes.

- **[Calculation of program expenses]** Public institutions should calculate the expenses incurred by the program based on the expense report and evidential documents submitted by the universities and public research institutions.

(3) Follow-up Management

- **[Education to nurture commercialization-specialized personnel]** Education on technology transfers and technology commercialization should be provided to patent management organizations of universities and public research institutions to nurture IP-specialized personnel, to prevent the Selection of Promising Technologies and Subsidy for IP Acquisition program from ending as a one-off event.

- **[Follow-up programs]** Through connections with follow-up programs such as support programs for technology commercialization, further support may be provided for the commercialization of selected promising technologies.

2) Guidelines for Universities and Public Research Institutions

Key Activities

1. Collecting employee invention reports and carrying out selection of researchers and promising technologies and IPR acquisition
2. Selecting promising technologies upon holding a selection and evaluation committee
3. Designing or adopting novel processes for IPR acquisition

(1) Application for Program and Program Implementation

- **[Application for program]** Applications and statements of proposals should be submitted to the public institution no later than the deadline, upon reviewing eligibility by referring to the program notice.

Note

- When applying for the program, IP-specialized institutions may be included as ‘partnering institutions,*’ the business scope of which should be specifically defined.

* Partnering institutions refer to institutions which operate the program jointly with selected universities and public research institutions, such as technology transaction institutions, IP-consultation institutions and patent agencies

Example

< Example of Contents for Proposal >

I. Current status and capabilities

1. IP related departments
   A. IP-specialized organizations
   B. Participating personnel
2. Research and development costs
3. IPR acquisition and technology commercialization
   A. Invention reports
   B. Patent application and registration
   C. Commercialization of technologies
4. Major accomplishments
   A. Results of IP-commercialization programs
   B. Major performances regarding technology transfers
   C. Identification of promising outcomes and successful cases of utilization

II. Program objectives

1. Quantitative objectives
2. Qualitative objectives

III. Program implementation strategies

1. Program implementation strategies and methods
   A. Strategies and methods of promising tech- nology selection and IPR acquisition
2. Program implementation system
   A. System for Selection of Promising Technologies and Subsidy for IP Acquisition
3. Program implementation schedule
4. Plans for expert involvement
5. Plans for involvement of partner agencies

IV. Plans for management of program expenses

1. General plan for program expenses
2. Details on each item of expenditure

- **[Report of program operation]** All documents requested by the public institution should be swiftly provided, including a “status report on Selection of Promising Technologies and Subsidy for IPAcquisition” in every other month. Furthermore, results of technology selection and IPR acquisition, the selection and evaluation committee, and program expenses should be reported in a standardized format.

(2) Report of Invented Technologies

- **[Collection of employee invention report]** A standardized format for employee invention reports should be designated, and employee invention reports (invention reports) should be collected for a set period, from researchers.program notice.

Example

<Example Invention Report>

| Basic information |

- Name of invention
- Elements that render the technology novel
- Main keywords that best express the invention (used in prior art searches)
- Whether the invention was previously showcased (academic conferences, seminars, etc.)
- Expected date of official invention report

| Details |

- List of potential licensees (markets, companies, etc.)
- Research projects, products, patents, researchers, and etc. in competition
- Any additional data required, scripts of theses previously released

(3) Inventor Interviews

- **[Inventor interview]** When an employer invention report is received, an interview will be held with the research either in person or over the phone to hear details on the invented technology. Ideally, inventor interviews should be conducted by the person in charge of program management at the university or public research institution (industry-university collaboration organization or technology transfer organization, etc.) or a patent attorney at the designated patent agency. To gain in-depth knowledge of the invention, interview questions or factors to take note of should be thought through in advance.

- When the inventor interview is completed, a prior art search should be conducted, in order to verify whether a similar technology has been reported. The person in charge of program management or patent attorney at the designated patent agency should take charge of this process as well.

Note

< Points of Note for Selection of Promising Technologies and Subsidy for IP Acquisition>

- What is the concerned technology regarding, and what issue does it address? How is the issue being resolved currently? Why could the concerned technology be a preferable option?
  The above question is aimed at identifying the potential marketability of the technology, and elements to be protected through patent acquisition.

- Are any companies looking forward to the commercialization of the technology? Why do they consider the technology valuable?
  The above question helps identify potential licensees of the technology, or potential sponsors for additional R&D expenses.

- Does the technology require further research in order to produce an invention that will intrigue companies?
  The above question will be used to determine whether if further research is required or if direct licensing is possible, to make improvements before the technology transfer organization explores potential licensees of the technology.

- How will the technology be financed? What responsibility will the technology transfer organization assume, with regards to financing for R&D expenses?
  The above question is particularly important as R&D contracts define how patents will be managed. R&D contract documents should be submitted in order to look into details.

- Has the technology ever been showcased or disclosed in the past? Are any theses involved? When and how were the relevant details disclosed?
  If the invention was ever disclosed previously, IPR acquisition could be made difficult. A patent application should be made prior to disclosure of the technology. If the invention has yet to be showcased, specific plans for disclosure should be discussed.

- Are there any other details that the person in charge of technology transfers should be aware of? What information does the researcher request from the person in charge of technology transfers?
  Important details may be overlooked. The above question allows researchers to ask questions on their topic of interest.

Example

Table 33. Example of Prior Art Search Report

Administration No.			Name of Office	
Patent Attorney			Contact Number	
Inventor		Department : Name :		
Task Information	Name of Task			
	Task No.			
	University/Public Research Institution			
Invention Information	Name of Invention			
	Field	□ Bio/Medicine □ Food □ Nano □ Chemistry □ Machinery □ Other		
	Exemptions from Lack of Novelty Regulations	□ NO □ YES (Type: Date of Thesis Disclosure:)		
Interview Summary	Technology Class	□ S class □ A class □ B class □ C class □ D class		
	R&D Stage	□ Idea □ Basic experiments complete □ Development completed		
	Type of IPR	□ Patent □ Trademark □ Utility □ Design		
	Necessity of Overseas Patent Acquisition	□ NO □ YES		
Summary of Technology			Scope of Inspection	

Serial No.	Prior Arts		Relevance
	Prior Art No.	Comparison of Components	
1			
2			
Final Review Comments	□ Traits of invention □ Information on the current development of the technology □ Prior arts and scope of IPR acquisition □ Overall comments □ Improvements required		

(4) In-depth Interview

- **[Selection and evaluation committee]** The selection and evaluation committee will be held based on the results of the inventor interview and prior art search. A rigorous analysis of the details of the invention will be conducted with the help of the researcher, to clearly understand the invention's value and potential for utilization.

- The selection and evaluation committee is largely aimed at identifying promising technologies, but it may also serve as an opportunity to seek ways to increase the technology's potential for utilization and upgrade it to a more impeccable technology with the help of committee members, who are experts in various sectors.

- The committee will be comprised of four to five members both internally and externally recruited, and external members should be experts included in the pool designated by the public institution.

- **[Operation of the selection and evaluation committee]** The selection and evaluation committee will be in the form of evaluating presentations, and presentations will be made by the researcher on the details of the technology, and by a representative of the designated patent agency (person in charge of Selection of Promising Technologies and Subsidy for IP Acquisition) on the results of the prior art search and how the concerned technology would be distinct from existing technologies.

- **[Evaluation criteria and evaluation of technology]** The criteria should be able to gauge the patentability, technological value and marketability of the technology, and give each technology a grade between S~C (four grades) or S~D (five grades).

- After the evaluation, the technologies will be classified into different grades and managed separately, being provided different levels of support in accordance with certain standards (potential for utilization), to enable efficient IP management.

(5) Follow-up Management

- **[Support for technology transfers and commercialization]** Universities and public research institutions may seek out potential licensees of the technology, or support may be provided in creating advertisements, to facilitate technology transfers to the business circle and, by extension, the launch of more start-ups.

Note

- Members of the selection and evaluation committee should consist of 1 member recruited internally (university and public research institution), and three to four external members. External recruitments should include a commercialization expert currently holding a post in or with past experience at an enterprise, a patent specialist (patent attorney, technology appraiser, etc.), and a market professional, etc.

Example

Table 34. Example of Evaluation Criteria for the Selection of Promising Technologies

Category	Item	Evaluation
Technological value/ Patentability (50)	1. Completeness	Evaluation will be conducted on the current development stage of the concerned technology
	2. Attributes	Evaluation will be conducted on whether the concerned technology should be regarded as a basic invention or an invention of improvement
	3. Compatibility with trends	Evaluation will be conducted on how well the concerned technology is aligned with the future development and development trends of its technology group
	4. Lifespan	Evaluation will be conducted on the future potential for utilization of the concerned technology
	5. Rigorousness of the IPR	Evaluation will be conducted on whether the claims of the technology specification encompasses the essence of the invention, and whether the scope of the claims includes diverse types, so as to make design-around difficult
Marketability (50)	1. Potential for commercialization	Evaluation will be conducted on the concerned technology's potential for commercialization
	2. Industry effects	Evaluation will be conducted on potential markets and products to which the concerned technology may be applied
	3. Growth potential of the market	Evaluation will be conducted on the growth trend of the product market to which the concerned technology will be applied
	4. Potential demand for technology	Evaluation will be conducted on the level of market demand for the concerned technology
	5. Feasibility of market entrance	Evaluation will be conducted on the elements that may facilitate or hamper the market entrance of products that have been applied the concerned technology such as policies or regulations

- **[Notification of evaluation results]** The results of the evaluation should be notified to the researcher by paper or phone, and the researcher will be allowed to express counter-opinions to the results for three days by filing a statement of opinion (objection). Support for each grade should be determined in accordance with the internal regulations of each institution.

Example

Table 35. Example of Grading Scores

Total Score	Evaluation Grade	Whether to File an Application			Potential for Technology Transfer	Notes (Example)
		Domestic	PCT	Member Phase		
85 and over ~ 100	S	File application	File PCT application	Two economies or more	First priority	Has high potential in terms of technological and commercial value; it is recommended that an aggressive review for overseas patent application be conducted, and technological transfers be pursued with the highest priority
70 and over ~ below 85	A	File application	-	One economy	Second priority	Has fairly high potential in terms of technological and commercial value; it is recommended that technology transfers be pursued with priority
55 and over ~ Below 70	B	File application	-	Prohibited	Third priority	Has average potential in terms of technological and commercial value; technology transfers may require some time
40 and over ~ Below 55	C	On hold	-	-	Low possibility of technology transfer	Whether to file an application should be re-considered after conducting further research and reviews; possibility of technology transfers is low, as potential in terms of technological and commercial value is below average
Below 40	D	Waived	-	-	Very low possibility of technology transfer	Possibility of technological transfers are very low, as potential in terms of technological and commercial value is poor

2.2.6. Program Tips

1) Program Tips for Public Institutions

- **[Formation of expert pool]** A pool of selection and evaluation committee members who are capable of selecting or evaluating promising technologies at universities and public research institutions, should be put together in order to enable an impartial evaluation process. The pool of experts should be comprised of (former or incumbent) business people, experts in technology commercialization, market professionals, patent experts and other experts who are capable of evaluating and selecting technologies by reviewing them from diverse perspectives. Public institutions should first organize the expert pool, inform universities and public research institutions, and internally select members to be included in the selection and evaluation committee.

- [**Program operation]** Each institution should be able to establish a commercialization model that best suits itself by being allowed to operate the program individually, as opposed to providing several institutions with the authority to operate the program. However, in the case where a university or institution is not undergoing active patent application activities, it may not have an effective patent application process in place, making it susceptible to numerous trials and errors. As such, public institutions should provide personnel at universities and public research institutions with no experience of operating the program with an opportunity to visit or be dispatched to other universities and public research institutions with a previously established patent application process, allowing them to learn lessons about patent management.

- **[Creation of standard manual for Selection of Promising Technologies and Subsidy for IP Acquisition]** Public institutions should create a standard manual and provide support to universities and public research institutions to enable them to abide by the manuals individually, and play a lead role in operating the program. Universities and public research institutions that find it difficult to apply the standard manual will be allowed to retain their individual processes, but will be given opportunities to review and improve areas of issue regarding their programs through examination by outside experts.

2) Program Tips for Universities and Public Research Institutions

- **[Selection of researcher]** It is most important to select researchers with the willingness to constantly take part in the development of the concerned technology and an enthusiastic attitude toward commercialization. This is because it may be necessary to train companies or initiate joint research projects if the developed technology is to be transferred or commercialized.

- **[Exceptional necessity for patent acquisition]** In the case where the technology was developed through joint research with an external institution or an industry-university research project with an enterprise, it may not be advisable to apply the university or research institution’s internal patent application process.

In which case, therefore, it is desirable to push forward with the patent application as swiftly as possible without conducting a separate selection process, and a separate regulation must be in place to be applied when such a case arises.

- **[Identification of patent portfolio]** Each university and research institution generally has a technological sector to which the researchers focus their efforts, and it is highly likely that patent application activities are most active in that particular sector. The program administrator, however, should refrain from allowing patent applications to be skewed toward a specific technological sector, and provide balanced support to diverse technologies. To this end, the patent portfolio of universities and public research institutions should be analyzed to identify the strengths and weaknesses, and efforts should be made to lay the institutional groundwork to nurture researchers to increase support for, or to give priority to, patent applications in weak areas

2.2.7. Successful Cases of Program Implementation

1) The Case of Research Institution A

- **[Name of technology]** Sea trumpet extract for sleep improvement

- [**Developments]** A technology transfer was made to enterprise K at a fixed royalty of 150 million KRW in September 2012. A food with health effects of sleep improvement was developed after two years of joint research and was certified by the Ministry of Food and Drug Safety in January 2015. A product was launched in March 2015 from a business agreement between enterprise K and enterprise N.

- **[Major accomplishments]** As of 2015, two products raised 105 million KRW of revenue.

2) The Case of Research Institution B

- [**Name of technology]** HUD (head-up display)

- **[Developments]** A technology transfer was made to enterprise H in July 2013 at a fixed royalty of 300 million KRW and an HUD that can be synchronized with smartphones was developed through further R&D, enabling a product release to the market in August 2014. In April 2015, the item was selected for government support for R&D and was provided approximately one billion KRW of project expenses for two years.

- **[Major accomplishments]** As of 2014, the revenue raised stood at approximately 19 million KRW, and a joint development plus three-year HUD delivery contract was signed with offshore H motors in July 2015.

3) The Case of University K

- **[Name of technology]** Composition including Undaria Pinnatifida Sporophyll and ascidian shell extract with improvement effects for atopic dermatitis

- **[Developments]** A technology transfer was made to enterprise I in September 2013 at a fixed royalty of 20 million KRW and a running royalty of three percent of total revenue, and the product launch was made in February 2014.

- **[Major accomplishments]** Revenue stood at 250 million KRW as of 2015, and plans for exports are underway.

2.3.
Dispatch IP Management Specialist

2.3.1. Program Overview

IP Management Specialists will be dispatched to universities and public research institutions to provide support in laying out the framework for creation, management and utilization of IP that best suits the unique environment and characteristics of the university and public research institution, enhancing the IP management capabilities of these institutions.

- Universities and public research institutions are conducting active research and development activities, but are falling behind corporations in utilizing R&D outcomes (such as product commercialization, etc.). The primary reason for this gap is a lack of IP Management Specialists[75] who can provide consultation on ways to translate research outcomes into IP in a systematic and efficient manner (creating patented technologies with high potential for product application), and to manage and utilize (e.g. technology transfers to enterprises) them.

- The public institution[76] that operates and administers the program should provide support for expenses entailed to the dispatch of IP Management Specialists to universities and public research institutions, and the universities and public research institutions being dispatched an IP Management Specialist will receive support including expert advice on various IP topics such as self-diagnosis of IP capabilities, strategies to create IP including patents, and ways to utilize IPs.

- Universities and public research institutions should respect the opinions of and cooperate with the dispatched IP Management Specialist, enabling the specialist to engage in active advisory activities on IP management. A preliminary plan should be set in advance to make the most efficient use of the IP Management Specialist's time.

[75] Refers to experts with professional knowledge in the creation, management and utilization of intellectual property such as patents, trademarks and design.

[76] Public institutions which operate and manage the concerned program including government offices.

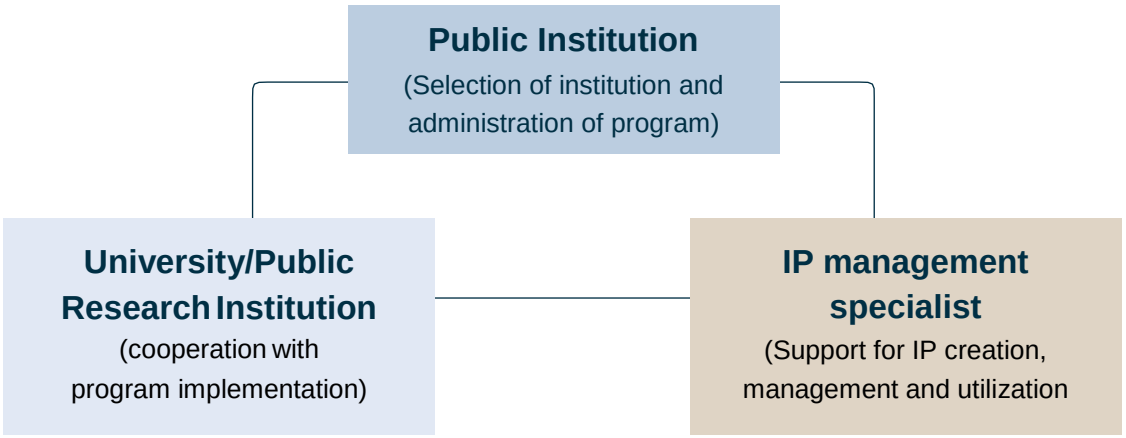


Figure 68. Program Framework (Dispatch IP Management Specialist)

2.3.2. Similar Programs of APEC Members

1) Industry-academia Collaboration IP Advisor Dispatch Program[77] (Japan)

- Japan's National Center for Industrial Property Information and Training (INPIT) is operating the industry-academia collaboration IP advisor dispatch program in various forms.
- The INPIT has been dispatching industry-academia collaboration IP advisors, or IP experts, from 2016 to universities conducting industry-academia collaboration activities to support them with the identification of R&D projects, technology commercialization and IPR management.
- IP Management Specialists are being dispatched within a wide area network including various universities as part of a broad-based effort to create a framework for selecting promising technologies developed at universities, and acquiring IPR to safeguard and utilize these technologies.
- Set out below are the various types of dispatch programs currently offered.

[77] https://www.jpo.go.jp/sesaku/daigaku_shien_01.htm

Table 36. Industry-Academia Collaboration IP Advisor Dispatch Program (Japan)

Dispatch Program	Application Season	Overview of System	Dispatch Period
Dispatch for general support	Late January and around August	Advisors are dispatched upon request from universities included in the wide area network, comprised of several (three or more) universities.	Dispatch period: One year in principle (maximum of three years) Frequency: Three days a week to stationed
Dispatch for preparatory support	Ad hoc	This system is most apt in cases where the new establishment of a wide area network of universities for a specific region or sector is being reviewed. Advisors are dispatched upon request, to provide preparatory support to members or potential members of the network preparing to apply for dispatch for general support	Dispatch period: Until the closest application season (maximum of one year) Frequency: Around one day a month ~to three days a week
Dispatch for diagnosis	N/A	Wide area network university advisors are dispatched upon request for support in preparation	Typically dispatched for under five occasions
Dispatch for follow-up support	N/A	When support is requested after the dispatch for general support program is completed, an additional dispatch of wide area network university advisors is made	Support period: One year in principle (renewal possible) Frequency: Around one day a month to one day a week

2) Industry Collaboration Program[78] (Chinese Taipei)

- An industry-academia collaboration program that aims to create value added and constructive outcomes from research projects conducted by universities and research institutions. The general objective of the program is to achieve collaboration between the industry and academia and to encourage creation and commercialization of patents. This is to create better outcomes and IP through academic and industrial research, and to bring the industry and academia closer to each other, enabling them to provide effective mutual feedback on research.

78) http://www.link-iac.org.tw/

2.3.3. Procedures and Details of the Program

1) Target of Support

- Support will be provided to universities and public research institutions with low awareness on IP, or with an underdeveloped system or infrastructure for IP creation and utilization.

2) Program Process

- Public institutions will carry out a two-staged selection and evaluation process to select universities and public research institutions for which support will be provided, and subsequently match and dispatch an IP Management Specialist who can be the best fit for

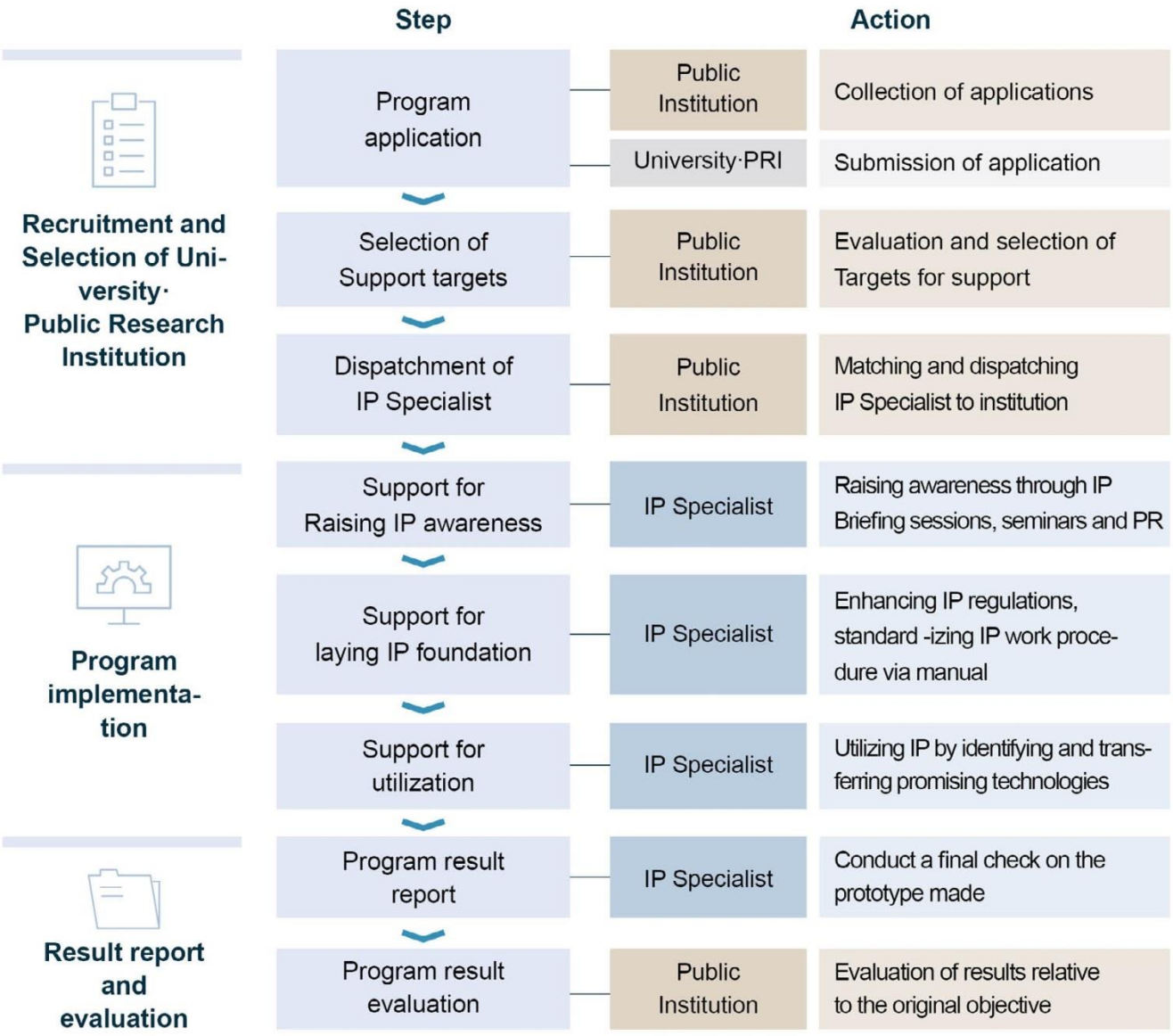


Figure 69. Program Process (Dispatch IP Management Specialist)

3) Scope and Conditions of Support

- One IP Management Specialist will be dispatched to each university or public research institution.
- Support will be provided in consideration of the annual payments to be made regarding the annual budget for program operation and the costs entailed to the dispatch of IP Management Specialists.

Note

- The Dispatch IP Management Specialist program is mostly financed from the budget of the concerned government (the annual budget for program operation may be determined in consideration of dispatch costs of IP Management Specialists).

2.3.4. Guide Map for Participating Entities

Table 37. Guide Map for Participating Entities (IDispatch IP Management Specialist)

<table>
<tr><td rowspan="2">Entity</td><td rowspan="2">Preparation</td><td colspan="7">Program Process (Phase)</td><td rowspan="2">Follow-up Management</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td rowspan="2">Public Institution</td><td>Program design</td><td>Recruitment of university/public research institution</td><td>Selection of university/public research institution</td><td></td><td colspan="3" rowspan="2">Operation and management of dispatch program</td><td rowspan="2">Program evaluation</td><td rowspan="2">Current status inspection</td></tr>
<tr><td>Recruitment of IP Management Specialists</td><td></td><td></td><td>Matching and dispatching IP Management Specialists</td></tr>
<tr><td>IP Management Specialist</td><td>Participation of IP Management Specialist in the program</td><td></td><td></td><td></td><td>Support to increase awareness on IP</td><td>Support to lay the groundwork for IP activities</td><td>Support for utilization of IP outcomes</td><td>Program result report</td><td></td></tr>
<tr><td>University/ Public Research Institution</td><td></td><td>Application for support program</td><td></td><td></td><td colspan="3">Collaboration with the dispatched IP Management Specialist</td><td></td><td>Current status inspection</td></tr>
</table>

- The guide-map for participating entities is a chart that encapsulates the end-to-end process of the program, from the planning stage to follow-up management.

- The program does not limit the period of support to long-term (e.g. support for an average of three years), and the implementing members may adjust the period of support prior to program introduction, according to their circumstances.

- The chart provides a summary of roles that are to be served by public institutions, IP Management Specialists and universities or public research institutions in each stage of the process, the details regarding which are spelled out in the following section 2.2.5 Detailed Guidelines for Participating Entities.

2.3.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Determining details of support and the general direction of the Dispatch IP Management Specialist program.
2. Matching and dispatching IP Management Specialists who meet the needs of each university and public research institution.
3. Conducting regular monitoring of the program to enable universities and public research institutions to achieve constructive outcomes.

(1) Designing the Dispatch IP Management Specialist Program

- The objective of the Dispatch IP Management Specialist program is to raise universities and public research institutions' awareness on IPs and to support them in establishing the infrastructure necessary for efficient creation and management of IPs via IP Management Specialists. Public institutions that operate the Dispatch IP Management Specialist program should determine the details of support and the general direction of the program by analyzing the current status of IP activities in universities and public research institutions (current status on patent applications and creation/utilization of IPs including technology transfers). For instance, the area of greatest priority should be determined, whether it may be greater awareness on the importance of IPs, IP creation, technology transfers or commercialization of technologies, and the IP Management Specialist should design the annual operation plan for the university or public research institution's IP management (creation, protection and utilization) program with a focus on that direction.

- Public institutions attempting to implement the IP Management Specialist program for the first time should design the program around raising awareness on the importance of IPs among universities and public research institutions. In often cases, a low awareness of IPs leads to poor performances by universities and public research institutions in IP creation and utilization. As a matter of fact, one of the greatest difficulties an IP Management Specialist faces upon being dispatched to a university or public research institution is their uncooperative attitude. It is common for professors and researchers to view IP management processes or systems (creation, protection and utilization, etc.) that did not exist before as cumbersome and unnecessary. As such, the program should necessarily include details on support to increase universities and public research institutions' awareness on IPs.

- In the case, however, an APEC member has several years of experience in operating an Dispatch IP Management Specialist program for universities and public research institutions, it may design the program with a focus on IP creation and utilization as opposed to raising awareness, and IP Management Specialists may adjust the specific program plans accordingly.

- In short, public institutions should design Dispatch IP Management Specialist programs in consideration of the program implementation period, IP awareness in the concerned member, the level of IP development, and infrastructure, etc.

- The Dispatch IP Management Specialist program should spell out the methodology and processes such as the criteria for IP Management Specialist recruitment, major roles and functions of IP Management Specialists, dispatch period, program implementation and management method, selection criteria for universities and public research institutions, and performance evaluation.

- **[Criteria for** IP Management Specialist r**ecruitment]** Public institutions should recruit and manage IP Management Specialists. In doing so, public institutions may make use of the IP Management Specialist pool, but it is recommended that they recruit and dispatch regular personnel if possible, to product better outcomes through close collaboration with the dispatched IP Management Specialists. The criteria for recruitment should be determined upon consideration of the level of IP application and the particular circumstances of the implementing member, but all IP Management Specialists should be armed with expertise in technology and patents, which is why they should fulfill the following requirements:

Example

1. An IP Management Specialist should meet one or more of the following requirements:

① A person with more than 7 years of experience in IP upon receiving a bachelor's degree
② A person with more than 5 years of experience in IP upon receiving a master's degree
③ A person with more than 3 years of experience in IP upon receiving a doctor's degree
④ A person with a patent attorney license

2. An IP Management Specialist should have the following abilities:

① Expert knowledge on IP laws and regulations and the ability to apply such knowledge in operations
② Ability to provide instructions on the establishment and operation of IP management systems in universities and public research institutions
③ Knowledge on technology transfer/commercialization and ability to provide instructions
④ Practical knowledge and hands-on experience regarding patent utilization in R&D, etc.
⑤ Ability to respond to requests from universities and public research institutions in a flexible manner
⑥ Other knowledge regarded as necessary for the operation of the Dispatch IP Management Specialist program, specified by the head of the managing institution

Note

- The basic qualifications for IP Management Specialists may be adjusted according to the qualification level of IP experts in the implementing member. For instance, if the IP experts in the region have little experience in general, the level of experience required will be downward adjusted. If there are no experts who meet the needs, requirements would be that one completes IP Management Specialist educational courses, and their level of knowledge would be enhanced through constant education and seminars.
- The selection of IP Management Specialists may take place either before or after the selection of universities and public research institutions. However, if the selection of IP Management Specialists takes place first, it may be difficult to match specialists to the precise needs of universities and public research institutions selected later.

(2) Selection of University and Public Research Institution

- [Application eligibility] Universities and public research institutions to which an IP Management Specialist had previously been dispatched, or with a currently dispatched specialist will be excluded from eligibility.

Note

- In the initial stage of the Dispatch IP Management Specialist program, a large number of universities and public research institutions will apply for support, but several years into the launch of the program, the number of applicants will start to dwindle. In such a case, public institutions responsible for the operation and management of the program should make active efforts to enlist greater participation from universities and public research institutions by stepping up advertisements and paying site visits, thereby expanding the potential scope of the program.

- **[Application eligibility and requirements]** In order to be eligible, universities should have an industry-university collaboration organization or technology transfer organization up and running, and public research institutions should be recognized by the government. Common eligibility criteria and requirements include the following: first, the institution must be aware of the necessity to reinforce IP management capabilities, and should have established or have plans to establish internal strategies to address such issues. Secondly, to guarantee IP Management Specialists' active participation, universities should give IP Management Specialists the title of "professors specializing in industry-university collaboration" or an authority that is equivalent thereof, and public research institutions should give them the title of "IP-specialized commissioner" or an authority that is equivalent thereof. Thirdly, to support the IP Management Specialist's activities, business promotion expenses, business trip expenses, IP-specialized personnel, office space and consultation room, accommodation for dispatch to remote or rural areas or any expenses that is equivalent thereof will be provided.

- **[Selection and evaluation]** The evaluation process for selection is comprised of two stages. The first stage is an evaluation of documents, during which universities and public research institutions are judged on whether the eligibility criteria and requirements are met, based on the submitted documents. The second stage is an evaluation of presentations. Applying institutions present on plans to utilize and support specialists, and evaluation is made by the evaluation committee based on various criteria such as the appropriateness of the applying institution's level of IP capabilities, how well thought-out the plan for IP capability enhancement is, the feasibility of the plan to utilize IP Management Specialists, and the level of support provided to IP Management Specialists' activities, etc.

- The first stage or the document evaluation is largely centered on whether the applying institution has mapped out specific plans to utilize IP Management Specialists, and whether it has sufficient willingness. Set out below are the major categories for document evaluation which should be used for reference when filling out relevant documents.

Note

1. Evaluation items for document evaluation (universities)

① Current IP activities at the university: Details such as R&D orders received, patent application and registration, technology transfers, industry-university collaboration organizations, current status on IP-specialized personnel, execution of relevant budgets, etc. should be stated.

② Plans to enhance the university's IP capabilities: An elaboration of the medium to long term plan to enhance the university's IP capabilities based on current data.

③ Plans to utilize IP Management Specialists: A comparison of the current status and future plans to achieve the medium to long term goal of enhancing IP capabilities by utilizing IP Management Specialists

- Raising IP awareness
- Enhancing IP management capabilities
- Specialists' position among the organizational structure of the industry-university collaboration organization

③ Plans to support the activities of IP Management Specialists

- Cooperation with public institutions and relevant institutions' business activities
- Program expenses necessary for the IP Management Specialist to implement the program in an efficient manner (amount should be specified)
- Providing a clear position and role to serve within the university or public research institution (e.g. professors specializing in industry-university collaboration)
- Specialized personnel and office space, etc. (specific details and photographs, etc. included)
- Accommodation or expenses that are equivalent thereof for dispatch to remote areas
- Proposal of welfare benefits such as available extra pay (in comparison with internal employees)

④ Summary of other IP capabilities' current status

Items included in the summary of other IP capabilities should include the following:

- Department in charge of IP management and its organizational structure
- Current information on the department in charge of IP management (budget, exclusively dedicated/dual-hatted employees, management regulations, business procedure, employee invention evaluation committee, etc.)
- Number of applied and registered patents, information of currently owned patents
- Technology transfer outcomes
- Current status of patent information utilization
- IP education outcomes and infrastructure
- Research infrastructure and research outcomes
- Evaluation of research outcomes and the compensation system

- Set out below is the evaluation sheet for the first stage of evaluation, which may be used for reference when filling out the sheet.

Example

Table 38. Example Evaluation Sheet for First Stage Evaluation (e.g. University)

Evaluation Category	Details	Points
Appropriateness of the level of IP capabilities	Details on R&D orders received, number of applied or registered patents, technology transfers, current status of IP-specialized organizations, and execution of relevant budgets, etc. should be specified (based on the summary of IP management capabilities)	20 points
Quality of plans to enhance IP capabilities	An elaboration of the medium to long term plan to enhance the university's IP capabilities based on the applying institution's current level of IP capabilities	20 points
Feasibility of plans to utilize specialists	A comparison of the current status and future plans to achieve the medium to long term goal of enhancing the applying institution's IP capabilities by utilizing IP Management Specialists	30 points
Level of support provided to specialists' activities	A list of support provided to facilitate the efficient implementation of the program such as activity costs, IP-specialized personnel, accommodation (in case of remote areas), office space and other forms of support available within the IP-specialized organization's budget (as for activity expenses, the exact amount should be specified)	30 points
Total		100 points

- Public institutions will select universities and public research institutions based on the first stage evaluation sheet, and the ensuing second stage evaluation will be centered on universities and public research institution's presentations on the evaluation categories set out on the evaluation sheet.

- After the second stage of evaluation, the institutions to which specialists will be dispatched will be determined through the final decision.

- **[Matching and dispatching IP Management Specialists]** The default number of specialists for dispatch is one person for each university or public research institution. Specialists and institutions will be matched based on their area of expertise in research and technology, and the specialist will be stationed at the university or public research institution to carry out their designated role. The program will typically be operated for one year, although the dispatch period of the specialist may vary depending on each institution's circumstances. Furthermore, in the case where a university or public research institution requests an extension, an evaluation for extension of dispatch period will be conducted, and the dispatch period will be extended if the results show that there is a probable cause for an extension. The maximum dispatch period is three years, and when the support period for the program terminates, public institutions will no longer provide for expenses incurred by the dispatch of IP Management Specialists. If an institution wishes for a further extension of the IP Management Specialist's dispatch period, it should employ the specialist internally. One of the objectives of the program is to maintain the operation of systems such as patent-related regulations and work processes over the long term. As such, support will be provided to enable institutions to hire alternative personnel, even when the dispatch period of the IP Management Specialist reaches an end.

Note

- When dispatching IP Management Specialists, those with expertise in the technological sector sought after by the concerned university or public research institution should be dispatched.

- In the case of research institutions, it may be easier to dispatch IP Management Specialists with a matching area of expertise, whereas it may be more difficult in the case of universities, which generally have a wider scope of research. Thus, in the latter case, dispatched IP Management Specialists should have technological expertise in the flagship research sector of the university.

- Furthermore, universities and public research institutions may require different skills from IP Management Specialists depending on the institution's capabilities or scale of TLO. In the case of universities and public researchers with sufficient capabilities and a large-scale TLO, IP Management Specialists who can engage in day-to-day operations are preferred. In the opposite case, institutions prefer to be consulted. Therefore, the dispatch of specialists should be tailored to the needs of universities and public research institutions.

(3) Program Operation and Management

- **[Program operation and management methods]** In order to enable efficient operation of the Dispatch IP Management Specialist program and management of its outcomes, field inspections on each university or public research institution's program operation should be conducted, and field evaluations of the role of IP Management Specialists should be carried out. Efforts should be made to actively involve universities, public research institutions and IP Management Specialists in the field evaluation process. Field evaluators may be comprised of public institutions' persons in charge, or IP Management Specialists of other universities and public research institutions. Evaluation on universities and public research institutions to which an IP Management Specialist has been dispatched will be centered on whether the concerned institution has provided active support and willingly cooperated with the dispatched IP Management Specialist. Information regarding the evaluation is stated in the chart below.

- Corresponding measures for results of the field evaluation are set out below.

- Universities and public research institutions with a field evaluation score of between 60 and 70 should submit a review of probable causes and improvement plans to the head of the managing institution within two weeks of being notified of the evaluation results. Also, the head of public institutions should conduct a separate field inspection on the universities and public research institutions which have submitted an improvement plan for a reevaluation.

- For universities with an evaluation or re-evaluation score of below 60, the agreement for the concerned year may be terminated.

- **[Operation of information exchange committee of IP Management Specialists]** IP Management Specialists should gather for an information exchange committee once a month to be engaged in information exchange, discussions, and meetings. During the committee, they will share ideas on prime examples regarding the program, difficulties, and issues.

Note

- The operation of the information exchange committee will be left to the discretion of the implementing economy. For instance, a regular committee may be held once in every two months, and ad hoc committees upon demand. IP Management Specialists may deem a committee being held once a month as appropriate or being too often.
- Also, there may be informal exchanges among IP Management Specialists, as they may contact each other to share ideas on information or know-hows relating to the operation of the program.

Example

Table 39. Example Evaluation Sheet for the Evaluation of Current Status on IP Management Specialists' Activities at Universities and Public Research Institutions

Evaluation Criteria	Evaluation Category	Excellent	Good	Average	Poor	Very Poor
Support by the Institution (Quantitative) (50)	**Support for IP Management Specialist's work procedure (30 points)**					
	How many IP-specialized personnel were dedicated to cooperate with the work procedure of the specialist	15	11	8	6	4
	Level of support provided to create a favorable working environment for the specialist (office space and meeting space arrangements)	15	11	8	6	4
	Disbursement of specialist's activity cost (20 points)					
	Separate account opened for independent management of specialist's activity costs	10	8	6	4	2
	Disbursement of compensation for specialist among the total activity cost allocated for the specialist	10	8	6	4	2
Subtotal:						
Cooperation and Efforts by the Institution (Qualitative) (40)	**Institution's efforts for cooperation with the specialist (20 points)**					
	Level of effort by the institution for cooperation with the specialist's work procedure	10	8	6	4	2
	Level of effort by the specialist and institution to create constructive outcomes	10	8	6	4	2
	Appropriateness of the specialist's role (20 points)					
	Appropriateness of the specialist's given role (title of the dispatched specialist and position in the organizational structure, etc.)	20	18	16	14	12
Subtotal:						
Program Implementation and Improvements (Partial) (10)	**Progress of the IP Management Specialist program (5 points)**					
	Level of progress made relative to the support plan announced when applying for the specialist dispatch program	5	4	3	2	1
	Progress in improvement plans relative to the previous year (5 points)					
	Level of progress made relative to the improvement plan of the previous year	5	4	3	2	1
Subtotal:						
Final Score (Out of 100 points)			**(points)**			
Other Comments						

- When conducting an IP Management Specialist's performance evaluation, a comparative evaluation of the original objective and the actual performance regarding the program implementation of the concerned year should be made. A statement of performance should be submitted for the performance evaluation, and evaluators of the evaluation committee should notify the results of the performance evaluation to the public institution upon conducting a performance evaluation. Below is a sample evaluation sheet to gauge the performance of an IP Management Specialist.

Example

Table 40. Example Evaluation Sheet of IP Management Specialist's Performance
(Quantitative-**Performance**, 50%)

University/Public Research Institution		**IP-specialized Commissioner**					
Evaluation Criteria	**Evaluation Category**						
Dedication to the Program (30 points)	**Level of satisfaction by the university or public research institution (5 points)**						
	Satisfaction survey score	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Performance in enhancing program capabilities (20 points)						
	Example (no. of patent consultation and advice)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Example (no. technology transfers)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Example (technology fee income)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Example (creation of promoting patents, S A %, etc.)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Disbursement of specialist's activity cost (5 points)						
	◦Activity cost: per year (Unit: 10,000 KRW) (Direct expenses: , indirect expenses: , compensation:)						
	Disbursement rate: % (100% if the total amount it disbursed)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
Subtotal:							
Contribution to Development of Institution (15 points	**Performance of institution's patent activities (5 points)**						
	Example (comparison of performance pre- and post-dispatch, etc.)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Contribution to institution's development (5 points)						
	Example (enhancement of capabilities, improvement of work procedure)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
	Contribution to the development of the specialist dispatch program (5 points)						
	Example (contribution to advertising program and identifying demand) Example (proposal of new program ideas)	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
Subtotal:							
Level of Cooperation (5 points)	**Level of cooperation with work procedures of the program (5 points)**						
	Cooperation required for operation of the program such as compliance with report items	S (110%)	A (105%)	B (100%)	C (95%)	D (90%)	
Subtotal:							
Final Score (out of 50 points)	**(points)**						

- Universities and public research institutions should submit a semi-annual report to the public institution on performances regarding the operation of the program. The format for the program performance report should be crafted in consideration of the below items.

Note

1. Results of patent activities
① Number of employee inventions and evaluations
- Aimed at raising awareness on IP
② Number of applied patents and expenses
2. Results of technology transfers
① Exclusive and non-exclusive licenses
3. Results of seminars and educational sessions
① Results of seminars held
② Results of educational sessions held
4. Results of patent cooperation network (council) operation
5. Results of consultation and advice
6. Results of industry-university collaboration organization's patented right transfers
7. Results of orders received regarding IP creation support program
8. Other major areas of effort
9. Difficulties and policy proposals
10. Photographs of major events and detailed explanations
11. Performance in identifying potential licensees and establishing a database

- **[Follow-up management]** Public institutions may conduct a current status inspection of IP activities on or require relevant literature from institutions with a completed dispatch program. Universities and public research institutions should abide by such requests, and in cases where institutions are deemed as being uncooperative, such facts will be accounted for in selection processes of future programs.

- Details of current status evaluation may be adjusted to the circumstances of the implementing member after referring to the below follow-up management status evaluation sheet.

Example

Table 41. Evaluation Sheet of the Status of Follow-up Management of Institutions that Have Completed the Dispatch IP Management Specialist Program

Name of Institution	
Evaluation Category	**Score**
Patent/technology commercialization education (30 points)	
Patent/technology commercialization education provided	
Participation in external education regarding IPs	
Identification and management of patents (20 points)	
Identification of IP, improvement of IP activities (application/registration), portfolio management	
Maintenance of system for patent management	
Enhancement of technology transfer capabilities (20 points)	
Improvement of technology valuation and commercialization	
Improvement of technology transfer outcomes	
IP related regulations, deliberation committee (20 points)	
Enhancement of IPR management regulations, operation of deliberation committee	
Succession of IP Management Specialist's duties (enhancement of internal capabilities) (5 points)	
Level of succession regarding IP Management Specialist's duties upon completion of program	
Securing IP-specialized personnel (5 points)	
Level of IP-specialized personnel within the institution	
Final Score (Out of 100 points)	**(points)**

<Other Comments>

2) Guidelines for IP Management Specialists

Key Activities

1. Designing a support plan that meets the needs of the university or public research institution.
2. Holding briefing sessions/seminars and carrying out PR to raise awareness on IP.
3. Reviewing and enhancing IP management systems in order to lay the groundwork for IP activities and systematizing the procedure for identifying and reinforcing IP.
4. Supporting building a business model for technology transfers and identifying potential licensees, in order to utilize IP outcomes.

- **[Main roles of IP Management Specialists]** IP Management Specialists should provide support to the university or public research institution in raising awareness on IP, laying the groundwork for IP activities, and utilizing IP outcomes based on the utilization plan that the institution submitted during the application process. Specialists should identify the institution's needs through consultative sessions, and design a support plan that is tailored to those needs. For information regarding the general role of IP Management Specialists, please refer to below.

Example

< Main Roles of an IP Management Specialist >

1. Providing consultation and advice on IP
2. Holding briefing sessions and seminars on IP
3. Providing education by offering educational courses on IP
4. Advertising Dispatch IP Management Specialist program
5. Enhancing regulations regarding universities and public research institution's IP
6. Forming and supporting the operation of patent evaluation committee
7. Identifying promising patents and providing support to facilitate technology transfers
8. Creating a manual for IP management
9. Creating a plan for program operation
10. Other requests specified by the head of the public institution

(1) Raising Awareness on IP

- IP Management Specialists should hold briefing sessions and seminars, and engage in promotional activities to raise awareness on IP. Briefing sessions and meetings will be centered on what function the Dispatch IP Management Specialist program serves, what role IP Management Specialists assume, the expected results through the program, what is required from universities and public research institutions to successfully operate the program, how to create R&D outcomes, and the importance of IP. Typically, universities will target university students, graduate school students and faculty members, and research institutions will target researchers and employees. There is no specific number of events to be held, thus universities and public research institutions may hold sessions or seminars either regularly or upon demand, depending on their circumstances.

- **[Overview of roles]** When consulting researchers in person or providing patent consultation, specialists should review in advance general IP elements that researchers should be aware of, and raise their awareness on IP by providing guidance and support on how to make improvements. Detailed roles include the following:

  - Informing university professors and researchers of the importance of IP and ways to utilize IP, disseminating the concept of and mindset regarding employee inventions, advertising universities' IP-related regulations, highlighting the importance of technology transfers and the following benefits (incentives), engaging in promotional activities to regard patent rights as property rights, informing institutions of the pros and cons of joint patent acquisition with enterprises when signing research contracts, explaining the correlation between theses and patents, collecting opinions on issues and difficulties regarding patent management, etc.

- To raise awareness on IP, IP Management Specialists should first prepare a checklist that covers the general elements, through which they can diagnose the researcher's current awareness of IP. Subsequently, specialists should design a strategy that best suits the researchers' current level of IP awareness and push forward with patent consultation and education. For details, refer to the work procedure specified below.

Example

Table 42. Example Work Procedure for Raising IP Awareness

Stage 1	**Creating a checklist that covers general IP information that researchers should be aware of** (Selecting checklist items for knowledge management in the laboratory, research planning, university regulations, acquisition and management of IPR and technology commercialization)
Stage 2	**Using the checklist to analyze researchers' current level of awareness on IP** (Identifying difficulties experienced by researchers, etc.)
Stage 3	**Designing strategies to raise awareness on IP** (Devising strategies using the checklist, designing plans for consultation and education)
Stage 4	**Carrying out patent consultation and education** (Carrying out patent consultation and education in accordance with the strategies to increase awareness onIP)
Stage 5	**Follow-up management** (Providing further management in areas that require additional consultation or education via e-mail or in person)

- Major items for the checklist include knowledge management in the laboratory, research planning, university regulations, IPR acquisition and management, and technology commercialization. For details of each item, refer to the table below.

Example

Table 43. Example Check list on IP Management

Category	Contents	Y	N	Note
Knowledge Management in the Laboratory	Have researchers in the laboratory ever received patent education?			No. of cases ( )
	Does the laboratory hold confidentiality agreements?			
	Is there standard research notebook?			
	Are researchers in the laboratory filling out the research notebook?			
	If a research notebook is being filled out, are there clear standards on filling out and maintaining the notebook?			
Research Planning	Is a patent information search conducted when selecting a research topic?			
	Has a market research ever been conducted when selecting a research topic, to enhance the utilization of research outcomes?			No. of cases ( )
	Regarding an R&D project, has a patent map, technology evaluation or prior art search ever been conducted, or commissioned to an external organization for use?			No. of cases ( )
University Regulations	Is there an understanding of university's employee invention regulations (duty-related inventions)?			
	Is there an awareness of the university's compensation system for employee inventions?			
	Is the industry-university collaboration organization notified by paper upon completion of a employee invention?			
IPR Acquisition and Management	Does the institution have experience in applying for IPR?			No. of cases ( )
	Upon completion of a research, which is conducted first: release of theses or application for patents?			
	Is the institution aware of cases where it may not be able to register a patent if an invention was made public (thesis was released, or published in an academic journal, etc.) prior to acquiring a patent?			
	Has the institution ever consulted with an expert for patent acquisition?			
	Is there a patent attorney or patent agency that is often referred to when acquiring patents?			
	Prior to applying for a patent, does the institution review specifications provided by the patent agency?			
	Is there an understanding on favorable interpretation of the scope of patent claim in order to secure a strong patent right?			
	Is the institution aware that even if a patent is registered, it may infringe upon a previously registered patent when licensing a patent?			
Technology Commercialization	Are market trends related to the concerned technology identified when planning for research?			
	Does the institution have potential licensees, which will utilize research outcomes, in mind when planning for research?			
	Is there an understanding on the negative aspect of enterprises and universities' joint ownership of patents?			

- IP Management Specialists should invite outside experts to provide education for enhancement of people in charge of patents' IP capabilities. Education should be carried out based on a curriculum centered on education necessary for a people in charge of patents. For education topics, refer to below.

Example

< Example of Topics for the Education of Persons in Charge of Patents at Universities and Public Research Institutions >

- **Patent acquisition for university inventions**
  - Role of people in charge of patents, patent acquisition for universities' research outcomes, introduction of patent associations
- **R&D and IPR**
  - Definition of R&D, overview of IPR, major clauses on IPR, environment to protect IPR
- **Introduction of the patent system**
  - Patent regulations and requirements, examples, patent amendment methods
- **Creation of a patent specification**
  - Understanding patent applications and specifications, domestic patent application procedure, examples of prime specifications, interpretation of scope of patent claim, designating the scope of patent claim, cases of patent infringement disputes
- **Patent information search**
  - Overview of patent information search, keyword search method, examples of patent information search, creation of a patent map, extracting core patents, devising response strategies, examples of patent maps
- **Employee invention (invention related to one's work or duty) and patent strategies**
  - Explanation of employee invention, ways to fill out research notebooks, theses and patent strategies
- **Technology transfers and commercialization**
  - Overview of technology transfers, cases of technology commercialization, examples of start-ups

- **[Education and seminars]** Education (plans) should be prepared to tailor to various targets of education and majors, and the curriculum should be selected based on the size of the audience. In the case where education is carried out on a specific group of researchers such as a specific department, laboratory, research institution or enterprise, education should be made more efficient by conducting a preliminary survey on the most preferred education topic to researchers and taking the result into account.

  - Introduction of major issues on IP creation/protection/utilization and disputes
  - Introduction of general information on invention methods, patents, utility models and designs, etc.
  - Education on methods for patent information search and patent information utilization
  - Education on creation of patent specification, and ways to revitalize technology transfers and commercialization

- Set out below is a sample work procedure for education and seminars.

Example

Table 44. Example of Work Procedure for Education and Seminar

Stage 1	**Creating an application form where one can select the educational curriculum of preference** (designating specific topics for each curriculum area – application for IPRR education is left to one's discretion)
Stage 2	**Recruiting professional lecturers for each education topic**
Stage 3	**Advertising IP education** (utilizing the industry-university collaboration organization's website, e-mail and bulletin boards, etc.)
Stage 4	**Devising strategies for IP education requested by researchers** (selecting different strategies for small scale briefing sessions and large scale seminars – education schedule and selection of lecturers)
Stage 5	**Analyzing IP education** (surveying the level of satisfaction after lectures – reflecting feedback into future education programs)

Note

- **Education and seminars should be carried out by securing a pool of professional lecturers for each technological sector. By operating a pool of outside professional lecturers, who can engage in a partnership with the university or public research institution, for each technological sector, professional education can be guaranteed.**
- **A medium to long term plan should be devised regarding education and seminars. During the initial stage of the program, IPR education should be tailored to the technological sector of each department, lab or research institution to increase the level of satisfaction. Around three years into the launch of the program, an eight to ten week long professional course for IPR education may be carried out.**
- **Since IPR education for a small group most often has a focus on a specific technological sector, participants may be more satisfied after being lectured by a professional lecturer with expertise in the concerned sector.**
- **Ideas on IPR should be shared by constantly receiving information on participants of educational courses.**
- **A synergy effect may be created by utilizing external institution's IPR related educational courses.**
- **n cases where there are not enough participants or a shortfall of budget occurs when planning for an IPR seminar at the university or public research institution level, holding a session jointly with other institutions should be considered. When several institutions decide to hold a session jointly, they should undergo sufficient discussions in advance regarding the date of the event, division of expenses, promotional strategies, and recruitment of lecturers, etc.**
- **Extreme discretion is required when preparing for these events as sufficient time is needed in advance, while making sure that the schedule does not conflict with other seminars or events at the university.**

(2) Building the Foundation for IP

- IP Management Specialists will be exerting efforts on many fronts including the establishment of a set of rules for universities and public research institutions, provision and implementation of a work process manual, support for prior art searches, and much more with aims of building a foundation for IP. Since it is highly likely that universities and public research institutions do not have an established set of internal rules and regulations pertaining to IP, establishing or enhancing a set of rules for these institutions is of utmost priority. Also, a lack of standardized work process regarding IP may lead to more costs and hinder systematic IP application. It is thus critical to provide a systemized IP application process so as to reduce application cost and allow for efficient R&D.

- **[Enhancement of IPR regulations]** When establishing or amending IPR regulations, major issues and relevant laws should be considered so that the most reasonable set of rules can be created.

- **[Establishment of specific operation guidelines regarding IPR regulations]** Due to difficulties in stipulating specific rules in the university's IPR regulations, it is vital to establish a separate set of specific operation guidelines attached to the IPR regulations that can be managed by the industry-university collaboration organization, as this will boost both transparency and efficiency of the work procedure. It is recommended that the specific operation guidelines include factors such as invention evaluation, succession deliberation process, treatment of IPR expenses, paperwork and procedures regarding compensation to inventors, evaluation of contributors to technology transfer, and others.

- Below are major factors to consider when enhancing IPR regulations.

Example

Table 45. Examples of Major Issues to Consider when Enhancing IPR Regulations

Category	Contents	Note
Definition of terms	IPR, inventions, etc. Employee inventions, free inventions Scope of staff and faculty Other personnel conducting research	Refer to relevant regulations
Attribution and succession of employee inventions	Succession planning regulations Invention report and notification of succession Regulations on filing objections	Refer to relevant regulations
IP expenses	IP application, registration and maintenance expenses	Refer to relevant regulations
Technology transfer and compensation rules	Standards on technology fee income Regulations on inventor compensation Incentives to technology transfer contributors	Refer to relevant regulations
Deliberation and evaluation committees	Formation and management of IPR deliberation committee Formation and management of technology evaluation committee	
Confidentiality provision	Inventor obligations Industry-university collaboration organization staff obligations	

- **[Operation of the IPR deliberation committee and technology evaluation committee]** By supporting the operation of universities' IPR deliberation committees, systematic management over IP creation, management and utilization by universities will be sought. The operation of technology evaluation committee, which assesses and selects technologies held by universities, will be supported to help the IPR deliberation committee make decisions on holding or discarding certain technologies, identifying promising technologies, and commercializing them.

- The IPR deliberation committee deliberates and decides on the following:
  - Whether an invention by a faculty or employee falls under the category of employee invention
  - Whether employee inventions that have been succeeded should be applied for IPR at home and abroad
  - Transfer transactions and utilization of IPR, and whether IPR should be maintained
  - Succession of rights related to employee inventions, free inventions and other IPs
  - Selecting and providing compensation to employees who contributed to technology transfers

Example

Table 46. Example of Work Procedure of the IPR Deliberation Committee

Stage 1	**Help build the foundation for operating the IPR deliberation committee** (Enhancing IPR regulations on functions and roles of the committee)
Stage 2	**Seeking measures to support deliberation and evaluation activities of the committee** (Deciding whether an invention is a employee invention*, identifying current developments in technology review and evaluation methods, and seeking support measures)
Stage 3	**Boosting expertise of deliberation and evaluation through input from professionals both within and outside the committee** (Boosting expertise regarding identification and evaluation of promising technology, and improving objectivity by incorporating the results of technology evaluation into the deliberation)
Stage 4	**Establishing a system to manage and utilize the results of deliberation and evaluation** (Delivering results of deliberation in written documents to the inventor and contributing to expanding the effects of technology transfers by utilizing the results of technology evaluation)

- Refer to the following for relevant work procedure.
  - Employee invention: invention created by an employee (inventor) in the execution of employment task under the employment contract.- Whether employee inventions that have been succeeded should be applied for IPR at home and abroad

Note

- **If the internal technology evaluation committee, aimed to support the management of the IPR deliberation committee, has not yet been operating in a stable manner, outsourced patent selection evaluation should be conducted and the results reflected in the deliberation so as to achieve objectivity.**
- **If there is a deliberation committee up and running, its operation method should be put under scrutiny. If there is room for improvement relating to technology review and evaluation method, relevant format, etc., it should be reported to the university so that the committee can be operated in an efficient manner with adequate support from the university.**
- **It is most desirable for IP Management Specialists to mainly take on the role of providing advice and support to the deliberation committee for its efficient operation.**
- **Issues with which the deliberation committee cannot easily come to an agreement should be left for reevaluation at a later date so that the meeting will not be overly prolonged.**
- **Those who have been dispatched to universities realize how difficult it is to convene an IPR deliberation committee. Bringing together professors is harder than bringing together those from the industry, especially since professors do not favor the idea of assessing peer researchers' inventions.**
- **Deliberation committees have been previously organized but have almost never served its full purpose of actual evaluation.**
- **What complicates the matter further is that IP management professionals cannot take the lead and play the main role. IP Management Specialists only attend and provide advice regarding evaluation requirements and preceding cases. They cannot take on the leading role as they are not employees of the concerned university.**

- **[Supporting prior art searches]** The main objective of prior art search is to secure patent rights and identify in advance potentials for commercialization with regards to technologies that have been deemed promising in patent consultations. This is done through assessing chances of patent acquisition while also identifying potential competitors and competing technologies. Furthermore, technology market research is conducted to check whether the concerned technology can create market demand in a few years' time. Refer to below for work procedures of prior art searches and refer to the prior art search program outlined above for details.

Example

Table 47. Example of Work Procedure for Prior Art Search

Stage 1	Deciding on whether to conduct prior art search after receiving applications from researchers or holding patent consultations
Stage 2	Conducting prior art search and technology/market research and analyzing the results (Identifying chances of patent registration/existing patent infringement, and conducting technology market trend analysis, etc.)
Stage 3	Pursuing PR and educational activities to raise awareness of patent information search and market research

- Refer to below for major factors to be included in technology and market research.

Example

<Example of Major Factors of Technology/Market Research>

- **Definition of the market and analysis of the scope of market**
- **Analysis of current trends and outlook of the market**
- **Value chain analysis**
- **Analysis of competition in the market**
- **Analysis of industry structure**
- **Analysis of policies and relevant institutions**

Note

- **In comparing and contrasting prior arts with the new invention, potential for patent registration and possible infringement should also be assessed. When prior art search is outsourced, only the potential for patent registration is assessed. However, there could be cases of existing patent infringements (e.g. dependent invention, selection invention) even when patents are successfully registered. Therefore, it must be considered that this may impede future technology transfers and/or commercialization of patent products.**
- **Continuous PR activities on the significance of patent information research should be carried out on researchers at universities.**
- **It is most desirable to conduct double-tiered research with the primary prior art search done by the inventor and a secondary search either outsourced or by the industry-university collaboration organization.**

(3) Utilizing IP Outcomes

- Dispatch IP Management Specialist program can allow for promising patents to be identified and give rise to more outcomes through technology transfers. To facilitate technology transfers, IP Management Specialists should research and identify companies with demand so as to manage the pool of promising patents while also focusing on commercializing technologies through technology transfers and marketing activities including drafting documents for marketing purposes.

- **[Marketing strategies for technology transfers]** Marketing efforts for technology transfers begin with identifying technologies that are being transferred from technology holders including research institutions, universities and enterprises. It is critical that the task force for technology transfers gather information on concerned technologies and consider the potential of transfers to sort and categorize them. When the types and number of technologies are great in size, they should be managed in a database. Refer to below for procedures of identifying technologies to be transferred.

Example

Table 48. Example of Procedures for Identifying Technologies

Procedure	Relevant Work Scope	Relevant Knowledge
Basic Consultation	• Understanding the needs of enterprises • Understanding the capabilities for adopting the technology • Understanding the financial ability of the enterprise	• Counseling, consultations • Understanding of enterprises in general
Introduction of Technology	• Identifying technologies owned • Identifying the technological area of expertise of professors • Matching enterprises with technologies	• Understanding of technology • Convergence of technology and enterprise
First Round Meeting	• Introducing two parties (enterprise, professor/ research institution) • First round of information exchange	• Building trust

- **[Evaluation of technology to be transferred]** If the technology to be transferred is selected, evaluation of the concerned technology is conducted. Unlike evaluation at the technology identification and management stage, evaluation at this stage needs to take commercialization and transfer of technology into consideration and account for expected effects of the technology provider and licensees and evaluate the lifespan of the technology. Considering the technological aspects, the potential for commercialization, application scope, the scope of rights, pros and cons, competitive edge, comparative advantage, expected market size and market share, expected returns, potentials for sustained technological development and support, and comparison with competing technologies should be considered and evaluated.

- **[Researching companies with demand and selecting target companies]** Enterprises that have collaborative relationships with universities are potential licensees with high demand for technologies. Thus, there is a need to select and manage potential target firms. Refer to below for issues to consider regarding technology licensees.

Example

Table 49. Examples of Issues to Consider Regarding Technology Licensees

Category	Details
Requirements of Technology Licensees	Technological requirements - Specifics and scope of technology to be transferred, whether equipment and technicians are provided, etc. Specifics on cost charged for the technology transfer - Royalty and means of payment
Capabilities of Technology Licensees	Technological capabilities, capabilities to turn technology into commercialization, analysis of credibility
Others	Are there other projects that could be jointly pursued by technology licensees and inventors? - For continued advancement of technology, joint or outsourced R&D by the technology developer (professor) and researchers should be carried out. Technology providers can expect additional returns in this process.

- When technology selection is finalized and a database has been established, the next step is to find aspiring licensees. Ways to find potential technology licensees include finding buyers online via utilizing technology brokerage or transfer websites, holding an information session on technology transfer, utilizing technology transaction institutions or personnel (license brokers, agents, consultants, technology transaction agents, etc.), or using internal or technology developer's networks.

- **[Preparing documentation]** If the technology to be transferred is identified and evaluation is being conducted, a description letter needs to be documented. Also known as the SMK (Sales Materials Kit), a description letter includes explanations about the technology product, its competitiveness, market competition, industry developments and risks in an easily comprehensible manner. Analysis on rights and evaluation of value in technology need to be conducted in advance. Pictures, drawings, process drawings and video clips also need to be prepared according to the needs in order to help the counterparty understanding the technology.

- **[Technology marketing efforts]** Means of technology marketing include PR, direct interviews and marketing via phone calls. Refer to the table below for means of technology transfer marketing and PR.

Example

Table 50. Examples of Means of Technology Transfer Marketing and PR

Category	Specific Channels
Technology transfer via offline channels Conveying information and securing potential licensees	• Utilizing technology developers' network • Utilizing technology transfer task force's network • Utilizing institutions related to technology transactions • Utilizing intra-region short distance network • Contacting project development teams of large and small enterprises • Hosting and participating in information sessions and other events regarding technology transfers • Marketing efforts targeting foreign companies
Technology transfer via online channels Conveying information and securing potential licensees	• Introducing internal websites and websites of relevant institutions concerning technology transactions • Introducing online channels including relevant websites by industry

- Refer to below for marketing efforts via direct interviews.

Example

Table 51. Examples of Marketing Efforts via Direct Interviews

Category	Specific Channels
Preliminary Contact Stage	• Send sales letters and technology product description letters via mail or email to shortlisted firms at business information sessions or via networks or meetings sponsored by relevant groups.
Proposal Stage	• Make a meeting appointment with the potential licensee or technology adopter, prepare in advance presentation materials and give a presentation on the technology to be transferred.
Negotiation Stage	• It is critical to realize what the client truly dislikes. In technology marketing, dislike can come in various forms. Logical dislike including skepticism, lack of understanding and hesitance as well as dislike that arises from engineers having a condescending attitude toward technology to be transferred.
Finalization Stage	• Use one of the various finalization methods.

- Phone call marketing efforts include drafting a list of names and titles of potential contact points, using the identification guidelines for prioritizing contact points in the order of importance. After compiling phone numbers, what to expect from potential licensee with high interest, potential licensee with low interest, and potential licensee with no interest at all should be distinguished. By utilizing the checklist for the content of phone calls, check the kind of information that needs to be obtained. Calls should be given out to shortlisted firms in the order of highest score given, and a response data sheet should be used to record the responses of the potential licensee during or after the call. Then a summary of confidential information and a sample of the technology transfer proposal should be sent via mail or e-mail, regardless of whether they were requested by the potential licensee.

Note

- **It is most critical that universities transform into a demand-centric, business-oriented institution if they wish to continuously expand their capabilities of technology commercialization.**
- **One-on-one marketing programs between universities and firms should be utilized so as to provide tailored approaches to each major customer. This will boost the success rate technology commercialization and provide a more satisfactory experience to the customer.**
- **Make use of various ways to approach enterprises including attending technology transfer information sessions and exhibitions, obtaining media coverage on promising technologies, and sending technology descriptions and marketing reports to potential licensees.**
- **Technology marketing refers to the entire array of planning, PR and transaction activities aimed to create value to technology providers by transferring technologies developed or held by the provider to the potential licensee.**
- **Technology marketing can be broken down into identifying the technology, turning the technology into a product, and marketing the product.**

- **[Technology transfer agreement and negotiations]** If a potential technology licensee with intentions of adopting the technology is identified through technology transfer marketing efforts, technology transfer agreement and negotiations should be pursued. Draft a checklist containing the information below and review the agreement prior to signing.

Example

Table 52. Example of Checklist on Points of Note Prior to Signing the Contract

Category	Specific Channels
Technology	• Outline of the technology • Value of technology • Form of technology transfer (transfer, license, instruction, etc.) • Method of transfer according to the allocation of rights
Counterparty	• Enterprise, individual • Existence of capacity of enjoyment of rights and capacity to act • The main person in charge, among all signatories, of negotiating terms and conditions • Size of enterprise (capacity of technology commercialization) • Capacity to further develop additional technology • Financial capacity to make payments
Terms and Conditions	• Method and destination of payment for technology transfer • Training method for transfer of technology • Attribution of achievements (scope of invention of improvement and reporting), allocation of rights • Cost of technology transfer (upfront royalty, running royalty, etc.) • Procedure and expenses of application and registration • Period and method of reporting and providing notice • Effective duration, modification, termination, expiration • Damage claims, scope
Others	• Aim of the contract • Background and details of the contract • Objective of the technology developer • Infringement of other laws • Confidentiality, returning of information • Mutual exchanges of information

- Refer to below for process of technology transfer negotiations prior to the signing of the agreement.

Example

Table 53. Process of Technology Transfer Negotiations

Phases	Procedure	Details
1	Put together a negotiation team	Select team members and the representative
2	Gather information and establish strategies	Gather relevant information and establish a response strategy
3	Prepare for negotiations and draft a proposal	Proposer must prepare in detail
4	Circumstances surrounding negotiation	Review the date, venue and negotiating counterparty Run an analysis on predicted negotiation outcomes
5	Efficient negotiation tactics	Research ways to most effectively succeed in the negotiation
6	Make an amenable negotiating atmosphere	Maintain good formal and informal manners
7	Negotiation tactics and bargaining power	Utilize more tactics to acquire the best deal
8	Persuade the counterparty	Progression of negotiation Spot any hidden agendas
9	Respond to the counterparty's persuasion	
10	Observations and findings	
11	Further negotiations	Boost effort to reach an agreement

Note

- When writing the agreement, industrial property law including patent law should be considered. Special consideration should be given to whether any terms and conditions may violate civil law or other relevantlaws.
- Terms and conditions of the agreement should be specific so as to prevent any disputes, but not to the extent of being verbose.
- The contract should be written in a format where the creditor and the debtor can be figured easily.
- Terms, duration, effectuation and termination of agreement must be clearly stated.
- When designating venue, cost, destination of payment, which are required for the contract to enter into force, they should be clearly specified.
- The content of the contract should be specific and precise without abstract expressions.
- Understanding of the concerned technology and business is critical.
- The university's business strategies and industrial property strategies should be identified and understood.
- The most important terms and conditions in this transaction should be identified.
- Alternatives to the most important terms in the concerned agreement should be considered.
- Write up a table of contents and a checklist for the agreement.

3) Guidelines for Universities and Public Research Institutions

Key Activities

1. Applying for the Dispatch IP Management Specialist program.
2. Providing active support and cooperation to enable IP Management Specialists to proactively carry out their roles.

(1) Application for the Dispatch IP Management Specialist Program

- When applying for the Dispatch IP Management Specialist program, the application form provided by the managing public institution should be filled out, and the assessment summary of the applicant's IP management capacity, as well as the general condition of the applicant, should be documented and submitted.

- Universities or public research institutions should request the specialist of the area of technology in need so that appropriate matching between the specialist and the institution can take place.

(2) Proactive Cooperation for the Seamless Operation of Program

- **[Providing for the expenses]** Salaries of IP Management Specialists are financed by the public institution, but all other expenses pertaining to IP management activities must be paid by the university or public research institution. Activity costs of specialists will be specified in advance to include bonuses, business promotion expenses, business trip expenses, educational and training expenses and office supplies expenses.

- **[Assigning position and status to** IP Management Specialist**s]** Universities or public research institutions should support the specialists to enable them to proactively pursue their projects. In the case of universities, the position and status of "professor specializing in industry-academia collaboration" or equivalent should be given to the specialists. In the case of public research institutions, position and status of "IP-specialized commissioner" or equivalent should be given to the specialists. Also, IP-specialized personnel, office space, consultation room, remote office as well as accommodation or equivalent when dispatched to provincial regions should be offered to the specialists. By IP-specialized personnel, staff who work together with the specialists and maintain and further develop the IP management system of the concerned university or public research institution upon the conclusion of the dispatch program is being referred to.

2.3.6. Program Tips

1) Program Tips for Public Institutions

- Dispatch IP Management Specialist program aims to incorporate IP regulations, system and processes into universities and public research institutions. The program's ultimate objective is to help institutions stand on their own feet after the incubation period by building a foundation within the institutions that allows continuous development of promising patents and facilitation of technology transfers even after the program has concluded. Thus, the objective of the program is to build a virtuous cycle in universities and public research institutions of creating and utilizing IP on their own.

- After selecting the enterprise, public institutions should match and dispatch the best-suited IP Management Specialist, considering the demanded area of technology of various universities and public research institutions. The needs and IP capacities of universities and public research institutions should be identified in advance so that the best-suited IP Management Specialist can be matched with the firms in need. The area of R&D technology of the IP Management Specialist and the firm should be aligned, and the specialist should have the capabilities that are required by universities and public research institutions. If there is a mismatch between the specialists and the universities or public research institutions, the success of the program cannot be guaranteed.

- When the public institution accepts requests from universities and public research institutions, it should identify their needs as well as future plans on working together with the specialists, and dispatch specialists accordingly. Furthermore, once dispatched, specialists need to identify specific needs of the institution. The public institution should provide support according to such needs. If the needs remain unfulfilled and the institutions are dissatisfied, then the program cannot successfully operate. Most specialists have work experience limited to enterprises so it is critical that they understand the distinct characteristics of universities and public research institutions.

- Usually, specialists are dispatched for an extensive period of time, such as three years, under the program, but if conflicts arise between the two parties then the program may be terminated after a year. Specialists may also decide to terminate the contract before the agreed termination date of the program. If this is the case, it may be required to dispatch another specialist for replacement.

2) Program Tips for IP Management Specialists

- The title or scope of work of IP Management Specialists is decided upon negotiation with the concerned institution. The title or scope of work of the specialist may be decided in a way to suit the objective of the program and the existing guidelines, but they are subject to change depending on the specific needs of the institution. It may be difficult for specialists to serve their role of managing IP if they become working-level staff. Thus, specialists need to be assigned the right title and scope of work, upon negotiation with the institution, to fulfill their role as IP Management Specialists.

- IP Management Specialists should come up with a one-year support plan for the institution. This plan must include the objectives of work that will be pursued in that year. When a year passes, the public institution should conduct an evaluation on whether the specialists have indeed reached their set objectives. Specialists should establish a program plan considering the institutions' achievements over the past year.

3) Program Tips for University and Public Research Institutions

- The cooperation of universities and research institutions is critical in successfully fulfilling the objectives of the program. Universities and institutions should first outline the roles and responsibilities of dispatched specialists, and support them so they can diligently carry out their assigned role. Specialists' role does not rest at simply engaging in duties such as applying for patents and transferring technology. They should also take on the role of an expert or advisor to help institutions build an IP infrastructure and raise awareness of IP.

- Universities and public research institutions should provide the minimum expenses to the specialists to enable them to pursue the project. These institutions have planned annual budgets which are likely to

include the expenses for supporting the specialists in carrying out their tasks. The operation costs of this program include expenses pertaining to holding seminars, education, PR, payroll for internal employees and external experts, patent application, holding deliberation committees, establishing systems, and technology transfers. Specialists can estimate the needed expenses for carrying out their tasks, and the institution should provide support accordingly. Expenses of operating such programs should be planned in advance as budget differs by institution. If expenses are not planned in advance, a lack of budget may impede smooth operation of the program.

- Specialists dispatched to institutions with low awareness of the IP system come across many obstacles while seeking to meet the needs of those institutions. One of the reasons is that they are not assigned a suitable position that can allow them to carry out their tasks. To meet the needs of the institution, specialists will have to upend inefficient processes or work procedures rooted in the institution. As this will be met with fierce backlash from existing professors and researchers, it is critical that the specialist's position and status allow them to push forth with their initiative despite the backlash. Only when they do have appropriate position and status can they truly deliver results that the institutions seek.

2.3.7. Successful Cases of Program Implementation

1) University A

- **[Summary]** Start-up creation support was provided to students who performed well at the students' start-up competition held as part of a project to nurture universities that can lead a start-up boom. After years of implementing this program, the final decision was made to incorporate the start-up as a subsidiary of the technology holding company of university A. This was done by attaining shares of the holding company by issuing stocks of the start-up according to the results of valuation of their technology.

- **[Outcome]** Two subsidiaries were established for stable operation and revenue flow of the holding company.

2) University B

- **[Summary]** University B and the Disabled People's Development Institute of university C jointly developed and created IP from puzzles for the visually impaired in 2013 (one local patent application, one PCT, one local registration). The technology was transferred to publisher D and the product was launched in October of 2014. (Contract terms: Upfront royalty of 22 million KRW, running royalty of 10% of excess sales when gross sales exceed 200 million KRW, 30% of gross sales when the product is exported, 50% of gross sales paid as royalty when technology is exported)

- **[Outcome]** Linked the efforts with students' start-up activities, created a student start-up club, transferred technology to a publisher and created revenue through sales of contents.

Guidebook for SMEs' IP-Business Cycle

III. IP Utilization Policy and Program

1.
IP Commercialization Support Policy and Program

1.1.
Overview of Support Policy and Program Group

- IP commercialization support program is a basic program aimed at facilitating the use of IP by supporting SMEs to utilize their IP for business activities such as development, production, and sales of products.
- Even if SMEs own excellent IP and innovative technologies, successful commercialization is not guaranteed. In particular, most small businesses lack commercialization capabilities even if they have excellent IP and advanced technologies. Hence, programs for commercialization are needed.
- One of the distinct features of the IP commercialization support program is that unlike other programs that support IP transactions or valuations by providing indirect assistance to general business activities of the enterprise with IP, it provides a rather direct support to the enterprises utilizing IP.
- Specific methods of IP commercialization include supporting the production of prototypes, marketing of products, or continued product innovation for products built based on IP.
- Through the supporting program, start-ups and small businesses can produce prototypes (i.e. working mock-ups) which can be costly in the initial stage of commercialization. Also, the program can help such enterprises overcome marketing difficulties that arise from low recognition and the lack of budget in comparison to enterprises with market dominance.
- Also, SMEs that participate in the IP commercialization support program can heighten their competitiveness in their market, improving their current or developing products by utilizing IP data, for instance.
- Policies and programs to support IP commercialization for SMEs have already been planned and carried out in different parts of the world taking various forms.
- In the US, TechShop offers hardware start-up companies equipment and offices to produce prototypes and programs related to starting a business. There is also the Small Business Innovation Research (SBIR), which encourages technical development and assists the commercialization of technologies of SMEs.

- Australia has Source IP and Accelerating Commercialisation, which are programs that offer an online platform for collaboration between public research centers and SMEs. Through Source IP, enterprises can find technologies that can be used for a product or R&D, and research facilities to partner with. Through Accelerating Commercialisation, enterprises can establish strategies on commercialization projects by receiving assistance from external experts and are given an opportunity to promote their products.

- One of the relevant programs from Japan is an IP business matching program called MoTTO PLUS. It assists SMEs by supporting them for technical development and new projects based on open patents held by large enterprises.

- Also, Europe has Innovation Voucher and high-risk R&D support programs, which are types of commercialization support program for SMEs.

Support for IP Prototype Developing

- SMEs need to quickly confirm whether or not a certain technology can be commercialized during the initial stage of technology development. This is because even if they own an excellent piece of technology, if commercialization is difficult, a substantial amount of time and money will be wasted. Hence, it is necessary to create prototypes before producing the final product despite the fact that prototypes involve high initial cost and risk.

- Supporting the production of prototypes begins with finding enterprises that are capable of creating excellent prototypes. To produce high-quality prototypes, certain equipment, system, experience, and know-how are required. This is why a pool of service providing entities should be selected and formed with appropriate standards before the program is carried out.

- By receiving prototype production support, SMEs can accelerate commercialization, which makes it easier for them to keep their competitive edge over other enterprises that imitate their technologies. Furthermore, such support can expand to include not only the production of prototypes but also casting and 3D blueprint. Also, support for the production of prototypes, running 3D simulations, and structure analysis can be provided using a 3D printer. For method patents, support can be provided in the form of producing the product according to the method explained in the patent specification.

Preferential Purchase by Government

- After SMEs use their excellent technologies to produce a product, the next step would be to sell it. It is very difficult for SMEs with minimal funding to acquire distribution and sales network. This, however, is a necessary step in commercializing IP and generating profit. Hence, the program recommends excellent inventions for preferential purchases to support SMEs that suffer from weak sales in increasing their sales and profit.

- This program is run by the public institution that selects excellent inventions of SMEs and recommends them to potential buyers.

- The basic infrastructure required for the program calls for the establishment of laws and regulations to recommend excellent products of SMEs to public entities. These policies need to ensure that excellent IP technologies can be preferred in the selection and purchasing processes.

- Ultimately, the program provides SMEs with excellent patents an entry channel into markets and can further encourage R&D investment through better sales.

Product Innovation Using IP Data (Address Product Problems and Develop Product Designs)

- SMEs need to continue upgrading their products on features, performance, and designs to create profit through sales and maintain or even increase market share. In reality, however, most SMEs experience difficulty in doing so due to reasons such as limited technological capabilities. The Product Innovation Using IP Data support program can assist enterprises that are facing such predicaments.

- The program supports the improvement of technology and design in products. In other words, the program utilizes IP to provide solutions to problems[79)] that occur within the improvement or upgrade processes and develop user-centered designs.

- The basic infrastructure needed for the program includes 1) problem-solving methodologies (Open Patent Intelligence Search (OPIS), Theory of Inventive Problem Solving (TRIZ, Teoriya Resheniya Izobretatelskikh Zadach), etc.) and 2) consultants.

- There are many ways to resolve products' technical problems, of which problem-solving methodologies such as OPIS and TRIZ are most often used. As OPIS differs in terms of methodology from prior art search in the same field, those that are not well acquainted with the methodology must be made familiar with it before utilizing it. Although TRIZ has been the more popular option, problems can be solved only

79) Solutions to address possible problems such as system error, increased product size, etc. when improving product's functions and performance

when it is used simulatneously with prior art search in other fields, so one needs full knowledge of both methodologies to utilize them at the same time.

- Product design development involves improving the functions of products and creating user-centered designs through problem-solving methodologies such as OPIS and TRIZ, along with design research and user survey methodologies.

- It is different from simply focusing on exterior designs, as the development takes into account customer's convenience and usability as well. This requires professional analyses such as market environment analysis, competitors' analysis, user analysis, and design SPEC analysis.

- Through this program, SMEs can handle technical difficulties that are difficult to solve independently when improving existing patented products or developing new ones. Also, they would be able to create optimized designs based on consumer, market, trend, and IP analysis.

PHASE	Program TREE	DESCRIPTION
I	**Support for IP Prototype Developing**	• Support production of prototypes to prevent competing enterprises from imitating, and seek commercialization of excellent inventions
II	**Support for IP Prototype Developing (3D Drawings & Working Mock-up)**	• Different kinds of support are provided besides production of prototypes such as 3D drawings, structure analysis, prototypes using 3D printing, etc.
I	**Preferential Purchase by Government**	• Select excellent inventions of SMEs and recommend to potential buyers (other public institutions) so that SMEs will have new sales channels and increase sales.
III	**Product Innovation Using IP Data**	• Provide solutions to technical problems SMEs face as they improve and upgrade their products, and support development of user-centered product designs.

Figure 70. Program TREE (IP Commercialization Support)

1.1.1. Self-Diagnosis for Program Implementation

- The programs to support SMEs on the commercialization of their IP (Support for IP Prototype Developing, Preferential Purchase by Government, and Product Innovation Using IP Data) may seem similar to one another from the aspect that they all provide support for commercialization. They differ, however, in terms of each program's specific purpose and method of providing support.

- Hence, when SMEs are developing products based on patented technologies and have prototype-makers, they can utilize the program for prototype production support. Enterprises with problem-solving methodologies and design consulting experts, on the other hand, can utilize the Product Innovation Using IP Data Program first. For enterprises with the entire infrastructure ready, different programs can be adopted regardless of order of priority depending on their situations.

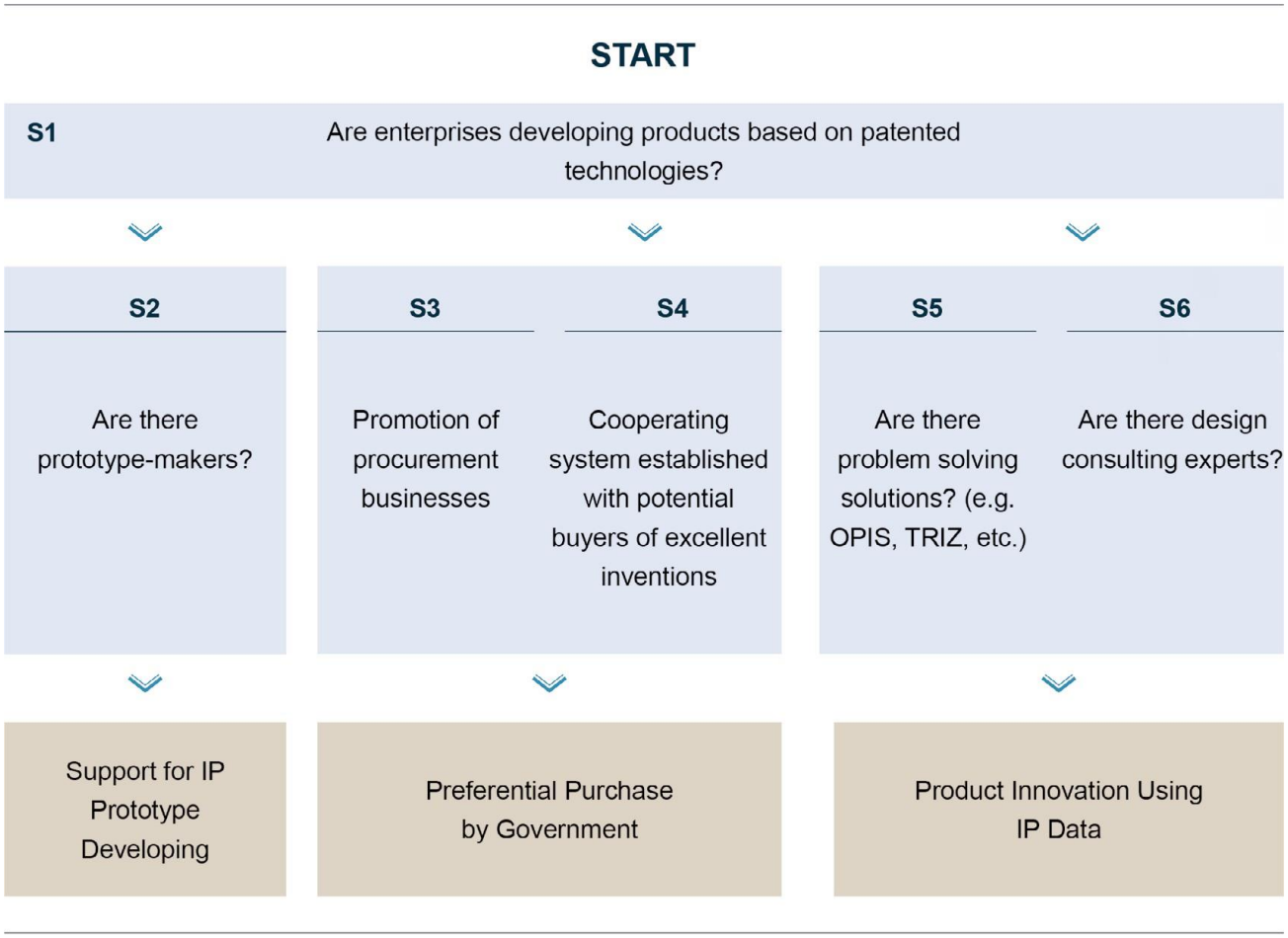


Figure 71. Phase Matching Flow Chart (IP Commercialization Support)

1.2.
Support for IP Prototype Developing

1.2.1. Program Overview

Subsidize the production of a prototype when an enterprise with excellent patents/utility models tries to commercialize its IP.

- Generally, prototypes including working mock-ups are produced using processes such as 3D drawing. Through prototypes, SMEs can verify whether their products are ready to be on the market by checking assemblability, mass production potential, and performance prior to the release, thus minimizing the development cost and time. Prototypes can also be used for product operation testing, product promotion, test marketing, and showcasing to buyers.

- For SMEs or inventors without sufficient funding, however, the cost of prototype production is often a huge burden that delays commercialization and ultimately increases the risk of profit loss from imitation goods.

- This program provides subsidies to enterprises, especially SMEs or individual inventors, with excellent patents or utility models to produce prototypes needed in the process of commercializing IPs registered at KIPO. The program's purpose is to facilitate the commercialization of IPs held by SMEs and individual inventors through subsidization.

- This program not only provides subsidies to SMEs and individual inventors for prototypes but also allows for a more systematic process of prototype production. The produced prototypes can be used to promote the products and verify their business feasibility.

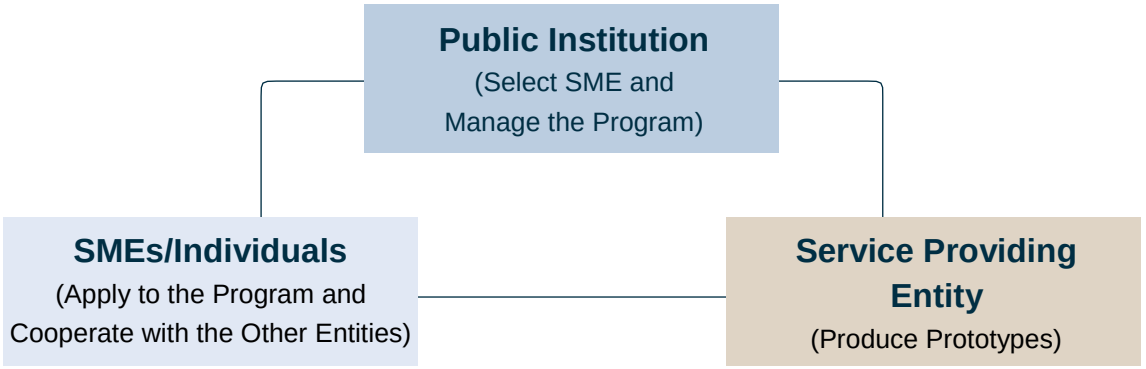


Figure 72. Program Framework (Support for IP Prototype Developing)

1.2.2. Similar Programs of APEC Members

1) TechShop[80] (United States)

- TechShop of the US is a chain of workshops that offers hardware venture companies start-up related services, open offices, and equipment for producing prototypes.

- TechShop is also called the playground of hardware entrepreneurs as it is the place where ideas can be translated into products in small numbers, using key equipment and infrastructure like 3D printer, laser cutter, CNC machine, sewing machine, casting machine, and plasma cutter. It also offers training on using all the provided tools and equipment in a safe manner.

- TechShop is currently open in 10 regions in the US, with overseas locations in France, Japan, and the UAE.

- The workshop is open 24 hours for anyone to use, running based on a membership system with the monthly fee of 99 USD for using the industrial equipment.

- One of the major successful businesses that were started in a TechShop is Square, an enterprise valued at 50 billion USD (about 5.4 trillion KRW) with its innovative mobile payment system.

Figure 73. Techshop

80) http://news.mk.co.kr/newsRead.php?year=2015&no=977202, http://www.techshop.ws/index.html

1.2.3. Procedures and Details of the Program

1) Target of Support

- Eligible applicants of the program are individual inventors preparing to launch a start-up or SMEs with patents or utility models to commercialize.

2) Program Process

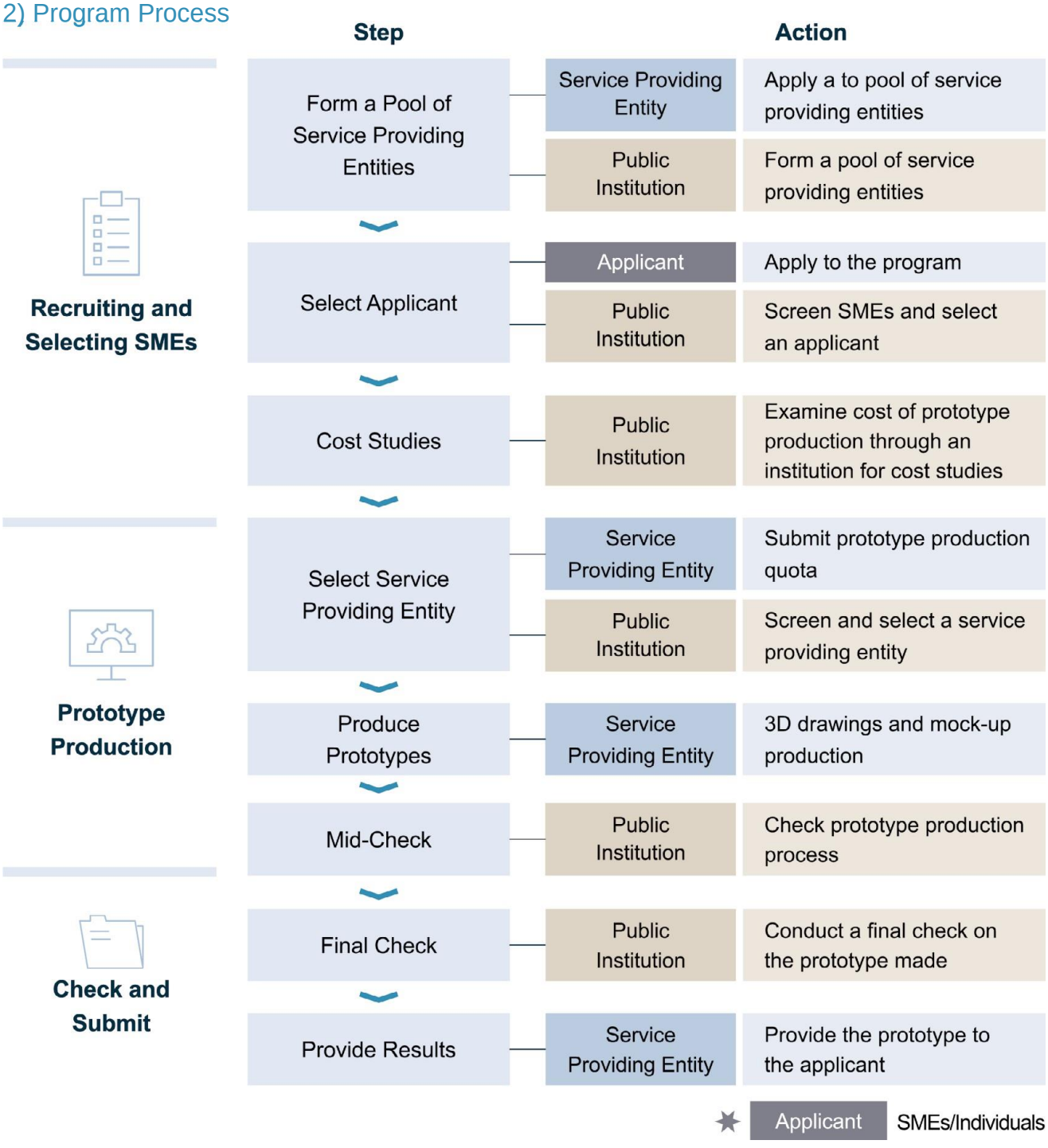


Figure 74. Program Process (Support for IP Prototype Developing)

3) Scope and Conditions of Support

- The public institution[81] subsidizes a portion or the entire amount of the production cost of a prototype (3D drawings and working mock-ups) per enterprise (e.g. 70~90%).

- If the public institution only funds part of the cost, the rest has to be covered by the selected SME, the ratio of which may change depending on the situation of the selected applicant.

- The subsidy is not directly given to the selected enterprise, but rather, an indirect method is chosen. A production request is made to the service providing entity,[82] which would deliver the produced prototype to the selected applicant (payment is made directly to the service provider). Such indirect support allows for the public institution to execute its budget in a transparent manner while operating and managing the program smoothly.

Note

- The “prototype” mentioned in this program is an extensive concept including not only general prototypes but also design prototypes, casting, structure analysis, 3D simulation, 3D drawing, prototype for method patent, etc.

[81] A public institution such as government departments operating and managing the program
[82] The prototype-maker of the program

1.2.4. Guide Map for Participating Entities

Table 54. Guide Map for Participating Entities (Support for IP Prototype Developing)

<table>
<tr><td rowspan="2">Entity</td><td rowspan="2">Preparation</td><td colspan="8">Program Process (Phase)</td><td rowspan="2">Follow-up Manage-ment</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>Public Institution</td><td>Form a service providing entity pool</td><td>Select an applicant</td><td>Research produc-tion cost</td><td>Select a service providing entity</td><td colspan="3">Operate and manage the program</td><td>Payment to the service providing entity</td><td>Check commer-cialization process</td></tr>
<tr><td>Service Providing Entity</td><td>Register to the service provider pool</td><td></td><td></td><td>Submit quotes on costs</td><td colspan="4">Interim check on the production process</td><td>Verify the final product</td><td>Provide services</td><td>Submit statement of account</td><td></td></tr>
<tr><td>SME/ Individual Inventor</td><td></td><td>Apply to the program</td><td>Provide blueprints</td><td></td><td>Pay its portion</td><td colspan="3">Be cooperative during the process</td><td>Receive the final product</td><td>Proceed with com-mercial-ization</td></tr>
</table>

- The Guide Map for Participating Entities is a chart made to easily understand the program process from preparation to the follow-up management stage.

- The chart summarizes the roles of the public institution, service providing entities, and SMEs in each phase of the process. Details on the phases are explained in the *1.2.5. Detailed Guidelines for Participating Entities.*

1.2.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Form a pool of appropriate service providers and select an applicant to support.
2. Monitor and supervise the appropriateness of the production process.

(1) Selection of a Service Providing Entity and an Applicant

- The program does not simply support the production of prototypes but also subsidizes the overall production process for the purpose of facilitating the commercialization of excellent patents or utility models.

- The program mostly supports individual inventors or SMEs as they generally lack experience and knowledge needed to produce prototypes.

- When the public institution simply pays the production cost, SMEs may select an inappropriate service providing entity that lacks relevant knowledge or the SMEs may receive a low-quality prototype due to lack of experience in management and supervision, even facing unexpected losses.

- Hence, the public institution along with the SMEs should select, monitor and supervise the service providing entity, and for the convenience of management, form a pool of service providers prior to selecting one.

- When forming the pool, it is recommended to include a sufficient number of service providers from different technical fields. For example, the public institution can form a pool consisting of enterprises capable of 3D planning, those that can make working mock-ups, those that can produce castings, and those that can conduct structure analysis.

- Also, by forming the pool with a sufficient number of service providers per field, flexible management is possible even when enterprises apply to the program for a particular field.

- **[Selection of Service Providing Entity]** When selecting the service providing entity, only those with strong will and capability should be selected for the program.

- It is advised that the public institution forms a pool of service providers by evaluating whether each is capable of carrying out 3D planning and prototype production satisfying the criteria of 1) technology, 2) management skills, and 3) understanding of the product and the program.

- In terms of technology, factors such as the number of personnel, level of expertise, 3D planning, prototype portfolio, and status of relevant equipment in possession, and utilization plan should be considered. These need to be taken into consideration when evaluating whether the service providing entity is capable of producing high-quality prototypes.

- From the management perspective, consider factors such as the number of recent prototype orders over a specific period of time, scale of those orders in monetary terms, and financial status of the enterprise to evaluate whether the service providing entity is not under the negative influence of management risks and can maintain a stable work.

- Lastly, to select the most appropriate service providing entity, check whether the service provider has a clear understanding of the product of the selected SME and the level of details in its work plan.

- The process of forming a pool of service providers is generally carried out through document evaluation (screening) and presentation evaluation (second evaluation), but additional assessments such as on-site visits and interviews are possible as well.

Example

<Example of Criteria for Selecting Service Providing Entities in Korea>

Table 55. First Stage (Technology + Management) Criteria for Selecting Service Providing Entities in Korea

Evaluation Items	Criteria	Score
Technology (70)	3D drawings and prototype production level (Creativity and originality of the portfolio)	25
	Level of expertise and appropriateness of the experts (Experience and tasks of participating experts, etc.)	25
	Condition and level of advancement equipment	20
Management (30)	Profit from programs in the last three years	10
	Number of programs carried out in the last three years	10
	Financial status and stability	10

Table 56. Second Stage (Level of Understanding of the Program) Criteria for Selecting Service Providing Entities in Korea

Evaluation Items	Criteria	Score
Technology (70)	Level of understanding and the will to participate	20
	Loyalty to program's plan and conformance (Including equipment and personnel plans)	25
	3D drawings and prototype production method (Excellency, originality. etc.)	25
Management (30)	Troubleshooting during the program	15
	Methods of follow-up management and confidentiality	15

- **[Selection of Applicants]** Selecting an applicant with excellent patents or utility models is crucial to successfully manage the program.

- Hence, the public institution needs to select an SME that owns innovative technology and rights that satisfy the purpose of the program.

- Also, to increase the chance of commercialization of the selected applicant's product, the public institution needs to consider technology, rights, and marketability of applicants' patents and utility models, as well as the commercialization conditions and plans in the applicant selection process.

- The selection process generally consists of document evaluation (first stage) and presentation (second stage).

- Considering the policy aspect in the selection process, additional points can be granted to enterprises that have technologies that have won awards in invention contests, own certified technologies, or have female employees or a person with disabilities as the CEO.

Example

Table 57. Example of Selecting Applicants in Korea (First Stage Criteria)

Evaluation Items	Descriptions
Technology (50 pt.)	Level of innovation and originality of the technology (30)
	Conformance to the technology and market trend (10)
	Level of rights and loyalty (10)
Utility (50 pt.)	Validity of the utilization plan (30)
	Commercialization conditions of the applicant (10)
	Commercialization feasibility (10)

- **[Cost Studies]** The production costs of prototypes are different depending on the product, so the amount of subsidy granted differs by applicant. The subsidy amount is decided based on a cost analysis conducted by an agency with expertise in cost studies.

- The production cost can be determined by a relevant agency and is generally based on similar subsidy cases or quotes reflecting material, personnel, management expenses, and profit of the service providing entity.

- When there are multiple agencies capable of conducting cost studies, select one through a set of procedures and evaluations.

- Use an open bidding system when selecting an agency for cost studies. Have evaluation meetings to select the appropriate one according to standards (e.g. past experience, capital, etc.).

- The agency conducting cost studies should estimate the production cost based on design plans and specifications. It is advised that the cost estimation includes some margin room (in case of material expense fluctuating).

- Thus, under the management of the public organization, the prototype production subsidy is determined according to the estimates given, so SMEs do not make any unnecessary expenditure and enjoy a rational process of commercialization.

- **[Selection of Service Providing Entity]** After selecting the cost studies agency and the SME, a service providing entity should be selected from the pool to start building prototypes. For instance, selection can be done by receiving quotes in open bidding and comparing them with cost estimates to find the most appropriate one.

- **[Inspection of Prototype Production Process]** To ensure a high-quality prototype and to increase excellent patents or utility models' success rates in commercialization, the public institution should conduct an inspection in the stages of specifying the tasks, planning, completion of 3D drawings, and completion of prototypes.

- Inspections can be briefings or presentations with industrial and academic experts present.

Note

- The public institution and service providing entity need to conduct an interim check to see whether the prototype is being produced according to the design plan.
- To ensure that all participating entities can be satisfied with the result upon completion of the program, the public institution needs to actively encourage the SME to get involved in the entire production process.

2) Guidelines for Service Providing Entities

Key Activities

1. For the prototype production subsidy, make 2D drawings for 3D design data and mass production.
2. Produce a working mock-up.

(1) Creating 3D Design Data and 2D Drawings

- The most important role of the service providing entity is creating 3D design data for prototype production and for future mass production, and producing a working mock-up in the end. The general process is, “structure analysis -> detailed design -> drawings verification -> 2D drawings -> data for production support -> mock-up and casting production.”

Structure analysis › Detailed planning › Drawings verification › 2D drawings › Data for production support › Mock-up and production and casting follow-up

Figure 75. Production Process of a Working Mock-up

- **[Structure Analysis]** For the production of a prototype, the service providing entity must first examine the structure of the product.

- In this phase, the service provider must first examine the product's design, specifications, material, and casting conditions, and design internal parts.

- After this, the service providing entity reviews the final data including design specifications to analyze the design structure and conducts a review of application to product design so that the overall 3D modeling structure plan can be checked.

- Lastly, the service provider checks the structure that fits the final exterior design, interference between internal parts, changes in the exterior aspect, and PCB circuit outline to conclude the phase.

- If design structure changes are needed due to specifications, materials, and casting conditions in the structure analysis phase, the service providing entity can discuss the details with the selected SME and the design development enterprise.

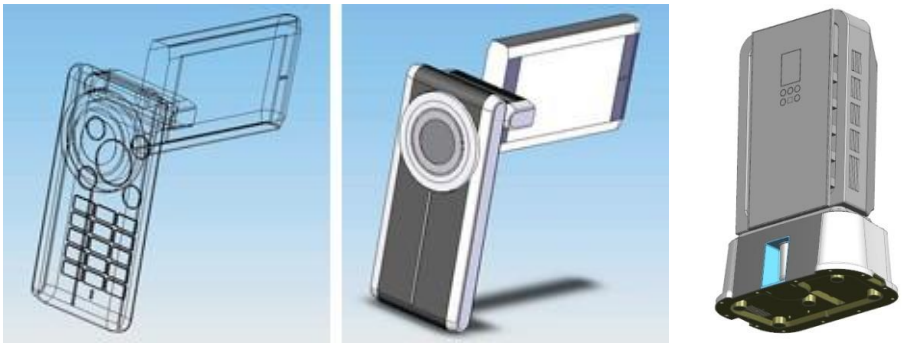


Figure 76. Structure Analysis

- **[Detailed Design]** Once structure analysis is completed, the service providing entity proceeds with the detailed design.

- The service provider should consider casting conditions and materials to determine the nozzle width and proceed with internal installation design.

- Afterward, the service provider should check the assemblability of internal parts and the exterior casing. Design planning should be based on the review of assemblability, and should take into account the number of parts and their sizes, parts attached to the internal PCB, and the assemblability of exterior casing.

- The service providing entity needs to check the engineering design of working mock-up to understand and design the working structure.
- **[Verification of Drawings]** Once the detailed design is completed, both the service providing entity and the selected SME need to proceed with verification.
- By verifying design data and the final design, the service providing entity can look for possible problems and changes needed to address them.
- The service provider needs to check assemblability and functionality with the design data and provide recommendations for improvement.
- **[Verification of 2D Drawings]** Once design verification is completed, the service providing entity should create a 2D drawing plan to provide details needed for the production of a mock-up.
- 2D drawings include detailed size of all the components, the names, and numbers.

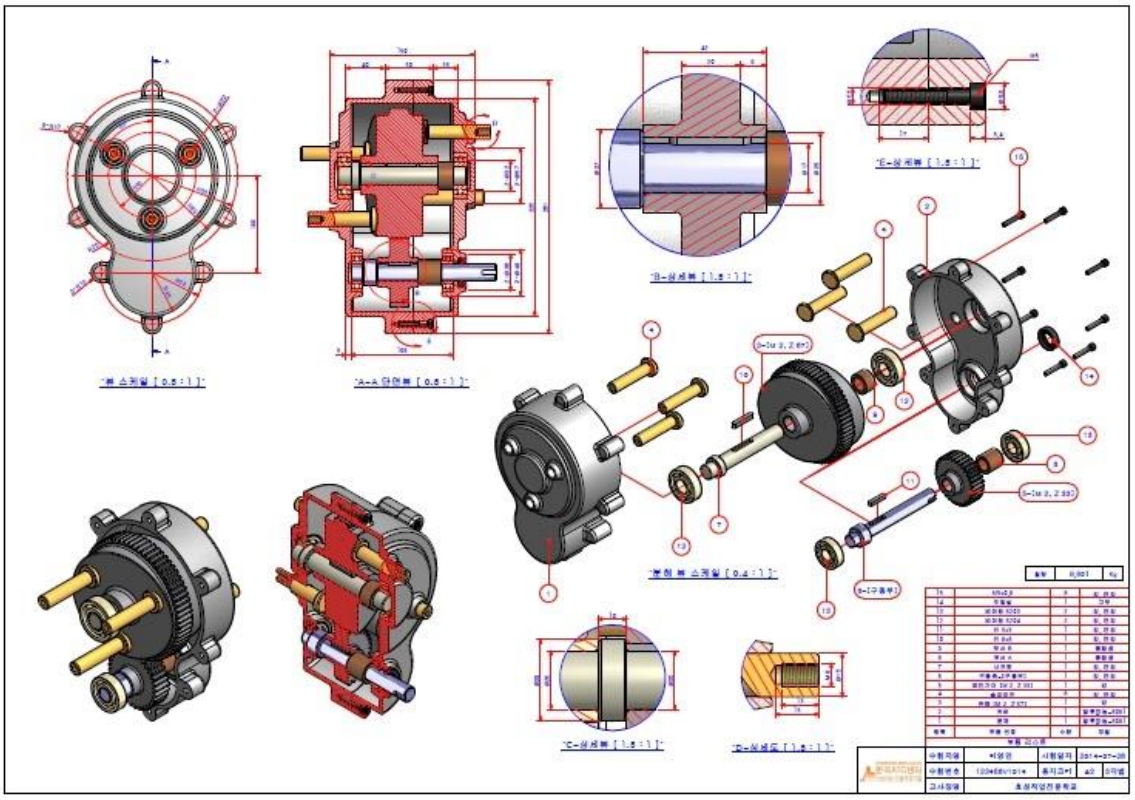


Figure 77. 2D Design Plan

- The 2D drawings should include production support data such as details on casting production, injection conditions, materials, number of components, and structure for assembly. Also, assemblability and structure in the production phase should be taken into consideration.

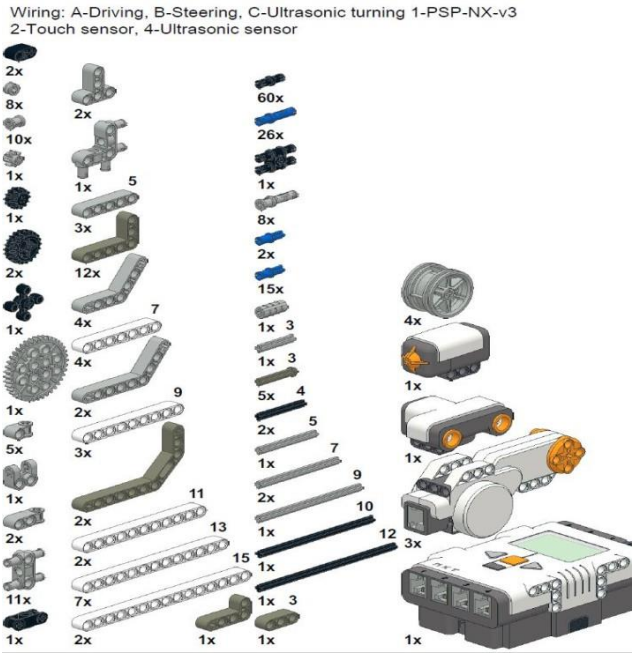


Figure 78. Drawings of Parts

(2) Production of Working Mock-ups

- The service providing entity builds a mock-up based on the detailed design and verified engineering design.

- Generally, working mock-ups are produced after conducting structure verification through design mock-ups to reflect improvements.

- Producing a working mock-up without a design mock-up may influence the integrity of the final product. Hence, the service providing entity should conduct a thorough verification of the design before producing a working mock-up.

- The NC (Numerical Control) process is used to produce internal and external components based on the 3D design data, after which the verification of design and engineering drawings need to be conducted.

- Components made with the NC process should go through a manual process for surface treatment and enrichment of precision.

- When parts using soft materials are needed, they are produced using silicon mold.
- Once the manual process is completed, the completed parts go through follow-up processing according to specification, including surface treatment, coloring, and silk screening.
- Once follow-up processing is completed, the prototype needs to be checked for any assembly problems and functionality. Also, problems regarding functionality need to be identified, and recommendations can be made for improvement.
- Upon completion of assembly, the working mock-up needs to be verified on design and engineering.
- After verification, the final mock-up along with engineering data and 2D drawings are delivered to the selected SME (or individual).
- The completed working mock-up and drawings are sent to a casting enterprise for follow-up work to make changes to engineering drawings according to the casting and injection conditions.
- The service providing entity delivers the working mock-up to the selected SME upon receiving field inspection and approval on the statement of accounts from the public institution.

Figure 79. Production Process of a Working Mock-up

3) Guidelines for SMEs and Individual Inventors

Key Activities

1. Make production drawings to produce a working mock-up.
2. Confirm designs for the prototype and conduct verification of the completed working mock-up.

- Unlike other programs, there are not many things the selected SME and the service providing entity need to work together on, and the role of SME is to prepare documents to request the production of a prototype and checking the integrity of the prototype once it is made.

- The SME should be prepared to explain in detail about the relevance of its patent or utility model and the prototype during the evaluation process of the program.

- The SME must have completed a basic design draft relevant to its patent or utility model before going into engineering drawings and the production of a working mock-up.

- Completion of design development refers to the state of having prepared design drawing data for the final design. At this stage, the design structure should be set in 3D data.

- **[Production Drawings]** In the program, the service provider should refer to the production drawings when producing the prototype. The SME should provide drawings to the service providing entity and has to make sure that they match what is written in the patent specifications and claims. As the program subsidizes the production of prototypes for excellent technology based on patents or utility models, there should be no changes made to the claims and/or production drawings. If the claims and production drawings differ in any way, the subsidy may be canceled (* Reason: Subsidy is only provided for the technology the SME or individual inventor has patent or utility model on.)

- If the prototype made according to the production drawings does not function, the responsibility may fall upon the SME. To ensure that the prototype works, the SME requesting the production and the service providing entity must work together closely.

- The SME needs to determine the specifications for the parts to be used in the final prototype and provide data on the number of prototypes to be produced, production cost, and things to consider in terms of production method.

- Also, as the working mock-up is not the final product but a prototype to check casting for mass production, after the working mock-up is built, the SME should be aware that there may be changes made to drawings.

1.2.6. Program Tips

1) Program Tips for Public Institutions

- The program is suitable for individual inventors, start-ups, or small-sized enterprises. Hence, the target of support would often be enterprises that are too small to pay even a small portion of the cost of prototype production.

- Hence, when running the program, different conditions of economies should be taken into consideration to minimize the portion of the cost that the SMEs would have to cover, or it is recommended to set different ratios of cost coverage depending on enterprises' profit size or their number of employees.

- When forming a pool of service providers, enterprises from various fields (machinery, electricity, electronics, chemistry, bio, etc.) should be selected according to the technology needed to produce prototypes.

- The public institution also needs to choose the contract type. As the managing entity monitors and supervises the prototype production process, a three-party contract including the service providing entity, public institution, and SME can be made. However, considering the follow-up management of the prototype, it is advised that the service providing entity and the SME sign a bilateral contract, and the public institution establish a separate contract with the SME for prototype production support and management.

- Managing the service providing entity is important in running this program. Excellent service providers should be encouraged to participate in the program, and the purpose of the program should be explained to them clearly. Also, there should be announcements and training sessions on the issue of confidentiality regarding business secrets when producing prototypes.

- Those that can benefit from the support provided by this program can also receive other supports related to patents or utility models (R&D, technology transaction, patented invention exhibitions, etc.).

- When the prototype is delivered to the SME, the requester may make a claim that it is not the product that the SME had intended to produce. In such cases, the applicant's technology and the product drawings are compared, along with the product with its drawings. If they match, the problem can be addressed, but if any difference is found, the SME should request that the service providing entity make changes and produce the prototype again.

- For the service providing entity to make the product according to the request of the SME, the public institution should visit the service providing entity during the program duration to check on its progress. When visiting, it is advised that the SME accompanies. Lastly, once the prototype is prodced, the public

institution needs to visit the service providing entity with the SME to confirm whether the prototype was made according to the drawings for production.

- If the selected SME or individual inventor falls under the conditions explained below, production may be halted or canceled, and the selected applicants can be made to return either a part of or the entire production cost executed:

  - If it was revealed that the SME/individual inventor was selected for the program using fraudulent or illegal methods;
  - If the SME/individual inventor has not paid its/his/her portion of the payment within the period set out in the program;
  - If the SME/individual inventor refuses prior negotiations or cooperation for the production of prototypes or neglects its/his/her duty to present briefings on the progress;
  - If the SME/individual inventor transfers its/his/her patent rights for the technology receiving support from the program without prior consultation with the managing entity or if the rights expire before production completion.

2) Program Tips for Service Providing Entities

- The service providing entity should recognize that the final product and the information provided for the program may be confidential business secrets and perform its duty to maintaining confidentiality. The ownership of the final product and the relevant IPR all belong to the selected SME.

- Hence, the persons in charge of prototype production should submit the final file with the completed 3D drawings to the public institution and the SME.

- Even after the working mock-up has been produced, the service providing entity needs to provide a final working mock-up with changes reflected if changes were deemed necessary after assemblability and functionality verifications.

- Hence, it is recommended that the service providing entity has sufficient discussion with the SME prior to production. For example, it is advised that the service providing entity and SME check together whether the production drawings and the claims in specifications match.

- Also, during the production period, the service providing entity should seek active cooperation with the SME to check whether the production is heading in the right direction.

3) Program Tips for SMEs

- Before producing a prototype, the selected SME needs to provide production drawings that match the claims of its patent to the service providing entity. As the program provides subsidy for the production of prototypes relevant to a patent or utility model that the SME owns, the technology that the SME has should not differ in any way from that being made into prototype. There should be no difference in the patent claims and the production drawings, nor can there be any improvements made to the model. To prevent such incidents from taking place, the SME should seek consultation from a patent attorney concerning whether the production drawings match the claims in patent (or utility model).

- Also, the SME should provide as much relevant material as possible to the service providing entity, along with detailed specifications on the parts and a plan for mass production so that possible problems that many arise during the production process can be prevented in advance while enhancing the prototype's degree of completion.

- While the production is taking place, the SME should not cease to cooperate with the service providing entity to ensure that the prototype is produced without any unnecessary trial and error.

1.2.7. Successful Cases of Program Implementation

1) A successful case of supporting the production of a prototype for an alkaline ionizer (Simulation: 3D)

- (Enterprise Overview) The SME that received the support was an ionizer manufacturer and seller established in 2013. With the target of penetrating overseas markets, it released various ionizer models in Ecuador, Indonesia, Italy, Russia, and Singapore, Ecuador, and Indonesia among others..

- (Support and Results) The SME received support for simulation (3D) production, with the objective of effectively entering international markets. With this support, the enterprise promoted its products in overseas exhibitions, resulting in a 143% profit increase YoY (export in 2013: 206 million KRW -> 2014: 501 million KRW).

1.3.
Preferential Purchase by Government

1.3.1. Program Overview

The program evaluates applications from SMEs, which hope to find buyers for their excellent inventions, and recommends inventions for preferential purchases in order to support SMEs in marketing and finding new sales channels.

- SMEs with new products make huge efforts and investments into marketing and promotion of products, as marketing is a deciding factor in the success of the business.
- Unless the enterprise is experienced in relevant markets and has a high brand recognition, it is difficult to enter new markets only by having IPR such as patents.
- The program selects excellent inventions of SMEs (including start-ups) and recommends them to public entities (“Potential Buyers”) so that the products can be given priority when such buyers plan to purchase them.
- SMEs selected for the program will be able to find new sales channels, which will increase the sales and product recognition, and eventually, lead to the success of the business.
- The program has the effect of nurturing SMEs with excellent technologies and inventions.

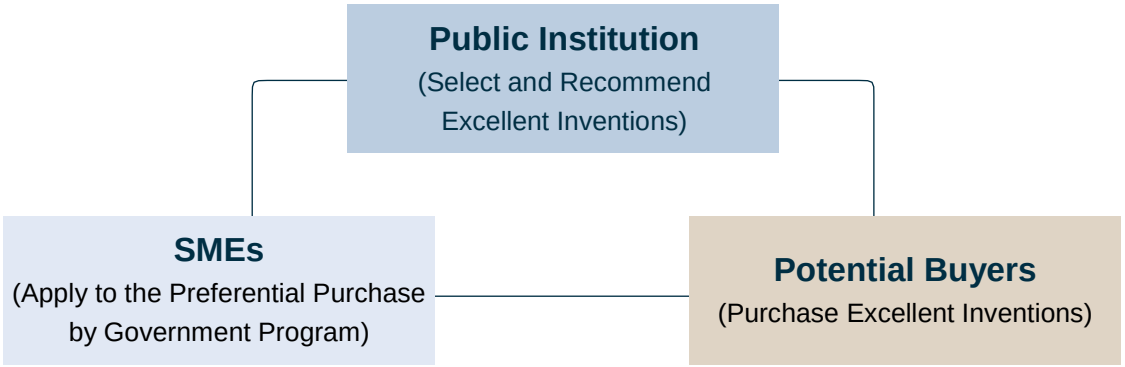


Figure 80. Program Framework (Preferential Purchase by Government)

1.3.2. Procedures and Details of the Program

1) Target of Support

- The program targets SMEs which hope to sell inventions produced based on excellent patents to public entities such as government departments, municipal government, etc.

2) Program Process

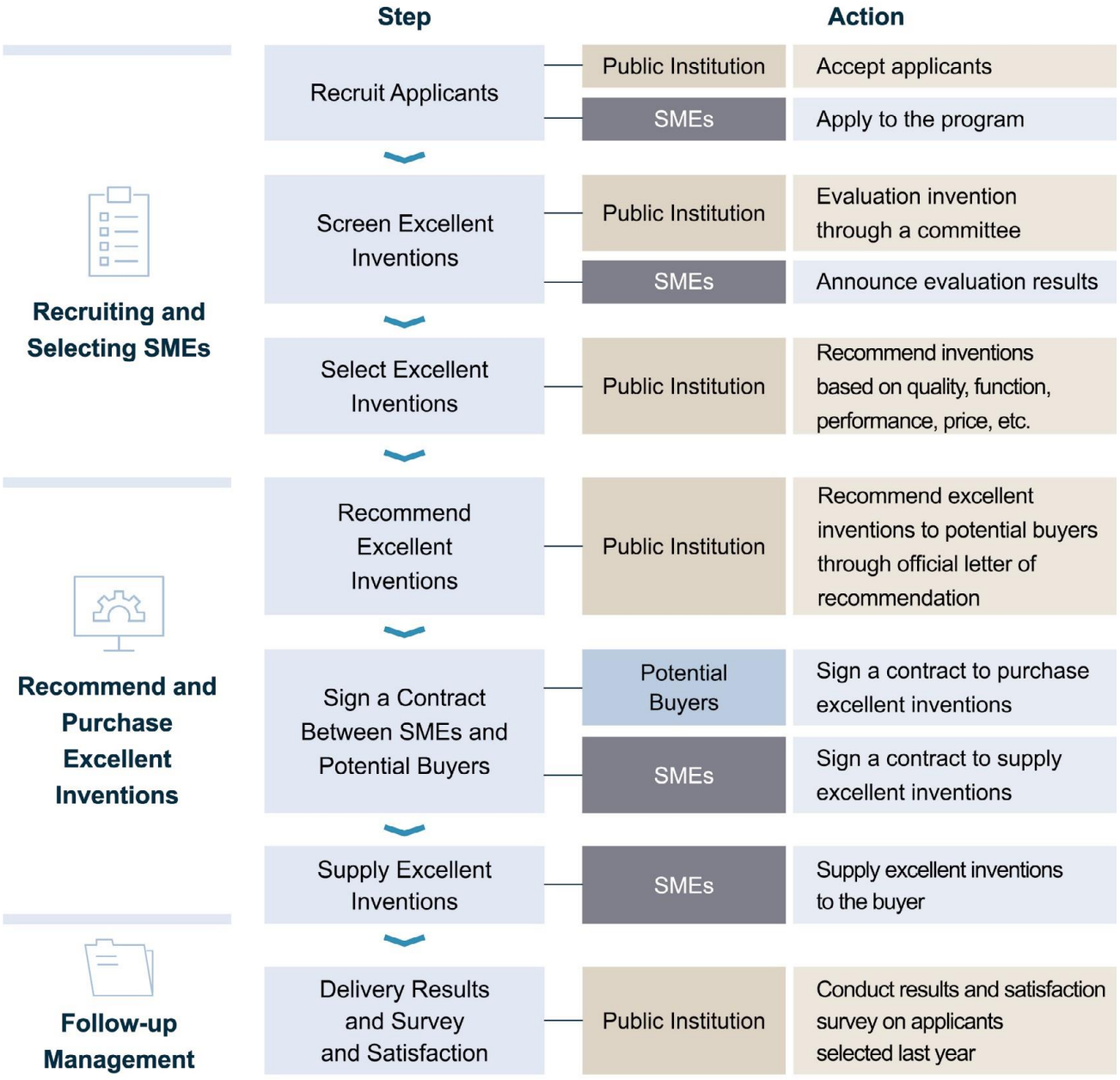


Figure 81. Program Process (Preferential Purchase by Government)

3) Scope and Conditions of Support

- The public institution[83] evaluates applicants' products, and when potential buyers are looking for products with such functions, it recommends them for preferential purchases.

- The program supports SMEs by making buyers give extra points to the recommended SMEs when buyers evaluate candidate enterprises according to relevant legal measures.

[83] A public institution including government department that manages and operates the program.

1.3.3. Guide Map for Participating Entities

Table 58. Guide Map for Participating Entities (Preferential Purchase by Government)

Entity	Preparation	Program Process (Phase)						Follow-up Manage-ment
		1	2	3	4	5	6	
Public Institution	Prepare relevant laws and regulations	Announce the program and receive applications	Evaluate excellent inventions	Select inventions and recommend preferential purchase				Examine the results
Service Providing Entity	Establish relevant regulations				Select a supplier	Sign a contract with supplier		
SME		Apply to the program		Receive the letter of recommen-dation	Apply to be the supplier	Sign contract as a supplier	Supply the product	

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up management.
- The chart summarizes the role of the public institution, potential buyers and SMEs in different phases of the process, and details on each phase are explained in *1.3.4. Detailed Guidelines for Participating Entities.*
- It is ideal for the program to be carried out within two months, and depending on the budget and conditions, the program can be done multiple times a year.
- For example, if the program was carried out multiple times in a year, such as once in the first quarter, a second time in the second quarter, and a third time in the third quarter, the excellent inventions that have been selected could be recommended to the potential buyers looking for certain products so that the inventions would have preference.

1.3.4. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Establish relevant laws and regulations to ensure efficiency of the program
2. Select inventions in accordance with fair and trustworthy procedures and standards
3. Send the letter of recommendation to the potential buyers the SME wishes to supply products to

(1) Legal Preparation for the Program

- Unlike other programs, this program does not provide financial support or tangible results such as consulting reports or prototypes.

- For inventions selected for recommendation, the public institution can issue a certification (letter of recommendation) and send a letter of cooperation (the letter of recommendation) to potential buyers or it can issue the certificate to the selected SME so that the SME can send the letter to the potential buyers it hopes to supply products to in procurement interviews.

- Hence, it is crucial that the public institution managing and operating the program prepare relevant laws and regulations to ensure the effect of recommendation for preferential purchase.

- The public institution managing and operating the program should first enact laws and regulations for recommending selected excellent inventions. The law would define the meaning and purpose of the recommendation, process, target, and potential buyers who would have inventions recommended to them.

- **[Ensuring Effectiveness of the Recommendation]** Potential buyers should be stipulated by law and regulations. Potential buyers include not only government organizations but also local government organizations or organizations funded by or receiving investment from government, and those deemed necessary for inclusion according to other procurement processes to maximize the effect of the recommendation.

- Then, it is important to change regulations related to procurement businesses of the potential buyers. The public institution should encourage relevant entities (potential buyers) to change their regulations by having negotiations so that they would give additional points to SMEs that have acquired a letter of recommendation from the program when evaluating candidates for procurement.

- If economies have different certification systems for excellent inventions, it is advised to have the recommended invention receive extra points during the evaluation of the different systems.

- **[Managing Credibility of Recommendation]** The public institution must put in the effort to maintain the credibility of the recommendation. For example, a validity period can be set so that the recommendation is valid only for a certain period of time (e.g. three years).

- The recommendation may be canceled under certain circumstances, for example when the IP that was the basis for recommendation becomes invalid, the IPR has low relevance to the invention or when the supplied product reveals technology or quality problems.

- **[Establishing Operating Procedure and Collaborating with Other Entities]** Operating procedures should be established before proceeding with the program. Operation manual should be developed in order to plan the duration and budget of the program to minimize the trial and error that may occur during the program.

(2) Program Announcement and Application

- The program announcement can be done both on and offline. Applying to the program would be easier via online if the infrastructure is in place. However, for regions with weak Internet infrastructure, applying offline should be allowed so that more SMEs and individuals may enjoy the benefits of the program.

- **[Submitting Documents]** The required documents may be designated by the person in charge of operating the program. However, including the documents below would ensure a smooth process in general:
  - Status of IPR of the invention to be recommended. In particular, evidence for registration of patents, utility models, and design patents.
  - Documents to prove exclusive licensee or non-exclusive licensee when they apply to the program
  - Designate possible buyers to a certain number (For instance, 20)
  - Invention catalog and figures
  - Specification of the patented technology related to the invention, OEM manufacturing agreement, etc.

- **[Program Application]** The application should include the additional point items, the name of the applicant, the applicant's address, name and address of the enterprise, phone number, and business registration number. Additionally, the patent number, name, usage and attributes of the invention should be written, along with the total asset, a number of employees, annual production capability and annual profit among other items.

- **[List of Potential Buyers]** Before publishing announcements, the public institution should conduct a survey on invention demands of the potential buyers to create a list and release the list along with the announcement to SMEs. For example, a list can describe what a particular buyer is looking for and how many the buyer needs, or how much budget is allocated for the purchase.

- The SMEs can utilize the list to see whether there is demand for their inventions or think about whether the invention has potential demand before applying to the program.

- The public institution managing and operating the program should check during the evaluation whether the invention is suitable for public procurement to select inventions that are actually needed or will be needed by the potential buyers. When SMEs consider in advance which buyers they would like to supply their inventions to prior to applying to the program, the evaluation process can run much more smoothly.

(3) Invention to Support and Evaluation

- **[Applying Requirements]** Considering the purpose of the program, the program should accordingly support enterprises or individuals with inventions made based on their patents, utility models, or design patents.

- As the selected SME will be supplying actual products to the buyer, production capability of the SME is important. Hence, the application requirements should include sales of the SME, the number of employees, financial status, work history, production and supplying capabilities, etc.

- For patents, only those within a certain period since registration can receive support to ensure that the program supports the very latest technologies.

- **[Managing Evaluation Committee]** For fair and high-quality evaluation, the public institution managing and operating the program should run an evaluation committee. To ensure that the program operates in a consistent and stable manner, experts from different fields should be included in the committee and those who are available at the time of evaluation can be selected to be included in the panel of judges.

- The committee should be composed of experts who can select SMEs from different sectors for recommendation by having diverse experience and thus qualified.

- Also, the applicants' inventions/technologies may be diverse, so the committee should be a balanced combination of experts in different fields of expertise (mechanical, metal, civil engineering, construction, electronics, computer, chemistry, daily supplies, bio, design, management, among others).

- **[Evaluation Process]** Program announcement can be made on and offline and it is crucial to make the announcement in the manner that provides opportunities to join the program to more SMEs and individual inventors.

- The public institution should check the documents submitted by the SMEs to see if they meet the requirements, and then have face-to-face interviews (presentations) to select the invention according to the evaluation criteria.

- **[Reviewing Documents Prior to Selection]** The public institution sends the documents submitted by applicants to the panel of judges so that they can review the documents before evaluation. As the judges are external personnel, the public institution should provide the necessary documents for review.

- When the judges have a thorough understanding of the program and the inventions, face-to-face interviews will be efficient in terms of time management. As a number of inventions need to be evaluated for a limited time, time should be spent wisely. For example, if the judges do not have information about the SMEs, they may end up asking less important questions, which may decrease the quality of the interview.

- **[Face-to-face Interview]** When evaluating inventions, document evaluation should take place before a face-to-face interview (presentation). The reason face-to-face interviews are needed is because the judges need to see the inventions themselves to make an accurate and effective evaluation. Hence, the SMEs are recommended to bring inventions to the interview.

- Also, the public institution can ask questions during the face-to-face interviews to ensure that both the SMEs (inventors) and judges agree that the evaluation process and the results are fair and reasonable. This would decrease the chance of complaints and claims from the applicants.

- One of the critical roles of patent attorneys as judges is to check whether the inventions are created according to the patent claims. Sometimes, SMEs may bring inventions that are produced based on a modified version of the claims. (In such a case, they may be excluded from the program.)

- Sometimes, the relevancy between the patented technology and the invention may be low. The judges, in particular, the patent attorneys, need to check facts by examining patent specifications closely.

- **[Evaluation Criteria]** To increase the credibility of the recommendation, products should not be selected based only by the fact that they are based on IP (patent). The actual competitiveness of the products (quality, functions, performance, price, etc.) needs to be taken into consideration when selecting an invention.

- First, the judges should review the overall quality of the invention based on the patented technology to check whether the technology is distinct and excellent and whether the product is high-quality.

- Furthermore, the judges should examine whether the invention has commercial feasibility worthy of recommendation. Factors such as whether the invention has good price competitiveness, advantages to replacing other similar products, and whether the invention's market size or growth potential is adequate should be considered.

- Lastly, the panel of judges should evaluate whether the applicant has enough production and supply

capability and whether the applicant is an enterprise that can guarantee quality.

- **[Reason for Elimination]** It is important to clearly state the reason for elimination for inventions that were not selected after the face-to-face interviews. Providing reasonable and valid reasons would reduce the complaints and claims from the SMEs, and enhance the transparency and fairness of the program. Therefore, the judges should offer a detailed explanation of the reasons for the elimination of the invention.

Example

Table 59. Example of Criteria for Selecting Candidates for Preferential Purchases in Korea

Evaluation Items	Criteria	Score	Evaluation Index
Technology and Invention Excellence (30)	Technology Advancement	10	Sophistication and superiority compared to existing technologies
	Technology Originality	10	Originality and substitutionality
	Quality	10	Quality compared to competing products
Purchasing Effects (30)	Price Competitive-ness	10	Price compared to competing products
	Relative Superiority	10	Efficiency, economic feasibility, superior product lifespan and import substitution effect
	Marketability	10	Market size, growth potential
Quality Guarantee and Supply Capacity (40)	Product Guarantee	10	Degree of quality control, certification, and product guarantee capacity
	Production and Supply Capacity	10	Number of personnel and facility size
	Commercialization	10	Management strategy and sales, measures to enter market and understanding of consumer demand trend
	Purchasing Effectiveness	10	Timely supply, expected consumers, and detailed demand forecast

- **[Additional Points for Evaluation]** When evaluating inventions, additional points can be given when certain conditions are met. For example, if the SME has won an award in an invention contest or has received certification from the government, or if the representative is a person with disabilities, woman, or a man of merit, the public institution can give additional points according to the evaluation regulation.

Example

Table 60. Example of Evaluation Process

Items	Document Evaluation (Level 1)	Document Review Prior to Evaluation (Level 2)	Presentation (Level 3)
Major Activities	• Screen submitted documents • Check whether requirements are met look for duplicate applications	• Send submitted documents prior to evaluation to the judges for review	• Closely examine the inventions through presentation to check eligibility • A 10-minute presentation per enterprise and a 10 minute Q&A session (May change according to the number of applicants)

(4) Recommendation of Excellent Inventions

- **[Sending Official Documents such as Recommendation Letter]** The public institution is advised to directly send a letter of recommendation for the selected inventions as doing so will improve the credibility of the recommendation. Recipients of the letter are institutions included in the list of potential buyers. When sending the recommendation, production information such as an invention catalog should be attached to the letter.

- The recommendation letter should have an expiration date (e.g. three years) so that it is valid only during the stated period. This helps reduce unnecessary time and effort and provides opportunities to more enterprises. The period of validity can be extended according to the decisions of the public institution.

- **[Ensuring Effectiveness of the Recommendation]** While the program makes recommendations for the preferential purchase of excellent inventions, actual purchase is not mandatory. Thus, for the program to be effective, negotiations with potential buyers should be given the utmost priority. When the public institution recommends inventions, negotiations with potential buyers actually considering preferential purchases and cooperating at the working level should take place. For the program to work, a system under the program needs to obligate the person in charge at the buyer organization to check

the letter upon receiving it from the public institution, and decide whether to purchase the invention. With such a system in place, preferential purchases might not be mandatory, but as the person in charge must check the letter of recommendation, the program can guarantee a certain degree of effect.

- **[Cancellation of Recommendation]** It is advised that a regulation be in place for situations when recommendations can be canceled to maintain the credibility of the program under circumstances explained below:

  - When the IPR the invention is based on becomes invalid
  - When there are exaggerations in promoting selection
  - When the relevancy between the patent and invention is low
  - When the IPR cannot be sold due to legal reasons
  - When the selected SME no longer owns the IPR as it was sold or transferred to a third party
  - When the buyer makes claims due to technical or quality problems after the invention is supplied or when follow-up service is not provided
  - When the selected applicant does not cooperate with the surveys and the inspection of delivery records concerning the selected invention.

(5) Follow-up Management

- For consistency and stable management of the program, the public institution should conduct surveys on the selected SMEs and reflect the results in the program in the following year.

- The survey should include questions regarding 1) program satisfaction (to understand applicants' awareness of the effects and processes of the program), 2) commercialization process of the IP of the SMEs after the recommendation (direct commercialization, transfer of license, M&A, etc.) or commercialization status of the IP to check commercialization outcomes (buyers, number of supplied products, etc.) and 3) any suggestions the SME might have for the program.

- The survey should be conducted on the degree of satisfaction and the business results of the enterprises that have been selected in the previous year. This helps identify and address any problems in the program and gather useful data to find out whether the program is running smoothly.

- It may be difficult to study results from enterprises that have been recommended this year. Thus, the survey on results and satisfaction should be conducted on the SMEs selected a year before.

- To improve the response rate of the survey, penalties can apply for not responding, for example in the form of cancellation of the recommendation.

- Considering the large scale and wide scope of the survey, it is recommended that the survey work is outsourced to a survey expert enterprise.

Example

Example of Program Satisfaction Survey

1. Program Satisfaction

(1) Was the program implemented in a fair manner throughout the phases?

(2) Was there anything about the selection process that should be improved? If yes, could you elaborate on the reason for disapproval?

(3) Benefits such as additional points during evaluation for preferential purchases are given when selected for recommendation. What do you think about this?

(4) How would you rate your satisfaction level of the program?

(5) Was there anything about the program that was not satisfactory and should be improved? If yes, could you elaborate on the reason for disapproval and share suggestions for improvement if you might have? Your feedback will help us make our program better.

2. Commercialization Status

(1) How is the commercialization of your enterprise's invention going after being selected for the preferential purchase recommendation program?

(3) If your enterprise's invention was successfully commercialized, how are your supply results? (to public organizations and other institutions)

(3) If your enterprise's invention was indirectly commercialized, could you elaborate on the reason for the decision?

(4) If your enterprise's invention was not commercialized in any way after the program, could you elaborate on the reason?

(5) Have you had any performance (or quality) inspection conducted on your enterprise's patented product?

(6) If you had performance inspection conducted on your enterprise's patented product, how much was the inspection cost?

3. Direction of the Program

(1) What are the biggest difficulties your enterprise is facing now?

(2) Have you applied to or completed the process of certification evaluation on the excellent invention at the public institution after being selected for the preferential purchase recommendation program?

(3) If you have supplied products through the certification mentioned above, how were the supply results? (in the public sector)

(4) What are the most necessary improvements you think should be made to the preferential purchase recommendation program?

(5) Do you have any suggestions that can improve the preferential purchase recommendation program or other kinds of support the public institution should also provide? Your feedback is greatly appreciated and will help us make the program better.

2) Guidelines for SMEs

Key Activities

1. Find buyers with demand for the IPR or relevant products (at mass-production level), and establish a detailed program plan
2. Prepare documents to apply to the program according to the application requirements

(1) Applying to the Program

- The program evaluates SMEs that have applied, and benefits are provided to those that have been selected. The SMEs should have a clear understanding of the detailed evaluation criteria and the purpose of the program before applying.

- First, the program aims to support SMEs to secure sales channels. In other words, once SMEs are selected to be recommended by the program, they must supply the products. Therefore, the status of product development and the mass-production capacity of the SME need to be examined.

- Before applying to the program, SMEs should identify the specific demand of the government and other public entities and analyze themselves and competitors to examine competitiveness of their inventions.

- Also, SMEs should check the status of their IPR related to the invention, especially patent registration status, utility models, and design patents, (including having paid registration fee) before applying to the program.

- Exclusive or non-exclusive licensees applying to the program are required to check and prepare the necessary documents of evidence. In the case of a non-exclusive licensee, it is advised to submit the consent of the licensee when applying in order to prevent possible disputes in the future.

- **[Surveys on Buyers]** Even if an SME's invention is selected, it cannot be recommended to all the buyers for preferential purchase so the SME should provide a list of possible buyers to supply to when applying to the program. In other words, the SME can do a survey and analysis on which organization of which field the invention would be best for.

Example

Table 61. Example of Application for Recommendation of Preferential Purchase Program

Application for Recommendation of Preferential Purchase of Invention

■ Conditions for Additional Points (Example)

□ Ranked higher than second place in invention contests (or exhibitions) (1 pt.)	□ Received certification for excellent patented technologies (1 pt.)
□ When there are causes for additional points, they can be given but the total extra points cannot exceed 5 points.	

Applicant	Name		Phone No.			
	Address		Mobile No.			
			E-mail			
Enterprise	Name of Enterprise		Representative		Business Registration Number	
	HQ (Address)		Phone No.			
			Fax No.			
IP Patent Number			Invention Name			
Total Asset		Million KRW	No. of Full Time Employees			
Annual Production Capacity			Annual Sales			Million KRW
Product Usage						
Product Features (Effects and functions)						

Under Article____Clause____, I apply to have my invention recommended for preferential purchase

201 . . .

Name of SME (Corporate Seal)

Example

Excellent Invention
Certificate of Recommendation Letter

Enterprise Name:

Representative:

Business Registration Number:

- Invention Name:
  (Patent)
- Product Name: Combi Oven
- Date of Selection for the Program(Date of Recommendation) : MM/DD/YYYY
- Valid Until: MM/DD/YYYY ~ MM/DD/YYYY

Under article 0000 of 0000 law ( ), it is confirmed that the aforementioned invention (Preferential Purchase by Government) is an excellent invention recommended by President 000 to increase support, growth, and purchase of excellent inventions.

* When a person under article 00 on procurement business law intends to purchase goods, he/she enjoy preferential purchase of excellent inventions from SMEs through recommendation of President 000 thanks to the Preferential Purchase by Government Program. (Article 000 of 0000 law)

MM.DD.YYYY

President OOOOO (Signature)

Figure 82. Example of Certification of Recommendation Letter in Korea

1.3.5. Program Tips

1) Program Tips for Public Institutions

- **[When to Run the Program]** It is advised to start the program as early as possible in a year. A delayed program would lead to a delayed selection of inventions, which would influence the date of contract signing between the selected SME and the buyer and the date of supply.

- **[Link with Other Programs]** The recommendation for preferential purchase under the program is valid only in the purchase deliberation process of the buyers and does not apply to other private enterprises.

- However, considering that the inventions recommended by the program are selected through a strict evaluation process and supplied to public organizations, the recommendation may have positive effects on private enterprises as well.

- Hence, the public institution should offer consultations for purchases in exhibitions and events, especially those related to IP, and match the buyers and sellers by providing information on excellent inventions to buyers to enhance the effectiveness of the program.

- Similarly, the public institution can include presentations on preferential purchase program when having other events to encourage participation of excellent enterprises with a small budget.

- **[Rounds of Program]** It takes approximately two months from publishing program announcements, evaluating and ultimately making a recommendation for preferential purchase. Therefore, the program may be implemented more than four times annually according to the needs of the economies of implementation.

2) Program Tips for SMEs

- **[Follow-up Management]** SMEs need to take due caution in order to avoid negative changes in the validity status of their recommendations that can arise from various reasons.

- Restrictions may be imposed when fraudulent actions are found during the selection process or there are problems with the delivered products, or when management issues arise such as inadequate follow-up service. Therefore, the selected SMEs should be attentive to follow-up management not only after selection but after supplying products as well.

- The public institution should select inventions with attributes that fit public procurement, so SMEs should check before applying to the program whether their inventions display such features by referring to the distributed demand list from the potential buyers.

- The purpose of the program is to support commercialization such as marketing of excellent inventions made based on patented technology, so it needs to be checked whether what is described in patent claims and specifications match the invention.

1.4.
Product Innovation Using IP Data

1.4.1. Program Overview

Address pending issues related to patented inventions of SMEs from the IP perspective to aid in strengthening the competitiveness of products and businesses

- The Product Innovation Using IP Data Support Program aims to address current problems SMEs cannot resolve on their own from the IP perspective and suggest IP utilization strategies to help them strengthen the competitiveness of their products and businesses.
- The program has the purpose of establishing a virtuous IP cycle in which utilization of IP leads to profit increase, reinvestment into R&D, and the creation of new IP by enhancing IP utilization capacity of SMEs that own IP.
- With increased global competition, technology and product innovation are becoming increasingly significant in enhancing an enterprise's competitiveness.
- Against this backdrop, SMEs have been striving to develop innovative products or services to differentiate themselves from others. As much as product innovation pursues drastic changes and accomplishments, however, the risks are equally as high.
- This calls for a way to improve innovation and decrease risks at the same time. Utilization of IP, which is the result of technology innovation, can be a valid solution for the desired reduction of the risks innovation entails.
- However, the current state of IP utilization by SMEs is mostly limited to preventing duplicate research through prior art search or establishing R&D strategies.
- Moreover, despite the various efforts to expand the scope of search into other fields to go beyond the basic prior art search, performing search in the other fields has been often beyond the capacity of SMEs, as there is an almost infinite amount of patent information and each technology field has its own share of jargons and terminologies.
- The program attempts to offer ways to support product innovation of SMEs by using methodologies such as Open Patent Intelligent Search (OPIS) or Theory of Inventive Problem Solving (TRIZ) which enable utilization of patent information as the basis for new innovation and reduce the risks involved.

Note

- Open Patent Intelligent Search (OPIS): A patent search method that benchmarks principle of problem-solving in other sectors and engineering fields
- Theory of Inventive Problem Solving (TRIZ): A creative problem-solving approach that discovers fundamental contradictions to come up with a solution

- The program is a process of finding ideas and problem-solving directions for product improvement and innovation drawing on patents. As search should be conducted not only in patent fields but also in product development fields, the selection process of the expert in charge of the program implementation is a particularly rigorous and highly selective one, especially more so when compared to other programs.
- Moreover, to ensure the success of the program, it will not be sufficient if external experts alone are working for the SMEs; rather, there should be a joint R&D between external experts and SMEs to address the pending problems.
- Within the program, patent experts will i) provide a pool of benchmark ideas ii) conduct primary verification on the direction of product innovation with TRIZ experts, and iii) be in charge of patenting the product to assist in commercialization.
- The TRIZ experts come up with innovative ideas based on the idea pool formed with the suggestions from patent experts and the needs of the SMEs.
- SMEs should provide a clear explanation about their needs concerning the technology or the product they own, and be in charge of the final verification and specify innovative directions (ideas) from the TRIZ experts.

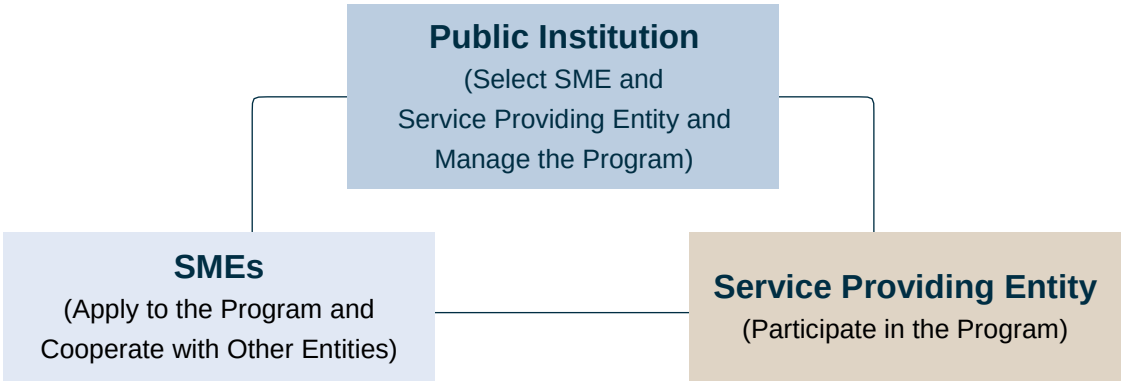


Figure 83. Program Framework (Product Innovation Using IP Data)

1.4.2. Similar Programs of APEC Members

1) Smart Program[84] (UK)

- The Technology Strategy Board from the UK supports SMEs with outstanding technologies by assisting the establishment of IP commercialization strategies and production of prototypes.

- It is a program that selects SMEs from applicants to subsidize research funds for the enterprises to develop new products, processes, and services through R&D projects.

- Subsidies for research are as follows:

  - Proof of Market: Subsidy of up to 60% of the overall project cost, maximum 25,000 GBP.
  - Proof of Concept: Subsidy of up to 60% of the overall project cost, maximum 10,000 GBP.
  - Development of Prototype: Subsidy of up to 35~ 45% of the overall project cost, maximum 25,000 GBP.

- Over 30% of the enterprises that have received investment have released new products or services and over half plan to release products in the future.

2) World Opening Innovation Spirit[85] (WOIS) (Germany)

- WOIS is a new product development process unique in Germany that is utilized by hidden champions and global leading enterprises of Germany (BMW Group, BOSCH, among others).

- The strategy of WOIS is simply put, contradiction and innovation. It utilizes contradiction-oriented innovation strategies, and by enhancing innovation capacity of the enterprises, it leads to product innovation and high-value creation.

- Using contradiction-oriented innovation strategies, the program provides future-oriented innovative roadmaps that improve innovation capacity of the applicants. The roadmap includes the creation of high-value from product innovation, market potential improvement, the establishment of innovative product portfolio, advancement in the organization and processes, and an upgrade in enterprise assets.

- In particular, the program provides an integrated innovation development process on product-processes-

84) http://www.now.go.kr/ur/poliTrnd/UrPoliTrndSelectdo?screenType=V&poliTrndId=TRND0000000000028275&pageType=017&currentHeadMenu=1&currentMenu=12

85) http://www.sciencetimes.co.kr/?news=%ED%9E%88%EB%93%A0%EC%B1%94%ED%94%BC%EC%96%B8-64%EA%B0%80-%EB%8F%85%EC%9D%BC%EC%9D%B8-%EB%B9%84%EA%B2%B0

organization-culture-business model to business leaders, taking into account various principles based on innovation philosophy so that the enterprises grow to become first movers.

- Also, the program forecasts an integrated future innovation direction considering various perspectives from natural resources, society, technology, thinking, culture, among others, allowing the enterprise to find the direction that to focus its innovation capacity on.

- The innovation strategy development process of WOIS is illustrated below.

Phase1:Impulse	Phase2:Kick-off	Phase3:Structure Initial Situation	Phase4:Process and System Analysis	Phase5: Front-Leveling
Explanations on WOIS philosophy, strategy, culture, and innovation development process	Kick-off of project to confirm innovation probability	Establish 5 world innovation column on enterprise's product, customer, support, institution and process, and value creation -> Deduce future direction	Maximize performance, forecast objective process and structure analysis, and develop direction-innovation	Forecast performance and develop direction-Innovation

Figure 84. The innovation strategy development process of WOIS

3) Accelerating Commercialisation Program (Australia)

- Accelerating Commercialization Program supports SMEs in the process of commercializing new products, processes, and services with guidance from experts and subsidies.

- Among the services offered, commercialization guidance provides primary guidelines on commercialization programs or strategies and gives feedback on portfolio services. The portfolio services provide guidance of experts, connection to expert's network, and promotion opportunities for the target of commercialization.

- To receive commercialization guidance, the applicants need to have new products, processes or services and own and exercise the relevant IPR. Also, the applicants' sales for the last three years need to be less than 20 million USD.

- The SME needs to be able to cover at least 50% of the program cost, which includes labor expense, contract fee, factories and prototype production expenses.

1.4.3. Procedures and Details of the Program

1) Target of Support

- The Product Innovation Using IP Data program mainly supports SMEs with patents, with middle-sized enterprises also eligible for application after consultation with the public institution.

2) Program Process

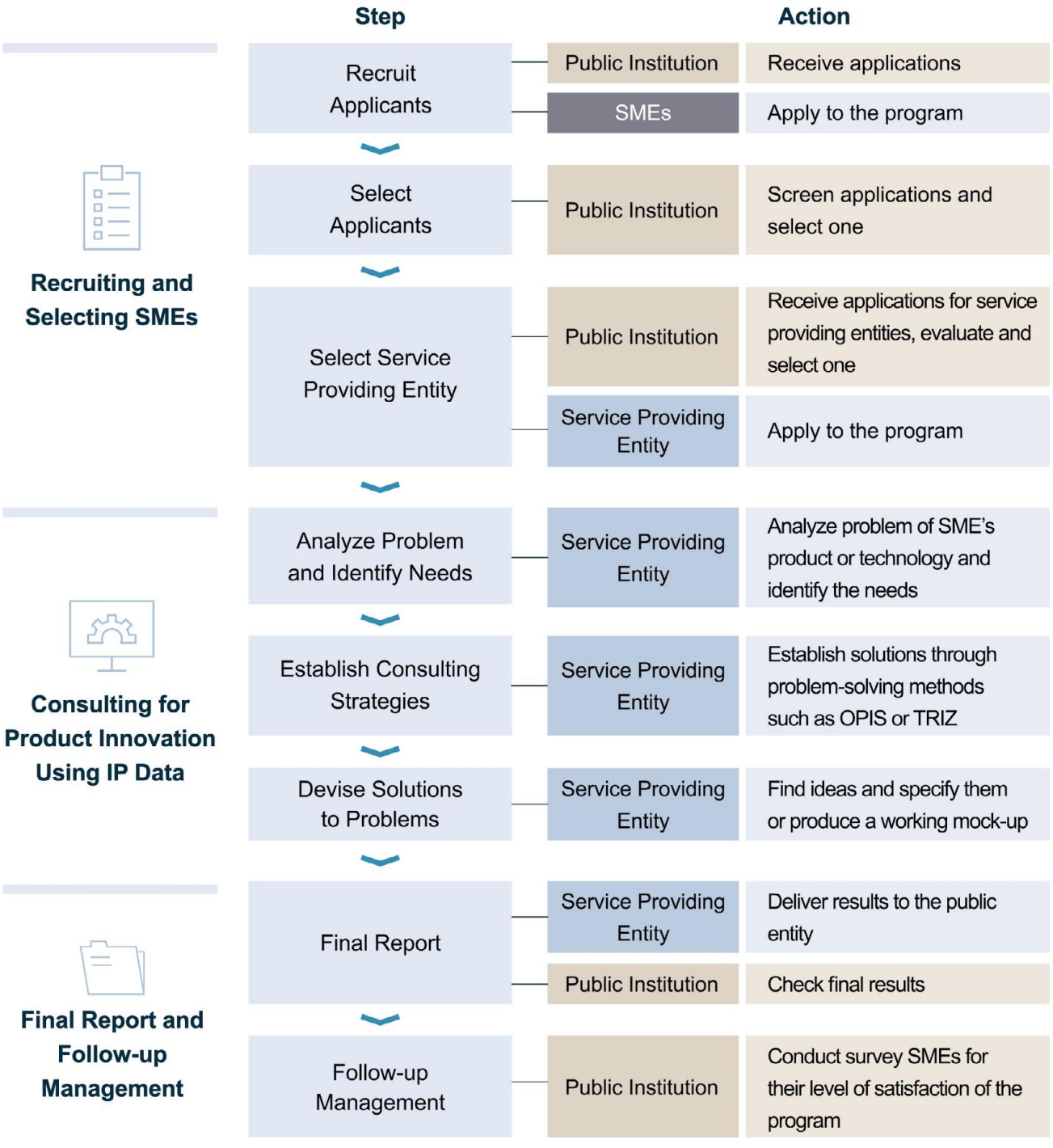


Figure 85. Program Process (Product Innovation Using IP Data)

3) Scope and Conditions of Support

- The public institution provides a partial subsidy for the program cost (70% to 90% of the overall cost) per selected enterprise.

- When the public institution pays part of the cost, the rest has to be burdened by the selected SME. The ratio between the two parties will be different depending on the sales of the enterprise.

- Program for Solving Product Problems and New Products

  - To improve technology and product competitiveness of SMEs, the program analyzes the cause of problems, finds ideas and fields to apply from through OPIS, and provides assistance to resolve pending issues on the products or processes from the patent perspective.
  - The service providing entity will be composed of patent and TRIZ experts.

- Program for Product Design and Improvement

  - The program comes up with product design ideas through OPIS for the development of user-centered designs and product function improvement, provides 2D sketch ideas or 3D rendering while supporting the production of working and study mock-ups.
  - The service providing entity will be composed of experts on patents, TRIZ, and product designs.

1.4.4. Guide Map for Participating Entities

Table 62. Guide Map for Participating Entities (Product Innovation Using IP Data)

Entity	Preparation	Program Process (Phase)						Follow-up Management
		1	2	3	4	5	6	
Public Institution	Program promotion	Select an applicant	Select a service providing entity	Manage and operate the program		Interim report	Final report	Survey on satisfaction
Service Providing Entity			Apply to the program	Provide services		Interim report	Final report	
SME		Apply to the program		Actively cooperate with the service providing entity			Receive final result	Survey on satisfaction

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up management.
- This program is generally operated with a five-month timeline, which is flexible and can be changed depending on the scope of support, budget, and capabilities of the service providing entity.
- The chart summarizes the role of the public institution[86], service providing entity[87], and the selected SME in different phases of the process, and details of each phase are explained in *1.4.5. Detailed Guidelines for Participating Entities.*

[86] A public institution such as government department that manages and operates the program
[87] The institution providing services in the Product Innovation Using IP Data Program

1.4.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Select an SME and a service providing entity for the program by establishing an evaluation committee
2. Provide support to ensure that an innovative solution is found to resolve technical problems regarding the patented technology and products of the SME

(1) Program Preparation

- The public institution plans the program and forms a separate committee to select SMEs which will receive support and service providing entities which will serve as consultants.

- First, the public institution should form a pool for the committee to select an SME and a service providing entity before publishing program announcements, and set qualifications for the committee members.

- The public institution follows the program plan to release announcements and explanations of applying to the program on newspapers and online sites. The announcement should include the purpose of the program, application requirements, type of support, scope of support, application process, subsidy amount, required documents, application period, and application method.

(2) Selection of SMEs

- The program aims to help SMEs that have a hard time finding solutions to pending problems related to their products and technologies on their own by providing them with ways to utilize OPIS or TRIZ to find innovative solutions to their problems.

- Therefore, the public institution should select SMEs that have already tried various methods to address the problems but have not yet found a solution due to weak problem-solving capabilities.

- The public institution should calculate the quantitative score of each SME according to the scoring rubric and hold a committee meeting to conduct document evaluation. After the document evaluation, the public institution selects SMEs double the number of the final candidates with scores above a certain level to have the final evaluation.

- The public institution should conduct field inspections on the SMEs that have passed the document evaluation to check whether their documents state facts and the status of SME. Also, it should help increase awareness for the program and announce to SMEs on how to prepare for the presentation interview.

- The public institution should announce the results from the committee on which SMEs have passed the evaluation and make the final decision based on the overall score, and the size of the budget allowed for the program for the year.

Example

Table 63. Criteria for Selection of SME in Korea

Items	Criteria	Score	Remarks
General Status and IP Status (60)	General status	12	Quantitative Index
	Technology development status	12	
	IP registration status	18	
	IP management and utilization status	10	
	Certifications and awards	8	
Suitability of Support (20)	Potential growth of IP utilization capacity and appropriateness of support	20	Qualitative Index
	Appropriateness of the desired field and pending issues for consulting		
Rationality of Support (20)	Necessity of policy support	20	
	Clarity of improvement goals from consulting		
Total Score (Out of 100)		**100**	

(3) Selection of Service Providing Entities

- To select service providing entities, the public institution should hold a committee meeting and evaluate performance capability of each applicant.

- During evaluations, the most crucial factor is whether the service providing entity is equipped with the capability to address the product and technology problems applicants have and whether they have experts such as patent attorneys, and product innovation experts to analyze the problems and their causes.

- The public institution should select an applicant through open bidding, and the request for proposals (RFP) should describe the selected SMEs' products or technologies, the nature of the problem, and the needs of the enterprises.

- The technical problems selected SMEs have may be confidential information, so such contents should not be included when announcing open bidding. Rather, it is recommended to share the information by having a proposal briefing session and revealing the information to only those present at the session.

- The public institution selects the service providing entity candidates based on the sum of capacity and bidding price scores, and the final candidate is chosen through negotiations with the selected SME.

Example

Table 64. Criteria for Selection of Service Providing Entity in Korea

Items	Criteria	Score
Qualification (25)	Level of understanding of the purpose and goal of the program - Validity and practicality of the proposal (strategy, goal, etc.)	**25**
	Effective organization and personnel pool for performance - Appropriateness of participating personnel (Including external personnel) - Appropriateness of participating personnel's capacity and roles	
	Level of experience and history of carrying out similar work - Level of innovation and strategy involved	
Capacity (20)	Overall management and operation capacity - Management and operation capacity of the person in charge - Capacity to realize core results according to the goal of the program	**20**
	Appropriateness and practicality of processes and planning	
	Appropriateness and practicality of the work methodologies	
Strategy (15)	Appropriateness and validity of the detailed strategies Level of preparation according to RFP	**35**
Performing Methods (20)	Appropriateness of work methods Appropriateness of research methods such as market research and data collection Appropriateness and level of details in establishing strategies per task	
Total (Capacity Score)		**80**
Price Score		**20**
Total (Capacity + Price Score)		**100**

(4) Managing and Supervising the Program Services

- Once the SME and service providing entity are selected, the person in charge from the public institution should carry out relevant work such as signing agreements and managing the payment of the program implementation costs from the enterprises. The business agreement can be a trilateral contract among the public institution, the service providing entity and the SME, or it could be two bilateral contracts between the public institution and the service providing entity, and the public institution and the SME.

- The public institution can appoint a program manager (PM) for efficient management and supervision of the program.

- To improve program results and the effects of the support, it is necessary to work together with not only patent experts but also experts from other fields such as TRIZ. As communication and coordination among the participating entities are crucial, the PM should be responsible for adjusting tasks of experts from the service providing entity, setting program directions, and facilitating communication between the SME and the service provider.

- Before the program begins, the PM should consult with both the SME and the service providing entity for setting the scope of business and checking whether the kick-off meeting during the program, launching report, interim and final briefing sessions are proceeding smoothly.

(5) Survey on Satisfaction and Follow-up Management

- Once the final checking is completed, the public institution conducts a program satisfaction survey on the selected SMEs. The survey can either be executed by the public institution or outsourced to an external entity specializing in such services. Areas to complement and room for improvement shown on the survey should be reflected in the planning of the program for next year.

2) Guidelines for Service Providing Entities

Key Activities

1. Analyze technical problems SMEs have through TRIZ
2. Come up with innovative ideas for IP products utilizing OPIS

(1) Overview of the Product Innovation Using IP Data Program

- There are many ways to achieve product innovation utilizing patent information. This guidebook introduces IP production innovation programs based on OPIS and TRIZ.

- Prior art search within the same technology field allows prevention of duplicated R&D efforts and is useful for establishing R&D and business strategies. Benchmarking patent search results in the same field to resolve patent or product issues, however, is vastly limited due to problems such as patent rights infringement.

- The program aims to go beyond the limits of prior art search in the same field to identify and effectively utilize innovative results in other fields. By doing so, the program will support the development of solutions to the pending problems SMEs have from the IP perspective.

- Under the supervision of the public institution, the service providing entity should provide consultation in establishing strategies for Product Innovation Using IP Data.

(2) Support for Troubleshooting and Finding New Products

- Methodologies such as OPIS and TRIZ can be utilized to provide innovative solutions to problems that could not be resolved through the capabilities of the SME alone.

- In developing new products, OPIS can be used to unearth new ideas for products based on patented technology and find solutions to technical problems that arise during the development phase.

- The OPIS process is composed of four phases – problem analysis, cause analysis, query formation, and problem-solving. Each phase consists of four modules.

Problem Analysis	Cause Analysis	Query Formation	Problem-Solving
Analyze the problem Review problem Diagnose problem background	Root Cause Analysis	**Writing Search Queries** System analysis basis Cause analysis basis Experience knowledge basis	Find Ideas
Technology status analysis Analyze current technology Analyze technology trend Diagnose patent risks	Problem Chain Analysis	**Finding Candidate Systems** Experience knowledge approach Science knowledge approach Technology knowledge approach	Apply Ideas
System Schematic	Physical Technical Contradiction	**Selection of Alternative Knowledge**	Develop Ideas
System Analysis Function analysis Process analysis Trimming	Solution Direction	**Writing Limit Queries**	Establish roadmap

Figure 86. Problem-solving Process through OPIS

- **[Problem Analysis Phase]** Review the problem regarding product or technology the SME owns, and identify the background of the problem from internal and external aspects from an objective viewpoint. It is important to correctly define the problems through the statements of the SME and examination of the service providing entity. Analyze the technology trend and problem-solving methods of the same field, and identify the reason why the issues cannot be resolved within the one technology field.

  - Problem Analysis: This is the phase to analyze technical problems and background. In this phase, internal and external diagnoses on the SME are conducted, and the needs of the enterprise are identified from an objective view. Also, product structures are analyzed, and patterns and environment of usage are examined if needed.
  - Technology Status Analysis: Examine technology trends and patent risks by analyzing the SME's technology related to the problem and patents in the same field. Through such a step, efforts and approaches of the SME and the field relevant to the problem can be analyzed to find a solution in the same field or identify the causes as to why it cannot be resolved.
  - System Schematic: Produce a system schematic, which is a visual diagram that includes only the core factors of the problem, based on the analysis results. The simple form of a system schematic allows even the children to understand the message without difficulty. A system schematic should be created using simple features such as straight lines, circles and rectangles without making it seem like a complicated drawing like a blueprint.
  - System Analysis: At this stage, the system is analyzed focusing on only the functions relevant to the problem. Correlation between functions can be identified either by gathering all the factors relevant to the system or by integrating only the core factors and focusing on the mechanism behind the caused problem. It is recommended to conduct the analysis based on the factors listed in the system schematic.

- **[Cause Analysis Phase]** Analyze causes of the problem, and find contradictions from the root cause to eliminate the cause or devise a resolution direction to overcome the contradiction. The Root Cause Analysis (RCA) and Problem Chain Analysis (PCA) can be utilized to come up with the possible resolutions. The possible resolutions should include trials and errors of the SME, solutions adopted by competitors, solutions that are difficult for the SME to adopt. Out of all the solutions, the most realistic direction should be chosen and the core of the problem should be re-defined through Physical Technical Contraction (PCA).

  - Root Cause Analysis (RCA): In RCA, the mechanism of the problem should be explained in detail. The logic needs to include root causes, and if the root cause can be eliminated, the focus should be on the root cause to come up with a solution. If the elimination is difficult, the reason has to be analyzed and it needs to be set as the contradiction.
  - Problem Chain Analysis (PCA): Instead of focusing on the root cause, all possible directions of solutions are devised through PCA.
  - Physical Technical Contradiction (PTC): From devised solution directions, the most realistic and effective one should be chosen. To find contradictions regarding the solution, the PTC needs to be carried out.

Through the PCT, an in-depth analysis of the solution can be performed and the core of the problem can be re-defined to specify the solution direction.

- Solution Direction: Compare solution directions made based on the root causes and contradictions analyzed through the processes of the RCA, PCA, and PTC to produce the optimal solution.

- **[Query Formation Phase]** Write search queries to find ideas needed to realize the solution directions from the problem and cause analysis phases not only in patent but also in technology and market databases. The OPIS process is not limited to a particular technology field and therefore is bound to give a huge number of search results. In case where there are too many items to be examined, it is often a good idea to select a technology field the most likely to yield new ideas as an alternative system for overall efficiency.

  - Writing Search Queries: Write search queries to find formation to perform the purpose deduced from system analysis such as function analysis, process analysis, or trimming analysis (system analysis based), or write queries to find technology formation needed to eliminate core causes deduced from cause analysis such as RCA, PCA, and PTC (cause analysis based). At the same time, search queries for solution directions deduced from experience and intuition of experts can be written (experience based).
  - Finding Candidate Systems: When there are too many search results, the search scope should be narrower. To limit the search on function for the deduced purposes, core causes, or solution directions to a particular system, find the system with the high probability of finding a solution and product application.
  - Selection of Alternative System: Once the candidate systems are identified, select the system with the highest probability of finding an idea and the highest chance of being applicable to the product.
  - Writing Limit Queries: Using the alternative system with the search queries written above, write limit queries. This is to limit the search range of search queries to the alternative system. When using patent databases, patent classifications or main keyword limits can be added to write limit queries.

- **[Problem-solving Phase]** Discover ideas that can help solve the problem through an analysis of the searched patent data and select one which can be applied the most effectively. In the process of applying the idea, address collateral problems to further specify the idea, and evaluate the ideas to rank them and establish a step-by-step roadmap for R&D and securing IP.

  - Finding Ideas: Using limit queries, analyze patent data found and search for ideas to utilize for solving the problem. Out of the ideas found, select the ones that are effective and have a high chance of application, and conduct an overall review of whether any other problems arise during the process of application.
  - Applying Ideas: Apply the selected idea to solve the problem and specify the idea. If problems occur within this process, solve them and modify the idea to suit the system.
  - Developing Ideas: Review the principle of the solution from the selected idea, and devise other specific ideas according to the principle, or use inventive principles such as TRIZ on the selected idea to further

specify it.

- Establishing Roadmap: Establish a patent strategy or a technology development roadmap by conducting a comprehensive review of the selected idea's probability of application, being patented, and infringement on other patents. Also, additional factors needed to apply the idea, and business strategies of the selected SME should be considered.

(3) Supporting Product Design Development

- The program aims to support developing user-centered product designs and improving product functions by utilizing creative problem-solving methodologies such as OPIS and TRIZ along with design research and user survey methodologies.

- OPIS can be used for product design development, but the program will focus on supporting commercialized products that can see immediate results in expansion of market or profit increase by reflecting patent and design improvements from functions enhancement in a short-term period.

- The product design development process is composed of four phases, which are design environment analysis, establishment of design strategy, development of design concepts, and design development. Each phase is composed of two modules. The detailed modules can be chosen selectively depending on the case.

Design Environment Analysis	Establishment of Design Strategies	Design Concept Development	Design Development
Design Environment Analysis Market environment analysis, competitors analysis, user analysis, design SPEC analysis	**Idea Conception** Define and analyze contradiction relations, Deduce TRIZ principles, conceive Ideas	**Devising Design Concept** Collect design motifs/ideas, 1st/2nd set of idea sketches	**Visualization of Final Design** 3D rendering results conceive Ideas
Patent Environment Analysis Analysis on technology owned, Technology trend analysis, Double patenting analysis	**Establishing Design Strategy** Design identify system, Design strategy guideline	**Devising Design Candidates** Candidate designs, Screening of designs	**Working Mock-up** Product drawings, 3D working mock-up

Figure 87. Product Design Development Process

- **[Design Environment Analysis Phase]** Review the SME's product problem and objectively identify the background of the problem and the needs of product development from the internal/external aspect of the enterprise. It is important that the service providing entity examine and re-define the problem and the needs of the SME based on the explanation from the SME. Also, the service provider should conduct an internal/external diagnosis from the design perspective and analyze competitors, product design structure, design trend, technology trend and problem-solving methods in the same field. It should also look into the reason the problem cannot be resolved in the same field.

  - Design Environment Analysis: This is the phase to analyze the product's market status and background. In this phase, internal and external diagnoses are conducted on the SME and the needs of the enterprise are identified in an objective manner. Political, technical, cultural and social issues related to the product are selected in terms of trend strength and relevance to be evaluated.
  - Usability testing should be done with actual users of the product. Based on the results, identify the unmet needs and problems that previous research could not find. According to different cases, utilize different methods such as survey research, in-depth interview, focus group interview, etc.
  - Design specification analysis looks into functions, structures, design patterns, and color, material, and finish (CMF) of the products that competitors have released in the market. The comparison between strengths and weaknesses of the products from the SME and other competitors in the same field should be displayed in image schematic diagrams or morphology charts for the SME to easily understand.
  - Patent Environment Analysis: Diagnose patent risks and technology trends by analyzing the SME's technology relevant to the product to be developed and patents in the same field. Through this process, the efforts and approaches of the SME and competitors in the same field to solve the problem can be analyzed to find solutions in the field or find the reason why the problem cannot be resolved.

- **[Establishment of Design Strategy Phase]** Conduct cross-tabulation analysis on issues from design environment analysis to establish and examine contradictory relations among the issues. Based on the results from the contradiction table, find the problem and devise ideas to solve it. Establish a design identity system and design strategy guideline according to the ideas conceived.

  - The Conception of Idea: Come up with ideas on solutions to the problem deduced from the analysis of contradiction relations using 40 inventive principles of TRIZ.
  - Establishment of Design Strategy: Based on the solution ideas and design environment analysis issues, build a design identity system and systemize a detailed strategy guideline according to the system.
  - For the strategy guideline, schematics can be made by suggesting keywords composed of core and sub-keywords, or by proposing keyword and related concept images together.

- **[Design Concept Development Phase]** Based on the results from the design strategy system and conception of ideas, produce sketches on design ideas and among the sketches, evaluate and select candidates to create the final draft.

- Devising Design Concept: Come up with design motif for the idea sketches and collect and analyze relevant images. Idea sketches can be done in one to two rounds, or three if needed.
- Devising Design Candidates: Through multiple idea sketch meetings, select the candidate sketches and evaluate them. The design evaluation should be done by internal and external design experts with quantitative scores. The major criteria for evaluation should include design preference, appropriateness of concept, registration probability, product expansion, usability, and production convenience according to each product.

- **[Design Development Phase]** Select the final sketch after having meetings with the SME. Then, proceed with design visualization work. Produce 3D product drawings and a working mock-up based on the final design rendering.

- Visualization of Final Design: The final design sketch is created by 3D rendering, and the final draft should have perspective, top, and side view and the product measurements.
- 3D Product Drawings and Working Mock-up: 3D product drawings and a working mock-up should be produced according to the final sketches. Depending on the product, whether to have a working mock-up in actual size or in a smaller scale should be decided. To enhance the integrity of the mock-up, continue to communicate with the service providing entity.
- Study Prototype: In the case of improving product designs, produce a study prototype rather than a working mock-up, and it should be made not in actual size but in a smaller size to check the accuracy of the product form.

3) Guidelines for SMEs

Key Activities

1. Apply to the program to address the problem the SME is currently facing
2. The request for support should be made clear to the public institution or the service providing entity

(1) Apply to the Program

- The SME that hopes to receive support can select one of the programs from i) solving product problems ii) developing new products and iii) product designs development support. The enterprise should choose the most suitable program that can provide innovative solutions to its product or technology issues.

- It is the responsibility of the enterprise to thoroughly understand the program announcement. Similarly, the enterprise should prepare briefing materials on the technical issues at hand not only to be selected for support but also to cooperate more effectively with the service providing entity after being selected.

- The SME should check application requirements and preparations for each step of the selection, and then fill out and submit the application required in each program. The requirements of each program are as follows:

- Product Problem-solving Program

  - [Product Explanation] Explain the current status of the product or patented technology problem and also include information the enterprise has gathered on product level compared to other competitors, the competitiveness, and factors that compromise the competitiveness of the enterprise.
  - [SME Status] Explain the enterprise's R&D personnel, and product production and marketing capacities, and describe the efforts undergone by the enterprise to address the problems on its own in terms of the input of labor, cost, and time.
  - In addition, information such as the size of product market, current status of competitors, and data on current and future customers may help the service providing entity to better understand the situation of the selected SME.

- New Product Development Program

  - [Current Technology and Product Status] Explain the core technology and relevant IP status of the SME, and also include status on the product based on the enterprise's core technology. Also, the SME needs to explain the direction for the new product development.
  - [SME Status] The selected SME should describe the R&D personnel and production and marketing capabilities and articulate the efforts undertaken by the SME in terms of input of labor, cost and time spent on developing new products.

- Product Design Development Program

  - [Current Product Design Status] The SME needs to suggest directions for functional improvement of the product in mind, along with overall design improvements. Also, the status of the product technology, relevant IP, and the level of competitors' product development should be explained.
  - [SME Status] The selected SME should explain not only its R&D personnel, production and marketing capacities, but also details on design development to enhance product competitiveness, and detailed utilization plan on the developed product designs.

(2) Preparing for Field Inspection

- After applications have been received, the public institution conducts document evaluation to select SMEs. The public institution may conduct field inspections on enterprises that have passed the first evaluation if deemed necessary.

- SMEs must actively cooperate with the public institution for the on-site inspection, and prepare presentation material for the final evaluation.

(3) Program Process

- Before the program starts off, the SME should explain the technology it owns, the technical problems it faces and the solution objectives to the service providing entity at the kick-off meeting phase.

  - It is crucial for the service providing entity to clearly grasp the pending product problem or design development issue from the beginning of the program in order to effectively determine a specific problem-solving direction.

- During the program, the SME is responsible for the review, verification, testing, and discovering ideas that can complement the solution for the suggestions by the service providing entity for product and design improvement.

- Even if the person in charge from the service providing entity is an expert in resolving product problems and improving designs, their knowledge of the product will not be quite the same as the expertise of the person in charge at each SME. This means that service providing entities will mostly be able to offer ideas or solutions in the form of rough drafts.

- Thus, for the idea to be applied to the actual product, consulting outcomes need to gain shape, and the ideas should be complemented in other ways. The ideas also have to go through tests involving models, samples and simulations, all of which require engagement and cooperation from the SME.

1.4.6. Program Tips

1) Program Tips for Public Institutions

- Serving the Role of PM Between SME and the Service Providing Entity

  - The PM should monitor and check the proceedings of the program, and be a mediator between the SME and service providing entity.
  - However, if the SME lacks management capacity or needs strategic management, the PM can manage consulting tasks on behalf of the SME under the consent of the final decision-maker of the SME.

- In particular, the program requires active participation and cooperation from the SME. The enterprise needs to verify the product and design improvements suggested by the service providing entity, come up with additional complements and even conduct internal tests when needed. As a result, the public institution should encourage the SME to get involved in the program and cooperate with other entities in an active manner.

2) Program Tips for Service Providing Entities

- The program can produce excellent results when the service providing entities have a good understanding of the SMEs. In other words, instead of simply understanding the technology or the product, the service providers need to have a thorough understanding of the SMEs' state of business management, R&D plans and capacities and their attitude on participation. Based on such understanding, the service providers should provide consulting services accordingly.

- Also, most SMEs do not provide all business secrets or information on management to the service providing entity they meet for the first time and to encourage their active participation, the service providing entity needs to put in the effort to earn their trust.

- Participating in Request for Proposal Briefing Sessions

  - In announcements that have been released via newspapers, etc., only limited information about the enterprise will be revealed due to business secrets. Hence, the service providing entity should participate in briefing sessions hosted by the public institution before applying to the program to listen to details on the technical problems the selected SME is going through.

3) Program Tips for SMEs

- The Importance of Clearly Explaining the Pending Problems
  - For results of the Product Innovation Using IP Data program to be successful, the SME needs to

provide a clear explanation of the product or technical problems at hand to the service providing entity in the beginning of the program.

- It is crucial that the SME collaborate with the service providing entity so that they gain a clear understanding of pending issues. Based on the understanding, the service providers will decide on the direction of the solution, whether it is through function analysis of the product system using TRIZ or PTC.

- Verifying Applicability of the Selected Idea

- The SME needs to work together with the service providing entity for verifying the applicability of the solution direction to the product. It is recommended that the SME prepare test environment for the solution idea, and having external experts to conduct additional verifications is possible as well.

1.4.7. Successful Cases of Program Implementation

1) Enterprise A (A case of solving a product problem)

- Enterprise A was having a problem with the dental handpiece having too tall of a head that when treating a cavity, the part would touch the roof of patient's mouth, making it uncomfortable for the doctor and the patient. In order to address this problem, the enterprise applied to the program.

- The enterprise's handpiece was structured in such a way that when the button at the top of the handpiece is pressed, the spring would shrink and loosen the bur pin, detaching the bur from the main body portion, which is expendable.

  - Through OPIS, an anti-theft tag's patented attach/detach technology was used as a benchmark case in product development although it was from a completely different field from dental handpieces (The pin-fixing structure of anti-theft tags were similar to that of handpieces and made application on the dental handpiece possible).

- **[Results]** Enterprise A was able to resolve the problem with the thick head portion of the headpieces, which it struggled with for the past 10 years with its own R&D. The head portion's width decreased, by 30% and the number of parts fell by 30%.

2) Enterprise B (A case of product design development)

- Enterprise B is a bathroom product manufacturer that applied to the program to develop a new product with aesthetic designs and high-quality to compete with European products.

- Utilizing OPIS, ideas on using various materials such as pottery, SMC and AMCS were developed, and it led to a successful development of a product design with aesthetic aspect strengthened.

- Current bathroom environment and user experience analysis were carried out to find the unmet needs. Based on the results, a new shower product with three part modules was developed.

- To match the brand image of previous products, product designs considered the consistency of brand identity, and through a design trend survey, a consumer-centered design was developed.

- **[Results]** Thanks to the product development from a completely new perspective, enterprise B became a market leader in the bathroom product markets home and abroad. Also, its sales saw quite a growth compared to the time before the development.

2.
IP Trade Support Policy and Program

2.1.
Overview of Support Policy and Program Group

- The basic form of IP utilization is for SMEs to take their own IP to develop, manufacture, and market a product based on their IP. But the recent rise of Open Innovation has highlighted the improvement of IP utilization rate through IP trading.

- As market volatility grows, SMEs are often faced with situations where they either have to give up or sell their businesses or make swift decisions to adapt to the rapid change of market and enter a new business.

- Under these circumstances, SMEs need to prevent their IP, a result of extensive development investments, from becoming useless, and to acquire IP appropriate for market entry at the right time.

- Therefore, by selling unneeded IP to gain revenue or by utilizing the necessary IP acquired or licensed, SMEs can enhance their managing efficiency.

- However, IP trading is not an easy task for SMEs to handle on their own in many economies. In most cases, SMEs lack the information for IP trading such as IP providers, and the expertise to autonomously carry out the negotiation and contract process.

- This program group aims at supporting the enhancement of IP competitiveness of SMEs by putting IP trading marketplaces in place and vitalizing IP trading.

- IP trade support programs can be categorized by content and external types. By content they are 1) IP trade information service (patent technology, patent owner) and 2) facilitating the process of IP trading or providing expertise. By external types they are 1) providing information on-line, 2) providing information off-line, and 3) expert consultation services.

- Many economies recognize the importance of IP trading and are currently operated programs related to IP trading. EEN[88] (Enterprise Europe Network) in Europe, CTEX[89] in China, AsialPEX[90](Asia IP Exchange) in Hong Kong, China, IP Market[91] in Korea, IP Market Place[92] in Malaysia, Thai IP Mart[93] in Thailand are IP trade support programs.

- It is worth noting that, in IP trading, it is most important to build the infrastructure. The key factors for success in this program group are: establishing a marketplace for IP that offers easy access to information on IP trading; increasing the IP trade volume; nurturing IP trade experts; and building a network for IP trading.

2.1.1. Phases of Program Evolution

[Introduction Phase] Establishment of IP Market

- The first step to support IP trading is to set up a market for trading IP. They can be online markets of offline markets.

- High use rates of the Internet and personal devices as smartphones makes a good environment for effective online markets. If that is not the case, offline markets may be a more approachable option.

- Online IP markets facilitate IP trades by storing information related to IP trading in the database and allowing its users to search and browse IP trade information.

- While online IP markets are useful in terms of providing vast information to a large number of users, it has limits to providing information that is in-depth and feasible compared to offline markets.

- Therefore, it is wise to use online IP markets to attract a large number of users and provide IP trade information in various forms and to connect them to offline IP trading programs.

- Offline IP markets provide information on IP trading with exhibits of products, and the onsite personnel helps visitors by matching them to IP trade deals.

- At offline IP markets, the information and service that can be provided at a time are limited to space. Still, visitors have access to detailed and concrete information on various items and matching service by IP trading experts, and this enhances the effectiveness of the support program.

88) http://www.enterprise-europe.co.uk/
89) http://www.ctex.cn/
90) http://www.asiaipex.com/Home/Index_EN
91) http://www.ipmarket.or.kr/2013/main/main.jsp
92) http://iprmarketplace.myipo.gov.my/?page_id=53
93) http://www.thaiipmart.com/

[Expansion Phase] IP Trade Support through Expert Advice and Consulting

- Once the infrastructure for IP trading is set up online or offline, the next step is to support actual IP trading cases to happen.

- In reality, IP trade will not happen just by providing information. Finding the right match of provider and consumer is not an easy task, and even when you do find the perfect fit, putting a price tag to the IP, deciding conditions, checking contract details and tax affairs can be a process arduous enough to make many entities quit in the middle of the process.

- In the expansion phase, the program supports SME IP trading through IP trade experts and by providing consultation.

- IP trade experts have extensive experience in IP trading. They provide advice and support to SMEs throughout the IP trading process. The public institution forms a network of IP trade experts in the public and private sectors alike and share IP trading information to discover the perfect match of technology owners and buyers by setting a stage for cooperation.

- Meanwhile, it is inevitable that an early-stage IP market suffers a shortage of experts. Therefore public institutions must grow IP experts and, at the same time, gradually lead market development. For example, a public institution may hire IP trading talents and train them in the field in a short term, and in the mid-to-long term strategy, it can provide its IP trading personnel the opportunity to found individual IP trading bodies in the private sector allowing them to capitalize on their experience and IP trading network they acquired while working for the public institution, thus leading the IP trade market to expand and grow.

- Ultimately, on/offline IP markets in the introduction phase and the IP trade expert and consulting support in the expansion phase are complementary to each other. The needed scenario is where on/offline IP markets expands the base of the market by raising awareness and bringing quantitative growth, and nurturing IP trade experts and consultation support pushes qualitative growth by providing consultation to enterprises that wish to acquire IP.

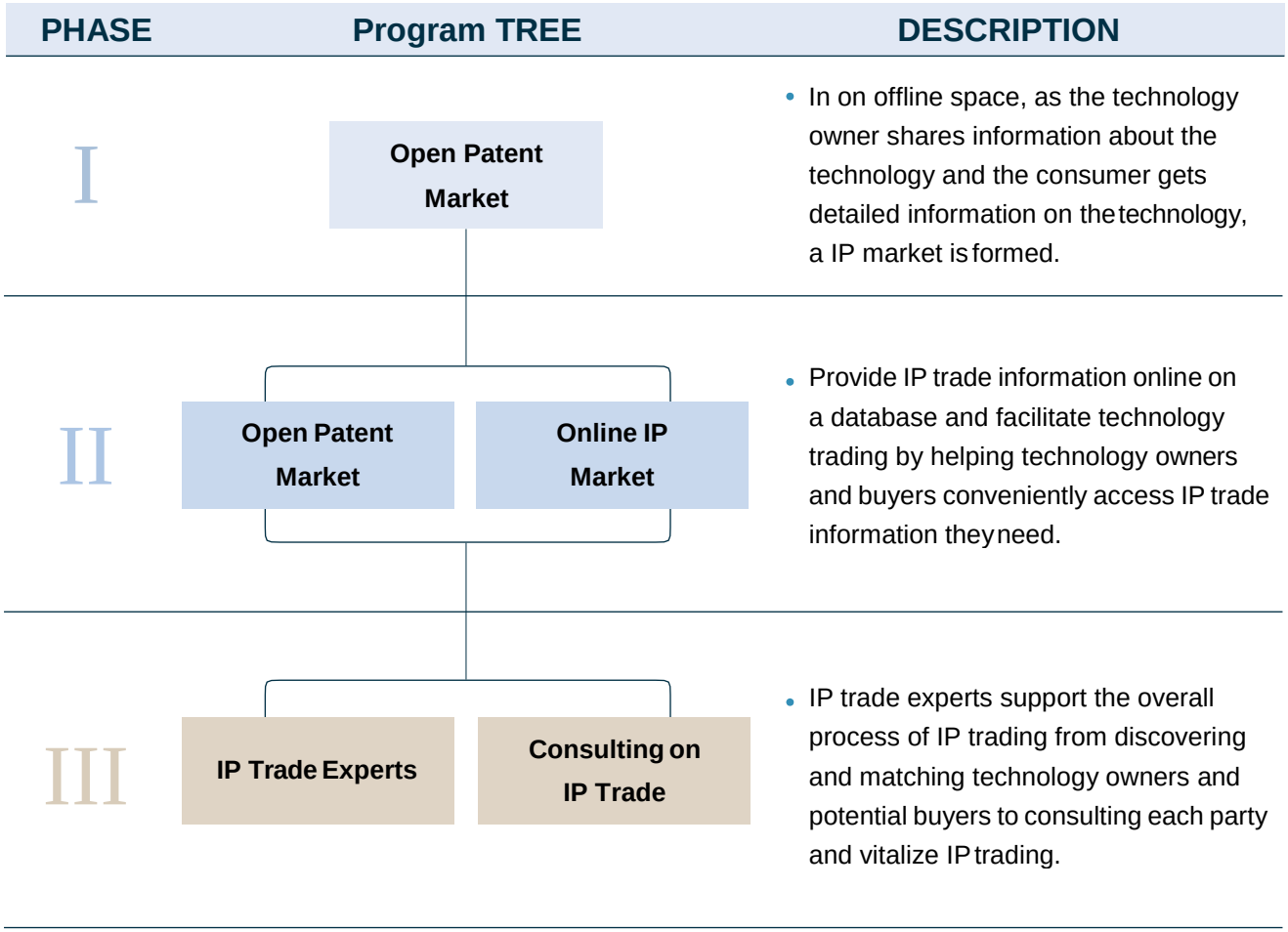


Figure 88. Program Tree (IP Trade Support)

2.1.2. Self-Diagnosis for Program Implementation

- IP trading group is a group that facilitates businesses that utilize IP, and it forms the basis of IP valuation and IP finance. Thus it is recommended that the program be implemented in an environment equipped with a certain level of awareness of IP and protection mechanisms.

- By following the questions in the Phase Matching Flow Chart, self-analysis and discovering needed aspects are possible according to the given answer.

- For example, if your answer to S1 was 'NO', the first step to take is to create IP and protect IP rights. If your answer to S2 was 'NO', the next first step would be the acquisition of IP that can be commercialized or is ready for product development. If you answered 'YES', your economy is ready for PHASE I. If you answered 'NO' to S3, you need to build an infrastructure for online IP trading; if you answered 'YES', you can move onto PHASE II. If you answered YES to all questions (S1 - S4), the required infrastructure for PHASE III is ready.

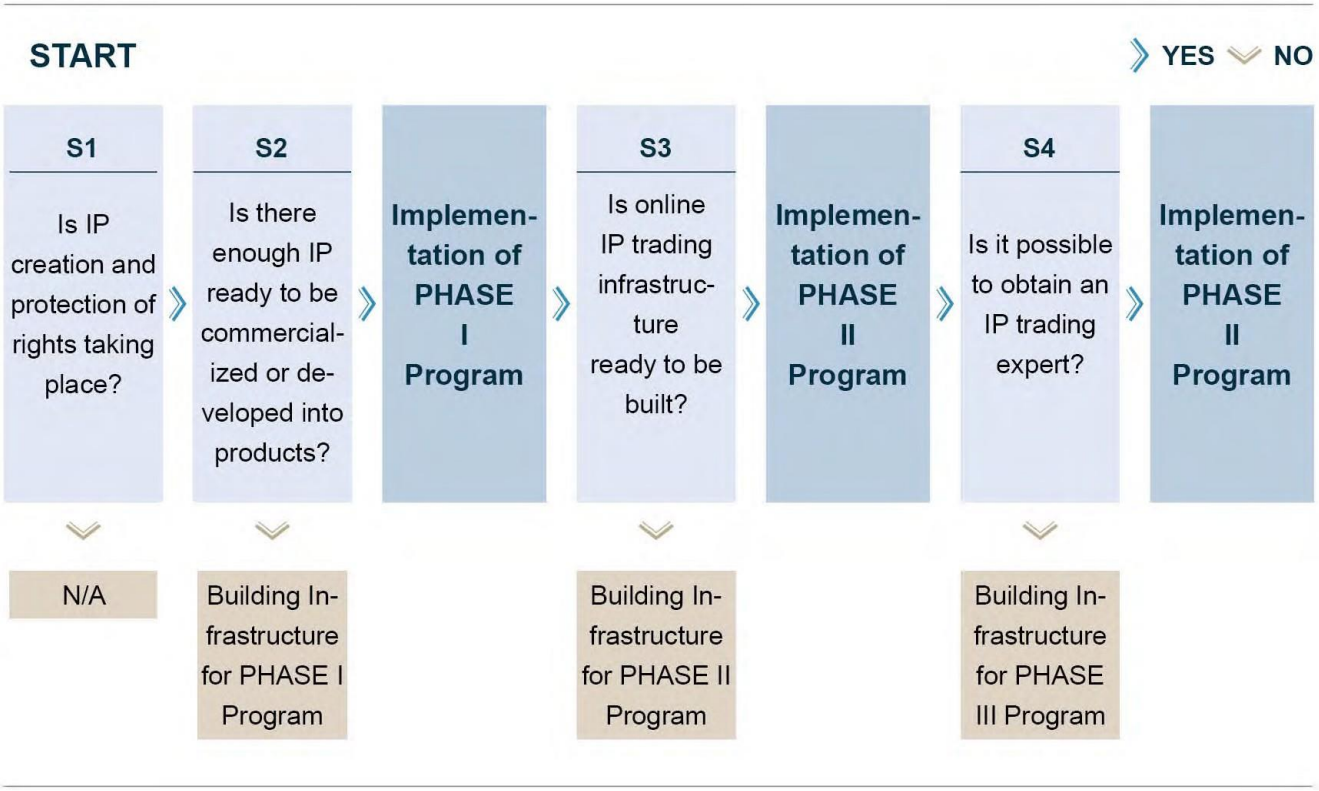


Figure 89. Phase Matching Flow Chart (IP Trade Support)

2.2.
Open Patent Market

2.2.1. Program Overview

The Open Patent Market is an offline space that exhibits patented technologies owned by individuals, enterprises, and universities. By introducing and promoting exhibited technologies, it assists potential buyers find information on patented technologies and assists transaction deals.

- One of the reasons trading technology is not as vibrant is because the information is not easily shared between the technology sellers and buyers.

- Although there are many new websites that offer online marketing space for technologies and broker technology trading, sufficient and detailed information by technology is not easy to access, and this makes actual deals hard to take place.

- The program provides an environment equal to an open market where detailed information is shared freely online and offline among individuals, enterprises, and universities that want to make technology trade deals. Accordingly, individual inventors, SMEs can access the patented technology trading market anytime in the Open Patent Market which facilitates technology trading including the transferring and licensing of patented technology.

- The program provides enhanced accessibility and convenience by offering constant access to a wide range of patent trading information at one stop. Compared to existing technology trading websites, it is easier to find detailed information on each technology and related products which raises the chance of closing a successful deal.

- The program also assists with various marketing documents such as Sales Material Kits and connects services with other programs that offer expert help including legal advice for negotiations and contracts between technology buyers and sellers.

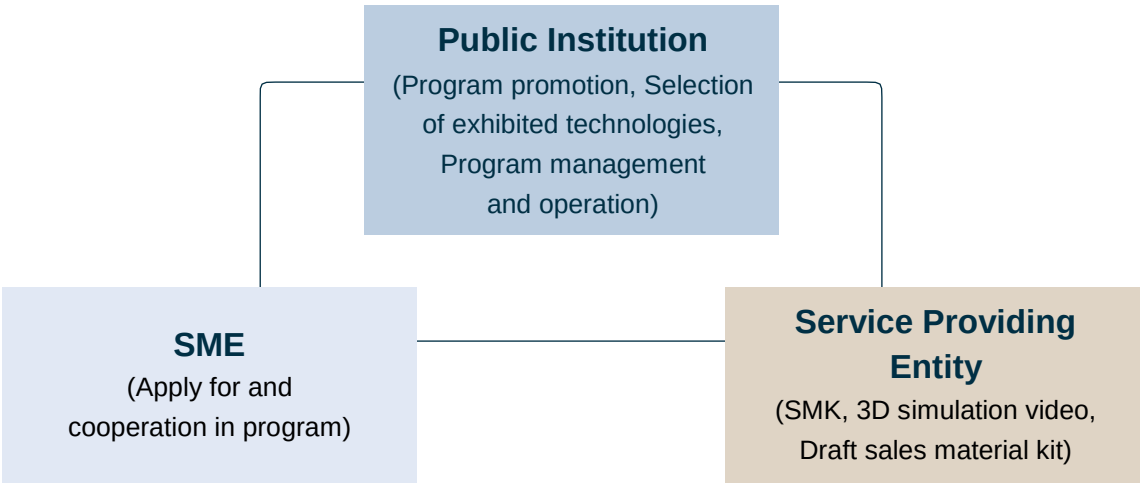


Figure 90. Program Framework (Open Patent Market)

2.2.2. Similar Programs of APEC Members

1) Off-line Open Patent Market (Korea)

- The off-line Open Patent Market in Korea, with the objective of facilitating the trading of outstanding patented technologies, is implemented and run by KIPA (Korea Invention Promotion Association), an affiliated organization of the Korean Intellectual Property Office.

- The Open Patent Market exhibits patented technologies by theme which are selected based on a comprehensive study on the most frequently searched patented technologies on the IP-Market and current IP market trends.

- Theme-based patent technology exhibitions may help efficient viewing and consultation of potential technology buyers and add to the impact of the presentations on exhibited technologies per theme.

- In selecting the exhibited products, exhibitions are planned and designed to attract the interest of potential technology buyers.

- Also, the program assists the production of leaflets, condensed versions of sales material kits, and video introductions of technologies to boost the effectiveness of exhibitions.

2) Taiwan Technology Marketplace (TWTM) (Chinese Taipei)

- The Taiwan Technology Marketplace (TWTM) was established by the Industrial Development Bureau of Chinese Taipei. It is a patent transaction platform for creating added value of technologies which also offers consulting services.

- TWTM assists technology transaction between SMEs that cannot maintain their patent rights and entities that are looking for excellent technologies.

- TWTM provides information on technologies up for transaction by enterprises, universities and research institutes. It also works with private patent trading agencies and provides patent matching services via website consulting services and techno mart exhibitions.

- Also, TWTM receives the help of patented technology trading service providers to provide resources for patent commercialization projects and support for inventors to access various trading marketing services. By facilitating the acquisition of patented technology needed for enterprise development and transitions, it is creating management value of patented technologies.

- Besides serving the role of patented technology trading market, the CTTM provides a thematic patent portfolio that is anonymous in its thematic patent platform.

Table 65. Overview of the Integrated Patented Technology Trading Services Center in Chinese Taipei

Items	Description
Services	• Consultation for patent commercialization – patent VAT evaluation, operation plan, commercialization verification, and new products development • Match parties for technology, or patented technology trading • Visiting consultation • Support resources needed for patent network • Conduct various activities to facilitate technology trade – trade fairs, business forums, open sales of patents • Promote cooperating and exchange for international technology trading
Provided Information	• Video field of patent commercialization • Collection of information on patent and technology available for trading home and abroad • Provide online patent valuation software function • Provide technology library for domestic trade experts – Utilize cooperating technology services providers, valuation experts, IPR distribution service providers • Provide regulations and knowledge relevant to IPR

2.2.3. Procedures and Details of the Program

1) Target of Support

- Direct support is for SMEs and individual inventors, and visits, consultations, and access to the Open Patent Market is open to anyone without requirements.

2) Program Process

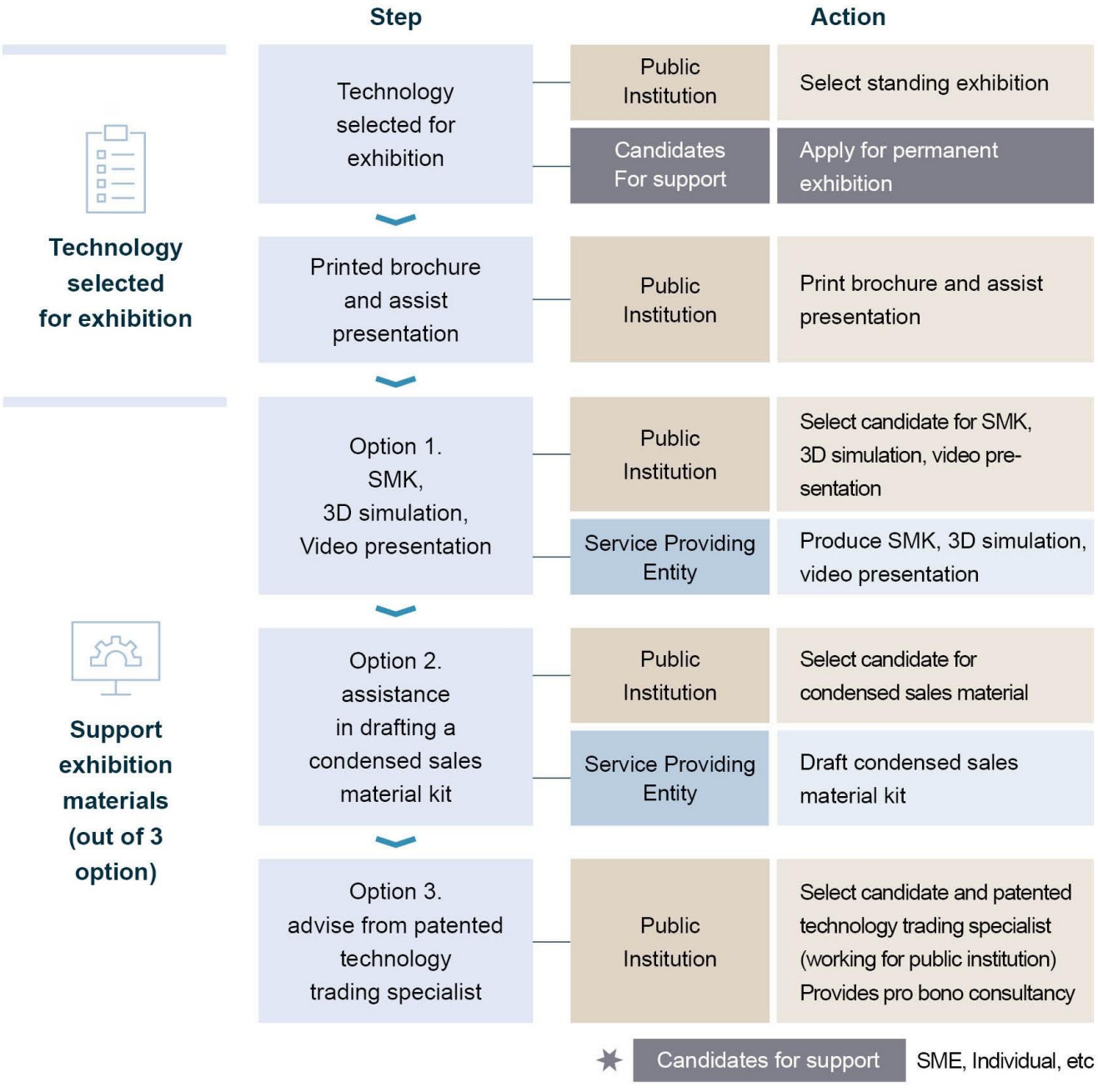


Figure 91. Program Process (Open Patent Market)

3) Scope and Conditions of Support

- The program provides individuals and SMEs that receive support of the program with space and material to exhibit and promote their patented technologies.

- Individuals and SMEs supported by the program may receive assistance in: producing brochures placed at the Open Patent Market, getting the opportunity to participate in regularly held technology presentations, and negotiating conditions with technology buyers on site.

- **[Option 1]** The operator of the Open Patent Market selects technology that meets the demands of potential buyers and puts them on permanent exhibition and produces an SMK and a 3D simulation video to help potential technology buyers easily understand the patented technologies on exhibition.

- **[Option 2]** Assistance in producing a condensed version of a credible and objective patent evaluation summary and in patented technology auction to facilitate technology trading deals.

- **[Option 3]** For patented technologies that have matched buyers and sellers, consultation is provided free-of-charge by patented trading experts throughout the process of negotiation and drafting contracts.

2.2.4. Guide Map for Participating Entities

Table 66. Guide Map for Participating Entities (Open Patent Market)

Entity	Preparation	Program Process (Phase)				
		1	2	3		
Public Institution	Introduction to Open Patent Market Program	Selection of technology for permanent exhibition	Assist brochure production and presentations and other functions	Select supported entity	Select supported entity	Select supported entity
Service Providing Entity				Produce Sales Material Kit (option 1)	Produce 3D simulation video (option 2)	Produce condensed Sales Material Kit (option 3)
SME, Individual Inventor		Apply for permanent exhibition	Apply for Support Program Options			

- ‘Guide Map for Each Party is a flowchart that shows the entire process of the program starting from planning to post management.

- Since this program is operated and managed continuously, the Guide Map highlights the key steps taken by the public institution[94)], service provider, and SMEs. Detailed actions per step are explained in Chapter *2.2.5 A Detailed Guide for Each Party.*

94) Government offices and agencies that operate and manage the program

2.2.5. Detailed Guidelines for Participating Entities

1) A Guideline for Public Institutions

Key Activities

1. Form and operate an Open Patent Market Program
2. Introduce patented technologies by producing materials that introduce technologies and by hosting permanent exhibits and presentations.
3. Provide users with information on how to receive support on technology trading in the Open Patent Market.

- Though this program focuses on promoting and trading patented technologies offline, a website for online promotion is needed in order to publicize the Open Patent Market and in turn attract more potential buyers.

- For a stable operation and securing of the budget for the Open Patent Market, it is advised to implement or amend laws related to technology trading, technology commercialization or invention promotion.

- The public institution is to announce and promote the program and receive applications prior to or at the point of the program launch, and it is to secure a location for the Open Patent Market.

(1) Implementation of the Open Patent Market

- The public institution provides the space for the Open Patent Market where individuals and SMEs that own patents can show and promote their technologies up for sale and potential buyers of technologies can visit and freely view and navigate patented technology in the exhibition.

- The Open Patent Market is to run permanently and be available to individuals and SMEs that want to take part in technology trading. Setting the Market at an accessible location will ensure a higher program performance.

- In order to differentiate the Open Patent Market from online technology trading websites, the Open Patent Market must provide visitors with detailed marketing materials unavailable online. In case there is already an existing presence of the on-line technology trading websites, selecting patented technologies that have a high search rate on-line and aligning the exhibition with such results by theme may be useful for better performance.

- The Open Patent Market can help visitors have a better and clearer understanding of the technologies by exhibiting actual products, e.g., marketed products, prototypes, working models, and lab facilities. The space for exhibition and the limit to the room and expense for producing the exhibits must go into account when deciding the exhibitions.

- Videos that show the principles behind the technologies and how they work, especially 3D simulations are needed to be provided so that visitors can freely search and look up technologies on site.

(2) Producing Promotion Brochures and Hosting Presentations

- It may be difficult to put in a large budget or manpower in the early stage of the market. Therefore, when the market is smaller in size, it may be difficult to house a large number of technologies with their products.

- In these cases, posters, brochures, booklets or display screens can be useful to provide information on the patented technologies, or presentation sessions on different themes of technologies can be given in turn for a set amount of time.

- Individuals and SMEs are often short of budget or manpower to produce their own marketing materials, and public institutions need to provide support.

- When hosting presentation sessions, you can expect better results when the owners of technologies participate, take active roles in marketing, and answer questions from potential clients.

(3) Selecting Patented Technologies for Exhibition

- With limited room in the Open Patent Market, selecting technologies appropriate for exhibition is needed.

- **[Candidates]** Provided the purpose of the program, candidates are limited to technologies and products that are pending for or granted patent, utility model, or industrial property rights.

- **[Selection Method]** Set a standard for evaluation and process such as a selection committee to select patented technology for exhibition.

- Set three (3) to five (5) criteria for evaluation based on scores. Since the goal of technology trading is commercialization, marketability and commercializability must be included in the evaluation criteria. Other criteria may include the excellence of technology, policy aspects and so on.

- Valuation may differ based on the type of technology. For example, machinery/metals, civil engineering/ architecture, chemistry, biotechnology, materials, electronics, computers can be treated as separate fields of technologies and have selections from each field.

- **[Support for Selected Technology]** Once selected for exhibition, assistance for producing posters, brochures will be provided. In addition, one of three options can be chosen as part of the support program: 1) sales material kits, 2) a 3D simulation video, or 3) a patent valuation summary.

- Due to limited space, exhibitions will be changed after a set amount of time such as every quarter or six months.

Example

Table 67. Example of Evaluation Chart of Invention for Exhibition

Criteria	Index	Score
Commercializability	Product development possibility after technology transfer	20
	Chance of replacing existing product	
Technological Excellence	Superiority over existing technology	20
	Impact of related technology	
Marketability	Scale of market and profitability outlook	20
	Economic impact	
Appeal to Global Market	Chance of replacing imported technology/product	20
	Potential of contribution to export	
Contribution to Domestic Industries	Impact on domestic industrial growth	20
	Contribution to improvement of life standards	

(4) (Optional) Producing Sales Material Kits

- SMK refers to sales materials Kits that introduce the patented technology in question. Normally, they include a summary of technology, its features and strengths, field of application, industry trends, patent information, R&D information, contact information of the patent owner, and so on.

- To maintain a certain level of SMK, it is advised to outsource producing SMK, using a company with experience and to renew the contract on a regular basis i.e. every one or two years.

(5) (Optional) 3D Simulation Video

- 3D simulation videos are 3D videos that capture how the exhibited technologies work and the principle behind the technologies. They help visitors of the Open Patent Market easy understand the technology.

- 3D simulations are to be produced by outsourced companies with experience. Production methods of 3D simulations are similar to 3D modeling. More detail can be found in IP Prototype Production Support for Excellent Inventions of this booklet.

- Also, it may be more efficient to select the 3D simulation production company taking in account IP Prototype Production Support for Excellent Inventions.

(6) (Optional) Patent Evaluation Summary

- In case the technology trading deal is negotiated through the Open Patent Market, the public institution can issue an evaluation report on the technology in question.

- Sales material kits are a useful source of information on technologies, but they usually do not include an objective evaluation on the excellence of technology, its marketability, and commercializability.

- Therefore, when potential buyers are provided with a patent evaluation form that includes objective information on the market scale of the technology or product, its commercializability, they have a better understanding of the technology or product and facilitate a smooth process of concrete negotiation.

- Since the patent evaluation is used as a reference at the early stage of decision-making, it does not need to be as detailed as the patent valuations used in the final stage of negotiation.

(7) Patented Technology Trading Experts

- Patented technology trading experts provide help to individuals or SMEs that lack the expertise or experience in terms of trading technologies. More detailed information is provided in the Patented Technology Trading Expert Program.

- Patented technology trading experts are allocated by region, and they assist with technology demand research, matching buyers with appropriate technologies, negotiation and the contract processes. In Open Patent Markets, having a patented technology trading expert on site can be useful for visitors.

- A potential buyer would not have to search through the database for technologies but instead consult the patent trading expert and browse relevant technologies in a shorter amount of time and get assistance over the negotiation and contract process.

2) A Guideline for Service Providing Entities

Key Activities

1. Produce Sales Material Kits, 3D Simulation Videos, Patent Valuation Summaries and provide materials for exhibitions and their promotion.

- Since the role of the Open Patent Market is to showcase and promote outstanding patented technologies and related products, the service providing entity is to not only provide brochures and posters but also produce Sale Material Kits, 3d simulation videos and patent valuation summaries.

- For details on producing 3D simulation videos and patent valuation summaries refer to *IP Prototype Production Support for Excellent Inventions* and *IP Valuation Support Program* of this guidebook.

- SMKs are produced to help visitors better understand the exhibited technologies and the content includes:
  - Summary of technology: a brief overview of the technology
  - Features and strengths: an easy and concise explanation of the technologies' strong points and inventiveness.
  - Field of application: fields of application in which the technology can be commercialized (Technologies in materials or parts can be applied to many different products or industries.)
  - Industry trend (market trend, commercializability): the scope and flow of the market, strategies for commercialization and its usefulness
  - References (patents): patent portfolio, references on related studies summarized, original copies made available.
  - Research information: information on researcher(s), related R&D projects (The reputation of the researcher often plays an important role in technology trading.)

Example

Technology for Preventing Aestivation of Sea Cucumbers and Sea Cucumber Farming Using Deep Seawater

Organization	Seawater Plant Research Center of KRISO (Korea research institute of ships & ocean engineering)
Main Inventor	OOO
Type of Technology	Industrial Bio > functional foods material
Keywords	deep seawater, sea cucumber farming, sea cucumber aestivation prevention technology

I Summary of Technology

With environmental impacts that have caused longer aestivation of sea cucumbers, the invention aims at preventing the drop in production volume of sea cucumbers. The technology collects deep seawater and surface water and by using heat exchange or fusion methods adjust the temperature of deep seawater between 10.5~25.5℃, then uses the deep seawater to suppress the aestivation of sea cucumbers which enables increased production of sea cucumbers and stable supply.

II Summary of Technology

- The invention provides methods to utilize deep seawater in marine farming. Once the seawater temperature reaches 25-26℃, sea cucumbers aestivate and cannot be collected. Taking advantage of the cleanliness and low temperature of deep seawater, the technology suppresses sea cucumbers' aestivation and enables stable supply of sea cucumbers.
- Research on the physio-ecology of sea cucumbers in different water temperatures using deep seawater and surface water found that 10.5~25.5℃ is the temperature with high assimilation rate of sea cucumbers and increased carbohydrate and protein in them.
- Deep seawater is collected and goes through heat exchangers where solar heat or low-temperature heat is used to cool the building, refrigerate, freeze, and levee, heating the seawater to 10.5~11.5℃, then deep seawater is used for farming water of sea cucumbers.

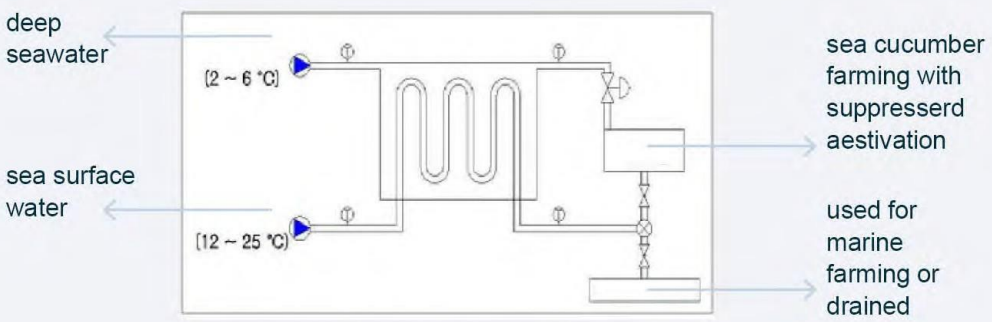


Figure 92. Example of SMK(1-1)

Example

Technology for Preventing Aestivation of Sea Cucumbers and Sea Cucumber Farming Using Deep Seawater

III Field of Application

Field of Application	Applied Product
Ocean biology and foods	Fishery and marine farming, Healthy supplements and tonic food

IV Industry Trends

Market Trend

- Sea cucumbers are organism feeders that take a vital role in the marine food chain. It gets its nutrients from organisms, bacteria, and protozoans, and are called scavengers for that reason. It is also one of the government-designated value-added farming products.
- As one of the top 8 luxury seafoods of Korea listed by the Ministry of Oceans and Fisheries, sea cucumbers are environmentally friendly and clean seafood products, and in Asia, its demand continues to rise since it is known to help boost stamina and as a tonic food.
- The sea cucumber market in China accounts for 1.8 billion KRW. Korea exports sea cucumbers as fresh products, steamed products, and dried ones. The price ranges around 15,000 KRW, 230,000 KRW, and 700,000 KRW respectively. Sea cucumbers are considered a high-value export item.
- Growing popularity of sea cucumbers and income growth in China brought the expansion of sea cucumber consuming region into the southern parts and inland regions of China. It is one of the luxury food products along with ginseng, bird's nest, and shark's fin. Compared to a decade ago, China's sea cucumber consumption increased by 10 folds, and the total amount of sea cucumber consumption in 2016 is projected to reach 2 billion KRW.

Commercializability

- Korea has a world-renowned sea cucumber seed producing skills, and it is making long-term investments in projects such as Sea Cucumber Island Project, Sea Cucumber Farming Complex Project, and Sea Cucumber Farming in Reclaimed Lands in the Form of a Local Festivals.
- Sea cucumbers are also one of the strategic export focus items under the government project to boost top 10 strategic export focus items. The goal is to invest 1.7 trillion KRW up to 2020 and meet 10 billion USD in annual export volume.
- Korea is a late starter in sea cucumber farming compared to China or Japan but boasts competitiveness with its clean seawaters and investment from Zhangzidao Fishery Group, China's largest fishery group, planned in a large-scale sea cucumber farming complex set to take place in Jindo.
- Neighboring China, the largest sea cucumber consumer in the world, technologies for mass production and processing may make sea cucumber farming grow into an industry of high added value. However, there are challenges as high tariffs and scrutinizing customs process when exporting to China.

Figure 93. Example of SMK(1-2)

Example

Technology for Preventing Aestivation of Sea Cucumbers and Sea Cucumber Farming Using Deep Seawater

V References

Category	Economy	Patent No.	Reg. No.	Name of Invention
Patent	KR			Technology for Preventing Aestivation of Sea Cucumbers and Sea Cucumber Farming Using Deep Seawater

VI Research Information

Program	Project	Supervising Ministry	R&D Period
Ocean Energy and Resource Utilization Technology Development Program	Deep Seawater Energy Utilization Project	Ministry of OOOO	

Contact Point				
	Person in Charge Contact E - mail		Person in Charge Contact E - mail	

Figure 94. Example of SMK(1-3)

2.2.6. Program Tips

1) Program Tips for Public Institution

- The Open Patent Market Program leans toward raising awareness on technology trading and building infrastructure. Therefore, it will take a long time to get quantitative results measurable by the number of deals closed or total value.

- To successfully run the Open Patent Market Program, active publicity is needed and the program must be interconnected with related programs such as IP Prototype Production Support for Excellent Inventions and IP Valuation Support Program.

- Support partnered with expert advice from the patented technology trading experts is especially important. Co-working between programs can be encouraged by setting and managing shared goal indexes to further the connectedness between related programs.

- It is advised to position patented technology trading experts on site or to appoint these experts as a regular personnel to help the communication between potential buyers and sellers.

- Exhibition schedules must be planned in consideration of the time for producing SMKs, 3D simulations, and patent valuation summaries which takes from 1 to 1.5 month(s).

2) Program Tips for Service Providing Entities

- When producing SMKs and 3D simulation videos, the content needs to be constantly checked to make sure they have accurate information on the patents, and each patent claim may need to be checked under the guidance of a patent attorney.

2.3. IP Trade Experts

2.3.1. Program Overview

Appoint and assign IP trade experts to major regions in a member economy to leave no blind spots in IP trade services, and provide free services to individuals and small businesses that do not have sufficient funds for the IP trading process.

- As the information-based society unfolded in the 21st century, along with the convergence of technologies technological advances heightened the demand of consumers, and as a result, the lifecycle of a technology is rapidly growing shorter. This leads to the increase of selling unneeded technologies or acquisition of new IPs. This shows that enterprises are choosing open innovation as their corporate management strategy. In other words, they lower the risk related to time and expense and introduce technologies from outside sources to acquire the technologies at the right moment.

- Reflecting on such changes in the economic environment, APEC member economies are running IP trade markets through online and offline channels to encourage IP utilization and support open innovation. In the era of open innovation, enterprises need an appropriate support program and an accessible information system. Conglomerates, big universities, and research institutions easily collect, analyze, and trade IP since they run their own IP trading departments, but this is not the case for SMEs.

- Most of the government programs that aim to support IP trading share the model of building a website and giving SMEs giving easier access to IP information on the market by universities and research institutions. But merely providing information on trading IP is not enough to vitalize IP trading by effectively connecting the supply and demand.

- Most SMEs lack the experience to make informed decisions on the trading process, method, and contract conditions, and they are often under budget to afford the entire process of a private IP trading organization. This program helps vitalize IP trading by hiring IP traders at public institutions and by providing consultation and brokerage service to SMEs on IP trading.

- For the development of patented technology markets, it is necessary to nurture experts in the field and host a network that serves as a platform for swift and effective information sharing and cooperation. Since it is unreasonable to expect the technology traders in the private sector to fill this role in the early stage of technology market, it is advisable for the public institution to use the program as a means to

setting grounds for cooperation among enterprises, universities, research institutes, and private sector technology traders with the patent trading expert as the main facilitator.

- The Patent Office of Korea has patent trading experts serving mainly in regions away from the Seoul Metropolitan Area since the position was created in 2006. This is mainly to provide expert assistance to the SMEs in local regions which had relatively less access compared to the capital area, where most of the private technology traders are based in. For entities considered to be in a vulnerable position including individuals and small businesses that cannot afford the cost of patent trading services, a free service is provided to raise awareness and demand for patented technology trading in the short term and to vitalize the technology trading market in the long term.

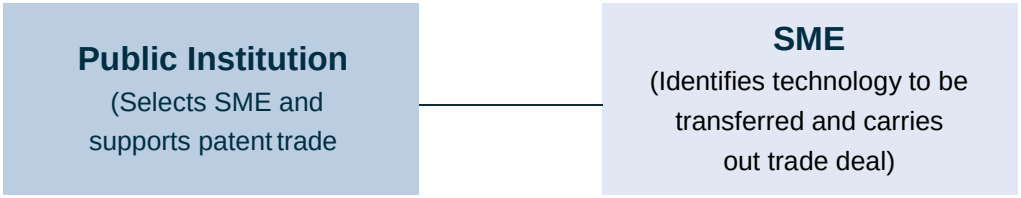


Figure 95. Program Framework (IP Trade Experts)

2.3.2. Similar Programs of APEC Members

1) Patent Distribution Advisors (Japan)

- Japan Patent Office (JPO) is running the patent distribution advisor program that dispatches personnel to support patent trading under the recognition of the importance of the role of experts who can connect the demand side and supply side of patented technologies.

- The program hires personnel equipped with work experience in planning/management jobs for patent management or R&D as patent distribution advisors who are positioned in a number of universities and make site visits to companies to collect and analyze information on technology needs and technology offers. The information is used to review potential patent trades, categorize technologies and devise trade conditions, which are part of their job scope.

- To lead a successful patent trade deal, the patent distribution advisors carry out matching potential patent buyer companies, support R&D efforts, assist with investments and loans, and facilitate contracts for cases that parties agree on patent trade conditions.

- While forming an organization of patent distribution advisors, the Japanese government has made a policy decision that it is necessary to build a network of outside institutions for patent trading, and it is making efforts to foster patent information research institutions and enterprises that provide service related trading patented technology and build an environment friendly to these enterprises.

- The Industrial Property Rights Information Center (IPIC) not only dispatches patent distribution advisors but also holds seminars throughout Japan for stimulating patent distribution and hosts the Patent Business Market since 2003 to connect patent owners and potential buyers.

2) SCORE (The Service Corps of Retired Executives)[95] (United States)

- SCORE is the name of association and the name of its program that helps startups with new business ideas to lead successful business through mentorship.

- A group of volunteers made of former or current corporate executives who have rich experience in corporate management offer pro bono consulting, and provide training and advice on issues that may rise in the business including patent issues.

[95] Research on Patent Support Programs for SMEs in Advanced Economies (KPO), Implications of SME Support from SCORE Program of the US (FKILSC)

- SCORE service areas are categorized into the basic services, which include business mentoring, workshops, seminars, and business tools, in-person consulting, online consulting, and media services.
- Small businesses can search online for a specific area they seek advice in including patent protection.
- SCORE programs also offer over 5,000 workshops or seminars annually for free or at a low rate.
- The SCORE website introduces approximately 220 model cases from various business fields including fund management, software, education, and F&B which attest to the credibility of the business advice given through the program.
- 389 offices and 800 locations in the US make consulting accessible for business owners who can easily visit one of the locations nearby. By securing a bigger number of volunteers with business experience in their service areas, consultations and workshops are tailored to the needs of the businesses in their respective communities.
- In 2006, SCORE recorded a total of 181,779 face-to-face mentoring cases and 114,960 online mentoring cases. Since the beginning of the SCORE program, approximately 7 million businesses received assistance through approximately 7.6 million cases in one way or another.

2.3.3. Procedures and Details of the Program

1) Target of the Support

- Individual inventors and SMEs that want to make patented technology transactions.

2) Program Process

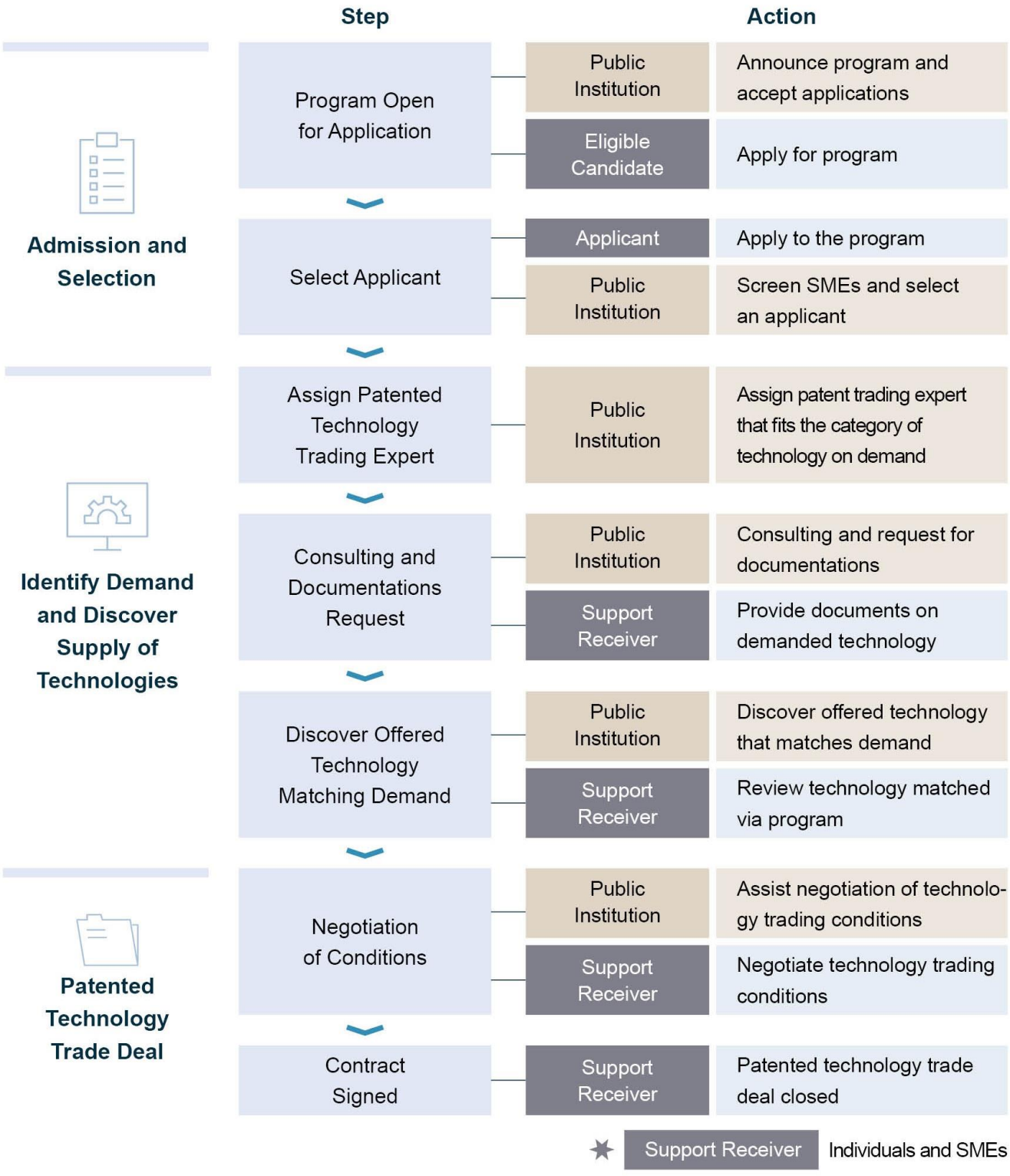


Figure 96. Program Process (IP Trade Experts)

3) Scope and Conditions of Support

- The program provides service to SMEs or individuals that are seeking opportunities for patented technology transaction. Trading consultancy service and assistance is provided through the steps of discovery and matching of patented technologies, brokering negotiations, closing deals. Services are free of charge.

2.3.4. Guide Map for Participating Entities

Table 68. Guide Map for Participating Entities (IP Trade Experts)

Entity	Prepara-tions	Program Process (Phase)						Follow-up Manage-ment
		1	2	3	4	5	6	
Public Institution	Hire patent-ed technol-ogy trading expert	Open for application	Assign patented technology trading expert	Provide con-sulting and Request doc-umentation on demanded technology	Research and discover appropriate technology	Assist negotiation for patented technology transaction		Recom-mend related projects
SMEs / Individuals	Prepare documen-tation on demanded technology	Submit appli-cation		Submit doc-umentation on demanded technology	Review technology matched via program	negotiation for patented technology transaction	Sign contract	commer-cialization

- The Guide Map for Each Participating Entity is a chart that shows the entire process of the program from planning to post management.

- Program period is normally less than six months but may be subject to change according to the environment and circumstances in the given economy.

- The chart gives a summary of the steps taken throughout the program process by each entity, which are public institutions[96] , SMEs or individuals. A detailed guide is provided below in *2.4.5 Detailed Guideline for Participating Entities.*

2.3.5. Detailed Guideline for Participating Entities

1) Guideline for Public Institution

Key Activities

1. Hire an expert in a relevant field as the patent trade experts, and form a supporting organization.
2. Establish a wide cooperating network for patent technology trade.
3. Foster relevant experts and establish specialized institutions.

(1) Forming an organization of patent trade experts

- The first preparation the public institution should take for the program is to hire a qualified expert in the relevant field as the patent trade expert and form a supporting organization.

- The main role of the patent trade experts in the program is to identify technologies that are in demand from the SMEs, match them with appropriate supplied technology, and support negotiation and signing of a contract. Hence, the experts should have a thorough understanding of IPR policies and have experience in patented technology transactions.

- However, when the patented technology transaction market has yet to develop, it is difficult to find a sufficient number of all-around qualified experts. In this case, the next option is to hire retirees who used to work in IPR-related departments of universities or enterprises, or those with qualifications to be patent attorneys. The public institution would then train them as patented technology trading experts.

[96] Government ministries or agencies that operate and manage the program

Table 69. Key Consultation Points on Patented Transaction and Support for Patent Trade Experts

Key Consultation Points	Support for Patent Trade Experts
How can I adopt a technology in need?	1. Visit the applicant and conduct an interview to diagnose technology funding, and the management capacity of the enterprise. 2. Identify details on the technology in demand and find matching technologies via the on/offline patented technology market to offer to the applicant. 3. When matching technologies are not found, the public institution can connect the applicant with universities and research facilities to have a joint R&D for the technology.
How can I transfer my patented technology?	1. Check technology for obsolescence, and research potential buyers to identify trading opportunities. 2. When potential buyers are found, produce SMK and provide support for patented technology marketing. 3. For technologies with a high chance of trade, connect with event organizers for technology road shows home and abroad.
How should I approach the patented technology trade negotiation?	To resolve data asymmetry between two parties of the patented technology trade, support evaluation of rights/technology/ marketability/business feasibility of the IP, and estimation of an appropriate technology price.
How do I establish a patented technology trade contract?	Provide support so that the party would review legal issues such as method of payment for technology price, and penalties when duties are not carried out to prevent conflicts in the future.
What kind of programs are there to suppose commercialization of adopted patented technology?	1. Introduce and connect the buyers with IP financing support programs so that they can procure funding by setting up the adopted patented technology as collateral. 2. Introduce the buyers to IP commercialization programs so that they can establish technology commercialization strategies that fit the current management situation.

- In the patented technology trade market, where demand and supply have a huge gap, finding enterprises with the demand to adopt external technologies is the most important yet difficult task. Generally, enterprises are worried about information leaks concerning blank patent information and other business information. That is why if patent trade experts fail to earn the trust of the enterprises, it is difficult for them to acquire information on technology in demand. Hence, it is recommended to make the experts employees of a public institution with high public confidence.

(2) Establishing Cooperating Network

- The important role of the public institution in the program is to establish a wide cooperating network for patent technology transaction. For the success of the transactions, the technology target of trade should be evaluated in multiple aspects such as rights, technology, marketability, and business feasibility with many external experts of different fields to determine excellence of the technology and an appropriate technology price. Also, this is because, in order to find supplied technology that meets the needs of the enterprise with demand, there should be a network to access the patented technology information owned by universities and research facilities in each member economy.

- To this end, the public institution should form pools of external experts per technology field, and dispatch them to major districts with the goal of establishing a support organization on the member economy scale.These experts would examine technology in demand of the local SMEs and share the information with patent trade experts in different regions, allowing finding supplied technology easier and quicker. It also enables requesting consultation and technology review to experts in the field in a timely manner. Thus, the blind spots are covered with a minimum number of personnel, and the program performance will be even better.

Example

In 2016, atotal of 17 patent trade experts were dispatched to four major cities of Korea (Seoul, Daejeon, Daegu, and Gwangju). They have established a cooperative network with local universities, research facilities and experts of different fields in each region to support patented technology trade of local SMEs.

Figure 97. Example of Organization of Patent Trade Experts in Korea

- For the patented technology trade market to further grow there needs to be a quantitative growth with the number of trade increased based on enterprises with demand. From this aspect, the government should pay close attention to the SMEs, which participate in the market, but the enterprises are reluctant to jump into the market. The reasons are that the procedure and contents of patented technology trade are difficult, but there are also those who cannot afford the funding to pay the technology price or the cost of developing products based on the adopted technology.

- That is why when the public institution establishes a cooperative network to facilitate patented technology trade, it should secure partners such as investment institutions that provide financing based on potential growth of the enterprises, and financial institutions which valuate the IP and offer loan products. Also, to assist SMEs in developing adopted technologies for commercialization, the government should find measures to connect the enterprises with programs supporting technology development and commercialization.

- Before the patented technology trade market goes beyond the quantitative growth phase and enters the phase of qualitative growth, the public institution should develop a cooperative system of industry, academic, and research institutes to provide technologies SMEs look for from universities and research facilities in a timely manner. This will allow SMEs to efficiently secure technologies needed for businesses. Also, when universities and research facilities develop technologies needed in the market in a timely manner, the R&D productivity will increase along with the utilization rate of patented technologies.

- Currently, there are efforts to have joint R&D among universities, research institutes, and SMEs, but finding a suitable partner is not easy. From this aspect, the public institution should utilize patent trade experts as the *middle men* among SMEs, universities, and research facilities for joint R&D, and this role needs to be expanded in the future.

(3) Fostering Experts and Establishing Specialized Institutions

- Lastly, the public institution needs to be in charge of fostering experts and establishing specialized institutions for the development of patented technology trade market. The role of the government is to establish the basic foundation for the technology market to take place, and after private technology trade institutions can grow on their own as private enterprises are the entities which should lead the technology market. Thus, patent trade experts should not only connect the demand and supply in the technology market, but also train newly hired patent trade experts and serve as coaching managers that offer in-service trainings.

- This allows newly hired experts to learn from the senior patent trade experts with years of experience useful information for effectively carrying out patented technology trade and success know-how to get accustomed to the job in a short amount of time. After the senior experts complete fostering talents to take over, they can build a private technology trade institution for profit based on patented technology trade network he/she has, or be employed by the current private technology trade institution again to fully utilize one’s potential.

2) Guideline for SMEs

Key Activities

1. Identify details on technology to be adopted and apply to the program.
2. Establish specific plans such as procuring funding for patented technology trade and commercialization.

(1) Applying to the Program and Determining to Adopt Technology

- In terms of acquiring a needed technology, SMEs should choose appropriate strategies from technology acquisition strategies such as development, adoption or M&A, according to conditions like relevant technology development trend, and the rate of market growth.

- For SMEs to utilize the program, they need to conduct an internal assessment based on questions such as ①is there a need to adopt technology at the moment, ②what kind of technology is needed, ③what would be the purpose of acquisition of a technology.

- There are many reasons as to why SMEs adopt external technologies, but generally, they choose adoption to either: ① look for already developed, and proven technologies because even if they can conduct R&D on their own, development period is long and there is a high risk of failure, ②quickly find and improve features and contradictions of pre-existing products, ③swiftly advance into a new business field, or ④acquire patents to gain entry into an overseas market.

- The checklist below can be helpful SMEs to determine whether to adopt technologies. For instance, if the total score of A+B+C is more than 0, the enterprise should have an in-depth review on technology adoption.

Table 70. Technology Adoption Decision-Making Checklist

Survey questions to see if technology adoption is needed	Evaluation		
	Strongly Agree	Agree	Disagree
	1	0	-1
Although the enterprise is preparing a new business field, it lacks ideas on products or technology.			
When product functions or performance are complemented, product life span would be extended but there is no technical solution			
Current product's competitiveness needs to be improved but there is not a technical solution.			
There is the need for entering overseas market, but it is difficult to overcome technical barriers.			
There are products the enterprise hopes to import and sell, but price competitiveness is difficult to adjust, so there is the need to develop them at home.			
The enterprise is looking for a solution to reduce R&D cost and risks significantly.			
There is the need to utilize other patents related to production and sales of a particular product.			
A technical solution is needed to shift the current business structure into a more sophisticated high-tech enterprise and high value-added business			
There is the need for early acquisition of competitive technology.			
Securing technology is needed but conducting R&D on its own has limits.			
Total	**A**	**B**	**C**

- For SMEs to acquire the technology they need in a short amount of time through patent trade experts, they need to prepare a specification on the technology in demand. The document should include the purpose of technology adoption, the contents and attributes, product to apply the technology to, type of patented technology trade and payment method along with technology capacity of the enterprise and its management status so that patent trade experts can match them with appropriate technologies.

- When determining patented technology trade type, factors like size of the relevant market, competition status, payment size of technology price, and capital of the enterprise looking for technology should be considered. Also, the SMEs should look into advantageous options other than technology transaction such as exclusive license contracts or non-exclusive license contracts.

- In addition, SMEs should prepare a specific commercialization plan after adoption of technology. Based on the adopted technology, the SMEs may apply to R&D support program of governments or prepare for applying to public financial institutions for technology financing support.

2.3.6. Program Tips

1) Program Tips for Public Institution

- One patent trade expert with an in-depth knowledge in a particular field cannot support multiple SMEs which look for technologies in various fields. Hence, a cooperating network should be formed with external experts in different technology fields to review rights, technology, marketability, and business feasibility of the patented technology for transaction.

- For patent trade experts to successfully fulfill their roles, they should be able to cooperate with the people in charge of R&D of universities and research labs, people in charge from financial institutions, and technology experts from various fields. Hence, the public institution should closely examine the field of expertise and work experiences when hiring patent trade experts to select those who have the skills and experiences.

- Information on technology in demand that the SMEs provide to patent trade experts are mostly business secrets, so those who handle the data should pay close attention to keeping them confidential. The public institution should establish confidentiality management measures and train the experts on this matter.

- For the public institution to dispatch patent trade experts to non-metropolitan areas, sufficient budget is required. When the central government lacks the budget for support, receiving the needed amount from the local government could be an option.

- Also, when hiring patent trade experts to be dispatched, factors such as level of understanding of the region's specialized businesses and regional ties should be taken into consideration. Thus, it could be better to select those who are from the region or reside in that area so that cooperation with relevant institutions is possible.

- For efficient operation and quality results from the patent trade experts, cooperation with external experts is important but internal cooperation is even more so. Hence, when setting performance evaluation criteria on experts, there should be cooperation performance index that can only be achieved by working together besides personal performance criteria.

- Performance evaluation index is composed of quantitative and qualitative indices. Items under quantitative evaluation include the number of successful contracts on patented technology trade and related technology price, while qualitative index includes response attitude on demand of the SMEs and extent of cooperation network externally and internally. The evaluation should be carried out every half a year to regularly check performance per patent trade expert. Those who have excellent results from evaluation should be given incentives such as receiving a bonus at the end of the year or a pay raise in the following year. Meanwhile, there should be follow-up management system such as retraining programs set in place to support those who received poor evaluation results.

2.3.7. Successful Cases of Program Implementation

1) Enterprise A (A case of successfully signing patented technology trade contract through patent packaging customized to enterprise)

- The Enterprise A, an SME developing telecommunications devices, requested a patent trade expert to mediate matching the enterprise with a technology it needed to pursue a new business concerning services that control movement situation for cabs, delivery vehicles, etc.

- The control equipment with a multi-tracking function that Enterprise A tried to develop required many technologies. According to the patent map, the rights were distributed among multiple patent holders, so technology trade was not an easy option. However, the patent trade expert found and selected suppliers who were willing to transfer the technology among the patent holders, and formed a package of relevant technologies. As a result, Enterprise A signed nine contracts in total, and adopted 26 technologies through technology transfer.

2) Enterprise I (A case of successfully adopting the needed technology and attracting investment)

- As an SME, Enterprise I was looking to adopt an external patent to improve the performance of the IPTV quality assurance system that it was producing, but it experienced difficulty finding the appropriate supplier and thus, requested the support of the patent trade experts. An expert examined the patent and technology development capacity of the enterprise and recommended the technology owned and developed by Research Institution E, leading to a successful contract for transfer of IPR.

- Afterward, based on the adopted technology, the enterprise successfully improved the performance of the product and its sales increase more than 50% YoY. The expert provided additional support by connecting the enterprise to an investment institution so that it could acquire investment worth three billion KRW.

3) Enterprise D (A case of successfully commercializing technology that was going to die)

- As a distribution enterprise for computer in/output devices such as keyboards, the Enterprise D sought the help of patent trade experts in the phase to plan development and distribution of innovative in/output devices. With the support from the experts, the Enterprise D purchased a technology related to manufacturing keyboards from B enterprise that was about to collapse, thus shortening the period of technology development. As a result, Enterprise D was able to make an early release of a new product into the market, and Enterprise B managed to avoid the risk of shutting down and acquired an opportunity to make growth.

4) Patent Owner C (A case of successfully signing patented technology trade contract by finding an enterprise with demand through target marketing.)

- A patent trade expert received a request from patent owner C to find a potential buyer, and an external expert assessed the RFID technology applicable to metal license plates from the technology and business feasibility aspects. The result of the evaluation was that it had high transfer probability, so the written sales material kits were introduced on online/offline patent technology markets to look for potential buyers.

- The sales material kits targeted and were sent to SMEs that manufacture and sell RFID-related products, and an SME with relatively small sales volume compared to other competitors was chosen for target marketing. Thanks to the effort, the patent holder was able to sign a patented technology transaction contract in a relatively short amount of time.

2.4.
Online IP Market

2.4.1. Program Overview

The program establishes a website that provides various services related to IP transaction in order to promote online IP transactions.

- Development of Information Technology and e-commerce is not only enhancing industrial productivity in profound ways and providing more useful and convenient services to clients, but it is also promoting changes in every sector of society including politics, economy, society and culture.

- The major obstacles in IP transactions are the lack of access and circulation of information about quality IPs up for transaction. In order to solve such problems, governments are making endeavors to promote IP transactions by building and operating Online IP Markets.

- Korean Intellectual Property Office supports sharing of information between potential IP buyers and IP providers by establishing an online IP Market in April 2000.

Figure 98. Websites for Online IP Transaction in Korea

- IP transaction information systems run by different relevant organizations began to be connected to each other in the year 2009 for user convenience. As of the end of December 2016, there was a database with about one hundred and sixty thousand listings of IPs for sale and four thousand listings of IPs for potential purchase.

- Users who are members at IP Market can receive information such as latest trends in IP market, recent IP transaction news, and government support programs via e-mail. The website also helps calculate the compensation for IPs when opinions differ greatly between IP providers and buyers in a more reasonable way by enabling search for cases of past IP transaction through a database of relevant information such as the form of transaction and price.

- The program creates an IP information database by collecting a big quantity of quality IP information (IPs for sale and IPs for purchase) and provides user-friendly services that enable IP providers and potential buyers to search and refer to the IP information they need.

- Establishing and operating an Online IP Market alone is basically building an online site for searching information on IP transactions and is relatively simple. In order to enhance IP transaction record, however, the market will need to be operated in a way that connects it to multiple support programs.

- If an IP provider or a potential IP buyer wishes sell or purchase an IP discovered through the program, it might be effective to provide support through connection to offline IP transaction support programs, such as Patent Transaction Experts Program or Open Patent Market Program.

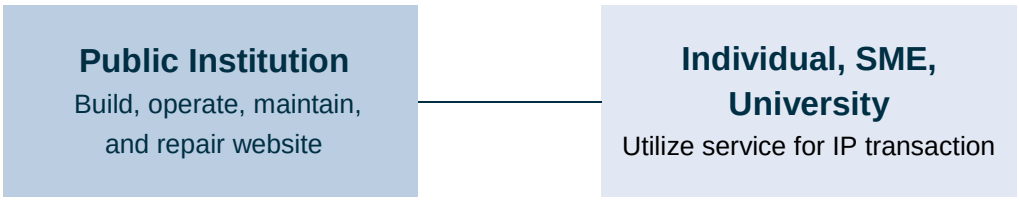


Figure 99. Program Framework (Online IP Market)

2.4.2. Similar Programs of APEC Members

1) IP Market Place[97] (Malaysia)

- IP Market Place was established by MyIPO in June 2014 in order to facilitate IP transactions.
- MyIPO is cooperating with major IP players in China; Hong Kong, China; and Singapore to expand the IP transaction market, while making endeavors to transform IP Market Place into a global IP transaction platform.
- IP Market Place provides information on purchase or licensing of patents, trademarks, industrial designs and copyrights. At the initial stage, around one hundred sixty listings of transaction information were collected and provided, and the number continues to grow in number every year.
- IP Market Place allows searching for IP transaction information by keyword or assignee information. “The IPR Marketplace Portal provides informative and educational tools and resources to commercialize IPR on a global market platform, as well as an avenue to list available IPR such as patents, trademarks, industrial designs and copyright for sale or licensing.

Figure 100. IP Transaction Website in Malaysia

97) http://iprmarketplace.myipo.gov.my/?page_id=53

2) Thai IP Mart[98] (Thailand)

- IP Mart of Thailand provides an opportunity for potential IP buyers and providers to engage in negotiations over IP transactions online. IP Mart is operated with specific categories such as patents, trademarks, copyrights and trade secrets.

- IP Mart has 1,386 members and 1,367 listings of IPs providers wish to sell. Based on the data, IP Mart provides IP provider information (address, telephone number, e-mail address, etc.), patent number and product information to users.

Figure 101. Website for IP Transaction Online in Thailand

[98] http://www.thaiipmart.com/

3) (Hong Kong, China) AsiaIPEX[99)]

- AsiaIPEX is a free online intellectual properties trading platform and database. Developed and managed by Hong Kong Trade Development Council, AsiaIPEX showcases IP around the globe, aiming to facilitate international IP trade and connection to global IP players.

- AsiaIPEX has formed strategic partnerships with over 30 global and domestic partners including R&D centers and technology transfer units of local universities. It features over 25,000 tradable IP listings.

- It provides a useful resource to IP owners who want to sell their patent, trademark, copyright or registered design; manufacturers looking to buy technology; and IP service providers offering quality IP intermediary services.

Figure 102. Asia IP Exchange Website in Hong Kong, China

99) http://www.asiaipex.com/Home/Index_EN

2.4.3. Procedures and Details of the Program

1) Target of Support

- Not only individuals and SMEs, but also large companies, universities and research organizations can use the Online IP Market.

2) Program Process

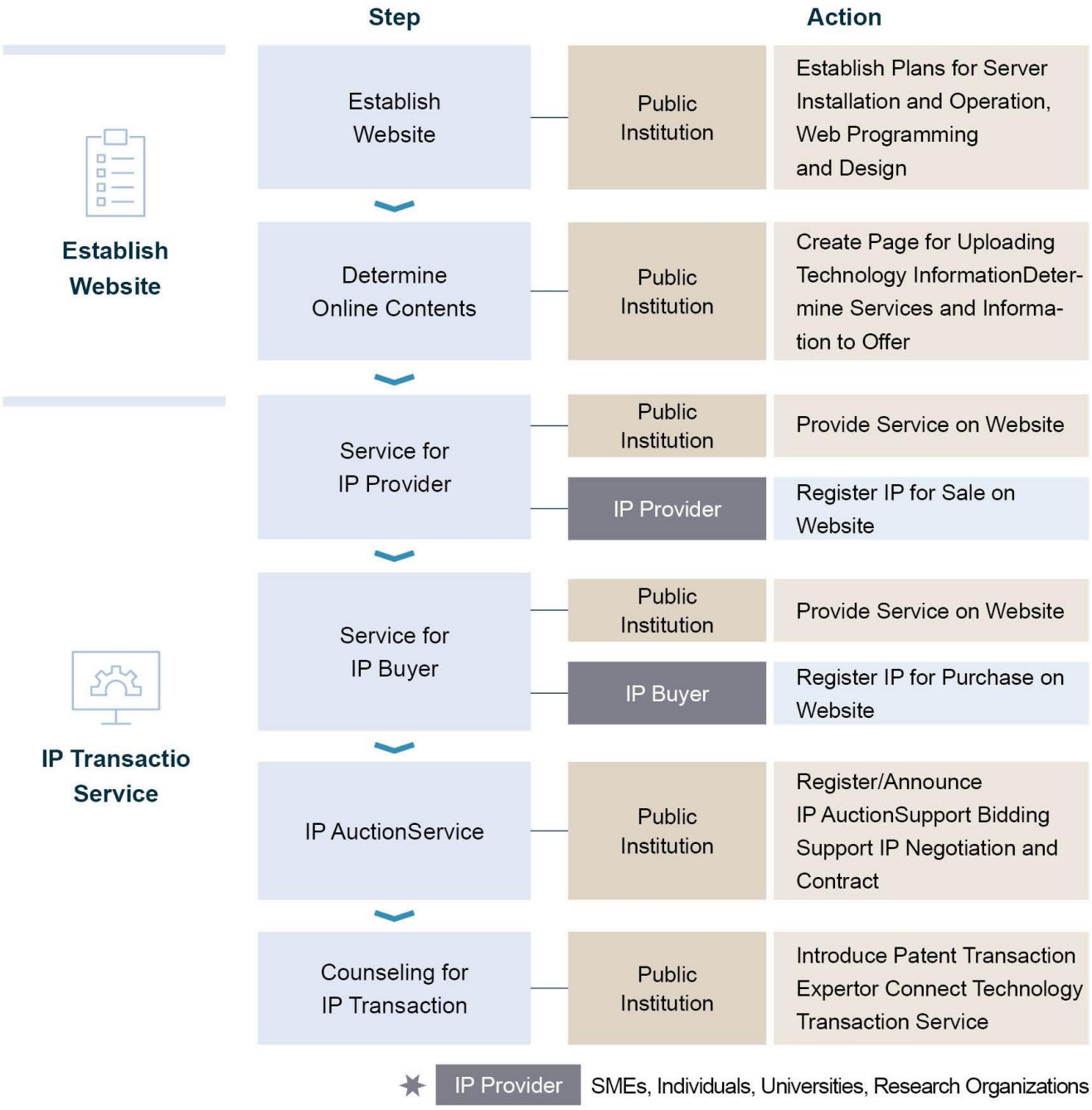


Figure 103. Program Process (Online IP Market)

3) Scope and Conditions of Support

- Online IP Market website is operated in a way that allows individuals, companies, universities, research organizations and other entities to make transactions with the technologies they own. The website also provides information on IP sellers and buyers, and IPs for sale and purchase to users of the website.

- Online auction service can also be provided if a provider wishes to auction technologies.

- Online IP Market provides a search function for cases of past IP transactions to help calculate a reasonable price for a technology on whose price the involved parties disagree on.

- Online IP Market runs an IP counseling service, and can provide support in connection with Patent Transaction Experts Program should the need arise for expert help in making negotiations and writing contracts.

- Online IP Market provides other relevant data such as standard forms of contract for IP transactions.

2.4.4. Guide Map for Participating Entities

Table 71. Guide Map for Participating Entities (Online IP Market)

Entity	Preliminary Preparation	Program Process(Phase)		Follow-Up Management
	1	2	3	
Public Institution	Design Program	Build Website	Collect Contents (IP Transaction Information, Cases in the Past), Create Specific Functions (Search, Auction), Operate/Maintain/Repair Website	Follow-Up Management (IP Counseling, Provision of Additional Information)
SME			Upload information about IP transaction on the website	Manage IP transaction information

- Guide Map for Participating Entities is a chart that allows for a quick overview of the overall process of the program from the designing stage to follow-up management.
- The guide map illustrates the tasks to be conducted at each stage, as this program is continuously operated and managed.
- The guide map provides a summary of the tasks to be carried out by the public institution[100)] and SMEs at each stage of the process. A detailed information regarding each stage is described in *2.3.5 Detailed Guidelines for Participating Entities* below.

[100)] Refers to public organization, for example a governmental organization, in charge of running and managing this program

2.4.5. Detailed Guidelines for Participating Entities

1) Guidelines for the Public Institution

Key Activities

1. Establish a website for Online IP Market
2. Provide various contents and services through the established Online IP Market, and bring the service in connection with other support programs for technology transfers

(1) Establishment of Online IP Market Website

- Online IP Market refers to a website established for IP transactions that also supports mobile devices.
- The public institution plans the establishment of a website for IP transactions by making plans for installation and operation of servers for website development, web programming, web design and other aspects of System Integration.
- The public institution should also determine the type of contents to be published online and the methods for gathering that information.
- An Online IP Market website should provide several basic services. IP providers should be able to introduce their technologies, upload relevant information, and search for listings of technologies buyers wish to purchase. IP buyers should also be able to upload the technologies they are looking to purchase and search for listings of technologies being offered by IP providers.
- In addition to the basic upload and search services, the website should also establish an auctioning function, provide a database of past cases of IP transactions as references for price calculation, and include necessary contract forms for conducting transactions.

(2) Information on IPs for Sale and Purchase

- Online IP Market website has a page where IP providers can upload information about the technologies they wish to sell. On this page, IP providers offer a detailed description of the technologies they own, the technology field of the IP, conditions of the transaction and contact information for potential IP buyers to refer to.
- Potential IP buyers can read the information uploaded by IP providers, understand what the technologies are about, analyze the value and directly contact the provider to start technology transfer negotiations.

- While the information items published on each individual website may vary, they should include the very basic information such as the title of the technology, description of the technology, IP classification (for example, patent or industrial design), relevant technology fields (for example, electrical engineering or machinery), application and registration number, expiration date, conditions of transaction (form of transaction and IP price), name of the rights holder and contact information.

Example

Table 72. Description of IP for Sale Published on IP Market in Korea

Type	IP Description	Registered Information	Commercialization
Item	Title of Technology	Application/Registration Number	Business Potential (Marketability)
	Technical Details(Features)	Application/Registration Date	Field of Application (Field of Utilization)
	IP Classification (For example, patent)	Notification Number	Distinct Features Compared to Existing Art
	Technology Field (For example, machinery)	Notification Date	Identical Technologies
	Assignee	Expiration Date	Commercialization Date
	Holder of Right	Termination	Capital Required for Commercialization
		Termination Date	Form of Transaction (Purchase, Licensing, etc.)
			Conditions of Transaction (Price, etc.)
			Desired Date of Transaction

Description	Description	Commercialization	Office action	Abstract

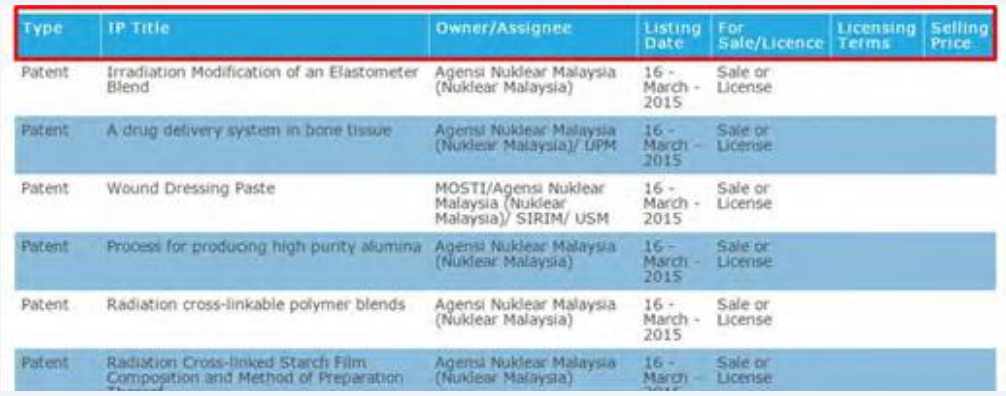
Title(Patent)	Floating body(drone) driven by repulsive power of fluid		
Description (Patent)	The technology is a floating body(drone) that the user can use to navigate freely, which is connected to pipes that provide fluids such as water and uses the repulsive power of discharging fluids to navigate. This invention uses three or more discharging outlets that can control the amount of fluid discharging. Because the invention uses the power from the body (pump) that supplies fluid to the floating body, there is no source of power on the floating body. The drone is capable of hovering and moving through the mere modifying the amount of discharging, which makes the technology easier to realize. The technology is applicable both on the ground and on the waters, which makes it highly capable of being utilized for agricultural, firefighting, land-scaping purposes and underwater salvage work.		
Uploaded by			
Assignee	XXX	**Patent**	XXX
Holder of Right	XXX	**IPC**	
Application Number	102015XXXXXXX	**Application Date**	2015.06.26
Registration Number	10XXXXXXXXXX	**Registration Date**	2017.01.03
Notification Number		**Notification Date**	2017.01.09
Legal Status	Patent	**Technology Field**	Machinery
Image File[C]			
Attachments	2_application(10-2015-0091167) (1).pdf		

Figure 104. Screenshot of Description of IP for Sale Uploaded to IP Market in Korea

Example

Table 73. IP Description for Sale Published on IP Market Place in Malaysia

Type	Description
Item	Technology Field (for example, patent)
	Title of Technology
	Holder of Right
	Date of Website Registration
	Form of Transaction (purchase, licensing, etc.)
	Conditions of Transaction (price, etc.)



Type	IP Title	Owner/Assignee	Listing Date	For Sale/Licence	Licensing Terms	Selling Price
Patent	Irradiation Modification of an Elastometer Blend	Agensi Nuklear Malaysia (Nuklear Malaysia)	16 - March - 2015	Sale or License		
Patent	A drug delivery system in bone tissue	Agensi Nuklear Malaysia (Nuklear Malaysia)/ UPM	16 - March - 2015	Sale or License		
Patent	Wound Dressing Paste	MOSTI/Agensi Nuklear Malaysia (Nuklear Malaysia)/ SIRIM/ USM	16 - March - 2015	Sale or License		
Patent	Process for producing high purity alumina	Agensi Nuklear Malaysia (Nuklear Malaysia)	16 - March - 2015	Sale or License		
Patent	Radiation cross-linkable polymer blends	Agensi Nuklear Malaysia (Nuklear Malaysia)	16 - March - 2015	Sale or License		
Patent	Radiation Cross-linked Starch Film Composition and Method of Preparation	Agensi Nuklear Malaysia (Nuklear Malaysia)	16 - March -	Sale or License		

Figure 105. Screenshot of IP Description listed on IP Market Place in Malaysia

Example

Table 74. IP Description for Sale Uploaded to Thai IP Mart in Thailand

Type	Description
Item	Title of Technology
	IP Classification(For example, patent)
	Assignee
	Application/Registration Number
	Technical Details(Features)
	Form of Transaction (Purchase, Licensing, etc.)
	Conditions of Transaction (Price, etc.)
	Remarks by IP Provider

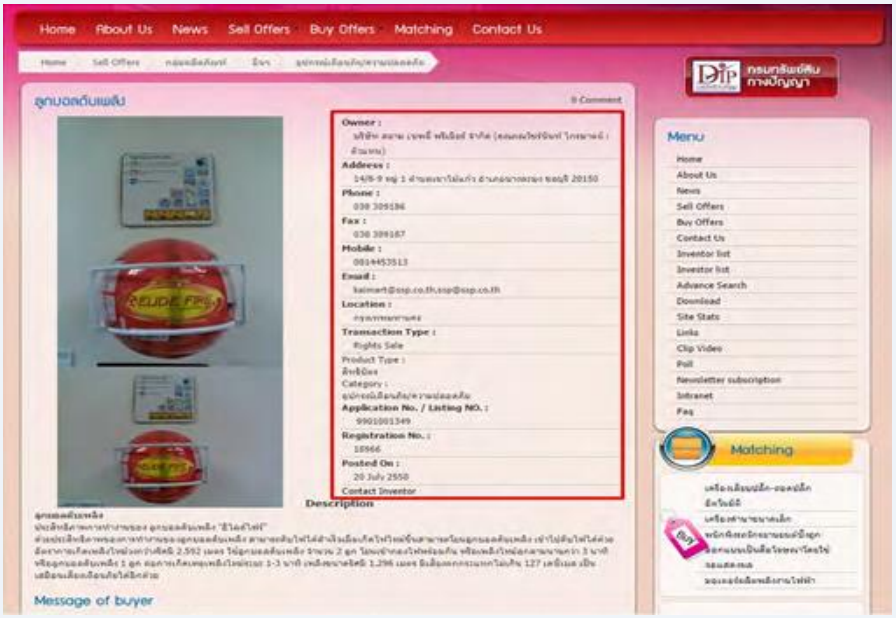


Figure 106. Screenshot of IP Description for Sale Uploaded to Thai IP Mart in Thailand

- The Online IP Market website should have a page where potential IP buyers can upload information on technologies they wish to purchase, so IP providers can find transaction partners by searching the listings uploaded by potential buyers.

- In general, listings by IP buyers are briefer than those by IP providers. They usually include title of technology, technology field (for example, electric engineering or machinery), IP classification (for example, patent or industrial design), legal status (for example, pending or registered), purpose and usage of technology, form of transaction (for example, purchase or licensing), and conditions of transaction (for example, IP price).

Example

Table 75. IP Description for Purchase

Type	Description
Item	Title of Technology
	Technology Field (for example, machinery or electric engineering)
	IP Classification (for example, patent or industrial design)
	Legal Status(for example, pending or registered)
	Purpose and Usage of Technology
	Form of Transaction (for example, purchase or licensing)
	Conditions of Transaction (for example, IP price)
	Desired Date of Transaction
	Contact Information

- As the amount of IP transaction information on the Online IP Market increases, users might have difficulties finding the information they want, and this may lead to a drop in website traffic. Therefore, a technology classification system and search functions need to be in place to make the search process for technologies of their interest easy and convenient.

- With enough listings for technologies to be sold and purchased, Online IP Market can enhance user convenience by providing automatic matching and recommendation services.

- In order to implement the automatic matching system, users should be required to include keywords that describe the technologies being dealt with in their listings of IP they wish to sell or purchase. When new listings are uploaded that have identical or similar keywords, newsletters of notification are automatically sent to the user. The automatic matching system can promote IP transactions by sending newsletters to users, thereby promoting transactions among members.

(3) IP Auction Service

- The IP market is traditionally a buyer's market as there are far fewer buyers than providers. As a result, buyers, few in number, review the technologies of many providers and initiate negotiations with them.

- However, the auction method can be applied to the transactions of the technologies that are high in demand, that have a high search and viewing rate, and have high records in a brief technological valuation.

- Auctioning technologies on the Online IP Market website can guarantee the safety of transaction as the auctions follow formal steps and procedures. Moreover, both the provider and the buyer can save money on auctioning costs.

- The procedures for auction on Online IP Market website are as follows.

Example

Table 76. Procedures for an Auction on Online IP Market Website

Join	IP provider or IP buyer
Register for Auction on IP-Market	IP provider applies for auction registration
Announcement of Auction and Bidding	Announce auction to members IP buyers review the technology and place bids
Notify Preferred Bidders	Notify Preferred Bidders from the highest bidders (from the first to the third)
Sign Contract of Technology Transaction	Negotiate and Sign Contract with Preferred Bidder (Patent transaction experts provide assistance in negotiating and contract signing process on demand upon request)
Follow-Up Management After Signing Contract	Confirm payment and fulfillment of contractual obligations

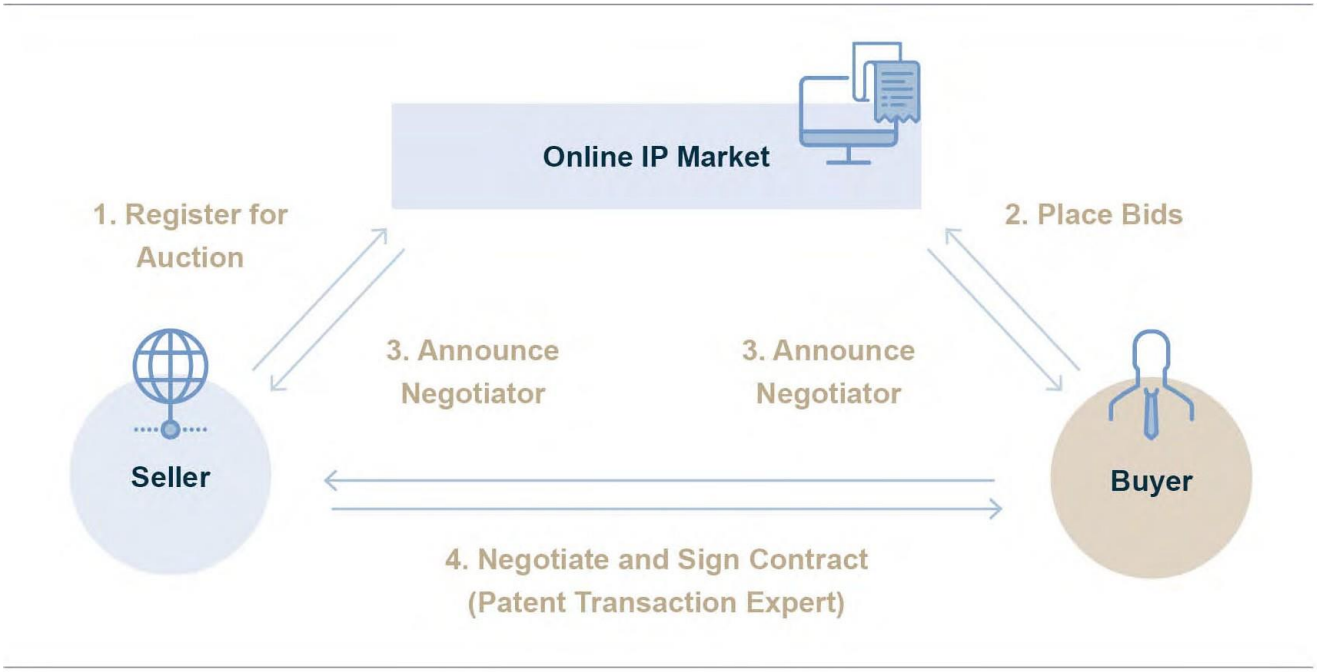


Figure 107. IP Auction Mechanism

- When negotiations are made and the contract is to be signed between the provider and a preferred bidder, supporting the process in connection with the *IP Trade Experts Program* or other patent expert programs can enhance the convenience of bidders in that the experts can help prepare the contract and provide legal assistance in examining the contract. For more information, refer to *IP Trade Experts Program*

(4) Establishment of Database for Past IP Transaction Cases

- One of the areas where contract parties disagree on the most during negotiations is calculating a fair price for the technology.

- Conducting technology value assessment to calculate the price is a possibility, but can be time-consuming and expensive. An alternative solution is to let users browse past IP transaction cases and find out the terms and conditions of transaction. In order to provide this function, relevant data such as form of transaction and prices need to be incorporated into a database.

- Database for Past IP Transaction Cases will contain information about contract and technology. Contract information includes the form of contract, specific conditions and contract parties, while technology information will include the details and classification of technology, quality, and aspects related to commercialization.

- The Database for Past IP Transaction Cases will allow IP contract parties to identify technology transaction trends in a particular technology field. For example, they will be able to search what kinds of technologies were sold and bought for how much and who the involved contract parties were. This will help them predict and plan their future IP transactions.

- Information to be provided in Database for Past IP Transaction Cases is as follows in the table below.

Example

Table 77. Database for Past IP Transaction Cases

Type	Contract Information	Registered Information
Item	Date of Contract	Title of Technology
	IP Provider / Buyer Type	IP Classification (Patent, etc.)
	Type of IP Buyer (SME, large companies, etc.)	Application/Registration Number
	Form of Transaction (Purchase, Licensing, etc.)	Application/Registration Date
	Conditions of Transaction (Prices, etc.)	Date of Expiration
	Region of Contract (Home/abroad)	Industrial Technology Classification
	Period of contract	Related Technology Fields
	Other Conditions	Product Name where Technology is Applied
	Source of Information (Name of Organization)	Technical Details(Features)

Example

Table 78. Detailed Contract Information

Item	Description (Sample)
Date of Contract	2016. 10. 23
IP Provider / Buyer Type	University / SME
Form of Transaction	Ordinary License
Conditions of Transaction	Upfront Fee, Royalties, etc.
Region of Contract	Korea
Other Conditions	Region and time period
Source of Information	IP Transaction Organization X

(5) IP Transaction Counseling

- IP transaction entities often face difficulties in that they do not have enough experience and information. It is especially difficult for SMEs to gain the necessary information in advance, such as the specific procedures of IP transaction, things to pay attention to during negotiations, and obligatory items that should be included in a contract.

- Taking this problem into account, this program provides expert counseling services in order to solve problems arising during IP transactions.

- For IP providers and buyers who find it difficult to proceed to the contract signing stage by themselves solely through the Online IP Market, they can receive support in the form of Patent Transaction Experts who provide offline counseling, or counseling from other private IP transaction organizations. For more information, refer to Patent Transaction Expert Program.

- Through counseling, users of Online IP Market can find experts by technology field and region to apply for their assistance.

- It can be helpful to have a FAQ (Frequently Asked Question) page on the website to answer questions frequently asked by Online IP Markets.

(6) Standard Contract Form and Other IP Information

- An Online IP Market website can provide tools for entities that wish to enter contracts without brokerage such as standard contract forms and contract generating online software.

- Contract writing tools assist the process of writing contracts by generating a sample contract by having the user answer the IP transaction questionnaire on the website. Members can automatically generate a sample contract by filling in their IP transaction information on the online form and use the form for future reference.

- The information required for online contract generation can be categorized into general information and contract conditions. General information includes information on IP contract entities and other bibliographical details. Contract conditions include non-disclosure obligations, indemnification for damages, and prices.

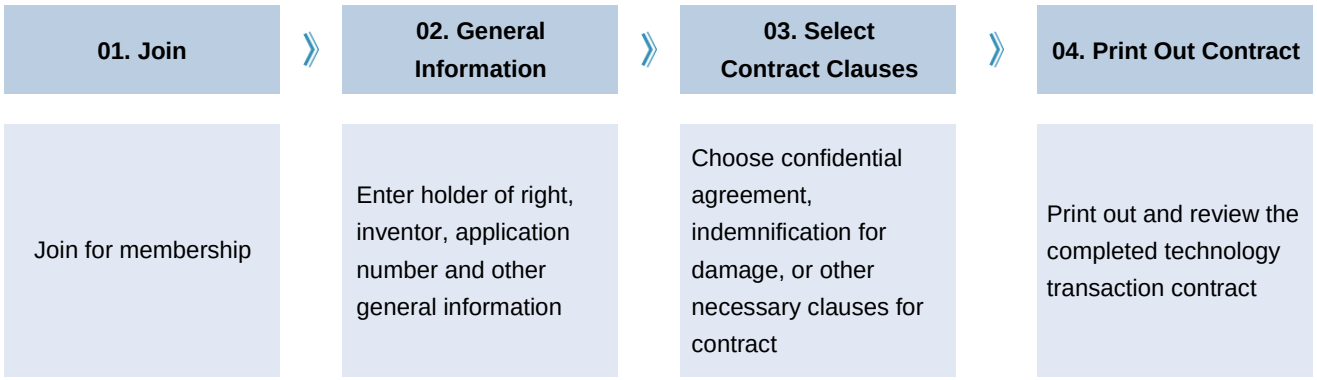


Figure 108. Standard Contract Writing Tool Provided by IP Market Website in Korea

- The website may provide other information for reference such as successful cases of contract, exclusive licenses and ordinary licenses

(7) Connection to Open Patent Market

- As the Open Patent Market supports IP transactions offline, high-quality technologies uploaded on Online IP Market website can be selected for display in the exhibit space of Open Patent Market.

- Similarly, technologies that are receiving attention in the exhibit of Open Patent Market can be selected to be auctioned on the Online IP Market, thereby enhancing the overall effectiveness of IP transaction support.

- 3D simulation videos, technology marketing reports and other outcomes produced through the Open Patent Market can be listed and provided to IP buyers as a means of promotion on the Online IP Market.

- To accomplish the aforementioned achievements, close cooperation between the operating organization of Online IP Market and that of the Open Patent Market is required. Preferably, the two programs should be operated by one organization.

2.4.6. Program Tips

1) Program Tips for Public Institution

- The public institution should abide by the government guidelines when building the Online IP Market website, and take into account different access points in order to secure compatibility among different systems. For example, the website should be designed in a way that allows it to be accessed from different web browsers, operating systems, and mobile devices such as laptops, tablets and smartphones.

- Protection of private information should be an important issue. It is recommended that information on IP providers and buyers is limited in access as it contains personal information such as contact point. It is safer to only allow users with membership to view this kind of information after they are logged in.

- In some cases, IP providers are understandably concerned about leakage of their technologies, which often prevents them from describing their technologies in sufficient detail. This can be problematic as IP buyers will want details, and this can hinder IP transactions. Therefore, it is crucial that the public institution establishes a system with a high level of data security and relevant preventive measures so that users can utilize the system with trust and share the details of their technologies without concerns of information leakage.

- Sometimes, IP providers might upload technologies that either do not qualify for technology transaction, for example, an inexhaustible energy source, or are ethically unsound. It is the responsibility of the public institution to keep watch over the website so that only the information pertaining to the purpose of the program can be uploaded.

2) Program Tips for SMEs

- Take caution to prevent important information such as R&D strategies, trade secrets and personal information are not disclosed by mistake on Online IP Market website.

- Establishing the scope of information for disclosure at each stage of IP transaction can be an effective way to protect information.

2.5.
Consulting on IP Trade

2.5.1. Program Overview

Make private patent trading institutions participate in government programs and provide consulting jointly with the public institution to create opportunities to strengthen the capacity on patented technology trading service.

- Technology trading is recognized as a useful means to strengthen the technological competitiveness and productivity of an SME, but most SMEs do not have experts for technology transaction. Hence, they face limits in acquiring various external technology resources on their own.

- Also, private technology trading agencies are invested in establishing infrastructure such as fostering technology trading experts and securing technology supply networks, but technology trading has a low success rate, and the profit structure allows earning only after securing a successful deal, making it difficult for the agencies to achieve growth.

Note

<Strengths of Adopting External Technology>

- When securing the needed technologies via technology acquisition, aiming for verified technologies (proven technologies) increase the chance of success, enable release of the product according to market changes, enter the market at an appropriate time, have no burden of failure from R&D, and decrease development costs.

- Also, adopting advanced and sophisticated technology can secure needed technology assets and lead to business restructuring which focuses on promising businesses.

- Against this backdrop, KIPA of Korea determined that supporting technology trading centered on small demand is more efficient than many suppliers, thus focusing on supporting "demand-centered technology trading," in which it identifies the technology in demand and finds and matches it up to appropriate technologies accordingly. Since 2009, KIPA has been increasing the success rate of demand-centered trading cases, and at the same time, it has been providing Consulting on IP Trade with the purpose of improving the mediating capacity of private technology trading agencies.

- In the program, the public institution and private technology trading agencies cooperate and provide service to SMEs that hope to improve their patent portfolio and expand their business into new fields by adopting external technologies[101]. Services include a comprehensive consultancy service by identifying the technology in demand, matching SMEs with appropriate technologies, and assisting the negotiation and the signing of contract for patented technology trading[102].

- Although there are complementary methods such as signing a non-disclosure agreement to prevent new product development strategies from leaking, SMEs are often reluctant to provide information on technology in demand to the technology transfer agencies. Taking this into account, the public institution should find SMEs hoping to adopt external technologies and research into technologies in demand, and the private technology trading agencies should be in charge of post-processes such as finding the appropriate technology, negotiating, and contract signing for patented technology trading to promote more efficient ways to conduct technology trading.

101) In the program, "technology" refers to a technology with its rights protected by patents, and "technology trading," refers to conducting transaction of patented technologies one owns.

102) In the program, patented technology trading refers to patent transaction or transaction of technologies protected by patents

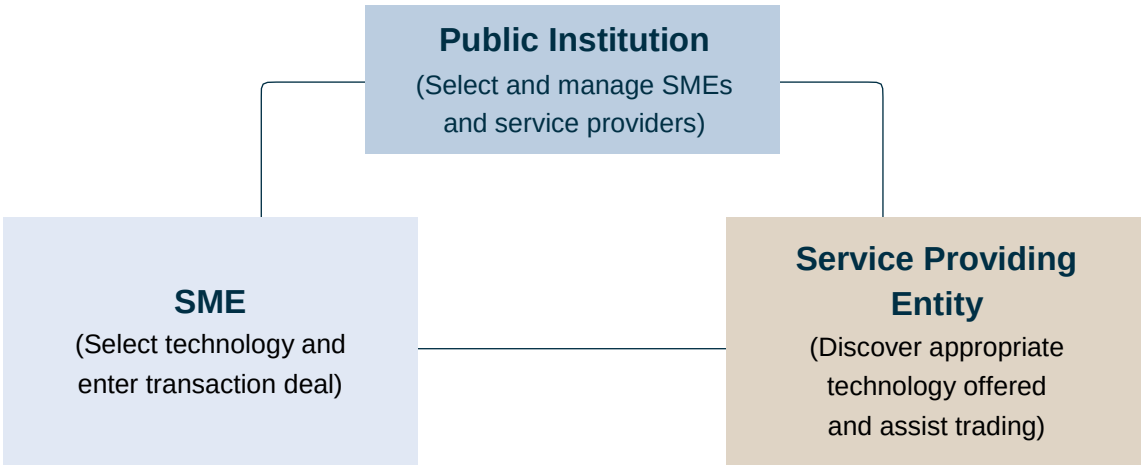


Figure 109. Program Framework (Consulting on IP Trade)

2.5.2. Similar Programs of APEC Members

1) Steinbeis Foundation of Germany

- The Steinbeis Foundation was founded in the mid-19th century by a pioneer of the industry-academy cooperating field, Ferdinand von Steinbeis. After being established as a public institution for SME support in 1971, it was privatized in 1983 and today, it is acknowledged as a global technology trading and commercialization consulting institution with over 1,000 Steinbeis network and 6,000 experts.

- Under the foundation's philosophy of, *Steinbeis: Problem solver for the economy*, the foundation runs a network of problem-solving organizations of experts from various fields such as technology, economy and accounting. The foundation assists its clients and partners see economic feasibility increased by transferring knowledge and technology to the businesses.

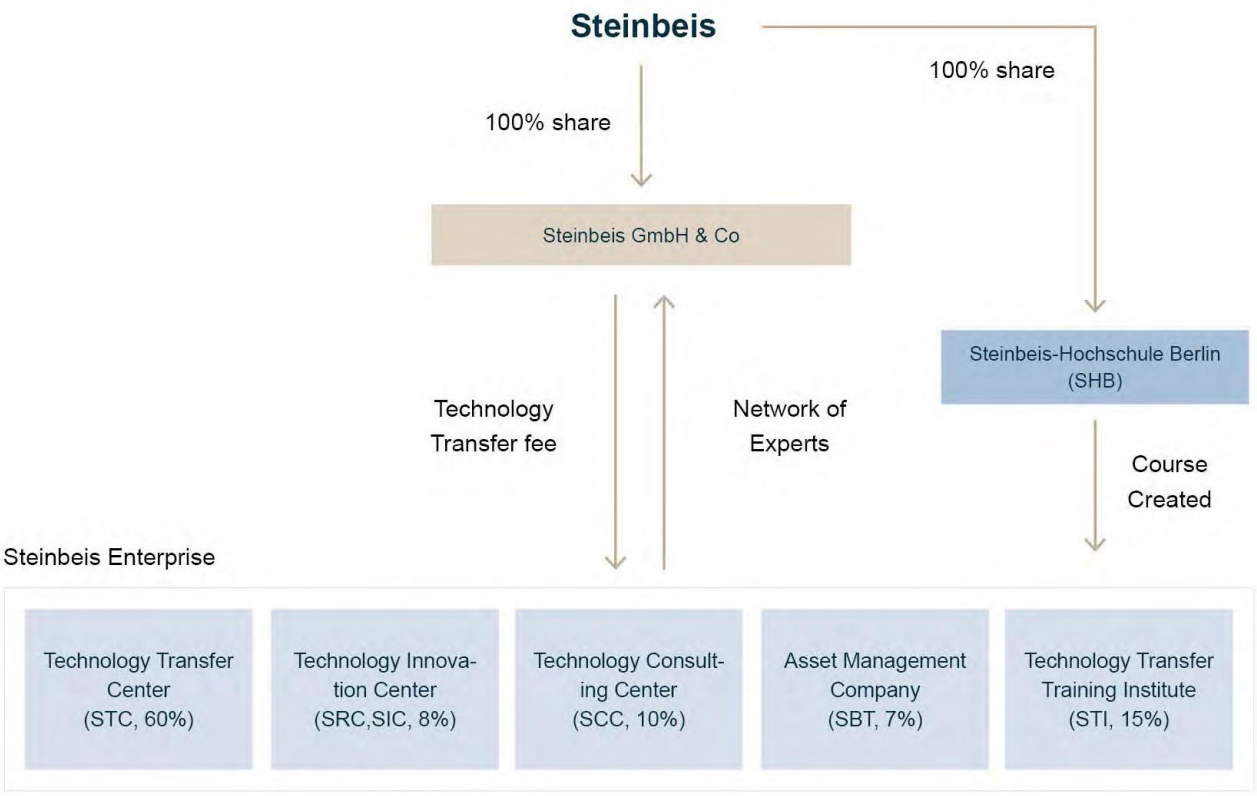


Figure 110. Steinbeis Foundation of Germany

- There are many of Steinbeis enterprises (STC, SRC, SCC, STI, etc.) around the globe. The HQ is Steinbeis GmbH & Co. KG für Technologietransfer.

<Steinbeis Enterprises>

- Steinbeis Transfer Center (STC): Conduct technology trading in various fields
- Steinbeis Research & Innovation Center (SRC, SIC): Research on technology development, technology trading, and technology commercialization, as well as establish network
- Steinbeis Consulting Center (SCC) : Providing consulting for business, and those relevant to evaluation/training
- Steinbeis Transfer Institute (STI): It is under Steinbeis University Berlin, and provides training programs such as capacity strengthening training and personnel development besides conducting researches related to technology trading.

- Steinbeis University is a private university established by the Steinbeis Foundation in 1998. It is located in Berlin and Stuttgart, and by providing Project Competence Degree, it educates students on theory and actual work carried out to offer consulting services on resolving technical/managerial issues of enterprises.

- Steinbeis enterprises utilize various cooperating network to offer technology trading, business solutions to meet the needs of clients such as SMEs, and even provides relevant training in a one-stop system.

- Most of the Steinbeis Transfer Centers (STC) are located either in universities or in the surrounding area, so they not only have the advantage of gaining access to existing infrastructure but also have a secure global network in almost all technology fields.

- Steinbeis Foundation is notable in its technology trading method. While other trading agencies adopt the Push Method, a supply-oriented method which focuses on transferring technologies developed by R&D efforts of universities and research institutes, Steinbeis Foundation adopts the Pull Method, a demand-oriented method which outsources the technology supply to experts based on demands of enterprises.

- The Steinbeis headquarters evaluates technology trading agencies that want to use the Steinbeis brand and determines whether to allow the use the brand name. They receive requests from clients including SMEs and match clients with the fitting STCs. Also, the headquarters supports legal reviews, signing contracts, publishing and promotion at STCs.

- The Steinbeis enterprise is run based on the profit generated from technology trading and business solutions provided, and 7-8% of profit such as commission from technology trading goes to the headquarters.

2) National Tech Transfer Center (NTTC) of the US

- The National Tech Transfer Center is a representative technology transfer organization in the US, and it functions as a hub for the US that connects enterprises with public research facilities. From the federal level, it provides technology information from NASA and other public research institutes, and it carries out technology evaluation, commercialization, and transfer.

- The NTTC provides services including a communication bulletin board, promotional activities, and access to experts to support technology transfer.

- The communication bulletin board service provides information on a list of technology available for licensing. Also, the NTTC database provides the contact numbers, current research status and data which can be uploaded and downloaded for more than 2,000 facilities and institutions.

- Promotion activities help government research facilities find private partners for commercializing new technologies. The NTTC is closely cooperating with the central government research consortium, central government, local governments, local economic development institutions, academia, enterprises, and industrial associations, and it introduces technologies to Regional Technology Transfer Centers (RTTC) of NASA.

- The technology access agent services allow technology access agents in the NTTC to give data from the database on NTTC to individuals and enterprises along with information on technologies they are interested in.

Table 79. Role and Activities of NTTC

Item	Description
Role and Activities of NTTC	• Distribute information on technology of all federal research facilities • Provide a gateway to enterprises, facilities, and private technology trading agencies to allow access to all federal technology database. • Establish network between institutions to build infrastructure for technology distribution, and unify technology trading information channel

2.5.3. Procedures and Details of the Program

1) Target of Support

- Support SMEs preparing to complement their patent portfolio, develop new products, and promote new businesses by bringing in external patented technologies.

2) Program Process

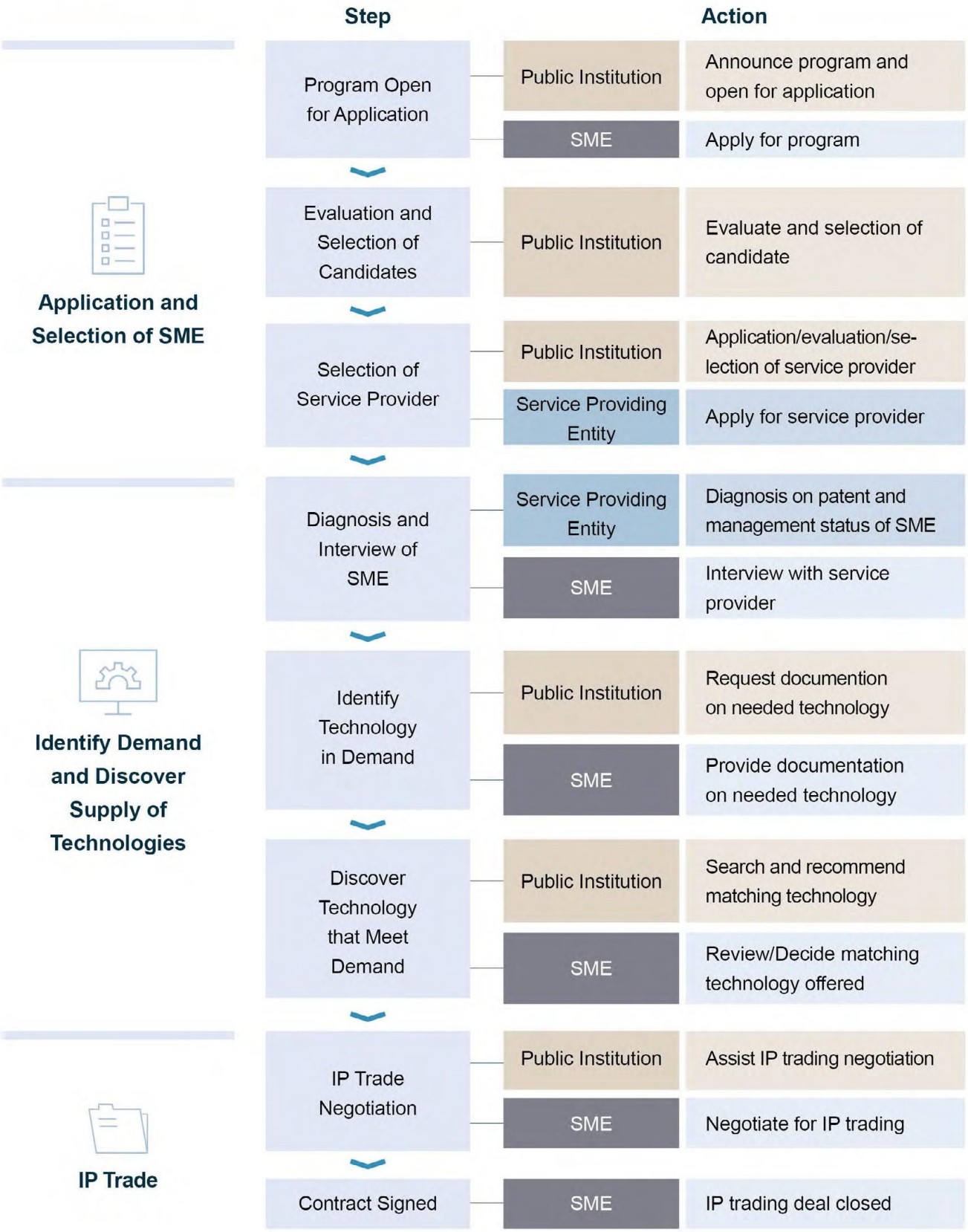


Figure 111. Program Implementation Process (Consulting on IP Trade)

3) Scope and Conditions of Support

- The public institution interviews the applicants to identify the purpose of technology adoption and the type of technology in demand, and form an evaluation committee to select an appropriate applicant.

- The public institution selects a service providing entity to provide consulting for patent transactions for selected applicants and provides a subsidy that covers a part of the consulting fees.

- The purpose of the public institution subsidizing a part of the consulting fees is to lessen the financial burden of the SMEs and to prepare financial resources such as a deposit for stable consulting services from the service providing entity.

- The service providing entity identifies the needs of the selected SME and provides consultation for patent transaction.

Example

< Example of Installment Payment for Patent Transaction Consulting Fees in Korea>

- In the case of Korea, the public institution covers 70% of the consulting fees for patent transaction, while the remaining 30% is paid by the applicant. The-70% subsidy is paid by the public institution to the service providing entity in two separate payments, once in the beginning and the other at the end.
- The reason the second payment is made after the consulting is completed is to check whether the service providing entity carried out the services according to the requirements and demands from the SME, and to ensure any follow-up work needed is done before the payment is complete.

2.5.4. Guide Map for Participating Entities

Table 80. Guide Map for Participating Entities (Consulting on Patented Technology Trading)

Entity	Preparation	Program Process (Phase)							Follow-up Manage-ment
		1	2	3	4	5	6	7	8
Public Institution	Program planning	Select an applicant	Select a service providing entity			Gather SME's opinions and check program process			Survey on SMEs' level of satisfac-tion
Service Providing Entity			Apply to the pro-gram	Diagnose the appli-cant and research technology in demand	Find and recom-mend appropriate technology		Support technolo-gy trading negotia-tions	Support signing a contract for tech-nology trading	Support estab-lishing commer-cialization strategies
SMEs		Apply to the pro-gram and interview with public entity		Interview with service providing entity	Review supplied technolo-gies	Select technology to adopt	Conduct technology trading ne-gotiations	Sign a contract for technology trading	Utilize program results

- "The Guide Map for Participating Entities" is a chart made to easily understand the program process from preparation to follow-up management.
- Generally, the program's duration is about six months, but depending on the conditions of each economy, the duration may be changed.
- The chart summarizes the role of the public institutions[103], a service providing entity, and SMEs in different phases of the process, and its details on each phase are explained in *2.5.5. Detailed Guideline for Participating Entities.*

[103] Public institutions such as government departments in charge of managing and operating the program.

2.5.5. Detailed Guideline for Participating Entities

1) Guideline for Public Institution

Key Activities

1. Conduct interviews with SMEs that have applied to the program and hold evaluation committee meetings to select an appropriate enterprise.
2. Follow standards and fair procedures to select the service providing entity that can provide consulting services according to the technology adoption plan per selected SMEs.

- The program is not simply about lessening the consulting fee burden of the SMEs, but by subsidizing the cost, the program encourages SMEs to participate in technology trading market, and this allows private technology trading agencies to gain trading experience and establish the foundation for them to make growth on their own. The program is carried out with the purpose of creating a patent technology trading eco-system in which the technology supplier, enterprises looking for technologies, and private technology trading agencies can seek growth together in the long-term.

- To produce good results from the subsidy program, there needs to be support in all parts of the process such as finding enterprises that hope to adopt technologies, identifying technologies in demand, matching enterprises with supplied technologies, trading negotiations, signing contracts, etc. For the patented technology trading market to further develop, the participation of SMEs is most crucial, hence, there should be a continued effort to increase the awareness of SMEs by sharing successful cases, etc.

- The public institution should hold regular meetings to look into the overall progress of the program. The public institution will monitor the demands of SMEs and measures devised by the service providing entity in efforts to make successful cases. Also, after the program comes to an end, there should be briefing sessions on the consulting services to share and evaluate cases, and ultimately, check and manage consulting contents and the results.

- For the patented technology market to grow, fostering private technology trading agencies with experience and personnel network is crucial. Hence, it can be a good option to have excellent service providing entities are preferred in the next year’s program or to limit participations of those who were below average according to evaluation results.

(1) Selecting SMEs to Support

- To produce quality results from consulting on patented technology trading, finding institutions with demand that have a specific technology adoption plan and capacity is important. Generally, announcements are made on newspapers but to be more efficient, the public institution can conduct targeted marketing activities; the entity would look for enterprises which own patents similar to the ones that enterprises, universities, or research facilities that receive government's technology development funding they hope to acquire.

- Generally, in the technology trading market, the number of technology providers is less than those who seek technology, so private technology trading agencies should collaborate with the public institution to promote the consulting program and find SMEs to support

Note

< Finding SMEs for Consulting Services Offered by Private Technology Trading Agencies >

- Private technology trading agencies can find SMEs which hope to acquire technologies and suggest them to the public institution when applying to be the service providing entity.

- The advantage of what is explained above is that if private technology trading agencies find SMEs to consult, the agencies would already know the demand and business status of the enterprise, making the consulting process go faster.

- The public institution visits the SME that applied to the program to check the business field, number of patents, technology development capacity, and technology in demand through an interview. Also, the entity can see the level of attention, will, and capacity of the representative of the enterprise on patented technology trading and use the information as a basis for determining which SME to support in an evaluation committee meeting.

- During the evaluation process of candidate SMEs, the evaluation committee checks the SME's ability to pay the cost of the technology transaction by reviewing the business management status based on data including the sales volume, debt and credit rating. In addition, production capacity, marketing capacity, and market share is reviewed to determine the SME's capability to commercialize a technology, and the employee's competence in technological development is also taken into consideration.

- To select an appropriate service providing entity, the public institution checks the needs of the SMEs and identifies information needed for technology matching including the technology in demand, the field of technology and so on.

(2) Selecting Service Providing Entity of the Program

- The service providing entity should be selected from an open bidding system following a fair set of standards and procedures. Opportunities should be given to many organizations by announcing the recruit on newspapers and other media channels.

- As SMEs have demand for technologies from a variety of fields, it is recommended to select a service providing entity of the relevant technology field. However, if this is not possible, similar technology fields can be grouped, and the service providing entity can be chosen from the group.

- A service providing entity can provide consulting services to more than two enterprises, but the public institution should consider the capacity of the service providing entities and allocate them evenly. This is to prevent a few service providing entities from dominating and to provide the most effective consulting services according to their expertise.

- When selecting a service providing entity, criteria such as work capacity, planning, relevant results are taken into account. To ensure that the purpose of the program is met when selecting a service providing entity, how much the applicants understand the Consulting on Patent Technology Trading Program and whether they need government subsidy are the important points to remember. According to the policy aim, private technology trading agencies that have growth potential yet lack operational foundation should be preferred.

Example

<Ideas for Table of Contents - Proposal by Candidate for a Consulting Service Providing Entity in Korea>

I. Proposal Overview

1. Purpose and background
2. Scope of work
3. Consulting purpose and major contents
4. Distinct feature of the proposal and advantages

II. General Information about the Enterprise

1. General status (History, organization and personnel status, sales amount, etc.)
2. Main businesses
3. Main business results (Focusing on technology trading results)

III. Consulting Services

1. Work system
   - Organization and work scope
   - Status of personnel
2. Work strategy and procedures

IV. Consulting Management

1. Work schedule planning and detailed planning
2. Measures to manage schedule and progress

※ **Applicants can add information not listed above into their proposals.**

- The selection evaluation for service providing entity can be divided into technology and price evaluation. The technology evaluation includes, how well the applicant understands the purpose and contents of the program, whether they provide specific consulting plans, how many experts they have to provide consulting services, and how many technology trading results they have, while price evaluation can look at the bidding price.

Example

Table 81. Example of Selection Criteria of Service Providing Entity for Transaction Consulting

Category	Fields	Criteria	Score
Technology Valuation	Work Planning	• Level of understanding on the program • Work plan per task • Specifics of the plan and practicality	25
	Relevant Results	• Technology trading amount in the last two years	15
		• Number of technology trading in the last two years	15
	Work Capacity	• Capacity of the person in charge of the work, composition and expertise of the participating personnel • Have a system to find technology in demand /supplied technology and a cooperating system • Method of communication with business supervising entity • Successful cases of technology trading (Case-focused) • Other work capacities	25
(Bidding) Price Evaluation		Apply contract standard's average calculation according to negotiation	20
Total			100

※ Technology trading results refer to cases in which trading and signing of contract is completed in the last two years.

※ Technology trading amount in the last two years refer to "technology cost" written down in the signed contract.

- [Price Evaluation Score]
  - When the bidding price is more than 80/100 of estimated price,
    Average score = Price Evaluation Score Limit (20) × (Lowest Bidding Price/Bidding Price)
  - When the bidding price is lower than 80/100 of estimated price,

$$\text{Point} = \text{bidding score limit} \times \left(\frac{\text{lowest bid}}{80\%\text{ of estimated price}}\right) + \left[2 \times \left(\frac{80\%\text{ of estimated price - bid amound for this term}}{80\%\text{ of estimated price - 60\% of estimated price}}\right)\right]$$

※ Lowest Bidding Price: Lowest bidding price from valid bidders

※ Applicant's Bidding Price: It should be bidding price of the applicant to be evaluated, but if the bidding price is lower than 60/100 of estimated price, calculate as 60/100.

※ When evaluating the bidding price with business budget, add VAT to the estimated price. If the expected price is presented, apply the expected price as estimated price in the formula.

- When there are two or more applicants with the same score, the applicant with higher technology score should be preferred. If the applicants have the same technology score, the applicant with better a score on detailed items will be selected.

- During the negotiation for final selection, there are two or more applicants with the same score, the applicant with higher technology score should be preferred. If the applicants have the same technology score, the applicant with better a score on detailed items will be selected. Also, negotiation standards and contents should be based on the applicants' proposal on the task contents, work schedule, offered price, etc. but minute adjustments may be made through a negotiation.

2) Guideline for Service Providing Entities

Key Activities

1. Perform a diagnosis on SME candidate for program, research and analyze technology demanded.
2. Research and analyze matching technology tailored to the needs of the potential buyer.
3. Support negotiation and the closing of the patented technology trading deal.

- Once the SME that wants to adopt technology is selected, the next step is to study the details of the technology wanted, the purpose of adoption and demanded specifications and so on. It is also necessary to identify the type of technology adoption (transfer, licensing, etc.), conditions including the price, the will of the CEO to carry out the deal, purchase power for technology trading, the employees' competence in technological development, which describe the capacity to accept the technology.

- The service providing entity writes a report on the SME's main business area, patent status, technology development capability, and the technology they wish to adopt before forming a working group of 2 to 3 experts in the field of the technology on demand and notifying the public institution.

- The service providing entity sets a strategy for technology transactions based on analysis on factors including the patent trends at home and abroad, features of the technology and the competitiveness of the field along with analysis on the potential value of the technology and the patent holder.

- The service providing entity discovers technology that matches the needs of the SME and assists the negotiation and contract signing in efforts to ensure a successful technology trading consultation.

(1) Diagnosis and Analysis of SME

- **[Currently Owned Patents]** The service providing entity identifies patents owned by the SME and sorts and processes descriptive and technical information as needed. Also, the characteristics of rights ownership information distinct to patents must be put into a chart for future analysis and interpretation.

Example

Table 82. Patent Portfolio Analysis Sheet

Invention Status		Ongoing						Planned					
Contribution to Invention		Large			Small			Large			Small		
Remaining Period of Right Ownership		Long term	Mid term	Short term	Long term	Mid term	Short term	Long term	Mid term	Short term	Long term	Mid term	Short term
Technology Factor Category	Technology Factor Name												
Process	Ingredient												
Process	Polymerization												
Process	Additives												
Process	Processing												
Process	Knitted Fabric												
Function	Recovery Of Elasticity												
Function	Chemical Resistance												
Function	Heat Tolerance												
Total													

- **[Quantitative Valuation of Patents Owned]** A quantitative valuation of patents owned by the SME allows the important level and influence of its patents, and this information is translated into evaluated score to be used for projecting the technological level of the patent owner, valuation of the patent in question, decision making on maintaining the patent or cross licensing, comparing technological feats of economies or enterprises. The basic index for a quantitative measure of owned patent competence is the number of patents filed or registered, the number of forward citations, and the number of family patents by economy. When evaluating an SME based on its patent competence index, the evaluation must use a combination of various indexes comprehensively, and the indexes may differ according to fields or situations of the technology trading.

Example

Table 83. Quantitative Patent Valuation Index Used in Korea

Items	Criteria
Number of Patents	Number of patents per technology and filing
Activity Index	Activity Index (same concept as RTA index) Level of concentration on a specific field of technology
Average Claims	Average number of filings per patent
CPP	Number of forward citations per patent
TII	The relative value or forward citation ratio a specific patent was cited more than a given number of times (top 10%)
TCT	Index that measures the development rate of technology based on publishing years of cited patents
FS	Average number of economies that form a patent family per patent
Number of Joint Filing or Joint Inventions	Number of patents filed jointly by 2 or more entities Number of patents invented jointly by 2 or more entities
Inflow and Outflow Rate of HR	Index that measures the flow of knowledge based on information of patent owner and inventor

- **[Qualitative Valuation of Patent]** Statistical analysis as quantitative analysis is not the only way to analyze SME patent status. An in-depth technology analysis can be used to form a strategic research proposal, and the SME's patent status can be more comprehensively understood by identifying core patents and vacant technologies. Types of qualitative valuation can be done as needed with factors including analysis of the person who filed for patent, analysis of technology, list of items, forward and backward citation analysis, core patent family relation analysis, rights analysis (e.g. patent claim analysis) and a comparative analysis of similar patents.

- **[Patent Technology Management Diagnosis]** Lay out diagnosis items for 5 perspectives that reflect the patent managing environment of the SME, identify strengths and weaknesses, and issue areas to improve through diagnosis of each item.
  - (Financial Perspective) measures the operation and management level of financial performance and patent management performance
  - (Customer Perspective) measures how well products and services are meeting the customers' needs
  - (HR Perspective) measures the level of employee competitiveness, organization management, decision-making system
  - (Process Perspective) measures the level of management and operating system for effective patent management
  - (Innovation and Development Perspective) measures the level of strategies and execution for long-term growth and achievement of profit goals

Example

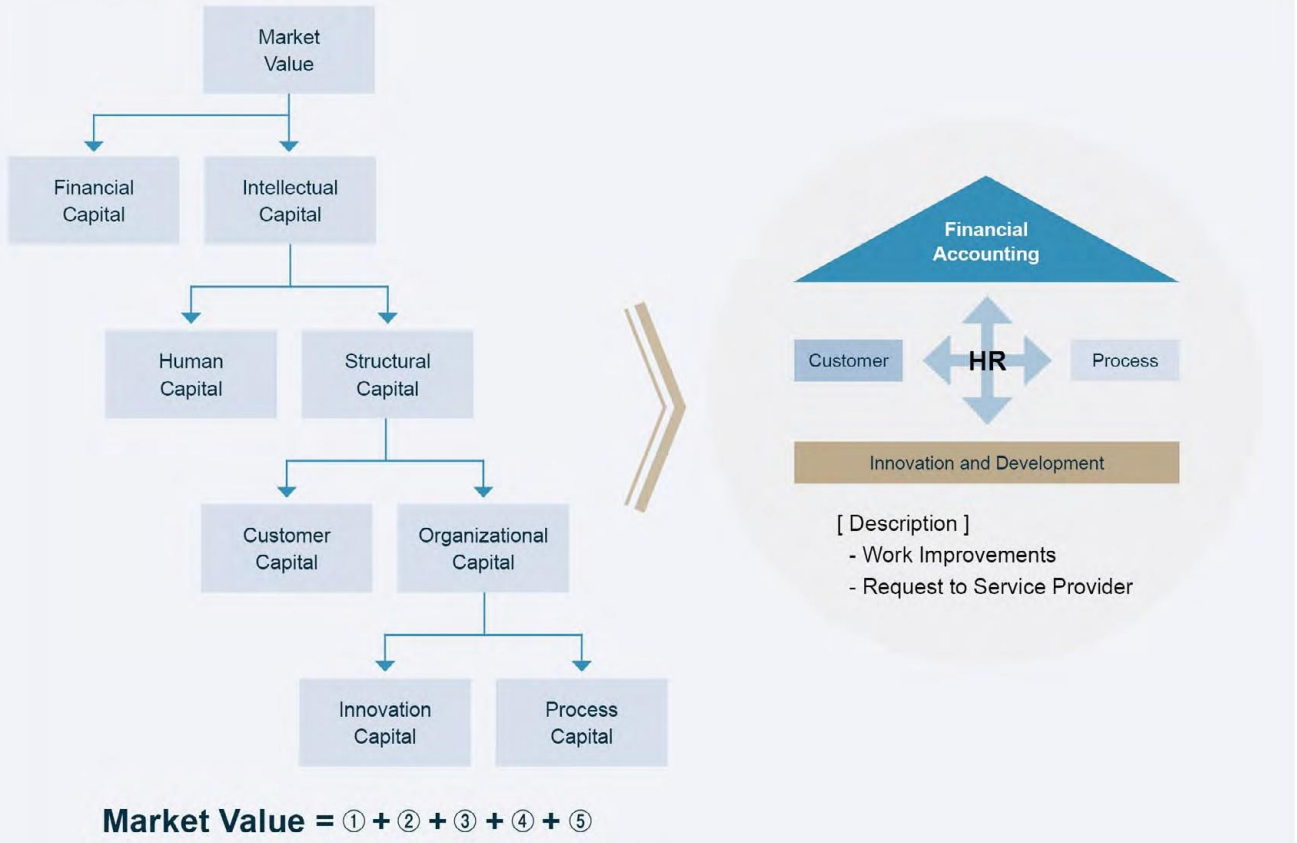


Figure 112. Basic Concept Diagram of IP Management Diagnosis Items

(2) Identifying Technology Demanded for Adoption

- In order to efficiently discover appropriate technologies that SMEs want to adopt, it is necessary to produce a form of specifications that describe the demands and needs

Example

<Demanded Technology Form of Specifications Korean Sample >

1. Technology Overview

1) Name of Technology
2) Summary or Introduction of Technology (Content, Features)
3) Product Application
4) Purpose of Technology Adoption and the State of Technology for Adoption
5) Scope and Projected Timeframe of Technology
6) Requests Regarding IP Rights and Patent
7) Method of Transaction and Payment Method

2. Introduction of Enterprise to Adopt Technology

3. Detailed Information to Facilitate Technology Adoption

e.g. advice for discovering technology provider, opinion or message on potential technology provider, tips and notes for discovering technology provider

- The service providing entity conducts research on technology agreement, commercializability, and technology provider after discovering a matching technology based on the written specifications form.

- Technology agreement decides whether the discovered technology provides the specifications and functionalities needed. Once the result shows that the technology does fulfill the purpose of technology adoption, proceed to the detailed negotiation stage.

- Commercializability studies can be made simple when there are multiple technologies discovered, and thorough studies can be done additionally during the negotiation.

- Technology provider inquiries are there to study and decide the eligibility of the technology owner. Competence factors, credibility factors, mutual compatibility in the business and strategies are some of the top criteria that are evaluated. If the technology owner is an enterprise, information such as enterprise overview, management status, level of technology and R&D strategies must be studied.

(3) Discovery Appropriate Technology

- Working with technology licensing offices in universities and research institutions would be an efficient way to discover technology that matches the needs of the buyer SME. It is also useful to set up evaluation criteria to provide an objective base for making the decision of technology adoption and use them to identify and select matching technologies.

Note

<Technology Discovery Process>

1.Vetting of the form of specifications for technology adoption that the SME submitted and extracting and combining keywords
2. Search patents from the patent database using the keywords. Focus the scope of search to registered patents to protect IPR.
3. Identify commonalities and/or similarities of the technology in demand and the selected patent by analyzing the patent summary, claim and drawings. Then prioritize among similar patents and sort and list patent information including name, registration/filing number, summary and patent claims.
4. Provide the patent information and specifications to SME for review

- For the patent that won the most attention from the SME among preselected patents, an analysis on the technology must be given by researching incumbent technologies and competing technologies in the same field. Then analysis on the patent rights by looking at the remaining period of patent rights, the strength, stability of rights, and whether the rights are acquired overseas. And finally, the marketability is analyzed to determine the technology's penetrability into the market and the market environment.

(4) Support on Negotiation and Contract Signing for Trading Patented Technology

- **[Forming a team of negotiators]** The service providing entity selects experts who will be involved in the negotiation process and forms a team of negotiators.

- The organization and role of negotiators are as follows:

- Chief Negotiator: The chief negotiator oversees the preparation process, sets strategies for negotiation, leads the negotiation proceedings, makes the final decision, and selects personnel with expert knowledge useful for negotiating. (i.e. technician, business expert, financial expert, lawyer, patent lawyer, etc.)

- Lawyer: In the case of joint capitals, mergers, and the import and export of technologies, lawyers must be familiar with the law of the adopting economy, and it is advantageous to hire multinational lawyers for international negotiations.
- Technician with expert knowledge or experience: A chief technician is needed for negotiations that focus on product and technology dealing with the specifications of product, quality guarantee methods and technology standards or product performance. More detailed technology items and contexts require separate specialists. PMs and technicians experienced in business and negotiation will have a significant impact on profit.

- Information must be gathered to set a strategy. Information is the foundation for setting negotiation strategies and is used to back up cases when persuading the counterpart. Some of the information needed for negotiations are information necessary for your team, which include information on the counterpart, FX rates, market current, and other information on external factors that may have an effect on the negotiation. If there is a competitor enterprise, it is important to gather information and latest news on the competitor.

- **[Negotiation]** Items needed at the negotiating table for a technology trading deal are as follows.
  - Glossary for contract
  - Scope or party of patented technology trade
  - Patent trading method
  - Cost (price) of patent trading
  - Payment method
  - Method of guarantying transferred technology
  - Arbitration and court of jurisdiction
  - Technology ownership of modified technology
  - Confidentiality clause
  - Response to third party infringement
  - Specifics on technology support (dispatch, technology material, etc.)
  - Effective date, period, and termination
  - Related taxes and payment obligations

- **[Reaching an Agreement and Signing of Contract]** Both parties need to discuss who will draft the contract and which language it will be written in. Once the contract is drafted, each party vets the contract to make sure every clause contains the agreed content and that both copies are identical. The contract is sealed with the signature of the representative of the negotiating team or the enterprise of each party. The following are the points to check before signing the contract.
  - Are the contract items a gain or loss for your party?
  - What are the risks and how can you minimize risks?
  - Does the contract correctly reflect what both parties agreed upon?
  - Is the contract unambiguous to a third party? Are there any hidden risks?

- Does the contract have a reasonable format and content for a lawyer?
- Does the contract include factors that conflict with other contracts or factors that may stir conflict?
- Is the language appropriate for the purpose of the contract?
- Is there any room for misinterpretation and related issues?
- Is there no content that goes against the law of the court of jurisdiction and international law?
- Has any of the content been omitted?

3) Guideline for SMEs

- The most important role of an SME in this program is providing detailed information to the service providing entity about the current status of technology development and management of the enterprise and closely cooperating with the service providing entity to ensure a smooth negotiation process once a technology match is made.

(1) Applying for the Program

- The first step of applying for the program is filling in an application form provided by the public institution in charge of the program. There are several points to check when filling out the application form.
  - The application form must include information on the main contact point of the SME, field of technology when consulting for patent trading, specifics of the technology to be adopted, patented technology transaction type (transfer, license, etc.), and the maximum price the enterprise is willing to pay for patented technology trading.
  - To ensure a higher possibility of being selected for the patent trading consulting program, SMEs need to describe the purpose of technology adoption and future plans of technology utilization for product development in detail.

(2) Working with the Service Provider

- SMEs applying for the program are expected to actively cooperate with the service providing entity for an interview session.

- In many cases, SMEs are reluctant to share information regarding trade secrets. Even a top-class service providing entity could not have a better understanding than the enterprise itself regarding the business the SME is planning after technology adoption is completed. Therefore, SMEs need to share with the service providing entity information regarding patented technologies they own, relevant market trends, and an analysis on the market and product. For successful consulting, SMEs must recognize service providers as business partners. This requires SMEs to make an effort to build trust in a short amount of time and share information needed for the job as much as possible.

2.5.6. Program Tips

1) Program Tips for Public Institution

- In operating this program, the biggest focus of the public institution must be building infrastructure. In most economies, patent trading is not as active and they mostly lack experts in the field. Therefore, for economies that do not have a vibrant patent trading market, it may be a good decision to run training programs for fostering patent trading specialists or distribute a manual to the public on trading patented technologies. It is also necessary to discuss ways to build infrastructures fit for the domestic market environment, for example, by running research groups on patent trading.

- The policy objective of this program is to nurture private patent trading institutions that are self-sufficient. The necessary steps are to put in place and manage indexes and methods for evaluation the performance of service providers and to limit program participations of the service providers which recorded a low SME satisfaction rate. Even if service providers win high ratings, they must be excluded from the program after participating for several years so that a greater number of small-sized private patent traders get a chance to participate in the program.

- In order to vitalize the patent trading market, the public institution must also focus on the publicity of the program. It is important to build a good reputation for the program to SMEs, universities and research institutes by promoting successful cases of patent trade consulting via newspapers, booklets, conferences and the media.

- In the selection process of program target SMEs and service providers, if there is need to validate the documents submitted by SMEs and private patent traders, the public institution needs to request complementary documents or conduct a site visit.

- In the negotiation stage, deciding on an appropriate price for a technology is often the point of disagreement between the buyer and seller. IP valuation is an objective way of setting a standard but casts a burden on small businesses because of its cost. One alternative to this is to build a database for reference during the negotiation process. The database would include data on trading cases such as the year, the field of technology, the type of patent transaction and paid price.

- Also, post program support methods such as additional development, attracting investment and supporting marketing operations can help SMEs boost their business performance after the technology transaction and help vitalize the patent trading market.

2) Program Tips for Service Providing Entities

- The focus of the service providing entity in order to enhance internal competence is to gain enough human network and experience. Trading technologies from various fields requires co-working with experts in those fields, which is why service providers must build a human network far before they join the program

- One of the hidden problems that service providers are faced with when consulting the SMEs is that SMEs do not provide enough information. Enterprises are mostly reluctant to share information on their enterprise or their competitors, and they often find it difficult to maintain an objective view. Service providing entities must make efforts to first build a relationship of trust with the SMEs, and they must pay continued attention and collect information and data on their business status and plans.

- Service providers must be thoughtful when drafting their proposals because, even after they enter the contract as the service provider, if the proposal is proven to have false representations or if the case does not meet the level of execution in the proposal, service providers are held accountable and must pay indemnities or compensations.

- In many cases, adjustments are made even after supported SMEs sign the contract. Therefore, service providers must establish a hotline for reporting to the public institution that contracted the program and maintain a constant flow of communication.

3) Program Tips for SMEs

- In securing needed technology, SMEs must choose the appropriate strategy from technology development, technology adoption, observation, and M&A depending on the market growth rate and the speed of technological development

- For instance, if there is great potential for growth in a currently small market, that gives time for developing technology. In this case, the SME is likely to decide to develop their own technology rather than obtain patents. If the market growth is rapid and an early launch of product promises great yields, it is reasonable to consider adoption of technology.

- On the other hand, in the case of rapid technological advancement in a slowly growing market with bleak projection, SMEs would tend to observe the situation rather than take swift actions. When both the market growth and technological development are taking place in a rapid pace, and if it is necessary to secure all management resources (technology, capital, and know-how) at once, it is time to consider M&A or a joint venture.

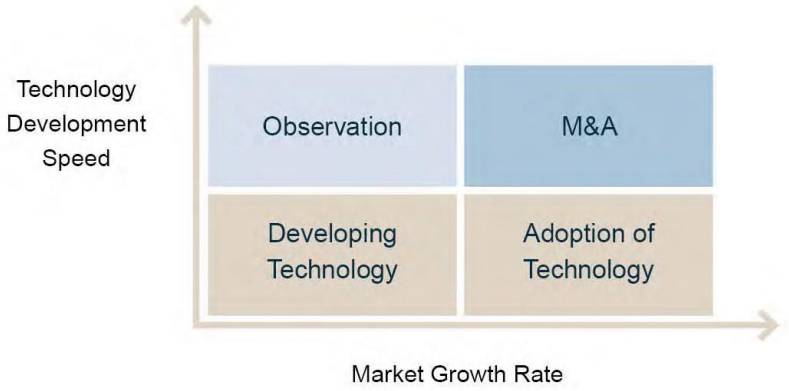


Figure 113. Adoption Strategy and Characteristics of Patented Technology

2.5.7. Successful Cases of Program Implementation

1) Enterprise A (Adoption of strategically important technology for SME to take a leap)

- Enterprise A is a manufacturer and seller of health food products made with natural and fermented ingredients. It wanted to adopt technology related to medicinal ingredients to increase revenue and expand their business.

- Enterprise A used a consulting agency specializing in the bio field and reviewed the technological viability, business feasibility, and commercializability of medicinal ingredient technologies owned by universities and public research institutions.

- The service providing entity worked with multiple technology providing institutes, and from the preselected technologies regarding natural materials, Enterprise A finally selected the technology for a chemotherapy side effects reliever.

- Also, the service providing entity took part in the negotiation process brokering the agreement between Enterprise A and the technology owner institute on a condition that enabled payment made in installments for each project stage.

- After signing the technology transfer contract, Enterprise A is currently carrying out additional technological development for commercialization.

2) Enterprise S (A technology transfer case of SME trying to enter the global market)

- Enterprise S based in Korea planned to take its eco-friendly soil technology to China's market by forming a joint capital with a private company in China but failed.

- Under cooperation with a technology trading agency in China, the program service providing entity discovered six Chinese companies that had demand for such technologies. Among the six candidates,

Chinese enterprise H went into a negotiation process for technology transfer with enterprise S. In order to prove the excellence of the technology, the program service providing entity applied it for Green Technology Certificate, invited enterprise H to have an on-site visit to the construction site in Korea, and provided assistance on negotiation for the technology transfer.

- Korean Enterprise S and Chinese Enterprise H formed a joint capital in China and signed a technology contract with a fixed technology payment of 1 million USD and a 30 percent running royalty.

- Enterprise H's right to the technology is limited to parts of China, and this will provide a stepping stone for enterprise S entering other Chinese regions.

3) Enterprise B (Consulting for patented technology trading and collaborated support for technology financing)

- Enterprise B is an SME that owns solutions including power generator and LEDs. While looking into business expansion, Enterprise B applied for the consultancy service for patented technology trading support program.

- **[Consulting on Patented Technology Trading]** After consultation, Enterprise B first considered adopting power generation technology owned by a public research institute but failed to reach agreements at the knowhow transfer stage.

- The two parties agreed on having a continued technology instructing process and signed a technology transfer licensing contract.

- **[Connecting to Technology Financing Program]** After technology adoption, Enterprise B needed to continue investing in technology development and commercialization at the same time. Upon learning the situation of Enterprise B, the public institution introduced it to IP collateral loan programs of financial institutions.

- The public institution requested active support from the financial institution and provided support in IP valuation through the IP Valuation for IP Secured Loan program, and the enterprise was able to secure capital for commercialization.

- **[Connected Program Support Effect]** By adopting a technology ready for commercialization owned by a university, Enterprise B captured the means to strengthen its technological competitiveness, and at the same time, got a IP secured loan from a financial institution which made it possible to secure the funds needed for commercialization, and laid the grounds for future competitiveness.

3.
IP Valuation Support Policy and Program

3.1.
Overview of Support Policy and Program Group

- While IP was usually considered as a means to develop and manufacture goods, the methods of utilization have diversified over time. Today, IP is utilized for procurement of business funding, proof for investment-in-kind or business feasibility review.

- To facilitate utilization of IP, IP evaluations should be able to provide an objective assessment of the excellence of IP, the probability of achieving business success through IP, or economic value an enterprise can enjoy by utilizing IP.

- The IP Valuation Support Program aims to foster an environment for IP valuation which will help SMEs receive objective and trustworthy IP valuation to utilize their IP in various ways. In addition, it aims to grant subsidies for IP valuation for SMEs.

- IP valuations that the program group supports, review factors such as technology, rights, business feasibility, and marketability on intangible IP or relevant technologies and give specific scores. The valuation results on the excellence of IP, business feasibility, or economic value created by the IP can be used as references for the purposes stated above.

- In many cases, financial institutions, investors, or even SME executives experienced in security, guarantee, credit loans or investment based on the evaluation of financial status but only rarely so in granting loans or investing based on IP competitiveness, business feasibility, or economic values.

- In order to operate the programs in this program group, the public institution needs to not only subsidize valuation costs but put in the effort for a long-term plan to foster the environment for IP valuation and its utilization.

- Currently, economies with advanced IP and technology industry are implementing financial programs utilizing IP valuation programs and the results thereof. Key examples are Zilongbao IP Financing in China, IP Valuation Support Program in Korea, EXIST in Germany, IP Finance (Promoting IP-based Financing) in Japan, IP Financing Scheme from Singapore, IP Finance Toolkit in the UK, and the SBIC in the US. Each program is run in a slightly different manner, but the SMEs of respective economies are benefiting by being able to utilize IP through these programs.

3.1.1. Implementation Stages of Program

[Introductory Phase] Implementation of IP Valuation Policy

- IP valuation considers future conditions of intangible assets, and IP is examined from various aspects such as technology, rights, marketability, and business feasibility, so it is difficult to provide an exact calculation. Furthermore, there are not many standardized IP valuation models or valuation methods with a certain level of credibility or experienced experts during the introductory phase.

- As a result, it is difficult to promote IP valuation only with the effort of the private sector in this phase. Thus, preparation of infrastructure for IP valuation requires support from the public sector.

- The most fundamental infrastructure for IP valuation are 1) IP valuation models that are fair and objective, 2) fostering an expert group to secure credibility of the valuation, and 3) establishing regulations to institutionalize the use of IP valuations.

- First of all, a research group must be formed to make IP valuation models that are in line with detailed policy objectives and situations of each economy. The research cost can be subsidized or the R&D work can be outsourced. Within the group, IP experts such as patent attorneys, and experts on technology, economy, accounting, and management should be included to develop reasonable valuation models through collaboration.

- When developing IP valuation models, the purpose of the valuation and who will be utilizing the results need to be taken into account. The valuation result can be used for various purposes such as reviewing the business feasibility of IP or acquiring secured loan, guaranteed loan, investment, and investment-in-kind. Each IP valuation model needs to have different valuation criteria and procedures that address the different purposes.

- To foster cultivation of IP valuation experts, it is recommended to provide training on IP valuation models or organize an IP valuation task force within the public institution. Also, IP valuation experts can be trained to have extensive experience by having a few from the task force or those who have received the training to conduct IP valuation for related programs in the initial stages.

- Without making IP valuation mandatory or establishing a law or institution setting the utilization purposes of the valuations, IP valuation might not be utilized and promoted fully. Therefore, the public institution is advised to promote development and utilization of IP valuation in the long-term by enacting laws and regulations to assign places where the valuation results from the support programs can be utilized.

[Expansion Phase] Expansion of IP Financing Based on IP valuations

- There are many IP financing models that utilize IP valuation, but main examples are secured loans, guaranteed loans, and investment.

- Financial institutions have a strict set of rules and procedures to screen applications for loans, investments or collateral, and they often adhere to a conservative stance in adopting new methods (IP valuation). Hence, if laws or regulations do not guarantee an adequate level of preparation and cooperation, it is difficult to make financial institutions utilize IP valuations.

- In the phase to promote IP financing, the public institution needs to support building infrastructure such as 1) establishment of a cooperative system with various financial institutions, and 2) enhancement of IP valuation models customized to financial institutions or detailed objectives of IP financing.

- In other words, it needs to be decided on which financial institutions (for loans, guarantees, investments, etc.) to cooperate with. Also, the support, procedure, and methods need to be determined to utilize IP valuation to negotiate with each financial institution or establish legal measures for it. Meanwhile, the format, deadline, and contents each financial institution requires in the valuation report should be considered. It is desirable to agree upon the size and period of public sector's support, and the countermeasures in the event of a default.

- IP valuation models can be applied differently depending on the financing purposes. For example, for investing institutions such as venture capitals, the expected profitability from a successful IP commercialization is crucial. However, for banks that utilize IP as collateral, the recovery value, that is, the amount that can be recovered through sales or licensing of IP in the worst case scenario, is a better valuation standard than profitability. Hence, it is reasonable to change valuation models even if it is the same IP depending on whether it is for investment or a loan.

- When the public institution works with financial institutions to promote IP financing, SMEs with excellent technology can receive significant help in commercializing their technologies which will enhance the value of IP utilization.

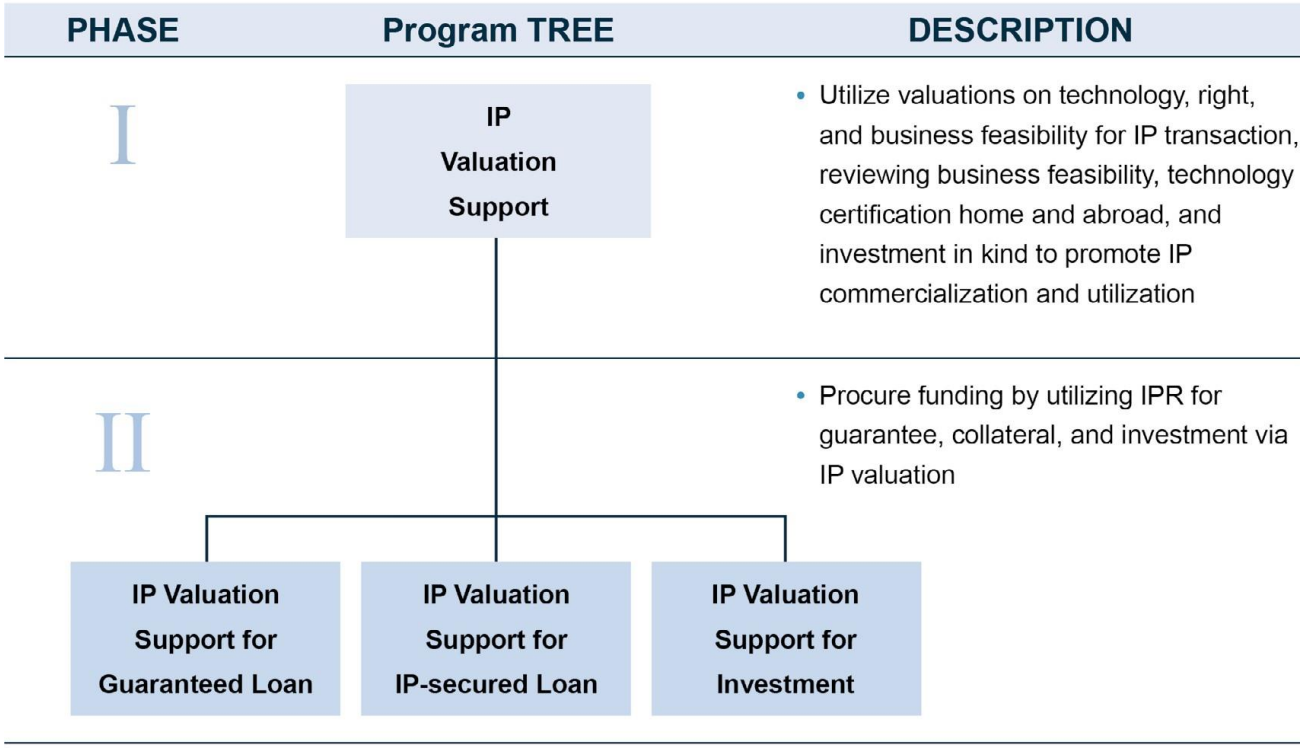


Figure 114. Program Tree (IP Valuation Support)

3.1.2. Self-diagnosis for Program Implementation

- By checking the answer to each question in the Phase Matching Flow Chart below, the implementing party can conduct a self-analysis of whether the environment for the program is ready and find areas that need improvement.

- For example, if the answer to “S1” phase is, “No,” it implies that the foundation for IP utilizing programs should be established first. If the answers to “S1~S4” phases are, “No,” it means they can start by building infrastructure to implement Phase I (legal measures on IP valuation, IP valuation models, and IP valuation experts). If the answers are, “Yes,” they are ready for Phase I. If the answers to all phases (S1~S6) are, “Yes,” they have the right infrastructure in place to start Phase II.

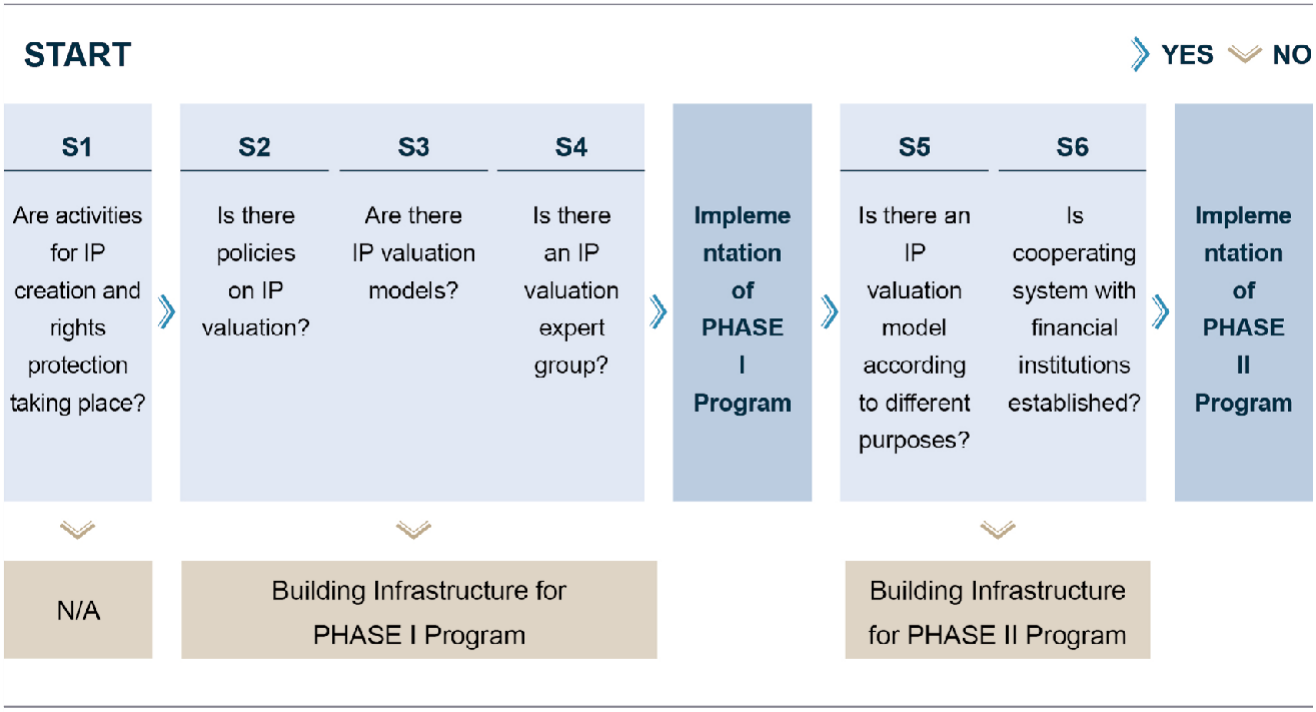


Figure 115. Phase Matching Flow Chart (IP Valuation Support)

3.2.
IP Valuation Support

3.2.1. Program Overview

Subsidize the evaluation costs of technology excellence, business feasibility, and economic value based on valuation criteria such as technicality, (patent) rights, marketability, and business feasibility on the IP (patent) owned by the selected SME

- This is the most central support program for IP valuation, as it subsidizes the cost of conducting performance analysis, comparative analysis, business feasibility, value assessment, etc. for patents owned by SMEs and individuals.
- Purposes of IP valuation may vary, as SMEs can utilize the valuation results to verify the competitiveness of the business relevant to the IP, estimate the appropriate amount for investment-in-kind, or to secure funding or technology certification.
- IP valuation is based on four valuation indices, which are technology, rights, marketability, and business feasibility with each index composed of more detailed indices and criteria. Before the program begins, a detailed valuation method and model need to be developed.
- Efforts should be made to establish a certain quality of IP valuation and credibility when this program is implemented for the first time. Not only should the IP valuation models suitable for the circumstances of each economy be established and experts cultivated, efforts should also be made on the operation and management side in order to improve the quality of IP valuation.

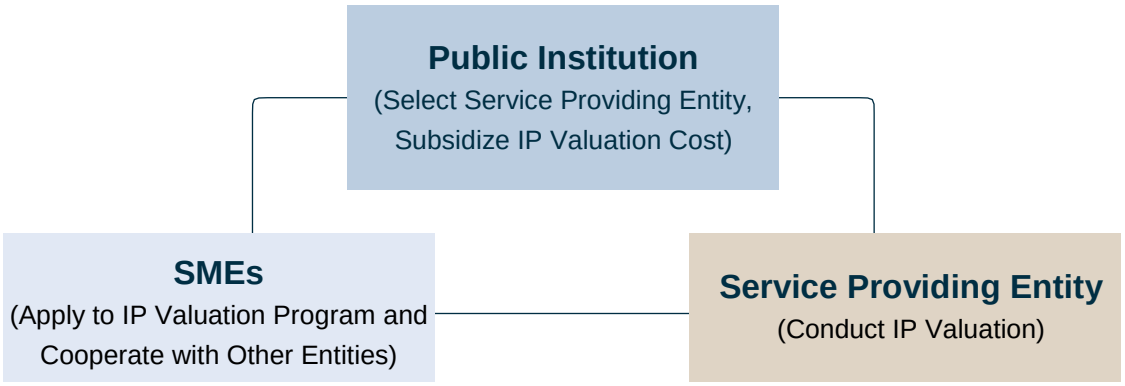


Figure 116. Program Framework (IP Valuation Support)

3.2.2. Similar Programs of APEC Members

1) Patent Valuation Support for Commercialization (Korea)

- The Korea Invention Promotion Association[104] (KIPA) is running the “Patent Valuation Support for Commercialization.”

- The program provides support in paying valuation costs for carrying out performance analysis and comparative analysis, business feasibility evaluation and value assessment. The purpose of the program is to provide objective valuation results to facilitate commercialization of patented technologies and their utilization.

- The target of support is individuals or SMEs who own registered patents or utility models, or those who are exclusive licensees.

- The scope of support is 70% of the valuation cost per case, up to a maximum of 40,000 USD.

- The patented technology valuation report includes valuation on technology, rights, business feasibility, and technology value, which can be utilized for patented technology transaction or used as evidence for reviewing business feasibility, technology certification home and abroad, and investment-in-kind.

2) IP Finance (Promoting IP-based Financing) (Japan)

- The Japan Patent Office[105] (JPO) evaluates the value of IP owned by SMEs and assists them in securing funding from financial institutions. To connect SMEs with financial institutions, the JPO provides the support in writing IP business valuation reports, and IP-based loan explanations and holds IP financing symposiums.

[104] The institution managing and operating IP-related programs
[105] https://www.jpo.go.jp/

Table 84. Promotion of IP Financing (Japan)

Items	Items
Support Writing IP Valuation Report	• The valuation institution working with the JPO writes a valuation report on the SME's ativities related to IP currently being screened for loan application, and sends it to a financial institution free of charge. • The financial institution is able to evaluate management by checking the rate of contribution of the patent or technology to the business and profitability through the valuation report.
Write Explanations of IP-based Loan	• Write explanations of IP-based loans by collecting and analyzing cases of IP-based loans from financial institutions and loans utilizing IP business valuation reports
Hold IP Financing Symposium	• Hold a symposium twice a year to introduce financial and public organizations working in the IP financing field, and promote and develop IP financing

3.2.3. Procedures and Details of the Program

1) Target of Support

- SMEs and individuals who own or are an exclusive licensee of registered IP (patent rights, and utility models) according to the filing dates

2) Program Process

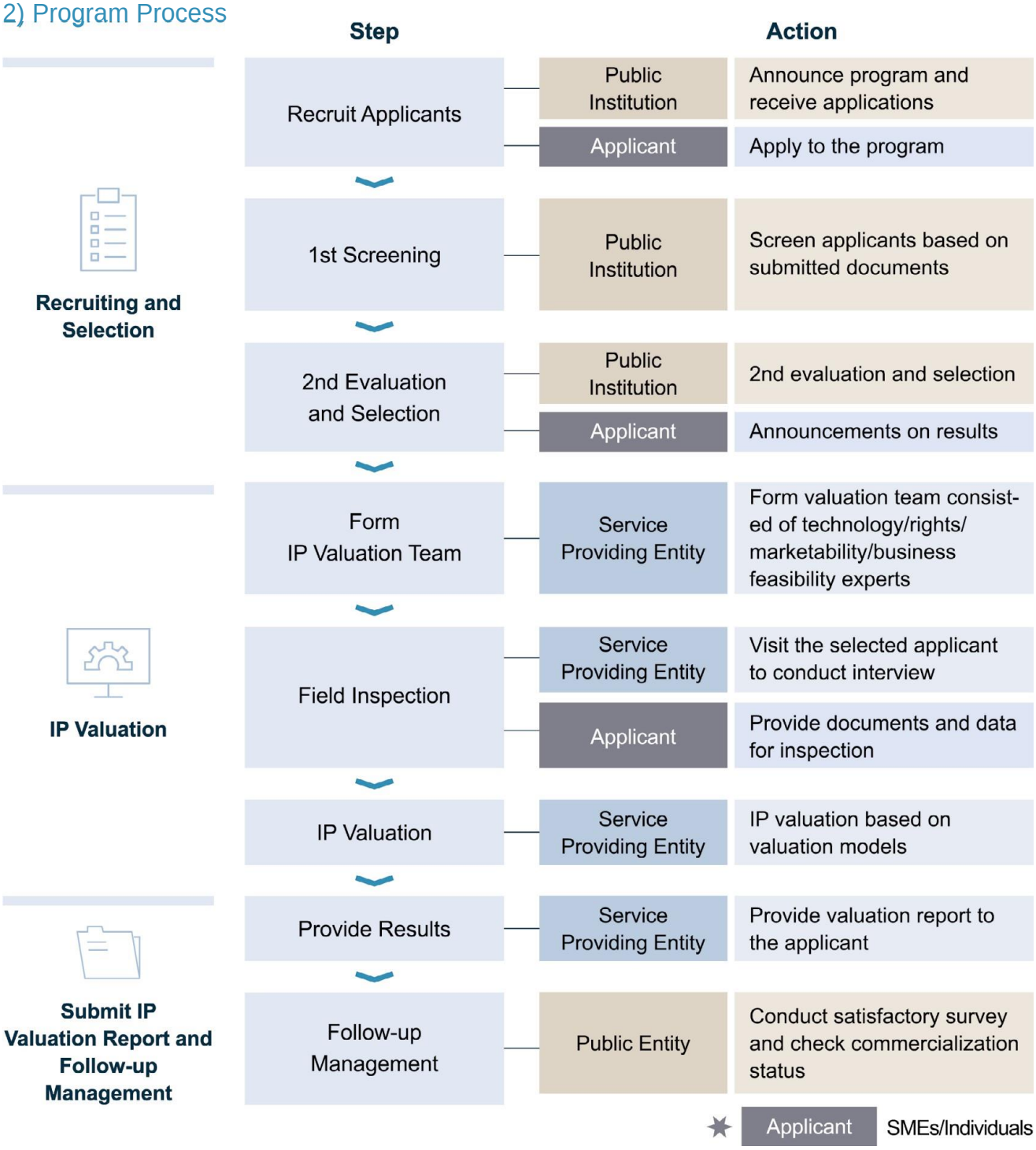


Figure 117. Program Process (IP Valuation Support)

3) Scope and Conditions of Support

- Subsidize the cost of writing an “IP Valuation Report” that includes evaluation of technology, patent rights, business feasibility, and technology value concerning the registered IP.

- The public institution provides subsidies to individuals or SMEs that participate in the program for a part of the IP valuation cost (e.g. 70% per case).

3.2.4. Guide Map for Participating Entities

Table 85. Guide Map for Participating Entities (IP Valuation Support)

Entity	Preparation	Program Process (Phase)						Follow-up Management
		1	2	3	4	5	6	
Public Institution	Program planning; Select and manage a service providing entity	Select SME					Subsidize valuation cost	Results and follow-up management
Service Providing Entity	Apply to the program and select a service providing entity		Form a valuation team	Request documents & materials to preliminary review	Field inspection, interview	Write valuation report	Submit valuation report	
SME		Apply to the program		Provide requested documents & materials	Field inspection, interview		Accept valuation report	

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up management.
- The program operates with a one-year timeline in general, which is flexible and can be changed depending on the circumstances such as budget.
- The chart summarizes the role of public institution[106], service providing entity[107], and SME in different phases of the process, and details on each phase are explained in *3.2.5. Detailed Guidelines for Participating Entities.*

[106] A public institution such as government departments operating and managing the program
[107] The prototype-maker of the program

3.2.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Develop IP valuation models, and select and manage service providing entities
2. Select the SME to support
3. Subsidize the cost of IP valuation

(1) Program Planning

- The public institution subsidizes IP valuation cost through this program by selecting valuation institutions (“Service Providing Entity”) for the evaluation. The specific plans of how to utilize the IP valuation results in practice is planned and carried out by the SME selected for the program.

- Hence, the public institution does not need to prepare negotiations with financial institutions to create financial products or combine with current financial products for the program, unlike the next phase IP valuation programs specializing in IP financing.

- However, the public institution should make special efforts to promote the program in the initial stages as most participants such as SMEs and researchers might not be aware of the purposes of IP valuation, ways to utilize the results, or how the valuation can be of use to them.

- The advantages of the program can be released through newspapers or websites for a certain period of time, and offline briefings can be held targeting SMEs or researchers in different local districts so that many SMEs will get to know the program and enjoy the benefits of the program by applying.

- Also, when internal guidelines are written with contents including the overall procedures of the program such as the procedure for selection of a service providing entity, program personnel information, planning report from the previous year and other important statistics, they can be useful for operating the program. Also, the guidelines would be especially useful when the person in charge has to be changed or when there are improvements to the program.

(2) Selecting and Managing Service Providing Entities

- The public institution needs to select a service providing entity that can be in charge of an IP valuation in an objective and fair manner.

- Service providing entity should be selected and assigned before the program begins. A valuation task force composed of qualified experts should be formed, and it needs to have IP valuation models on its own. It needs to be arranged so that only the designated service providing entity can write the valuation report.

- In the introductory stage of the program, there are only a small number of experienced experts to choose from. In this case, selecting public entities and public financial institutions as the service providing entities can secure credibility and help establish the program.

- Also, it may be difficult to find an institution capable of evaluating based on all of the valuation indices (technology, rights, marketability, and business feasibility). For example, public entities may be capable of evaluating the technology aspects but not from the perspective of rights or marketability.

- Therefore, the public institution needs to take into account performance capabilities of each service providing entity when assigning tasks.

- The number of service providing entities can be changed depending on factors such as budget and the demand for valuation. Once the valuation models establish themselves and the number of relevant experts increases, private enterprises such as patent and law firms or consulting firms can also serve as service providing entities in the program.

- For a stable and continued operation of the program, the public institution needs to establish legal measures and regulations stipulating selection methods and procedures for service providing entities, their selection requirements, work scope, and duties.

- The main work of service providing entity includes 1) evaluating technology and IP, 2) working for building valuation foundation such as developing valuation models, 3) conducting and analyzing demand studies on IP valuation, and 4) collecting data related to valuation and promoting utilization of valuation results.

- It is recommended for the public institution to select institutions that meet the following conditions:

Example

1. Have following experts as full-time workers:
- More than three experts who can evaluate IP with qualifications of being patent attorneys, accountants, technicians, doctorates or have such level of expertise.
- More than seven experts who have conducted IP valuation for more than five years
- More than 10 experts including the ones mentioned above

2. Have an IP valuation task force for the program
3. Have valuation methods for IP valuations (Valuation models)
4. Established data network for collection analysis and distribution of data needed for IP valuations
5. If the service providing entity has expertise in testing and performance analysis, it needs to have the needed equipment
6. Keep guidelines on the key elements of the IP valuation process such as standards for valuation cost and valuation procedures, and other infrastructure for valuation

- There are three main phases in selecting a service providing entity.

- ① Preliminary screening phase to check whether document requirements are met, ② the field inspection phase to visit the applicants and perform a fact check on the documents they submitted, ③the selection phase where an evaluation committee evaluates proposals from the applicants and selects the qualified applicant to be the service providing entity of the program.

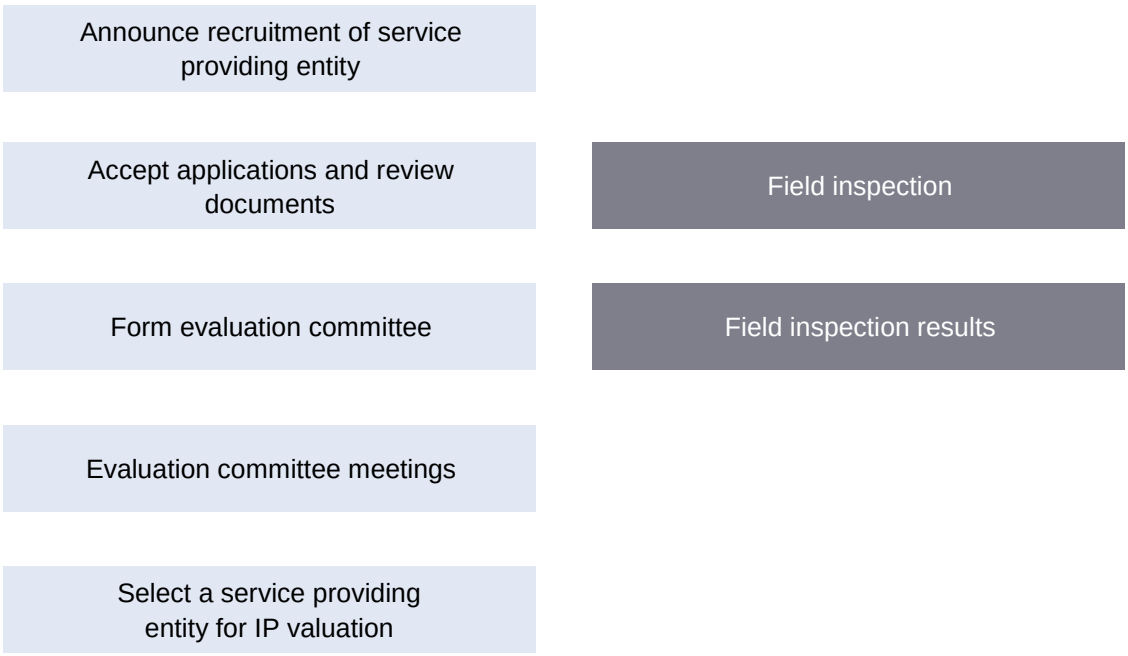


Figure 118. Selecting a Service Providing Entity

- The institution applying to the program should submit following documents:

  - Application to serve as a service providing entity
  - A certified copy of corporate registration and a copy of certificate of business registration
  - Documents proving requirements
  - A program plan including plans for work procedures and ways of promoting IP valuation
  - Other documents necessary for the selection of a service providing entity

(3) Selecting and Signing Contract with the Selected SME

- The public institution selects the SMEs who will receive IP valuation support.

- The criteria to select the applicant are 1) how excellent the technology related to IP is, and 2) the level of thoroughness of the plan for commercialization of IP. Additional criteria can be established to apply depending on conditions of each economy.

- Once applications have been submitted by SMEs, the public institution should screen the documents to see if they meet the basic requirements, and look into the applicants' history of applying to the program to eliminate providing duplicated support, and check whether an SME did not exceed the maximum number of participation in the program allowed for each entity.

- For those who have passed the screening, the first round of selection meeting is held with external

experts as evaluators, and a certain multiple the number of final applicants are selected (e.g. 150% of the number of the final candidates).

- The second round of committee meeting is held to evaluate the SMEs that passed the preliminary round of assessment, and it will be decided and announced which SMEs will receive support.

- After announcing the decision, the selected SME and the service providing entity sign a contract under the IP valuation support program.

(4) Subsidizing IP Valuation Cost

- Upon receiving the application for IP valuation cost support from the SME, the public institution reviews the application along with the attachment and request complements when needed.

  - Attachment: A copy of the IP valuation result report, expenses receipts, support application, etc.

- When the application is properly prepared without any issues, the public institution provides the agreed subsidy to the service providing entity.

(5) Follow-up Management

- The public institution should collect and keep results management data such as the level of satisfaction from SMEs that have received support, the scale of the subsidy, the technology transfer results, commercialization status and other factors for follow-up management.

2) Guidelines for Service Providing Entities

Key Activities

1. Form an IP valuation task force with internal and external experts and develop an IP valuation model
2. Form a team for IP valuation and conduct valuation

(1) Establishment and Management of IP Valuation Task Force

- Institutions or enterprises applying to become a service providing entity for the program should first form a task force for IP valuation.

- The task force should be composed of experts more than the required number (e.g. 10 people), and the experts should have experience for more than a certain period of time as patent attorneys, accountants, doctorates, technicians, or those who have equal qualifications.

- IP valuation experts should be able to conduct valuation on at least one or more of valuation indices, which are technology, marketability, rights, and business feasibility.

- As the program involves evaluation in various technology and industry fields, it is impossible for the service providing entity to have experts from all fields. Therefore, service providing entities should secure a pool of external experts even if it has many qualified experts within their task forces.

- Once IP valuation begins with a case assigned by the public institution, the person in charge of the service providing entity should form a task force composed of internal and external experts to commence the work.

- In most of the cases, it is difficult for an expert to be in charge of all four valuation indices (technology, rights, marketability, and business feasibility), which requires that multiple experts should gather their evaluations to write the final valuation report. Also, communication with the selected SME is crucial to maintain a certain level of quality throughout the program. Thus, it is desirable to appoint a coordinator to communicate, mediate and adjust overall valuation schedule with experts of different fields for better work efficiency.

- The coordinator can be one of the experts in charge of IP valuation or a separate person.

- Also, the person in charge of the service providing entity should put in consistent efforts to improve the quality of the valuation report.

- First, the service providing entity should have training sessions on actual cases of actual IP valuation, various IP valuation models and methods. The experts should continue to examine and research IP valuation methods, theory trends, know-how on applying valuation models, distinct features of valuation models per sector, integration process of valuation indices, etc.

- Also, to produce credible and qualified IP valuation report, the service providing entity needs to appoint a person in charge of quality control. The person would review and edit the written report on IP valuation, and share it with the experts to continue the process of improvement.

(2) Development of IP Valuation Models

- Generally, valuation models for intangible assets include ① market-based approaches which estimate the value based on similar trading cases, ②income-based approaches that translate future profit into the present value, and ③cost-based approaches which estimate the value based on costs needed to acquire the intangible asset. These models can be categorized into more detailed models.

- The service providing entity selects the IP valuation model suitable to the valuation target, purpose, and circumstances and specifies which models it will use.

Example

Table 86. Example of IP Valuation Methods

Market Approach	Income Approach	Cost Approach
Comparable Transaction Method Auctions Relief from Royalty	Technology Factor Relief from Royalty Multi-Period Excess Earning Incremental Income Method Real Options Method	Historical Cost Replacement Cost Reproduction Cost

- When the target market exists, for example such as the stock market for listed enterprise, and when there are abundant case examples, using the market approach is desirable and it can provide results with high credibility. However, if there is not sufficient market transaction data and if an IP is estimated to have greater value in the future than in the present, the technology factor method or relief from royalty from income approach are used often.

- Methods under cash flow approach consist of three phases: ①preliminary screening to review index with documents to check business feasibility, ②business feasibility evaluation phase to conduct a qualitative evaluation of the feasibility, and ③ the IP valuation phase which uses results from the second phase to conduct a quantitative evaluation to translate to current value.

- Details on relief from royalty and technology factor methods of income approaches are explained below.

(A) Relief from Royalty (Income Approach)

- Relief from royalty method estimates the saved royalty that the IP owner does not have to pay to a third party because it owns the right. Then, the estimation is translated into the present value.

- Select a license transaction similar to the IP to be evaluated and reflect the rate of royalties to calculate the value of the IP.

- The valuation based on this method begins with: ①the screening phase to review information on the IP and the enterprise mostly by documents, and ②the business feasibility phase in which qualitative analysis is conducted on the IP and the business the SME planned to assess the feasibility, and finally ③the valuation phase in which the economic value of IP is evaluated based on the results from the previous phases.

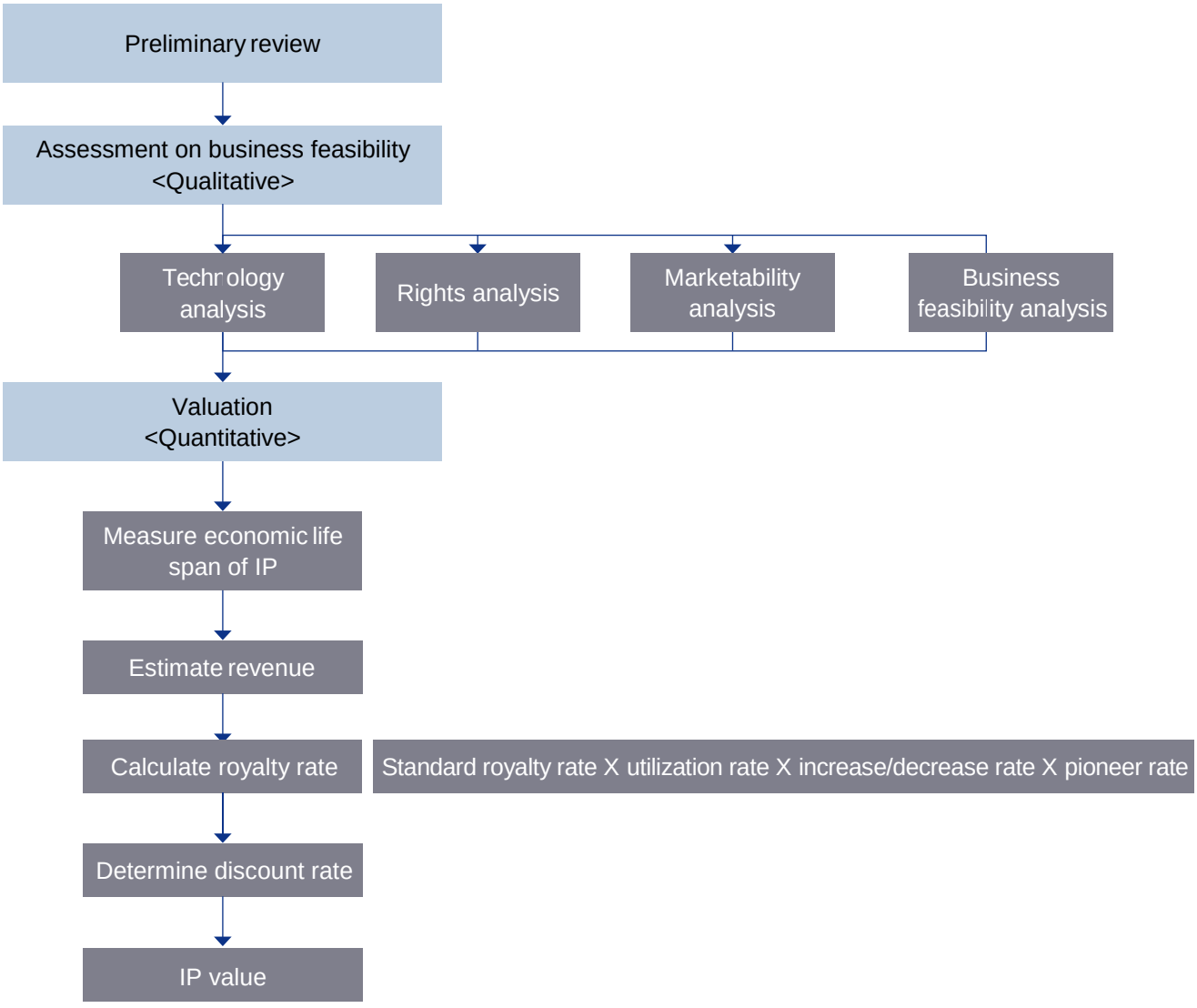


Figure 119. IP Valuation Procedure for Relief from Royalty Method (Income Approach)

- In this method, valuation is conducted by 1) estimating the economic lifespan of IP, 2) possible profit within that period of time, and 3) the rate of royalty needed to generate revenue to calculate profit in the future. At this stage, the discount rate should be applied to the number to get the estimated present IP value.

- The distinct variable of this valuation model is the royalty rate, and it is desirable to find cases with similar rates. However, as finding sufficient amount of cases is difficult in an IP valuation field, methods explained below can be adopted to estimate royalty rates.

< IP Value = Present Value of (Revenue x Royalty Rate) >

(Royalty rate = standard royalty rate x utilization rate x increase/decrease rate x pioneer rate)

Revenue	✖	**standard royalty rate x utilization ratio x increase/decrease ratio x exploration ratio**	✖	**discount rate**

- Revenue: The revenue can be estimated through various methods that take commercialization of the IP into consideration.
- The royalty rate is composed of standard royalty rate, utilization ratio, increase/decrease ratio, and exploration ratio.
- Standard Royalty Rate: This is the standard royalty rate (DB such as individual transaction cases, data on royalty rate per industry, and reasonable royalty rate data) to apply to the revenue. The standard royalty rate becomes the standard in estimating royalty rate for the IP. It is most appropriate to find the royalty rate used in a transaction with similar technology as the IP to be evaluated. However, if such a case cannot be found, median (or average) value of the royalty rate of the industry that the IP product belongs to can be applied.
- Utilization ratio: Out of all the technology that creates the product, the portion of the IP that takes place (When one patent is used to make a product, 100%).
- Increase/decrease ratio: Determined by considering the technology, right, market, and business aspect of the IP
- Exploration ratio: Determined by the factors such as the size of the investment for the IP to be made into a product and entrance barriers
- Discount Rate: The rate used to translate royalty revenues within the revenue estimate period by reflecting risks from technology, rights, and commercialization aspects faced within the commercialization process of patented technologies.

Example

Table 87. Example of Using Relief from Royalty Method

(Unit: Million KWN)

Item	1st Year (2015)	2nd Year (2016)	3rd Year (2017)	4th Year (2018)	5th Year (2019)	6th Year (2020)	7th Year (2021)	8th Year (2022)	9th Year (2023)	10th Year (2024)
Revenue	1,691	2,919	3,093	3,276	3,471	3,677	3,896	3,701	3,516	3,340
Royalty Rate	1.91%									
Royalty Earned	32	56	59	63	66	70	74	71	67	64
Taxes Such as Corporate Tax	4	6	6	7	7	8	8	8	7	7
After Tax Royalty Earned	29	50	53	56	59	63	66	63	60	57
Discount Rate	14.42%									
Present Value Interest Factor	0.8740	0.7639	0.6676	0.5835	0.5100	0.4457	0.3895	0.3405	0.2976	0.2601
Present Value	25	38	35	32	30	28	26	21	18	15
Total Present Value	268 (on January 1, 2015)									
IP Value	304 (on December 1, 2015)									

Valuation Date: December 1, 2015

(4) (B) Technology Factor Method (Income Approach)

- The technology factor method focuses on economic profit the IP and the related technology would generate in the future and translates it into present value. Considering that investment into technology enterprise is done with the forecast that it would be a successful business in the future, this method can be suitable for an IP valuation model.

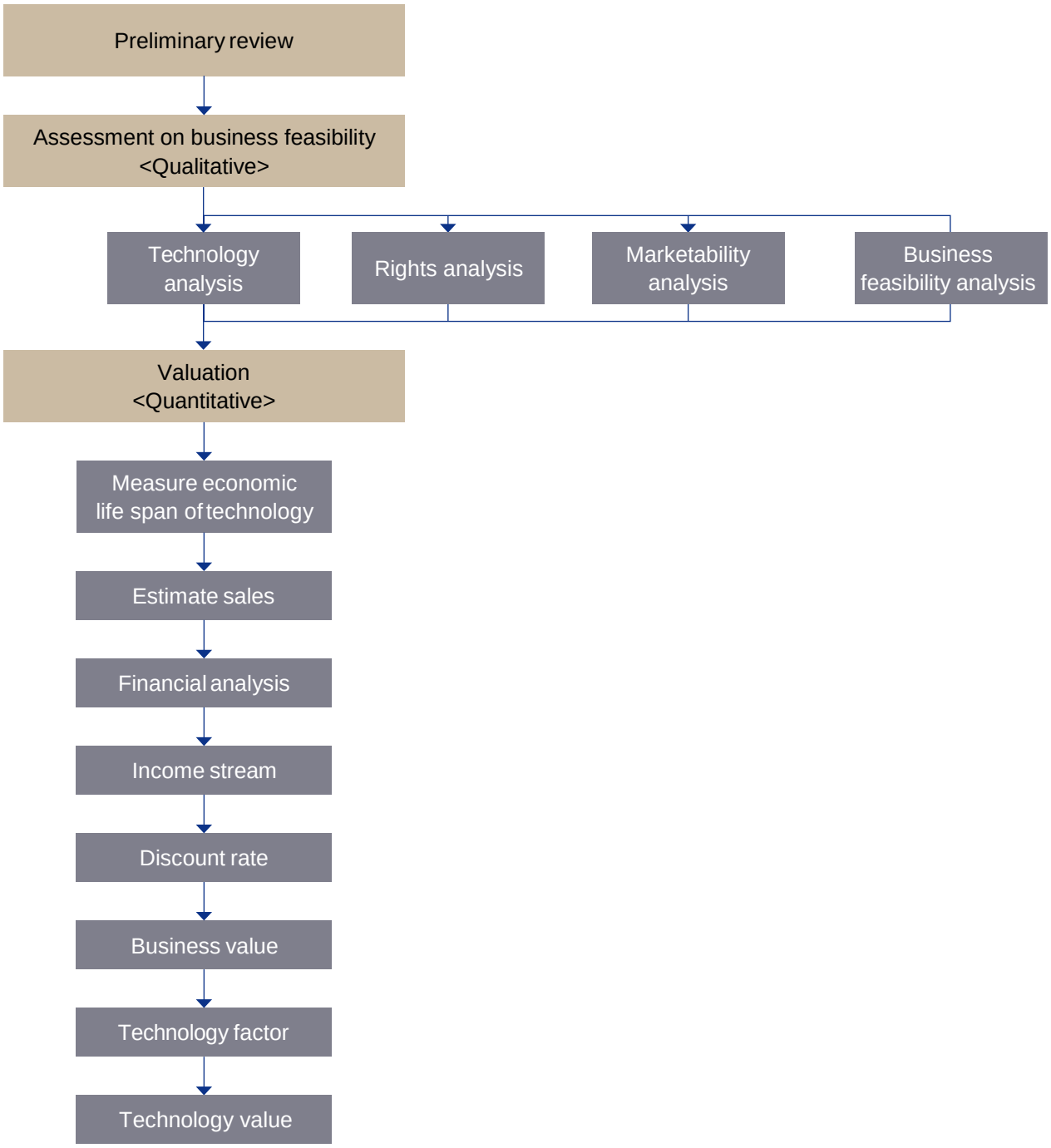


Figure 120. IP Valuation Procedure for Technology Factor Method (Income Approach)

- When using the technology factor method, factors involved are ①economic life (t) of IP ②estimated cash flow (CF_t) within the period, ③the technology factor which shows the level of contribution of the IP to the business value estimate, and ④the discount factor. The formula to calculate the value is explained below.

- The distinctive variable of this valuation model is the technology factor. The factor is set between 0~100% considering the attributes of individual technology calculated according to industrial features and qualitative valuations (valuation on business feasibility).

$$\text{Technology value} = \sum_{t=1}^{n} \frac{CFt}{(1+r)^t} \quad * \text{Technology factor}$$

- Time when cash flow is estimated (= IP's economic life)
- CFt : Cash flow within t period
- r : Discount rate
- Technology Factor: The percentage of business value that can be credited to the IP.
- Cash Flow: Business profit after tax (Sales – cost of sales – operating profit-corporate tax) + depreciation cost – capital expenditure – (±) change in working capital

Example

Table 88. Example of IP Valuation Calculation Using Technology Factor Method

(Unit: Million KRW)

Items	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	Total
	2017	2018	2019	2020	2021	2022	2023	
Sales	717	6,381	32,094	152,509	355,565	406,902	434,170	
Cost of Sales	469	4,176	21,003	99,808	232,694	266,291	284,137	
General and Administrative Expenses	149	1,328	6,680	31,744	74,008	84,693	90,369	
Taxes Such as Corporate Tax	11	171	948	4,632	11,385	13,092	13,999	
After Tax Operating Profit (A)	88	706	3,462	16,326	37,478	42,825	45,666	
Capital Expenditure(C)	5,000	3,000	3,000	-	-	-	-	
Depreciation(B)	200	550	850	1,000	1,000	1,000	1,000	
Changes in Working Capital(D)	269	2,125	9,647	45,179	76,186	19,261	10,231	
Return on Investment(E)	-	-	-	-	-	-	168,229	
Surplus Cash Flow(F) (F=A+B-C-D+E)	-4,981	-3,869	-8,335	-27,853	-37,708	24,564	204,734	
Present Worth Factor(G)	0.8723	0.7609	0.6638	0.5790	0.5051	0.4406	0.3843	
Present Value(H) (H=F×G)	-4,345	-2,944	-5,533	-16,127	-19,045	10,823	78,685	41.513
Technology Factor(J)								42.88%
Technology Value(K) (K=∑H×J)								**17.801**

(C) Qualitative Analysis (Business Feasibility Evaluation)

- The business feasibility evaluation phase is needed to acquire needed estimates for IP valuation. The phase includes conducting qualitative evaluations of IP and technology.

- Basic evaluation items are technology, rights, marketability, and business feasibility and each item has more detailed sub-categories. Depending on features of the product or the technology, the evaluation items, sub-categories and criteria can be changed.

- <Technology> The evaluation of technology involves assessing the technical excellence by examining criteria such as ① completeness of technology development, ② extent of the efforts needed for additional development (for commercialization), ③ originality, ④ probability of a replacement technology being developed, ⑤level of difficulty to create imitations, ⑥the phase of technology life cycle and ⑦technology expandability.

- <Rights> The evaluation of rights assesses the excellence of the registered IP as a right by looking into ⑧the appropriateness of IP portfolio, ⑨the breadth and narrowness of right's scope and ⑩the stability of the rights.

Example

Table 89. Example of Technology/Rights Criteria to Evaluate Business Feasibility

Evaluation Item	Category	Sub-category	Description
Technology	Implementation	1. Completeness of technology development	Evaluate the completeness of the development of the technology
		2. Additional development	Evaluate the time and efforts needed to bring the credibility and integrity of the technology to the commercialization level
	Competitiveness	3. Originality	Evaluate distinct features of points of advantages the technology has compared to other competing technologies
		4. Probability of development of a replacement technology	Evaluate whether a technology to replace the technology exists and the probability of one being developed
		5. Difficulty to make imitations	Evaluate the risks from imitations or information leak
	Utilization	6. Technology life cycle phase	Evaluate the probability of utilization in the future by identifying the technology's life cycle phase
		7. Technology expandability	Evaluate whether the technology can be applied and expanded to other products, or technology fields
	Technology Protection	8. Appropriateness of the IP portfolio	Evaluate how comprehensive the scope of the rights of the relevant patent pool is
Rights	Scope	9. Breadth and narrowness of right's scope	Evaluate how comprehensive the scope of the rights of the relevant patent pool is
		10. Rights stability	Evaluate legal stability of the rights of relevant patent pools

- <Marketability> This evaluation item analyzes relevant product (service), and market status by evaluating ①potential growth of the market, ②level of competition in the market, ③market entry barrier, ④level of demand and ⑤the probability of acquiring a market position.

- <Business> The evaluation item forecasts and evaluates competitiveness of the technology once it is commercialized by examining ⑥how easy it is to manufacture, ⑦profit forecast, ⑧growth of revenue, ⑨ease of marketing and ⑩the size of funding needed for commercialization.

Example

Table 90. Example of Marketability/Business Criteria to Evaluate Business Feasibility

Evaluation Item	Category	Sub-category	Description
Marketability	Market Environment	1. Potential growth of market	Evaluate the growth phase of the market for the technology and the potential growth
		2. Competitiveness	Evaluate market structure, types of dominant players, whether there is monopoly, or whether there is too much supply of competing products
	Market Competitiveness	3. Entry barrier	Evaluate the exterior and environment-related barriers about of different market entry barriers and whether there are incentives
		4. Level of demand	Evaluate the forecast of demand in the market
		5. Acquiring market position	Evaluate possible market positions the enterprise can acquire with the technology
Business	Productivity	6. Ease of manufacturing	Evaluate use of production facilities and ease of procuring raw and sub-materials during the commercialization process
	Profitability	7. Profit forecast	Evaluate profitability of enterprises conducting business with similar technology based on operating profit
		8. Revenue growth	Evaluate growth of sales for enterprises conducting business with similar technology
	Marketing	9. Ease of marketing	Evaluate environment setting and marketing infrastructure for enterprises conducting business with similar technology
	Required Funding	10. Size of funding needed for commercialization	Evaluate the size of the funding needed from the phase of technology transfer to commercialization

- Each item is given a score (e.g. 0~10 points) and the total sum is calculated. The scores can be weighted if needed.

- Once the qualitative valuation is completed, determine the economic life (t) of the IP, revenue, cash flow (CFt), discount rate (r) and technology factor based on the valuation to calculate the value price.

(3) Performing IP Valuation

- IP valuation consists of 1) the valuation preparation and screening phase, which is the stage to form IP valuation team and prepare documents, 2) the field inspection phase to visit the SMEs and conduct interviews, 3) the phase for research and analysis of each of valuation item, 4) the valuation meeting among experts on the valuation results and 5) writing the final valuation results report.

Table 91. IP Valuation Process

Items	Description	Duration
Preparation	Form an IP valuation team Request and review documents(Check business plan, patent status, understanding of technology application market and technology, etc.)	One Week
Field Inspection/Interview	IP Valuation Announcements Explain the enterprise (Advantages and disadvantages of the technology, market characteristics, business status of similar enterprises or those in the same field, financial and management analysis data collection, etc.) Q&A and fact check the submitted documents	
Examination and Analysis	Technology analysis such as technology trend, advancement of technology, technology competitiveness, and life span and analysis of prior arts and rights Analysis of marketability such as market status, product life span, market size, estimated sales, etc. Analysis of business feasibility such as business capacity of the enterprise Analysis of the same field or similar enterprises, financial status, etc. Risk analysis such as business risks, technology risks, and market risks Valuation	Three Weeks
Valuation Meeting	Qualitative analysis of technology, right, marketability, and business value Analyze appropriateness and consistency of IP valuation and valuation opinions Analyze appropriateness and consistency of logic in each expert's report	
Write and Submit Final Report	Final review of the report from each field Final review of the overall contents Hold evaluation committee meeting when needed Final negotiation with the requester and review complaints Submit the final report	One Week

(A) IP Valuation Preparation

- The service providing entity should form a valuation team composed of experts on technology, marketability, rights, and business feasibility to evaluate the IP owned by the selected SME and a person in charge of IP valuation team.

- Moreover, the person should be appointed to be in charge of performance that oversees the team and a coordinator for progress.

- If necessary, the service providing entity can hire external experts under contracts to be included in the IP valuation team. In such a case, the service provider should make external experts sign and submit non-disclosure agreements and integrity pacts to maintain confidentiality.

- The coordinator of the team should share IP valuation models and technology valuation report formats with experts of each field and negotiate with the selected SME to schedule a field inspection.

- The coordinator should request documents for screening before going on the field inspection. Requested documents would include those related to IP, the business plan utilizing IP, materials showing financial status of the enterprise and other data on technology market.

- Also, the coordination should check whether experts of the IP valuation team request additional documents and if there are requests, convey the message to the SME.

- The documents submitted by the SME should be collected and shared before the on-site inspection for screening.

Example

Table 92.Example of Document Request Prior to Field Inspection

No	Items
1	Business plan
2	Granted patent number - Patent-related documents, if documents are not released because it was recently registered, request patent specification.
3	Financial statements
4	If there were license contracts, relevant documents
5	Recent sales operation and sales results, and future plans
6	Self-analyzed domestic and overseas market data - Estimation of market size, etc
7	Self-analyzed data on competitors - Enterprise overview, operating results, sales results, etc.
8	Other documents needed for IP valuation

(B) Field Inspection and Interview

- The IP valuation team of the service providing entity visits the SME for an on-site inspection.
- The representative of the enterprise, core technology developers and key executives should participate in the inspection, and inspections venues should include the HQ of the SME, research facilities and manufacturing facilities.
- Generally, the coordinator during the on-site inspection has to briefly explain the IP valuation, the SME and the SME's technology, hold a Q&A session between the experts and the SME and check facts on the submitted documents.
- Experts of technology, marketability, rights and business feasibility should ask respective questions and request needed documents to receive them on the spot or make additional requests.
- Along with the Q&A session, the visitors should check the facilities where technology development and production take place, the level of personnel and equipment, and whether the application is based on facts.
- Experts of each field should write valuation report for his/her respective field according to the valuation models and report formats. After valuation meetings, the coordinator collects the reports and edits them to produce the final valuation report.

(C) Examination/Analysis of Valuation Items and Valuation Meetings

- The IP valuation team conducts analysis to write IP valuation reports based on the data gathered from the application, the field inspection and other necessary data.
- The expert on technology analyzes technology trend and current level of advancement of the technology related to the IP as well as the competitiveness of the IP technology and its lifespan.
- The experts on rights should review stability of the rights with prior art search and contents in the patent claim to analyze the scope of the rights. Also, the patent status of the selected SME should be compared to other competitors' status to analyze suitability of the IP portfolio.
- The experts on marketability should analyze factors such as the status of the related markets, the lifespan of the technology, the size of the market and future profit forecast.
- The expert of business feasibility should analyze internal capacity of the selected SME, business models of similar enterprises in the same field, financial factors, risks of business, etc.

- Generally, the business feasibility experts should be the in charge of producing the final valuation report.

- Once each expert completes his/her analysis, the person in charge of the valuation opens evaluation meetings (or evaluation committee meetings) with each field expert and the coordinator participating.

- In the meeting, the suitability of the analysis results from each expert will be reviewed in a comprehensive manner, and valuation opinions, ratings and consistency among the reports should be examined.

- Under the following circumstances, valuation results can be reviewed and adjusted in evaluation meetings (consisted of the person in charge of valuation and the experts).

  - When there is a big difference in rating among technology and marketability/business feasibility items.
  - When valuation results of a particular item is found to be peculiar
  - When there are errors in the valuation results
  - Other conditions in which valuation results, rating change or adjustment are deemed necessary

(D) IP Valuation Report Contents

- Generally, an IP valuation report is composed of 1) valuation summary 2) table of contents, 3) evaluations on each category/item (technology, rights, marketability, and business feasibility) and 4) a comprehensive conclusion.

- The technology evaluations consist of the followings:

  - Trend and prospect of the IP
  - Overview of the IP to be assessed
  - Distinct features and strengths and weaknesses of the IP (Include evidence such as performance tests depending on the case)
  - Research and analysis of similar competing/replacement technologies
  - Analysis of distinct features, strengths and weaknesses of competing/replacement technologies
  - Comparative analysis of performance and quality of the IP compared to competing/replacement technologies
  - Identify differentiated factors of the IP
  - Identify the level of advancement of the IP and probability of imitating
  - Based on relevant technology trend and prospect, identify where the IP stands and check its competitiveness
  - Find utilization of the IP by looking into life span of the IP product or the IP's industry.
  - Analyze commercialization factors such as the level of IP technology development, additional development tasks, additional development periods, etc.
  - Purchasing technology data on the technology trend, prospect, and competing replacement technologies

may be needed. For reference data, thesis statements, patents, technology trend and prospect analysis report, technology roadmap and books can be used.

- The rights evaluations are composed of the followings:

  - Current status of the IP to be evaluated
  - Evaluation of competitiveness by reviewing IP rights of the SME
  - Prior art search on the IP
  - Analysis of competitiveness of the IP compared to other relevant IP
  - Evaluate competitiveness of the IP by conducting a comparative analysis with IP of other enterprises, and coverage of the rights, scope and legal stability

- The marketability evaluations are composed of the followings:

  - Defining scope of market-related to the IP product
  - Analysis of surveys of the market relevant to the IP (Mostly, surveys are done both home and abroad)
  - Analysis of the features of markets with the IP applicable such as existence of a market, market type, competition structure, the size of the target market, demand attributes, etc. (Trend analysis reports should be purchased if needed.)

- The business evaluations are composed of the followings:

  - Survey the IP-related businesses that are carried out or will be carried out
  - Analysis of the business value and profitability of relevant enterprises
  - Analysis of the current status of equipment and facilities, and raw and sub-material procurement
  - Analysis of the financial status of relevant enterprises
  - Analysis of the marketing activities of relevant enterprises
  - Utilize online database or business information reports that show data on enterprises

- When the IP valuation is completed, the SME is notified in the form of a document or a phone call. During the period to give opinions (file complaints), receive opinions from the SME on the valuation result.

- For credibility and fairness of the valuation, the service providing entity should have quality management committee meetings before submitting the final report. It is recommended to have third party experts that have not participated in the valuation to organize the committee meeting. Within the meeting, whether the valuation model was applied in an appropriate manner and whether the report was written logically should be checked.

(4) IP Valuation Report Format

- **[Format for Table of Contents]** The table of contents for the IP valuation report can be made as explained below:

Example

< Example of Table of Contents for IP Valuation Report >

I. Summary of Valuation Results
1. Valuation overview
2. Technology-based business overview
3. Valuation method, procedures, and major hypothesis
4. Valuation result summary

II. Technology Analysis
1. Technology overview
2. Technology trend
3. Usefulness and competitiveness of the technology
4. Comprehensive analysis of the technology

III. Rights Analysis
1. Patent contents
2. Information on relevant patented technologies
3. Rights analysis and evaluation opinions
4. Comprehensive opinions on rights

IV. Marketability Analysis
1. Product based on technology and market overview
2. Distinct features of the industry
3. Market status and size
4. Comprehensive opinions on marketability

V. Business Feasibility Analysis and Value Calculation
1. Business overview
2. Business to be evaluated
3. Business feasibility analysis and value calculation

3) Guidelines for SMEs

1. Prepare to apply to the IP valuation support program.
2. Actively cooperate with the service providing entity by providing requested documents for valuation or field inspection when asked.

(1) Applying to the Program

- For an SME to receive support from the program, it first needs to have a patent that can be commercialized acquired either through R&D or technology transfer and submit the application.

  - Documents for Applying to the Program: A letter of request, application, consent for collection and utilization of business information, power of attorney, subsidy application, and the consent to transfer valuation cost subsidy, etc.

- Also, the SME needs to establish a specific business plan utilizing its IP, and by addressing the valuation process in a diligent manner, it can increase the chance of receiving the support.

(2) Preparing and Cooperating for Field Inspection for IP Valuation

- The SME needs to cooperate with the service providing entity on having field inspections, and actively respond by providing documents when asked by the IP valuation team.

- The information the SME should provide to the service providing entity should not only be about its R&D but also about the relevant market and industries, management of the enterprise, and its financial status. Below is an example of a list of documents that should be provided by the SME.

Example

< Example of Documents SMEs Should Provide >

1. Technology Overview
   - Brief explanations of the IP

2. Main Contents and Completeness of the IP
• Main Contents
   - Most distinct attributes of the IP compared to other technologies
• Completeness
   - Level of technical completeness and development of the IP (Distinguishing levels on establishing definition, pilot producing, and mass-production)
   - The need for additional development of the technology for commercialization

3. Regarding additional developments for Commercialization
• Additional Technology Development
   - Additional technology to be developed for commercialization of the IP
• Technical Problems
   - Major technical problems that are expected to occur during the additional development process
   - Necessary resources needed to resolve the problems (From technology, personnel, and finance aspects)
• Commercialization Cost
   - The equipment, cost, and time needed to make commercialization to the mass production level for the IP (Exclude buildings or land sites and write only about production equipment)

4. Distinct attributes different to other technologies such as advantages and disadvantages of the technology
   - Areas of relative competitiveness compared to other technologies and expects effects

5. Application field of the Technology (Product/Services applicable)
   - Write down products/services to which technology can be applied in the order of feasibility

6. Target customer and buyer of the product with technology applied
   - Factors that will increase purchase and potential buyers of the product with the IP applied.

7. R&D status and the entity on the day of evaluation (today)
   - The R&D trend of technologies related to the IP to be evaluated
   - Trend of competing enterprises and developers' R&D on relevant technologies

Example

8. Current application and utilization of the technology
   - Application of IP and the form of application

9. Competing technologies
   - Candidates of current and future competing technologies
   - Case of application for current competing technology
   - Information on enterprise, institution, researcher that are running R&D on or own competing technologies

10. Technology literature
   - Technology literature related to the IP

11. Information on joint R&D
   - Information on external research institution or enterprise which worked together for development of the IP

12. Market size
   - Size of markets home and abroad for the IP-related products and forecast on potential market

- **[Document Preparation Prior to Field Inspection]** The SME should prepare documents needed prior to the on-site inspection.

  - A list of documents to be prepared before the field inspection: Business plan, the patent to be evaluated, financial statements, document related to license contracts, sales for the past couple of years, profit results and future plans, data on markets home and abroad, competitors and other information provided to investing institutions

- **[Field Inspection]** The SME should actively cooperate with the service providing entity for field inspections. The enterprise should set the place of business (HQ, factory facilities etc.) as the venue for inspection and discuss the selection with the service providing entity. The representative of the enterprise and core personnel such as R&D personnel should participate to explain the point of differentiation of the IP, its competitiveness, market status, capacity of the enterprise, and future business plans and answer the questions asked with thoroughness.

  - A list of things to prepare for the inspection: Government-related data, production flow chart, analysis of the profit per unit of product made based on the IP, the product's production plan, recent sales results (both home and abroad), marketing status and strategies, business risk factors and explanations, quality, safety, product, technology, environment certification status, etc.

3.2.6. Program Tips

1) Program Tips for Public Institutions

- **[Selection and Management of Service Providing Entity]** The service providing entity should be given the environment to conduct IP valuation in an objective manner. SMEs may be heavily influenced by the valuation results, so problems may occur in which the SMEs make strong complaints about the process or results of the Valuation, the person in charge of valuation or the service providing entity.

- Hence, the public institution should select a service providing entity that is qualified and can produce objective results. The institution should also find ways to verify the entire process of the IP valuation to prepare against possible complaints from SMEs. Also, an environment to conduct valuations without external pressure is necessary.

- For consistent management and improvement of quality of IP valuations, there should be seminars and workshops held regularly or every often for IP valuation personnel and experts. In some cases, it is advised to have a separate service business for further development and sophistication of valuation models.

- **[Implementation Environment per Economy]** The program does not link valuation results with secured loan or investment as a mandatory. However, in actual implementation cases, the results are used for technology transaction, commercialization, certification, investment-in-kind and marketing. Therefore, the public institution should first check whether the economy is equipped with the minimum environment to implement the program before deciding the implementation.

- **[Securing Enterprise's Share of Cost]** When the program does not provide subsidy covering the entire cost of valuation, the enterprise has to burden the rest of the cost incurred in the program.

- When the IP valuation results are not positive, SMEs can face obstacles in carrying out their business plans. In these cases, SMEs may refuse to pay their share or delay the payment, which may burden the process of the program. To prevent such events, the SMEs should be aware about the purpose of the program and there should be rules and regulations set to ensure that irrelevant to the valuation results, the enterprises would pay their share of the cost.

2) Program Tips for Service Providing Entities

- **[Forming and Operating an Expert Pool]** For fair valuation, a pool of internal and external experts should be formed. Also, to strengthen their capacities and enhance the quality of IP valuation reports, regular training should be prepared.

- In particular, it may be difficult to quickly expand and improve experts' experience and capabilities when they do not handle many IP valuations. Hence, it is desirable to create a comfortable atmosphere for the experts to share, discuss, and examine problems and solutions.

- **[Field Inspection]** The service providing entity should conduct an on-site inspection after reviewing the selected SME's commercialization plan and other documents needed for the valuation. Thus, it is efficient to make a list and standardization on the documents needed for field inspections.

- Also, during the inspection process, valuation experts should heed to the opinions from the SMEs (individuals), discuss general issues and pay close attention to features of the core technology personnel or the CEO that does not show on documents when reviewing the necessary data.

- The person in charge of carrying out of the program or the coordinator should be trained to not be seen as authoritative or pessimistic to the SME during the valuation process.

- Some SMEs may not have the capacity to properly prepare the documents (business plan, financial statements, cost studies, data on competitors, etc.) needed for the service providing entity to carry out inspections.

  - When there are not enough data or proper preparation is difficult due to lack of manpower, it is difficult to carry out an accurate valuation within the set period, so the service providing entity should advise the SME on this matter and at least collect data orally by having interviews on site.

- **[Writing IP Valuation Report]** When writing the report, experts should have thorough discussions on technology, rights, marketability, and business value aspects. As many experts collaborate to make one report, writing styles, logic, valuation opinions may contradict each other and it might be difficult to come to a single conclusion. Therefore, adjustments should be made in order to produce a coherent report.

3) Program Tips for SMEs

- Before applying to the program, SMEs should first specify the reason why they need the valuation and present the business plan utilizing IP valuation. When they apply out of curiosity or without proper preparation, it might result in low quality valuation results.

- **[Working with the Service Providing Entity]** SMEs need to acknowledge and trust the expertise and objectivity of the service providing entity.

  - The selected SMEs hope to get good results on their IP, but the service providing entity aims to give objective valuations to heighten the credibility of valuation reports. Hence, although their positions may clash, SMEs need to acknowledge the objectivity and expertise of the service providing entity.

- Also, it is recommended that SMEs prepare abundant data on excellence of their IP, objective information on the relevant markets, other cases that may help the program, etc. Experts should collect and analyze such data, but if the SMEs have them prepared and provide them to the experts, it would prove to be helpful in getting positive results.

- **[Preparation for Field Inspection]** The service providing entity conducts valuation based on the data from SMEs, field inspections, and experts' in-depth analysis per field. Through on-site inspections, valuation experts can learn about the IP, IP-based product/services, points of differentiation, competitiveness, usability, market status and size, probability of commercialization, the capacity of the enterprise for commercialization, etc. so it is advised to prepare well for the inspection to get better quality valuation reports.

3.2.7. Successful Cases of Program Implementation

1) Enterprise B

- B is an enterprise that develops, plans, manufactures, and installs integrated broadcasting system such as multimedia broadcasting services, and it produces and installs equipment for school broadcasting. The enterprise planned to develop and produce broadcasting equipment at home instead of relying on imports, and it required a business direction review so the enterprise applied to the program to have business feasibility of the IP evaluated.

- **[Results]** Based on the results, the enterprise doubled its sales by two times (2013, 6.6 million USD -> 2014, 13 million USD), and successfully opened business channels by receiving orders from many public offices.

2) Enterprise D

- D is an enterprise that manufactures car parts focusing on wiper system parts. Recently, the increase in orders led to an increase in debt from acquiring plants and investment for new facilities, and the enterprise was in a dire need to improve its financial structure. Based on the valuation for investment-in-kind for five of its patents, the enterprise successfully increased its capital by 1.55 million USD, which was the assessed value.

- **[Results]** Thanks to the valuation, enterprise D secured financial soundness and borrowed 2.51 million USD from a financial institution. Then, the sales made a quick growth afterward (2013, 410,000 USD -> 2014, 10 million USD).

3.3.
IP Valuation Support for Guaranteed Loan

3.3.1. Program Overview

Subsidize IP valuation cost to SMEs for them to acquire a letter of guarantee from a guaranteeing institution, thus, supporting procurement of capital

- The program supports IP valuation and acquiring guarantees for financing. Therefore, the program is similar to *3.2. IP Valuation Support Program* in essence with the difference that this program focuses on IP utilization through a letter of guarantee.

- Loans financial institutions provide can be categorized into credit loans based on the credit rating of the enterprise, secured loans based on collateral that the enterprise offers (e.g. real estate properties), and guaranteed loans granted with a third party to guarantee the repayment.

- SMEs prefer credit loans most of the times, but the disadvantages are that screening is relatively strict. This means that it might be difficult to receive the desire loan unless the SME can provide collateral or other guarantees. Another thing to consider is that even if the loan is granted, it will be only a small amount.

- Compared to credit loans, secured loans or guaranteed loans are easier to receive, but the problem is that it is difficult for SMEs to secure collateral or a guarantor.

- To address such a situation, governments often implement policies or run institutions as guarantors to allow SMEs to have better access to funding. When the guarantor issues a letter of guarantee after evaluating the enterprise, funds or financial institutions provide loans.

- Guaranteeing institutions evaluate IP of SMEs to issue a letter of guarantee as well. In such a case, whether to issue the letter or the guaranteeing conditions (guaranteeing limit, guarantee fee rate) depend on the result of the IP valuation. The program subsidizes IP valuation cost for issuance of a letter of guarantee.

- The IP valuation for guaranteed loans uses ratings to determine whether to provide guarantee and the guarantee fee rate.

- The valuation for guaranteed loans is conducted by a valuation institution (“Service Providing Entity”) and when the IP belongs to a special technology field, the institution may receive consulting services from external experts or institutions.

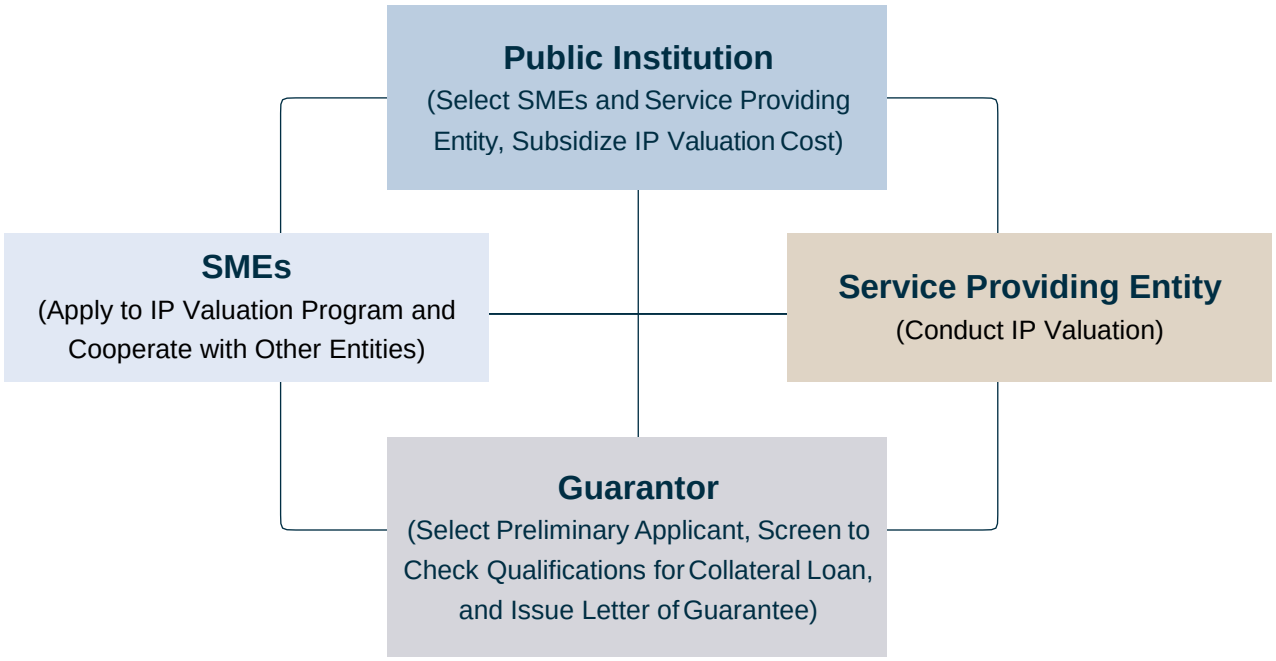


Figure 121. Program Framework (IP Valuation Support for Guaranteed Loan)

3.3.2. Similar Programs of APEC Members

1) IP Valuation Support for Guaranteed Loans (Korea)

- The Korea Invention Promotion Association[108] (KIPA) is running the “Patent Valuation Support Program for Guaranteed Loans.”

- The program evaluates the value of a patented technology owned by an SME and the purpose is to provide a subsidy for valuation so that SMEs can utilize the valuation results to secure funding and loans.

- The program is made to support SMEs which aim to commercialize their IP registered according to the filing date.

- KIPA subsidizes IP valuation conducted by a valuation institution, and the guaranteeing institution provides a letter of guarantee within the assessed value with the limit at 830,000 USD per enterprise. The guaranteeing institution has credit and technology guarantee funds, and the institution subsidizes 4,100 USD out of the total cost of the IP valuation conducted by a valuation institution.

2) 5 in 1 IPR Financing Services (China)

- The State Intellectual Property Office of the People’s Republic of China (SIPO) offers 5 in 1 IPR Financing Services, which is an innovative IP financing program targeting science and technology centered SMEs that are under difficulty in financing.

- The financial services provide valuation, guarantee, loan, investment and trading services together based on an IP value analysis index system.

- For the program, an alliance was formed with IPR valuation enterprises, mortgage enterprises with registered capital of 200 million CNY, bond investment funds, and an Internet platform for bonds, IPR, and stock exchange with registered capital of 500 million CNY. The program provides subsidy after calculating the investment value of the enterprise and understanding the IPR value utilizing financial methods such as bank loans, trust, small loans, factoring and P2P investment.

- The program services seek to heighten the understanding of IPR values, support identifying investment value of scientific technology enterprises, and establish a risk analysis system so that such SMEs can have financing options by utilizing their IP.

108) The institution managing and operating IP-related programs

3) Small Business Investment Company (SBIC) Program (United States)

- The Small Business Administration (SBA) is an agency established on 1953 under the central government of the US to be in charge of providing financial support to SMEs. The SBA runs a program called the Small Business Investment Company Program (SBIC) to support SMEs by providing credit guarantees. The program supports SMEs by having a venture capital approved by SBA take over investment or corporate bond of SMEs through SBIC established in the form of joint-stock or a limited liability company.

- The program begins when the SBA designates a private venture capital as an SBIC. The SBIC program carries features of fund of fund. It provides capital to start-ups and SMEs through government subsidy and guarantee, allowing public-private joint investment.

- The SBIC can invest in small-sized enterprises within the US, and the innovative enterprises that receive the investment will gain access to funding support, management, and operation. The SBIC funding is covered by issuing bonds.

- The SBA supports the enterprises that fall under the definitions of SMEs in the SME law. Meaning, the target of support must be SMEs that are not receiving federal government's funding, and cannot procure funding for valid reasons (interest, period, etc.). There are four categories of SMEs, which are 1) nascent enterprises, 2) start-ups (six months ~ one year since founding), and 3) current enterprises (Those that have been established for more than a year).The real-estate investment or gambling-related enterprises, and non-profit organizations (NPO) are excluded.

3.3.3. Procedures and Details of the Program

1) Target of Support

- The program provides support to SMEs that hope to utilize the IP they have by using the IP valuation to get guaranteed loans.

2) Program Process

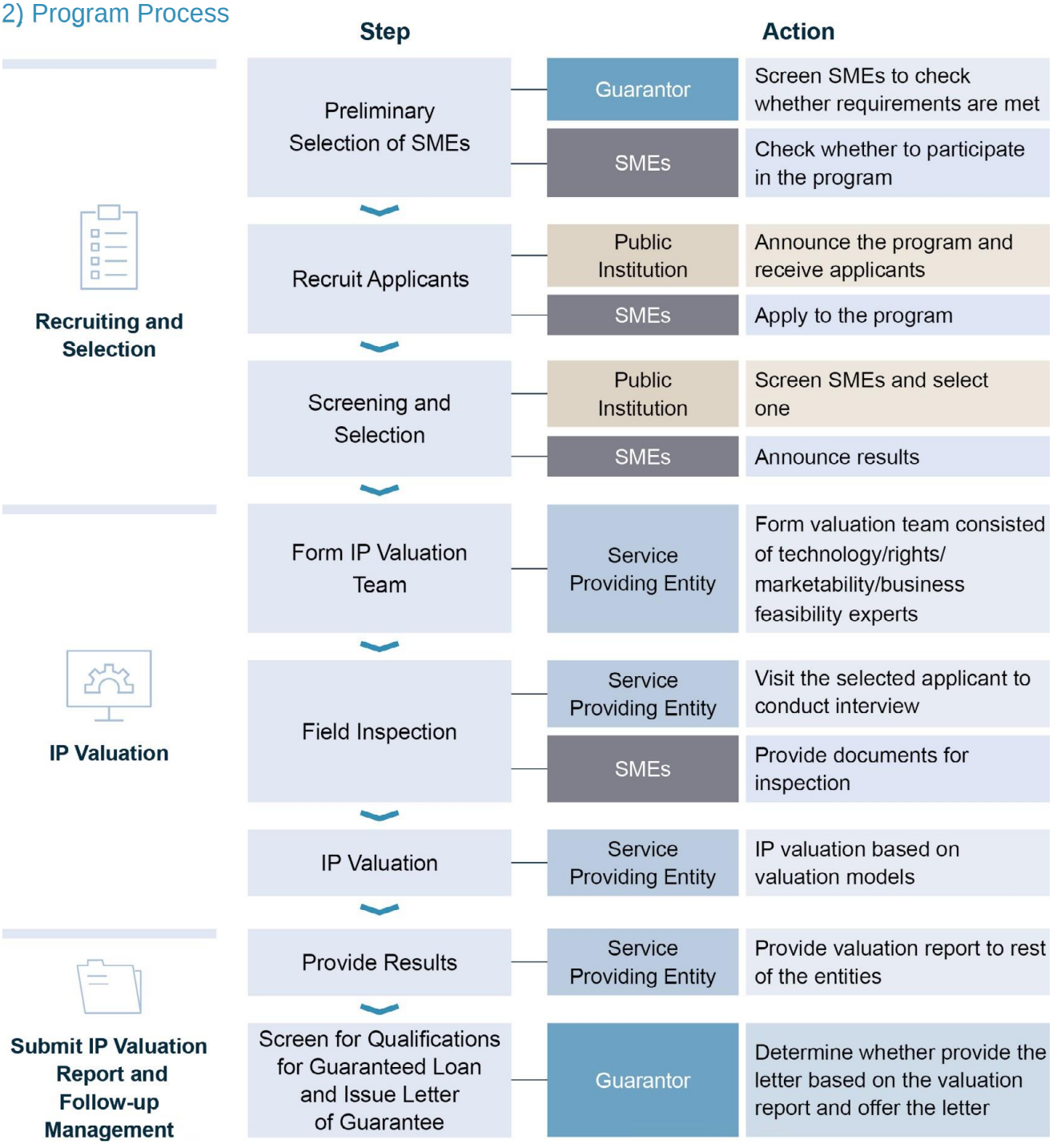


Figure 122. Program Process (IP Valuation Support for Guaranteed Loan)

3) Scope and Conditions of Support

- The SMEs that hope to receive support should go through consultations with guarantors before applying to the program. When the public institution chooses an SME, the IP valuation is conducted with certain standards, and according to the results, a letter of guarantee is issued by the guarantor. The public institution subsidizes a part of the cost of the valuation.

3.3.4. Guide Map for Participating Entities

Table 93. Guide Map for Participating Entities (IP Valuation Support for Guaranteed Loan)

Entity	Preparation	Program Process (Phase)							Follow-up Management
		1	2	3	4	5	6	7	
Public Institution	Select and manage a service providing entity; Sign a contract with a guarantor	Select an SME					Subsidize valuation cost		Results and follow-up management
Guarantor	Develop guaranteed loan products; SME consultation and preliminary selection						Receive the valuation report	Issue a letter of guarantee	
Service Providing Entity	Apply and select a service providing entity; Sign a contract with guarantor		Form a valuation team	Request documents & materials preliminary review	Field inspection, interview	Write valuation report	Submit valuation report		
SMEs	Consultation with the guarantor	Apply to the program		Provide requested documents & materials	Field inspection, interview		Receive valuation report	Receive letter of guarantee	

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up management.

- The chart summarizes the role of public institution[109], guaranteeing institution[110], service providing entity[111], and SME in different phases of the process, and details on each phase are explained in *3.3.5. Detailed Guidelines for Participating Entities*

[109] The public institution in charge managing and operating the program
[110] The institution that issues a letter of guarantee for SMEs to receive funding from financial institutions based on IP valuation results from the service providing entity
[111] The institution conducting IP valuation for guaranteed loans

3.3.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Develop IP-backed guaranteed loans, and secure guaranteeing institutions
2. Select a service providing entity to conduct IP valuation and select the SME to receive support
3. Manage the service providing entity to have it carry out the valuation and send the results to the guarantor

(1) The Guarantee System and Securing Guarantor

- The program is for guaranteed loan products that require IP valuation. Hence, for the program to work, there should be legal measures put into place, and there should be institutions to guarantee SMEs when these enterprises apply for loans based on their IP technologies.

- Such products are often operated with a large budget or funds from government and there are also many products besides the ones with IP as security.

- Generally, government-led loan products involve issuing a letter of guarantee to enterprises that suit the purpose of the policy run by the government (policy funding guarantees), or a particular institution issuing the letter for enterprises that meet the criteria (guarantee from institutions with contracts).

- The policy funding guarantees conduct IP valuations to not only select the SME to receive subsidy but also to set the amount to be guaranteed. Then, the entity managing funding and the institution managing trust subsidize policy funding based on the valuation results without further evaluation.

- The enterprises that hope to receive support from the program should submit both applications for funding and guarantee. The guaranteeing institution reviews the submitted documents and conducts on-site inspections to determine whether to provide support. Then, the result is delivered to the fund managing entity and the trust managing institution, and they convey the results to the SME. Based on the results received, the SME can take out a guaranteed loan from a bank.

- The guarantee from institutions with contracts is provided with an agreement signed between the guarantor and another public organization (e.g. Korea Technology Finance Corporation (KOTEC), KIPA, financial institutions). The range of SMEs to receive subsidies, guarantee fee rates, and targets of guarantee are determined by the agreement.

- The public institution that will run the program, therefore, must first establish an agreement with the

guaranteeing institution regarding guarantee supports and legal measures for guarantees.

(2) Selecting and Managing Service Providing Entity

- The public institution should select and manage a service providing entity to evaluate IP for guaranteed loans.

- Details on selecting and managing a service providing entity are explained in *3.2. IP Valuation Support Program,* so refer to 1) *Guidelines for Public Institutions,* in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Selection of SMEs

- The public institution accepts applications of SMEs which own excellent IP and hope to apply for loans based on IP valuation results and selects SMEs to receive support.

- The purpose of the program is to issue a letter of guarantee to the selected SME based on IP valuation results, so the public institution should select SMEs with high chances of receiving guarantees to prevent unnecessary use of resources.

- Hence, SMEs can apply to the program only after passing the preliminary screening through consultation with the guaranteeing institutions.

- The public institution screens applicants based on the submitted documents (applications, reason for applying, etc.) to select an SME.

(4) Subsidizing IP Valuation Cost

- Upon receiving applications for IP valuation cost subsidy from SMEs, the public institution reviews attached documents and requests more documents when needed.

  - Attachments: A copy of IP valuation results, receipts for expenses, consent for transfer, subsidy application, etc.

- When there is no error found in subsidy application and valuation report, the public institution provides agreed subsidy to the service providing entity.

(5) Follow-up Management

- For management of the program, the public institution should collect data for results management such as data on the level of satisfaction of the SMEs that received IP valuation cost subsidy, and concerning taking out loans with a letter of guarantee.

2) Guidelines for Guaranteeing Institutions

Key Activities

1. Develop IP-backed guaranteed loan products
2. Conduct consultations with SMES to select ones eligible for applying to the program
3. Screen qualifications based on IP valuation results and issue a letter of guarantee

(1) Development of Guaranteed Loan Products based on IP valuation

- **[Development of Guaranteed Loan Products]** The guaranteeing institution has to develop guarantee products to issue a letter of guarantee to SMEs that have received IP valuation according to the contract signed with the public institution.

- The public institution in charge of IP policy can also develop guarantee products specifically related to IP.

- For example, the public institution can develop a product to provide guarantees within the value price patents and a variety of form of IP. Another way is for the public institution to offer products to support SMEs that are in the process of taking over IP with the grant of license or purchasing IP.

- The guaranteeing institution can design IP-related products to support ① costs spent in the development stages such as R&D funding, purchasing equipment or producing prototype, ② funding needed to have IPR transferred or for additional R&D required to complete transferred IP technology, ③ funding needed in commercialization stages such as purchasing raw and sub-materials, production cost, and marketing costs or ④ funding for all stages from development to commercialization.

- As shown below, there are a variety of guarantees handled by KOTEC and the products for the program are the IP-backed products.

Example

Table 94. Example of Guaranteed Loan Products in Korea

Items	Product Explanation and Features
Policy Funding One-Stop	Information & Communication Promotion Fund, Korea Broadcasting Development Fund, and Funds for start-ups and growth of promising SMEs
Support by Cooperating with Other Institutions	Special investment guarantees from financial institutions, guarantees of subsidizing guarantee fee from financial institutions, IP valuation guarantees, etc.
Specific Purpose Guarantee	Starting and growing field guarantee, guarantee on special operation fund for employment, cultural industry guarantee, R&D guarantee, renewable energy guarantee, guarantee for those who plan to start a business, restructuring cooperation guarantee, etc.
IP Guarantee	IP valuation guarantee, IP transfer guarantee
Other Guarantees	e-Commerce guarantee, enterprise purchasing capital loan guarantee, guarantee on purchase card loan for enterprises, collateral loan guarantee

(2) Consultation and Preliminary Selection of SME

- The guaranteeing institution provides consultation to SMEs on the program and the guarantee support, and the institution can check the SMEs' growth potential, profitability, financial structure, and credit status.

- Based on the consultation results, SMEs that are deemed eligible should be selected to apply to the program.

(3) Screen Applicants as Guarantor and Issue Letter of Guarantee

- After receiving valuation report from the public institution, the guaranteeing institution screens SMEs to see if they are qualified for guarantees according to the institution's regulations.

- The institution issues a letter of guarantee to those who are deemed qualified for guarantees after screening.

3) Guidelines for Service Providing Entities

Key Activities

1. Establish an IP valuation task force composed of internal and external experts and has its own valuation model
2. Form a team for IP valuation and conduct valuation

(1) Establishment and Operation of IP Valuation Task Force

- To evaluate IP, the service providing entity should establish and operate an IP valuation task force.

- Details on establishment and operation of IP valuation task force are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(2) Development of IP Valuation Model

- The IP valuation model for guarantee has similar contents and procedures explained in *3.2.5. Detailed Guidelines for Participating Entities.*

- What is different is that the IP valuation results are used to determine whether to issue a letter of guarantee and the limit of guarantee and guarantee fee rate.

- As explained above, the guaranteeing institution uses technology, the business feasibility of IP and competitiveness rather than economic value as criteria to give evaluation scores. In a few exceptions, economic values are assessed as well.

- Evaluate business feasibility in the same manner *as explained in 3.2.5. Detailed Guidelines for Participating Entities*, but the results are shown in grades for each range of scores.

- Details on grading definition and differentiation may differ by the conditions of each economy.

Example

Table 95. Example of Comprehensive Valuation Grading Chart

Grade	Total Score	Average Score	Grade
A	More than 180 ~ Less than 200	More than 9 ~ Less than 10	Excellent
B	More than 150 ~ Below 180	More than 7.5 ~ Below 9	Good
C	More than 120 ~ Below 150	More than 6 ~ Below 7.5	Average
D	More than 80 ~ Below 120	More than 4 ~ Below 6	Fair
E	Below 80	Below 4	Poor

(3) Performing IP Valuation

- The service providing entity should carry out an IP valuation according to the valuation procedures.

- Details on conducting IP valuation are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities*

(4) IP Valuation Report Format

- The service providing entity can refer to IP valuation report formats when writing the results report.

- The format is explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

4) Guidelines for SMEs

Key Activities

1. Consult with the guaranteeing institution and apply to the program
2. Actively cooperate with service providing entity for field inspection, including providing requested documents
3. Apply for a loan from a bank with the letter of guarantee from the guaranteeing institution

(1) Consultation for Preliminary Selection and Applying to the Program

- As the program supports SMEs by having guaranteeing institutions issue a letter of guarantee based on the results from IP valuations, SMEs must have consultations with the guarantors before applying to the program. Otherwise, they cannot apply to the program.

- SMEs mostly apply to the program after having gone through consultations with guaranteeing institutions to be checked upon whether they meet the requirements to apply to the program, so SMEs should have consultations prior to applying.

- Details on how to apply to the program are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for SMEs*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(2) Preparing and Being Cooperative for Field Inspection for IP Valuation

- SMEs should prepare for on-site inspections by the service providing entity for IP valuation, and if there are requests for documents, the inspected enterprises should actively cooperate with the service providers and provide them.

- Details on preparing for field inspections are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for SMEs*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Receipt of Letter of Guarantee and Taking out Loans

- When SMEs are considered qualified to be guaranteed after screening, they receive a letter of guarantee to submit to banks for guaranteed loans.

3.3.6. Program Tips

1) Program Tips for Public Institutions

- **[Cooperating with Guaranteeing Institutions]** In order to better promote the program, an active cooperation from guaranteeing institutions are critical. To this end, the public institution needs to have good communication with the guarantors and work together to develop guarantee products based on IP valuation.

- **[Follow-up Management]** A follow-up management system needs to be established to check factors such as loan amounts of the enterprises participating in the program, their credit ratings, sales, and rate of default.

- It is recommended to review general environment such as financial market, investment trend, technology transaction market, etc. of developing economies before planning policies to develop IP financing products suitable to the market of the economy.

2) Program Tips for Guarantor

- **[Cooperation of Guarantors]** For the IP financing and technology financing including IP-backed loans to be successful, collaboration with guaranteeing institutions is a key factor. Negotiations need to take place to ensure that the institutions are well aware of the need to facilitate technology commercialization and the importance of IP and technologies.

- The guaranteeing institution needs to consistently monitor the relationship between valuation results and rate of defaults to improve relevant products.

- Also, guaranteeing institutions may need to handle multiple IP valuations considering their scope of work, so it is desirable to share experience and know-how on IP valuation with the service providing entity to achieve quality enhancement of the valuation.

3) Program Tips for Service Providing Entities

- The service providing entity must pay close attention to the tips in participating in the program.

- The details are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Service Providing Entities,* in *3.2.6. Program Tips.*

4) Program Tips for SMEs

- SMEs should keep in mind that the offered products are guaranteed loans from banks, with the loan amount set within the range of IP value assessed in IP valuation. Therefore, when the applying enterprises have poor financial status or low credit ratings, loan applications may be rejected or they may not pass the preliminary screening relevant to IP valuation.

3.3.7. Successful Cases of Program Implementation

1) Enterprise A (Successful Procurement of Commercialization Funding)

- **[Enterprise Overview]** Enterprise A is an SME with the capital of 410,000 USD, 25 employees, and sales hovering 9.2 million USD that tried to commercialize production of black boxes for cars.

- **[Support]** Enterprise A owned many excellent patents, but due to low sales and mortgage capacity, it experienced difficulty in financing its business. Then in 2009, through the IP valuation support for guaranteed loan program, it received a guarantee for 160,000 USD and managed to procure the needed funding.

- **[Results]** Through a successful commercialization, Enterprise A is seeing a rapid growth as its sales increased to 1.67 million USD in 2010, and 7.11 million USD in 2011.

2) Enterprise K (Successful Procurement of Commercialization Funding)

- **[Enterprise Overview]** Enterprise K manufactures and sells automated drug packaging machines, with over 30 patents registered home and abroad.

- **[Support]** Although Enterprise K had many excellent patents, due to weak sales and financial structure, it was difficult for the enterprise to acquire funding. Then, through the IP valuation support for guaranteed loan program, it managed to receive 250,000 USD worth guaranteed loan from a financial institution.

- **[Results]** Thanks to the successful commercialization, its sales reached 830,000 USD in 2008 and 4.93 million USD in 2009.

3.4.
IP Valuation Support for IP-secured Loan

3.4.1. Program Overview

Subsidize IP valuation cost so that SMEs can procure funding with IP as collateral to commercialize their technologies.

- While many SMEs hold advanced IPs, many fail to commercialize or make a profit out of them, mostly due to the lack of funding needed for commercialization of IP.
- The program is for SMEs who own excellent IP yet lack capital. The program aims to subsidize SMEs on IP valuation[112] costs to enable the SMEs to apply for loans with IP as collateral worth the amount of assessed value.
- The public institution selects an IP valuation institution (“Service Providing Entity”) to conduct IP valuation and provides subsidies to SMEs to lessen the burden of paying valuation costs.
- Upon receiving requests from financial institutions, the service providing entity evaluates IP of SMEs for its worth as a security.
- Based on the valuation results, the financial institutions provide IP-secured loans to SMEs.
- Service providing entities conduct IP valuation for IP of the SMEs, and the SMEs offer their IP as collateral as a financing option.

[112] In the program, an IP valuation refers to evaluating IP as collateral

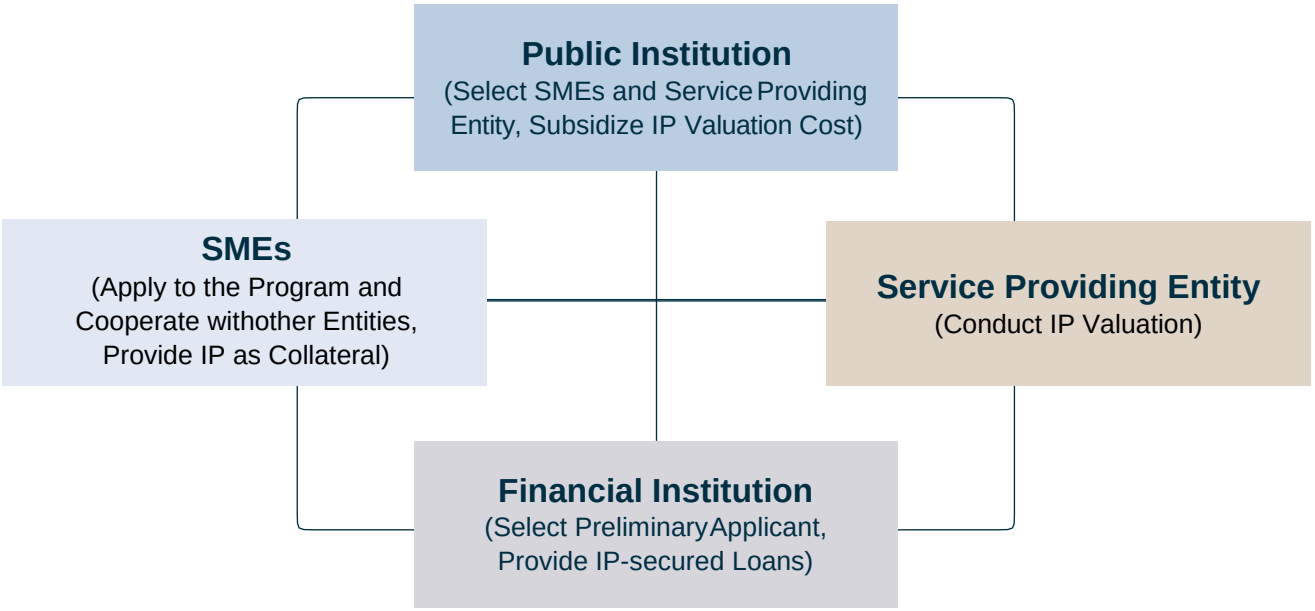


Figure 123. Program Framework (IP Valuation Support for IP-secured Loan)

3.4.2. Similar Programs of APEC Members

1) (Korea) IP Valuation Support for Secured Loans

- The Korea Invention Promotion Association (KIPA)[113] is running the “Patent Valuation Support for Secured Loans.”
- The purpose of the program is to ensure that SMEs can finance their business utilizing IP as collateral by subsidizing the valuation cost.
- The program supports SMEs, which own IP registered according to the filing date and have commercialized their IP.
- SMEs receive a partial subsidy for IP valuation costs conducted by the valuation institutions, and IPR is set as collateral worth within the assessed value of IP to acquire loans.

[113] The institution in charge of managing and operating IP-related programs

2) (China) Zilongbao

- Science and technology SMEs with low capital, high investment, and high risks have difficulty getting bank loans with IPR as collateral, so the Beijing Intellectual Property Operations Management Co Ltd began Zilongbao Program together with Zhongguancun branch of Construction Bank to provide loan products with IPR as security.

- Zilongbao is the first program in China to provide loans with only IP as collateral and its purpose is to assist science and technology SMEs to seek innovative growth. The most distinct feature of the program is that with only IP, loans can be given and other assets or credit loans are not offered.

- The Beijing Intellectual Property Operations Management Co. Ltd is having a pilot period in 2016, and the target is science and technology SMEs in Haidian district of Beijing. By 2020, the program will be spread to Jingjinji to offer services to over 1,000 SMEs.

- For loans under five million CNY, a quick approval system is applied and it would take 15 days to receive loan approvals. SMEs in Haidian district can receive up to 50% of financial cost as subsidy, and one million CNY is the maximum.

3) (China) IP Pledge Loan Risk Compensation Fund

- The State Intellectual Property Office of the People's Republic of China (SIPO) in Shandong province established the IP Pledge Loan Risk Compensation Fund under cooperation with relevant institutions as a means to resolve financing problems science and technology SMEs face and promote IP pledge loans. The fund was founded by the Ministry of Science and Technology in Shandong, SIPO and Ministry of Finance working with the Shandong branch offices of Qilu Bank and Bank of Communications.

- The SIPO expects that the fund will facilitate the development of innovative businesses in Shandong province, strengthen bank loan services to SMEs, and expand IP pledge loan services to SMEs that had trouble financing their businesses.

- The initial investment was 50 million CNY, which was utilized to compensate IP pledge loan risks of banks that have signed contracts to work together.

Table 96. IP Pledge Loan Risk Compensation Fund (China)

Items	Descriptions
Target	The fund targets the default cases of IP collateral loans granted by cooperating banks to SMEs in the Shandong province, and the fund compensates up to 40%.
Mandatory Conditions	The increase of interest rate cannot exceed 30% of the People's Bank of China (PBOC).
Requirements	Starting and growing field guarantee, guarantee on special operation fund for employment, cultural industry guarantee, R&D guarantee, renewable energy guarantee, guarantee for those who plan to start a business, restructuring cooperation guarantee, etc.
IP Guarantee	Loan qualifications are enterprises that meet SME criteria stated by the Ministry of Industry and information, and Ministry of Finance.
Criteria	The Shandong Ministry of Science and Technology, SIPO, and Ministry of Finance will evaluate results on service quality, interest benefits, risk management, and loan sizes of the year from the cooperating bank.

4) (Singapore) Intellectual Property Financing Scheme (IPFS)[114)]

- The IP Value Lab runs the Intellectual Property Financing Scheme (IPFS), which is a program that offers loan services from financial institutions to Singapore enterprises with patents, trademarks, and copyrights as collateral.

- Applicants have to be enterprises registered in Singapore with registered patents or trademarks that can be commercialized as a part of the collateral package.

- To receive loan services, the applicants have to go through three steps of 1) relevant financial institutions' screening, 2) valuation institutions assessing the value of IPR portfolio and 3) submission of applications to relevant financial institutions.

- Financial institutions participating in the IPFS include AFC Merchant Bank, DBS Bank Ltd, Oversea-Chinese Banking Corporation (OCBC) Ltd, and United Overseas Bank (UOB) Ltd. Private valuation institutions selected by the Intellectual Property Office of Singapore (IPOS) are Panel of Valuers, Baker & McKenzie Wong & Leow, CONSOR Intellectual Asset Management, Deloitte & Touche Financial Advisory Services Pte Ltd, Duff & Phelps Singapore Pte Ltd, Ernst & Young Solutions LLP, KPMG Services Pte Ltd, Advisory Services Pte Ltd, etc.

114) http://www.ipos.gov.sg/IPforYou/IPforBusinesses/IPFinancingScheme.aspx

3.4.3. Procedures and Details of the Program

1) Target of Support

- The program aims to support SMEs, which own and have commercialized their IP registered according to the filing date.

2) Program Process

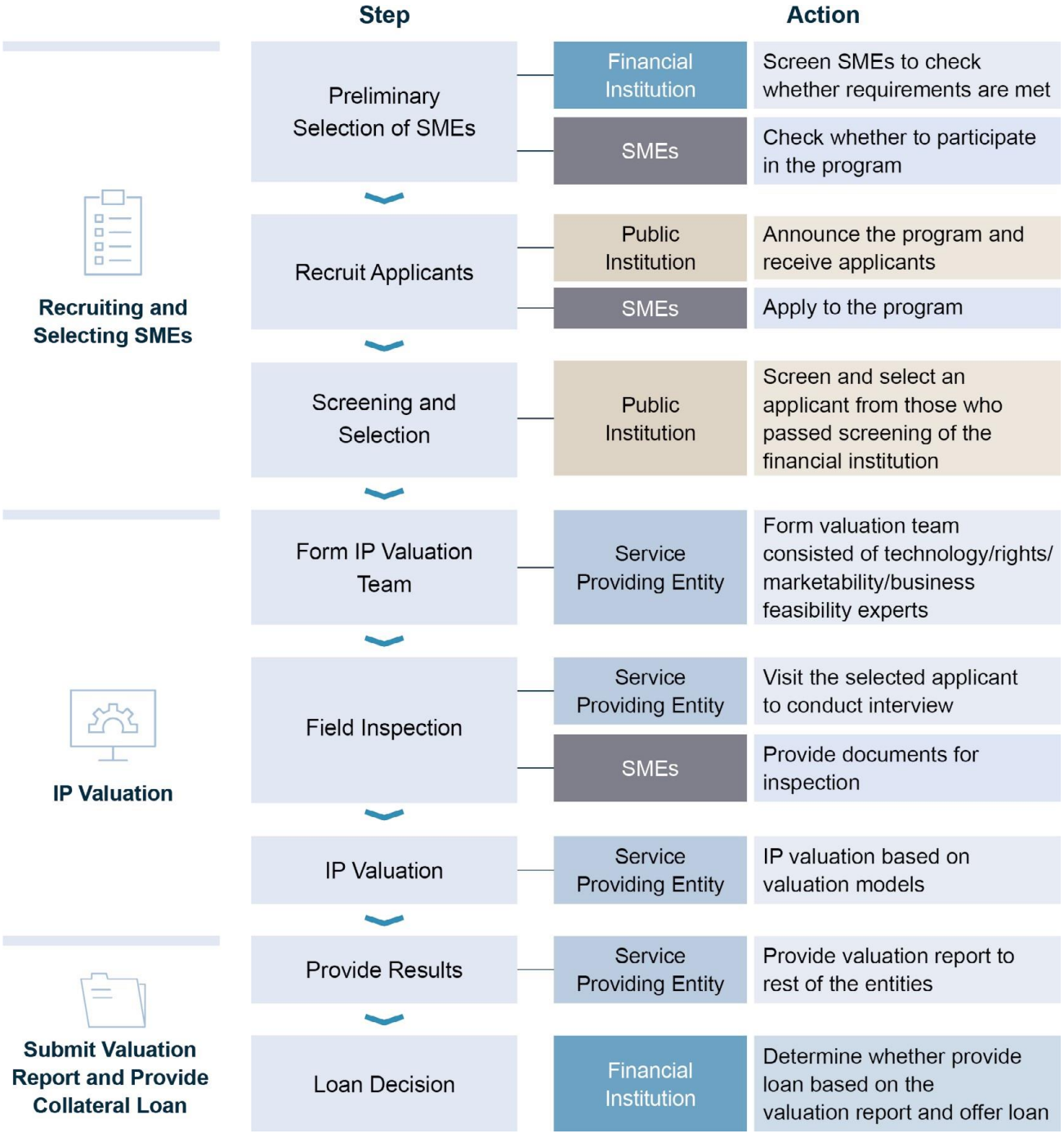


Figure 124. Program Process (IP Valuation Support for IP-secured Loan)

3) Scope and Conditions of Support

- The service providing entity conducts a valuation on the registered IP. Based on the results, SMEs receive subsidies to cover valuation costs so that they can acquire IP-secured loans.
- The public institution burdens approximately 50% of the total cost of IP valuation per enterprise.
- Rest of the cost is shouldered by the financial institution, and the enterprise does not have to pay for any costs incurred.
- The IP valuation is conducted by the service providing entity selected by the financial institution among the candidates the public institution chose.
- The financial institution provides IP-secured loans based on the valuation results.

3.4.4. Guide Map for Participating Entities

Table 97. Guide Map for Participating Entities (IP Valuation Support for IP-secured Loan)

Entity	Preparation	Program Process (Phases)							Follow-up Management
		1	2	3	4	5	6	7	
Public Institution	Select and manage a service providing entity; Find financial institutions to cooperate with (Agreement)		Select applicants				Subsidize valuation cost		Results and follow-up management
Financial Institution	Develop IP pledge loan products; Consultation with SMEs and preliminary selection						Receive valuation report	Loan screening	
Service Providing Entity	Apply to the program and select a service providing entity; Establish agreements with financial institutions		Form a valuation team	Request documents &materials;, preliminary review	Field inspection; interview	Write a valuation report	Submit the valuation report		
SMEs	Consultation with financial institutions	Apply to the program		Provide requested documents & materials	Field inspection; interview		Receive the valuation report	IP pledge loan	

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up.

- The chart summarizes the role of the public institution[115], financial institutions, service providing entities[116], and SMEs in different phases of the process, and details on each phase are explained in *3.4.5. Detailed Guidelines for Participating Entities.*

[115] The public institution in charge of managing and operating the program.
[116] The institution conducting IP valuation for IP-secured loans

3.4.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Develop loan products with IP as collateral and secure financial institutions (banks) to participate in the program
2. Select a service providing entity to conduct IP valuation, and select an SME to receive support
3. Share follow-up management information, and prepare measures for managing a default

(1) IP-secured Loan Policy and Securing Financial Institutions for the Program

- **[Fostering Financial Environment]** The public institution should first foster policy environment for IP financing and secure financial institutions to cooperate with. To foster the environment, the public institution should form a financial consultative body like IP financing forums and put in the effort to heighten the level of understanding and awareness for IP financing among financial institutions.

  - It is recommended to encourage financial institutions to voluntarily provide IP financing products by increasing their level of understanding, and an MOU should be signed between the public institution and the financial institution in the process of preparing IP financing products.
  - Financial institutions require additional experts for profitability and risk management to provide IP financing products, so they may be passive in providing such products. Therefore, it is advised for the public institution to establish legal measures to give incentives to the institutions that offer products for IP financing. Examples of incentives include budget project (support valuation), IP utilizing network (after collecting IP secured loan, support transactions), relevant legal measures (collecting IP secured loan and registering patent transfer), etc.

- **[Preliminary Negotiations with Financial Institutions]** The public institution needs to have a prior negotiation with financial institutions willing to offer IP financing products on several matters.

  - IP valuation report is the main data for IP financing products, so when writing a valuation report supported by the public institution, it needs to be planned so that it reflects requirements from the financial sector. For example, it is advised to discuss items such as valuation models, valuation costs (the portion bank has to burden), valuation quality and the valuation institution in preliminary negotiations.

- **[Checking IP Valuation Report Utilization Plan]** It is desirable to check how financial institutions will utilize the valuation report supported by the public institution. In other words, it should be checked from the financial institutions on whether IP valuation can be successfully linked to financing (enterprise with IP procuring funding). For example, the following items should be checked: whether

subsidized valuation led to investment/loan, how much of the assessed value of IP would be acknowledged for investment/loan, whether investment/loan would be determined based on IP and not on the SME's credit rating in offering IP financing, etc.

- As profitability and risk of IP financing are crucial matters to banks, providing IP financing products should not be coerced. It is best to increase the area of agreement gradually to ensure that budget can be used efficiently based on the fundamentals of IP financing.

(2) Selecting and Managing a Service Providing Entity

- The public institution should select and manage a service providing entity for conducting IP valuations for IP-secured loans.

- Details on selecting and managing service providing entity are explained in *3.2. IP Valuation Support Program*, so refer to 1) *Guidelines for Public Institutions*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Selecting SMEs

- The public institution receives applications from SMEs, which own and utilize their registered IPs, and select eligible enterprises for the program.

- The purpose of the program is to allow SMEs to acquire IP pledge loans from financial institutions based on IP valuation results, so the public institution should select SMEs with high chances of getting loans to prevent unnecessary use of resources.

- SMEs can apply to the program only after passing the preliminary selection through consultation with the financial institutions.

- The public institution screens applicants based on the submitted documents (application, plan, etc.) to choose an SME.

(4) Subsidizing IP Valuation Cost

- Upon receiving applications for IP valuation subsidy from SMEs, the public institution reviews attached documents and requests more documents when needed.

  - Attachments: A copy of IP valuation results, receipts for expenses, a subsidy application, etc.

- When there is no error in the subsidy application, the public institution provides agreed subsidy to the service providing entity.

(5) Follow-up Management

- **[Management of Default]** During the collection process of secured IP in the case of default, IP has less effectiveness of auctioning unlike, for example, real estate properties. Hence, banks as the pledgee normally prefers a direct transfer of IP or direct sales of it (to entities such as SPC). At the same time, the legalities of such methods should be checked as well. Also, when banks directly sell IP, they would need to reevaluate the IP, and find a buyer based on the reevaluated price. Thus, it is possible to negotiate beforehand on patent management enterprises to participate in such a process.

- There are various ways to collect on debts, but the main method is to invest in funds for collection upon default. The funds could be created with investment solely from the government or a joint investment between the government and government-run banks.

- When creating funds for debt collection, regulations are needed on items such as the size of the funds, rate of investment per entity, amount to directly use for IP collection, whether reevaluation is mandatory when purchasing secured IP, the entity to burden reevaluation expenses and the SPC or NPE to transfer the purchased IP to.

2) Guidelines for Financial Institutions

Key Activities

1. Plan IP-secured loan products linked with IP valuation
2. Consult SMEs hoping to apply to the program to select eligible applicants
3. Based on IP valuation result, provide loans secured against IP as collateral

(1) Planning IP Pledge Loan Products

- IP-secured loan products should be planned according to situations of the financial institutions, as institutions' amount of lending available differs and there are risks involved.

(2) Consultation and Preliminary Selection of SMEs

- The financial institutions explain their IP pledge loans to SMEs, which own excellent IP yet have limits in taking out loans based on credit or real estate properties and consult them on whether they hope to apply for loans with IP as collateral. Also, the institutions should check the financial and credit status of SMEs.

- Select SMEs, which have excellent IP and have a high chance of acquiring loans through IP valuation.

(3) Setting up Collateral and Providing Loans

- The financial institution provides loans within the range of the assessed value of IP and set IP as collateral based on the IP valuation results.

- Whether a loan would be granted or not is determined after the screening process by the financial institution.

3) Guidelines for Service Providing Entities

Key Activities

1. Establish an IP valuation task force composed of internal and external experts and has its own valuation model
2. Form a team for IP valuation and conduct valuation

(1) Establishment and Operation of IP Valuation Task Force

- To evaluate IP, the service providing entity should establish and operate an IP valuation task force.

- Details on establishment and operation of IP valuation task force are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(2) Development of IP Valuation Model

- The service providing entity should develop an IP valuation model to conduct valuation for IP-secured loans.

- Details on IP valuation models are explained in *3.2. IP Valuation Support Program*, so refer to *2) Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Performing IP Valuation

- The service providing entity should carry out IP valuations according to the valuation procedures.

- Details on conducting IP valuation are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities*.

(4) IP Valuation Report Format

- The service providing entity can refer to IP valuation report formats when writing the results report.

- The format is explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

4) Guidelines for SMEs

Key Activities

1. Consult with financial institutions, and apply to the program
2. Actively cooperate with the service providing entities for field inspections, including the provision of requested documents
3. Based on IP valuation results, apply for a loan to financial institutions

(1) Consultation for Preliminary Selection and Applying to the Program

- As SMEs apply for loans to financial institutions based on the results from IP valuations, they must have consultations with financial institutions before applying to the program. Without the proper preliminary consultation, SMEs are not allowed to apply.

- In many cases, SMEs apply to the program after having gone through consultations with financial institutions to confirm whether they meet the application requirements. This is why SMEs should engage in consultation sessions prior to applying.

- Details on how to apply to the program are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for SMEs*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(2) Preparing and Being Cooperative for Field Inspections for IP Valuations

- SMEs should prepare for on-site inspections by the service providing entity for IP valuation, and if there are requests for documents, the inspected enterprises should be ready to provide them in a cooperative manner.

- Details on field inspection preparations are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for SMEs*, in *3.2.5. Detailed Guidelines for Participating Entities.*

3.4.6. Program Tips

1) Program Tips for Public Institutions

- **[Follow-up Management]** A follow-up management system needs to be established to check factors such as loan amounts of the enterprises participating in the program, their credit ratings, sales and default rates.

- **[Management of Default]** In the case of a default, there needs to be support for handling collateral and recovering the loaned amount.

- In the case of the US, IP investment and IP licensing funds are widespread. China, as a state centered on policy financing, is promoting IP financing focusing on IP pledge loans. Thus, the government covers the risks and losses from the cases of loan defaults. Singapore is similar to Korea in that it subsidizes valuation costs and encourages banks to provide IP-secured loans based on the valuation results.

- It is recommended to review general environment such as financial market, investment trend, technology transaction market and other elements in developing economies before planning policies to develop IP financing products suitable to the market in the economy of implementation.

- For the cases of IP-secured loans, review whether IP can be set up as collateral, what policies related to patents are prepared for recovery of IP pledge loans, and whether environment for IP transactions as collateral exists. Also, check the demand of enterprises hoping to secure loans based on their IP, their growth potential, and whether there are markets or public organizations capable of evaluating IP. For investment, check whether there is environment made for a direct investment on IP on a project basis besides equity investment.

2) Program Tips for Service Providing Entities

- **[Meeting the Needs of Financial Institutions]** Financial institutions are generally conservative with loan criteria and try to avoid risks. Accordingly, financial institutions pay attention not to the value earned from future success of the SMEs, but the value that can be recovered even if the SMEs fail, so the service providing entity should keep this in mind and adhere to conservative perspectives when making estimations for IP valuation.

- Also, in terms of selecting valuation methods, the relief from royalty method is more realistic than the technology factor method as the IP that became the collateral is mostly sold or put up for licensing in the case of a default.

3) Program Tips for Financial Institutions

- **[Providing IP-secured Loans]** When financial institutions receive IP valuation reports, they estimate the collateral value of IP to determine whether to provide loans and how much. It is recommended that the financial institution's requirements or problems regarding IP valuations be shared with the service providing entity to increase the credibility of the IP valuations in the long-term.

- Also, the person in charge of IP pledge loan should put in the effort to handle IP collateral loan products and also monitor problems that occur during the loan process for improvements.

4) Program Tips for SMEs

- SMEs should keep in mind that banks' loan products are IP pledge loans based on IP valuation, so when an applicant has a poor financial status or low credit rating, the loan application may be rejected or it may not pass the preliminary screening irrelevant to IP valuation.

- In addition, SMEs should remember that unlike investors such as venture capitals, banks are less sensitive to the assessed value of IP from valuations, and they might not trust the results when the value is too high.

3.4.7. Successful Cases of Program Implementation

1) Enterprise A

- **[Enterprise Overview]** Enterprise A is an enterprise manufacturing reinforced concrete and rebar for constructing railroads, roads, and bridges, and with the engineering method it developed, the enterprise manufactures and installs decks, screens, etc.

- **[Support]** The enterprise applied to the program to acquire funding to enter overseas markets and for the development of a new technology that allows accelerated construction. Based on the IP valuation on three of its patents (assessed value of 2.56 million USD), the enterprise acquired 1.65 million USD from the Korean Development Bank (KDB).

- **[Results]** The enterprise won the Kazungula Bridge order in Botswana, and with the acquired funding from the loan, it is in the application process for a new technology (precast deck for accelerated construction) in the second half of the year.

2) Enterprise B

- **[Enterprise Overview]** Enterprise B is an enterprise manufacturing medical devices and other medical-related products. Specifically, it manufactures small products such as medical staplers, endoscopic trocars for single-use, and clips.
- **[Support]** Due to the expansion of Korean diagnosis-related groups (DRG) payment system, the need for economical materials for treatment (surgery) is rising. As the enterprise needed funding to expand production line and increase production, it applied to the program. With its one patent, it secured 820.000 USD from the Industrial Bank of Korea (IBK) based on IP valuation for secured loan (the assessed value was 1.4 million USD).
- **[Results]** The enterprise established a new product line which increased production and the stable production made its sales to rise.

3.5.
IP Valuation Support for Investment

3.5.1. Program Overview

Subsidize IP valuation costs so that investment institutions such as venture capitals will consider valuation reports when screening to invest in SMEs with excellent IP

- The program aims to support financing and improving financial structures of SMEs which own IP of excellent technology with business feasibility by having the government subsidize IP valuation costs to encourage investment institutions to provide investment based on the valuation results.

- Generally, government-led financial supports for SMEs are indirect financings such as loans or guarantees, and there are not many direct financing methods (such as investment). However, indirect financing methods may worsen SMEs' financial structure and cash flow and there is the burden of repayment to consider.

- SMEs that have excellent technologies yet have high-profit and high-risk business structures with no collateral set up can experience difficulties in acquiring guaranteed or collateral loans. For such enterprises, seeking direct investments for capital will be crucial.

- Investment institutions such as venture capitals go through their own set of screenings to evaluate enterprises target of investment to determine whether to invest in them. If the enterprises are focused on IP, then a thorough valuation is needed, but to investment institutions which do not have IP experts, it is not easy to evaluate IP.

- The program involves IP valuation institutions ("Service Providing Entity") conducting an objective valuation on IP, and the results are provided to investment institutions so that they would be able to have accurate assessments on SMEs' IP to determine whether to invest and the investing conditions. Also, SMEs that had trouble getting loans can receive direct investment through the program.

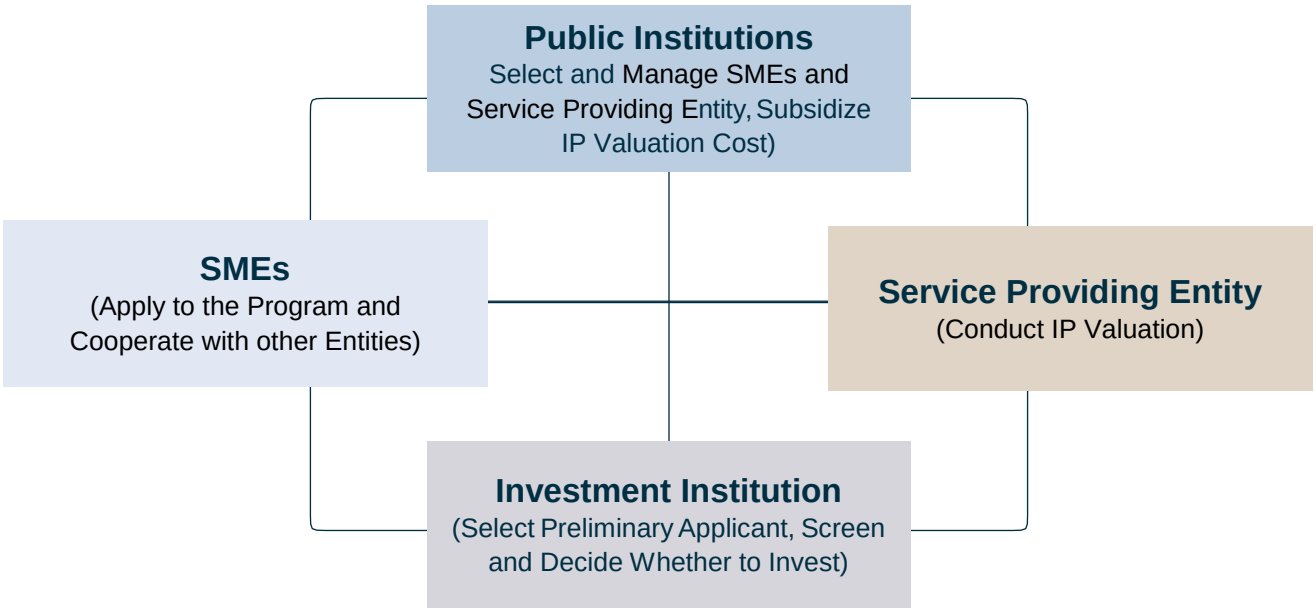


Figure 125. Program Framework (IP Valuation Support for Investment)

3.5.2. Similar Programs of APEC Members

1) (Korea) IP Valuation Support for Investment

- The Korea Invention Promotion Association (KIPA) is running the Patent Valuation Support for Investment.

- The purpose of the program is to subsidize SMEs with excellent technologies on IP valuation costs so that the resulting certified reports can be utilized by investment institutions when screening for investment candidates.

- The program supports SMEs which own IP registered according to the filing date and have commercialized their IP, and the investment institutions that are looking for opportunities to invest into such SMEs.

- The public institution subsidizes a part of the cost of IP valuation conducted by the service providing entity, and the rest (10%) including VAT is burdened by the selected SME.

2) (Japan) Private-Public IP Fund

- The Innovation Network Corporation of Japan (INCJ) is a corporation established with joint investment from the Japanese government and a private enterprise. The purpose of the fund is that the government supports promising enterprises with advanced technologies, combines not well- known patents or technologies of enterprises or universities, or brings together technologies and talents to create new businesses for economic growth.

- The INCJ provides funding to commercialize patents from universities, invests into venture businesses with good technologies but weak financial foundations, and supports enterprises in the same field merging into a new business to improve their competitive edge.

- Recently, the INCJ established a fund with joint investment from Panasonic and Mitsui & Co to facilitate IP distribution at home and abroad and commercialization of technologies based on patents to enhance Japan's industrial competitiveness.

- The fund is operated by purchasing sleeping patents from large enterprises in Japan and selling or lending them to emerging economies or venture businesses to create profit. The fields to purchase patents from are those with high R&D cost yet have fast innovation and life cycles such as mobile phones, liquid crystal panels and optical disks fields.

- The expectations are that when the INCJ liquidates the purchased sleeping patents, enterprises will

be able to secure funding to develop new patents, and if they are sold overseas, Japan's economy will have an influx of foreign currency. Also, having the private and public fund purchasing patents is expected to reduce the burden of patent maintaining costs for large enterprises.

3) (China) Key Industry IP Operations Fund

- The State Intellectual Property Office of the People's Republic of China (SIPO) and China's Ministry of Finance have planned and prepared the Key Industry IP Operations Fund based on the Notice of the Ministry of Finance and the State Intellectual Property Office Concerning the Promotion of Intellectual Property Operation Services through Marketization Approach in 2015. The purpose is to encourage a consistent flow of social capital, create links between the capital and key industries so that key IP enterprises can enhance their market competitiveness and innovativeness.

- The one billion CNY fund planned for 10 years was established in the form of a limited partnership. The central government and Beijing invested 95 million CNY, while enterprises and IPR services institutions invested 305 million CNY, amounting to 400 million CNY.

- The fund would be used for development of telecommunications and biomedical industries, and it would be investing heavily in key patents and high value-added patent portfolio of enterprises. It will also be utilized for start-ups and growing enterprises with high potential growth, and institutions operating unique IPR in the relevant industries. The SIPO announced that the fund would expand to investment in stock gradually.

- The SIPO expects that the fund will emphasize the importance of IP in the development of future industries, and strengthen creation and utilization of high value-added patents.

3.5.3. Procedures and Details of the Program

1) Target of Support

- The program aims to support SMEs which own and have commercialized their IP registered according to the filing date.

2) Program Process

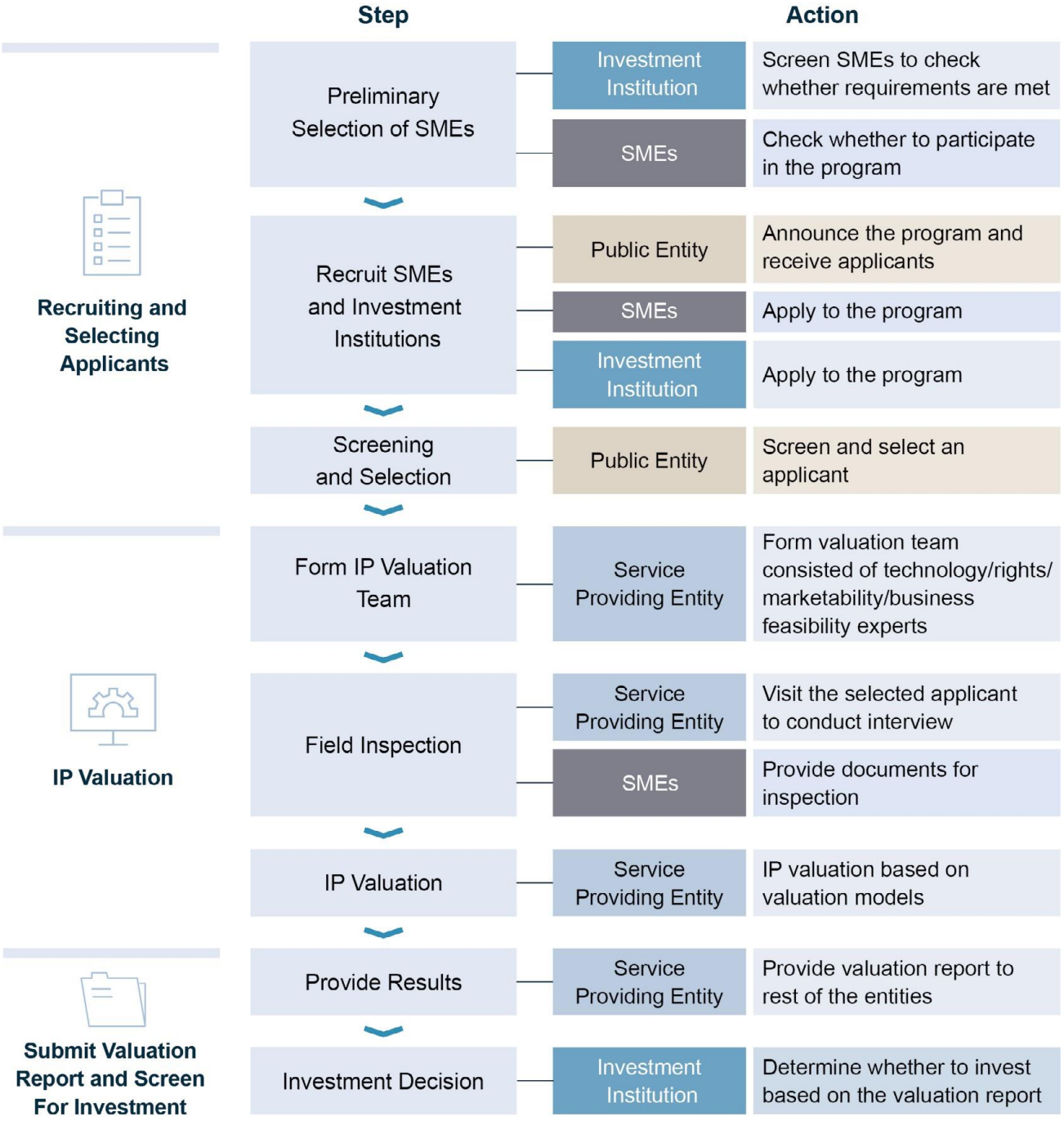


Figure 126. Program Process (IP Valuation Support for Investment)

3) Scope and Conditions of Support

- The service providing entity conducts valuations on the registered IP of the selected SME, and the investment institution utilizes the results to screen the SME for investment.
- The public institution burdens a certain ratio of the total cost of IP valuation per enterprise (e.g. 90%) and the rest (e.g. 10%) is burdened by either the investment institution or the selected SME.
- The IP valuation is conducted by the service providing entity selected by the investment institution among the candidates the public institution chose.
- The service providing entity delivers IP valuation results to the investment institution and the SME.
- The investment institution decides whether to invest based on IP valuation results (technology, market, business feasibility, and technology value) and its own standards.
- Whether the investment institution will make the investment or not is determined by its investment screening processes after the completion of IP valuation.

3.5.4. Guide Map for Participating Entities

Table 98. Guide Map for Participating Entities (IP Valuation Support for Investment)

Entity	Preparation	Program Process (Phases)							Follow-up Management
		1	2	3	4	5	6	7	
Public Institution	Select and manage a service providing entity; Sign agreements with investment institutions	Select SME					Subsidize valuation cost		Results and follow-up management
Investment Institutions	Consultation with SMEs and preliminary selection		Apply to the program				Receive the valuation report	Investment screening and investment decision	
Service Providing Entity	Apply to the program and select a service providing entity		Form a valuation team	Request documents & materials; preliminary review	Field inspection; interview	Write the valuation report	Submit the valuation report		
SMEs	Consultation with investment institutions	Apply to the program		Provide requested documents & materials	Field inspection; interview		Receive the valuation report	Receive investment	

- The Guide Map for Participating Entities is a chart made to easily understand the program process from the preparation to the follow-up management.

- The chart summarizes the role of the public institution[117], investment institutions, service providing entities[118], and SMEs in different phases of the process, and details on each phase are explained in *3.5.5. Detailed Guidelines for Participating Entities.*

[117] The public institution in charge of managing and operating the program.
[118] The institution conducting the IP valuation for investment.

3.5.5. Detailed Guidelines for Participating Entities

1) Guidelines for Public Institutions

Key Activities

1. Plan the program (securing investment institutions, etc.) for IP valuation to be utilized to acquire investment
2. Select a service providing entity to evaluate IP

(1) Program Planning

- It is recommended that the program should be implemented when there is a certain level of awareness and certain policies regarding IP valuation are in place, as a low level of understanding or awareness of IP valuation is low, it would be difficult to find investment institutions willing to make investments based on valuation results.

- Therefore, the most important task in implementing the program is to secure investment institutions willing to reflect IP valuation results when determining whether to invest in SMEs by utilizing the valuation results in the screening process.

- However, the investment institutions only use valuation results only as a reference, so whether to reflect them and to what degree are decided by the institutions.

- Also, the public institution should select and manage the service providing entity for IP valuation.

(2) Selecting and Managing Service Providing Entity

- The public institution should select and manage the service providing entity to carry out IP valuations for IP-secured loans.

- Details on selecting and managing the service providing entity are explained in *3.2. IP Valuation Support Program,* so refer to 1) *Guidelines for Public Institutions*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Selecting SMEs

- The public institution selects the SME to support by receiving applications from the SMEs that are trying to acquire investments and the investment institutions that are considering to investing into the SMEs.

- Considering that the purpose of the program is to facilitate investments by subsidizing IP valuations, it is advised to limit applying to the program without an investment institution. In fact, it is recommended that the investment institution apply to the program and write on the application the name of the SME it plans to invest in.

- The selection of an SME should be based on the IP it owns, and it would be desirable to include the plan of the investment institution on how to utilize the IP valuation report.

- The public institution should select the enterprise to support based on major criteria such as 1) advancement of technology the enterprise owns, 2) thoroughness of the commercialization plan of the technology and 3) market size and competition status. Also, include the plan on how the investment institution will utilize the IP valuation report in its screening process.

- The public institution evaluates applicants based on the submitted documents (application, plan, etc.) to choose an SME.

(4) Subsidizing IP Valuation Cost

- After receiving the IP valuation subsidy application from SMEs, the public institution reviews attached documents and requests more documents when needed.

  - Attachments: A copy of IP valuation results, receipts for expenses, a letter of consent for transfer a subsidy application, etc.

- When there is no error in the subsidy application, the public institution provides the agreed subsidy to the service providing entity.

(5) Follow-up Management

- For management of the program, the public institution should collect data on whether SMEs actually received investments, amounts of investment, sales, etc. to check the program results and reflect them onto the plan for the next program.

2) Guidelines for Investment Institutions

Key Activities

1. Find SMEs to invest into through IP valuation
2. Utilize IP valuation results when making decisions on whether to make investments

- The most important task of investment institutions in the program is to find SMEs worthy to invest into through IP valuation.

- Investment institutions generally invest in enterprises with core capacity in something besides IP (e.g. distribution). Hence, they should look for SMEs with a high probability of being selected for investment. Enterprises with key IP, those that need IP for technology development, or those in fields where IP conflict influences the business should be the focus when searching for SMEs to support.

- Investment institutions should carry out their screening processes for investment destinations. When IP results are poor or investment does not take place after IP valuation is completed, the SMEs may have complaints, so it is advised to target enterprises with a high chance of acquiring investment.

- Also, IP valuation results can be used by investment screening committees, but investment institutions are not obliged to take the results into account fully as the decision for investment is made following the standards and procedures of each institution.

- An investment institution should select a service providing entity for IP valuation beforehand, and both entities should share information and engage in negotiations to help facilitate the valuation process.

- An investment institution applies to the program for IP valuation support for investment with an SME.

3) Guidelines for Service Providing Entities

Key Activities

1. Establish an IP valuation task force composed of internal and external experts and has its own valuation model
2. Form a team for IP valuation and conduct valuation

(1) Establishment and Operation of IP Valuation Task Force

- To evaluate IP, the service providing entity should establish and operate an IP valuation task force.

- Details on establishment and operation of IP valuation task force are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(2) Development of IP Valuation Models

- The service providing entity should develop an IP valuation model to conduct valuation for investment.

- Details on IP valuation model are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(3) Performing IP Valuation

- The service providing entity should carry out IP valuations according to the valuation procedures.

- Details on conducting IP valuation are explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

(4) IP Valuation Report Format

- The service providing entity can refer to IP valuation report formats when writing the results report.

- The format is explained in *3.2. IP Valuation Support Program*, so refer to 2) *Guidelines for Service Providing Entities*, in *3.2.5. Detailed Guidelines for Participating Entities.*

4) Guidelines for SMEs

Key Activities

1. Consult with an investment institution, and apply to the program
2. Actively cooperate with the service providing entity for field inspection, including the provision of requested documents

(1) Consultation for Preliminary Selection and Applying to the Program

- The purpose of the program is to encourage investment institutions to utilize IP valuation results in the investment screening process. Thus, SMEs have to apply either with or in the name of an investment institution and they cannot apply to the program just by themselves. This is why consulting with the investment institution is necessary before applying to the program.

- Often, SMEs apply to the program after having gone through consultations with an investment institution to be checked upon whether they meet the requirements to apply to the program.

- Although the application is submitted by an investment institution or jointly with the SME, the target of evaluation is ultimately the SME and its IP owned by the SME. Thus, for SMEs to successfully receive subsidies, they need to establish business plans utilizing their IP when applying to the program and prepare for field inspections during the valuation process.

- For SMEs to receive support from the program, they first need to own patents that can be commercialized either through R&D or technology transfer, and they should have submitted applications for subsidy and valuation. Based on the applications received, the public institution evaluates SMEs and notifies the selected SMEs to which it will grant subsidies.

(2) Preparing and Being Cooperative for Field Inspections for IP Valuation

- SMEs should prepare for on-site inspections by the service providing entity for IP valuation and be ready to provide the required documents upon request.

- Details on preparing for field inspections are explained in *3.2. IP Valuation Support Program*, so refer to 3) *Guidelines for SMEs*, in *3.2.5. Detailed Guidelines for Participating Entities.*

3.5.6. Program Tips

1) Program Tips for Public Institutions

- **[Securing Investment Institutions]** The most challenging aspect of program implementation is securing investment institutions to work with. Investment institutions focus on financial and market aspects when making investments rather than purely focusing on IP aspects, which means that they often do not share the awareness for the need or the benefits of IP valuation in making investments.

- The best method to improve awareness is to establish a fund for enterprises linked to IP valuation and look for investment institutions to operate the fund. However, to adopt this method, a large budget and negotiations between government departments are necessary. Therefore, it is recommended to have adequate preparation time before implementing the program.

- **[Securing Enterprises' Portion of Valuation Cost]** One of the problems that occur during IP valuation processes is that when the assessed value of the IP is lower than what the selected SME expected, the enterprise may reject the results and file complaints or even go as far as to refuse to pay its share of the cost.

- To address this problem, the public institution should provide sufficient amount of explanations to SMEs before the program begins, and at the same time, prepare conflict resolution procedures.

2) Program Tips for Investment Institutions

- Investment institutions have their set of evaluation criteria just like financial institutions. They decide whether to make investments or not by looking at the industry of the enterprise, its size, history, marketability and financial status among other factors. Thus, there need to be continued discussions with the service providing entity on valuation directions and perspectives so that the service provider would complement what the investment institution lacks.

3) Program Tips for Service Providing Entities

- Investment institutions are experts of enterprise evaluations, so it is recommended to check valuation directions and tips from investment institutions before conducting IP valuations and reflect them onto the valuation process.

- The program can be seen to be a part of an investment process of an investment institution. Thus, considering the investment screening schedule of the investment institution, there may not be adequate time for IP valuation, so the service providing entity needs to pay close attention to schedule management.

4) Program Tips for SMEs

- Investment institutions often decide to make investments based on the growth potential of SMEs, unlike financial institutions. In other words, when the assessed value of IP is high, there is a higher chance of receiving investment with good conditions, so SMEs should make sure to provide all the documents needed to the service providing entity and focus on strengths when explaining about the enterprise.

- Also, most investment institutions are used to evaluating marketability or business feasibility but not on IPR, while service providing entities excel in IP valuations. Hence, it should be remembered that the IP valuation results from the service providing entities can have the high credibility to investment institutions.

3.5.7. Successful Cases of Program Implementation

1) Enterprise S

- Enterprise S manufactures interior and exterior materials for mobile phones, and it tried to develop a new alloy material for smartphones based on its excellent die casting technology, and expand into car parts industry. However, the enterprise was struggling with acquiring capital and investment to achieve these goals. To resolve the matter, the enterprise participated in the program.

- **[Results]** Based on the results of IP valuation for investment, the enterprise successfully acquired an investment of eight million USD. Currently, it is well into the development stage of a new alloy material for smartphones, and it is expanding into car parts industry by looking for new buyers.

REFERENCES

Guidebook for SMEs' IP-Business Cycle

REFERENCES

REFERENCES

Ahn, K. K., & Seo, K. (2007). *Status Report on Patent Support Policies in Advanced Economies.* Daejeon: KIPO

AsiaIPEX (Asia IP Exchange). (n.d.). http://www.asiaipex.com/AboutUs/AsiaIPEX_EN

AusIndustry. (n.d.). Accelerating Commercialisation. Retrieve from https://www.business.gov.au/

Beak, I. H., Kim, Y. K., Lee, T. H., Hwang, J. H., & Lee, S. C. (2016). *IP Product Innovation Manual.* Daejeon: KIPO (Korea Intellectual Property Office)

City of Yokohama. (n.d.). Retrieve from http://www.city.yokohama.lg.jp/

City of Yokohama. (n.d.). 横浜知財みらい企業.http://www.city.yokohama.lg.jp/keizai/happyou/h27/20150416163827.html

Hong, Jeongim. (2010). *The IP Policy Status of Japan.* Sejong City: STEPI

https://www.leanmethods.com/upload/presscoverage/105.pdf, http://trizcenter.co.kr/

IE Singapore (International Enterprise Singapore). (n.d.). GPC. Retrieve from https://www.iesingapore.gov.sg/Assistance/Global-Company-Partnership

IMF. (n.d.). World Economic Outlook Database. Retrieved from http://www.imf.org/en/data

INCJ(Innovation Network Corporation of Japan). (n.d.). Retrieve from http://www.incj.co.jp/

INPIT(National Center for Industrial Property Information and Training). (n.d.). Retrieve from http://www.inpit.go.jp/katsuyo/ippd/index.html

IPO(Intellectual Property Office). (n.d.). IP Finance toolkit. Retrieve from https://www.gov.uk/government/publications/banking-on-intellectual-property-ip-finance-toolkit

IPOS(Intellectual Property Office of Singapore). (n.d.). Retrieve from http://www.ipos.gov.sg/

IPR Marketplace. (n.d.). Retrieve from http://iprmarketplace.myipo.gov.my/

IRAS(Inland Revenue Authority of Singapore). (n.d.). PIC. Retrieve from https://www.iras.gov.sg/irashome/PIcredit.aspx

JIII (Japan Institute for Promoting Invention and Innovation). (n.d.). Retrieve from http://www.jiii.or.jp/, http://www.jiii.or.jp/index.html

JPO (Japan Patent Office). (n.d.). Retrieve from https://www.jpo.go.jp/

KIIP (Korea Institute of Intellectual Property). (2007). *Status Report on Patent Support Policies for SMEs in Advanced Economies.* Seoul: KIIP

KIIP(Korea Institute of Intellectual Property). (n.d.). Retrieve from https://www.kiip.re.kr/

Kim, Gyutae. (2010). *Strategies and Practice manual for IP Management of Universities and Public Research Institutes.* Daejeon: KIPO

Kim, H. J. (2009). *TRIZ MP, TRIZ for Forecasting Future Technologies.* Asia TRIZ Conference. Retrieved from *https://www.leanmethods.com/upload/presscoverage/105.pdf, http://trizcenter.co.kr/*

Kim, Y. H., & Park, H. K. (2014). *The Secret to Success of Steinbeis Foundation, the Frontier of German Technology Transactions*. Seoul: POSRI (POSCO Research Institute)

KIPA (Korea Invention Promotion Association). (2011). *A Standard Manual for Customized Patent Mapping,* Retrieve from http://www.google.co.kr/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwj1jKO4tITSAhVIurwKHYWoAIIQFggkMAE&url=http%3A%2F%2Fwww.kipa.org%2F_custom%2Fkipa%2F_common%2Fboard%2Fdownload.jsp%3Fattach_no%3D3691&usg=AFQjCNE5XZkSZMiJbtOYx1c-3FX1taSeFA&bvm=bv.146496531,d.dGc

KIPA (Korea Invention Promotion Association). (2011). *A Working Manual for Technology Transactions.* Seoul: KIPA

KIPA(Korea Invention Promotion Association). (n.d.). Retrieve from http://www.kipa.org/kipa/index.jsp

KIPO (Korea Intellectual Property Office). (2016). *SME Support Strategies and Policies for Strengthening Intellectual Property Competitiveness.* Daejeon: KIPO

KIPO(Korea Intellectual Property Office). (n.d.). Retrieve from https://www.kipo.go.kr/

KISTA (Korea Intellectual property Strategy Agency). (2016). *Inventor Interview, Application Form and an Operation Manual for the Public Sector IP Utilization Support Program.*
Retrieve from http://kista.re.kr/usr/com/prm/BBSDetail.do?boardTab=&menuNo=11005&upperMenuId=11&bbsId=BBSMSTR_000000000251&nttId=2826&pageIndex=1

KISTEP (Korea Institute of S&T Evaluation and Planning). (2013). *Benchmarking Research on R&D and Managing Systems in Major Economies.* Retrieve from http://www.google.co.kr/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwibn8XrgoXSAhVDgLwKHRd3BScQFggdMAA&url=http%3A%2F%2Fwww.kistep.re.kr%2FgetFileDown.jsp%3FfileIdx%3D2176%26contentIdx%3D884%26tbIdx%3DBRD_BOARD&usg=AFQjCNEaIZbVi4-jsD-HHBC-SV-TV_S6SA&sig2=9k4sWZtLlMQ9UPINtHLEiQ&bvm=bv.146496531,d.dGc&cad=rjt

Lee, K. Y. (2008). *SCORE system of the US and its Implications for SME Support Programs. Seoul*: FKILSC (Federation of Korean Industries' Center for Large and Small Business Cooperation)

Marc G. Stanley. (2004). ATP proposal Preparation Kit: NIST

METI-Kansai(Ministry of Economy, Trade and Industry, Kansai Bureau). (n.d.). 知財ビジネスマッチング. Retrieve from http://seeds-matching.go.jp/, http://www.kansai.meti.go.jp/

MOST(Ministry of Science and Technology). (n.d.). link-iac. Retrieve from http://www.link-iac.org.tw/

NASA(National Aeronautics and Space Administration). (n.d.). Technology Transfer Program, Retrieved from https://technology.nasa.gov/startup

National Research Council Canada. (n.d.). Retrieve from http://www.nrc-cnrc.gc.ca/eng/index.html

OCCI(Osaka Chamber of Commerce and Industry). (2014). Retrieve from http://www.osaka.cci.or.jp/Chousa_Kenkyuu_Iken/press/260911motto.pdf

RIPC(Regional Intellectual Property Center). (n.d.). Retrieve from https://www2.ripc.org/portal/main.do

S.J.Son, C.Y.Yoon, S.W.Hang, C.S.Park, J.C.Lee. (2014). *Exploring the Possibility of Applying Technology Valuation to National R&D Project Evaluation and Royalty System*: STEPI(Science and Technology Policy Institute)

SBA(Small Business Administration). (n.d.). SBIC program. https://www.sba.gov/sbic SBIC

Scottish Enterprise. (n.d.). Fund R&D project and feasibility studies. Retrieve from https://www.scottish-enterprise.com/services/develop-new-products-and-services/smart-scotland/overview

Seo, S. H. (2007). *TRIZ for Inventive Problem Solving and Innovation*. Seoul: CAD&Graphics

Shin-Ichiro Suzuki. (2011). Introduction to Patent Map Analysis: Japan Patent Office Asia-Pacific Industrial Property Center

SIPO (State Intellectual Property Office of P.R.C). (2015). *government capital led IP fund.* Retrieve from http://english.sipo.gov.cn/news/ChinaIPNews/2015/201511/P020151118400254161836.pdf

SIPO (State Intellectual Property Office of P.R.C). (2015). Retrieve from http://www.sipo.gov.cn/

TechShop. (n.d.). Retrieve from http://www.techshop.ws/index.html

Thai IP mart. (n.d.). Retrieve from http://www.thaiipmart.com/

TIPO (Taiwan Intellectual Property Office). (n.d.). Retrieve from https://www.tipo.gov.tw/

TWTM (Taiwan Technology Marketplace). (n.d.). TWTM, Retrieve from https://www.twtm.com.tw/Web/index.aspx

USPTO (United States Patent and Trademark Office). Retrieved from https://www.uspto.gov/

WIPO (World Intellectual Property Organization). (2016). *Global Innovation Index 2016* : Winning with Global Innovation. Retrieved from http://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf

WIPO (World Intellectual Property Organization). (n.d.). IP Statistics Data Center, Retrieved from http://ipstats.wipo.int/ipstatv2/index.htm

大阪商工会議所. (2014). http://www.osaka.cci.or.jp/Chousa_Kenkyuu_Iken/press/260911motto.pdf

一般社団法人発明推進協会. (2016). 特許情報を経営に活用しませんか？. http://www.ip-bunseki.go.jp/pamphlet.html

知財総合支援窓口. (n.d). Retrieve from http://chizai-portal.jp/index.html

Asia-Pacific
Economic Cooperation

APEC#217-CT-03.1 ISBN 978-981-11-2920-9