

2018/19 KSP Policy Consultation Report

ASEAN

Strengthening the IP Infrastructure in ASEAN
Member States



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2018/19 KSP Policy Consultation Report

ASEAN

Strengthening the IP Infrastructure in ASEAN
Member States



Ministry of Economy
and Finance



Korea Development
Institute



KIPA
Korea Invention Promotion Association

2018/19 KSP Policy Consultation Report

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2018/19 KSP Policy Consultation Report
Strengthening the IP Infrastructure in ASEAN Member States

Preface

In the era of the 4th Industrial Revolution defined by hyper-connectivity and hyper-intelligence, intellectual property (IP) has become increasingly important. In light of this era, major economic powers including the Republic of Korea are actively promoting IP protection and strengthening policies that foster the growth of innovative companies, acquisition of IP in core industries such as Artificial Intelligence (AI) and the Internet of Things (IoT), and standardization of relevant systems.

IP was not the driving force for Korea's initial economic development, as the manufacturing sector was originally the backbone of economic growth. However, as the world economy shifted to a knowledge-based value creation mechanism, the Korean government helped to promote employment in knowledge-intensive industries and developed an economic growth model based on IP. To this extent, the economic development of Korea and ASEAN member states (AMS) share commonalities such as colonial experience, dependence on foreign direct investment, and manufacturing-based economic growth. Therefore, Korea's experience of economic development based on IP will serve as a model for AMS.

To facilitate the sharing of our experience, the Ministry of Economy and Finance (MOEF) of Korea introduced the Knowledge Sharing Program (KSP) in 2004 to share Korea's development experience with the international community through joint research, policy consultations, and capacity-building activities. Since its inception, the program has played a vital role in supporting the socio-economic development of partner countries around the world. This KSP project for strengthening the IP infrastructure of AMS was carried out by the Korea Invention Promotion Association (KIPA) in cooperation with the Korea Development Institute (KDI) under the supervision of MOEF.

KIPA was established in 1973 and has been carrying out various projects for IP education and training and IP commercialization for last 45 years. We provide diverse online education courses and IP educational materials for a wide-ranging audience, including corporations, researchers, teachers, school and college students and the general public. We are also a leading public institute specialized in technology commercialization, patent technology transactions and evaluation through local IP support programs.

KIPA's experience and expertise on IP education, training and IP-based technology commercialization will be shared with AMS through the KSP project to help strengthen their IP infrastructures and support economic growth in the ASEAN region. Through the KSP project, KIPA

has worked closely with AMS to understand the current status of their IP infrastructures and delineate the specific needs of each AMS. It served as an opportunity to not only share the development experience of Korea, but also our distinctive culture and sentiments which will pave the way for future cooperation.

The ASEAN Secretariat has supported the project with enthusiasm and passion, and helped to derive active cooperation between the Korean researchers and the member states at every stage. In particular, I would like to express our thanks to Deputy Secretary General Aladdin D. Rillo and Assistant Director Looi Teck Kheong, with special recognition of Senior Officer Maslina Malik of the ASEAN Secretariat. In addition, I would like to extend our sincere appreciation to the patent offices of each member state who welcomed us and energetically cooperated with the Korean researchers at the time of the visit. The completion of this project would not have been possible without their devotion.

Moreover, I would like to extend my sincere thanks to all those who have made valuable contributions to the successful completion of the project. I am also grateful to the Center for International Development of KDI, in particular Executive Director Dr. Sanghoon Ahn, former Executive Director Dr. Youngsun Koh, Project Manager Kyoung Doug Kwon, and Project Officer Jee Hee Yoon, for their hard work and dedication to the project. Last but not least, I would also like to express our gratitude to the Korean team for their efforts to ensure the project was a success. In particular, as this project was agreed to be carried out at the meeting of the Heads of Patent Offices of AMS, the Korean Intellectual Property Office (KIPO) played an important role in the fruition of the project and did not hesitate to offer advice and counsel. I am grateful for the efforts of Director Yongjoo Park, Senior Deputy Director Iksoo Jeon and Deputy Director Eunrim Choi of the International Cooperation Division of KIPO.

I firmly believe that the KSP will serve as a stepping stone to further elevate mutual learning and economic cooperation between ASEAN and Korea, and hope it will contribute to the sustainable development of the region.

Koh, Joonho

President

Korea Invention Promotion Association

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2018/19 KSP with ASEAN

Dong Hwan Yoo (Korea Invention Promotion Association)

2018/19 KSP with ASEAN

Dong Hwan Yoo (Korea Invention Promotion Association)

The Knowledge Sharing Program (KSP) with ASEAN is a project to support the sustainable growth of the ASEAN region through the improvement of inter-border links and the dissolution of the regional development gap by sharing the experiences of Korea's intellectual property (IP)-based economic development.

The Association of Southeast Asian Nations (ASEAN) is a regional intergovernmental organization representing Southeast Asian countries established on August 8, 1967. ASEAN aims to promote cooperation in a number of areas, including trade, politics, security, defense, and education, and support socio-cultural integration. It is comprised of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand, Singapore and Vietnam. In December 1995, the member states signed the ASEAN Framework Agreement on Intellectual Property Cooperation in Bangkok, Thailand to promote closer cooperation among AMS in IP and other related fields. Since the agreement was signed, AMS have continued to make efforts on improving intellectual property rights (IPR) protection, including amending respective laws in line with international standards, improving IPR protection systems, and harmoniously developing IP laws with other member states. In 1996, ASEAN established the ASEAN Working Group on IP Cooperation (AWGIPC) as a specialized IP working group to improve policies and systems related to patents and trademarks of all member states.

In 2007, ASEAN adopted the ASEAN Charter to strengthen its identity in the international realm and to adopt the ASEAN Economic Community (AEC) Blueprint with the aim of establishing a single market and a single production base by 2015. The AEC Blueprint 2015 has set four key characteristics: (a) a single market and production base, (b) a highly competitive economic region, (c) a region of equitable economic development, and (d) a region fully integrated into the global economy.”¹ In addition to the 2015 blueprint, the

1 AEC Blueprint 2015, <https://asean.org/wp-content/uploads/archive/5187-10.pdf> (accessed on May 12, 2019).

contents were improved to include resilience, sustainability, and inclusion to formulate the AEC Blueprint 2025. In regards to IPR, strengthening intellectual property rights cooperation is proposed in Section B of Part II, with the interim objective of “A Competitive, Innovative and Dynamic ASEAN.”

AWGIPC has established and implemented the 10-year strategic plan for the IP sector as part of its efforts to integrate the ASEAN economy. “ASEAN IP Action Plan 2016–2025” aims to strengthen the protection and utilization of IPR by (1) establishing a more robust ASEAN IP system by strengthening the functions of IP offices in AMS and strengthening IP infrastructure in the region, (2) developing regional IP platforms and infrastructure to contribute to strengthening the ASEAN economic community, (3) expanding a comprehensive ASEAN IP ecosystem, and (4) enhancing regional mechanisms for asset creation and commercialization, including geographical indications and the protection of traditional knowledge.² These four strategic objectives are pursued through 19 detailed action plans.

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In order to overcome the level of disparity and strengthen the IP infrastructures among the AMS, this project analyzes the current status of IP infrastructures in AMS and finds out harmonious development plan for building an integrated patent system. Moreover, in order to strengthen the IP capacity of public officials and to raise the general public’s IP awareness, Korea’s experience in operating IP education and training is shared. On the premise of the future establishment of the ROK-ASEAN IP Education and Training Center, methodologies on the development of curriculum for operating the center are proposed. Furthermore, the experience and know-how of Korea’s successful IP creation and utilization policies and programs are shared so that SMEs’ technological innovation processes and monetization of the derivative products in the region can be facilitated.

Considering the needs expressed by the ASEAN Secretariat and the demands from AMS to strengthen their IP infrastructure, this project is designed to provide policy consultation on the following sections : (1) “Strengthening IP Offices: Analysis of the Current Status of IP Infrastructure in AMS,” (2) “Developing IP Platforms and Infrastructure: Policy Consultation on the Establishment of the Korea-ASEAN IP Training Center,” (3) “Enhancing Regional Mechanisms to Promote Asset Creation and Commercialization: Consulting on IP Creation & Utilization Policies for Technology Commercialization of SMEs,” and (4) “Strengthening IP Capacity-building and IP-based Technology Commercialization.”

2 <https://www.aseanip.org/Resources/ASEAN-IPR-Action-Plan-2016-2025> (accessed on May 12, 2019).

The Korea Development Institute (KDI) commissioned the project from the Ministry of Economy and Finance (MOEF) of Korea and developed the action plan to initiate the 2018/19 ASEAN KSP project. The project manager was selected according to the systematic planning and management of the project. The project required professional expertise in IP and patents, and was pursued through open bidding to select the organization that would be re-trusted with the project. The Korea Invention Promotion Association (KIPA) was finally selected through the public bid announcement.

The local consultants were selected through the briefing and field research sessions based on the subjects' expertise and recommendation of the ASEAN Secretariat. In addition, in order to improve the effectiveness and quality of the report, four external experts with subject-specific expertise were selected under the guidance of MOEF and KDI. The research team and the members of the Advisory Evaluation Committee for the 2018/19 ASEAN KSP project are as follows:

Strengthening the IP Infrastructure in ASEAN Member States

Sub-topics	Researchers	Local Consultants
1. Strengthening IP Offices: Analysis of the Current Status of IP Infrastructure of ASEAN Member States	Dr. Yusun Park, Korea Invention Promotion Association	-
2. Developing IP Platforms and Infrastructure: Policy Consultation on the Establishment of the Korea-ASEAN IP Training Center	Dr. Seungwoo Son, Chung-Ang University	Mark Teng, That.Legal LLC
3. Enhancing Regional Mechanisms to Promote Asset Creation and Commercialization: Consulting on IP Creation and Utilization Policies for Technology Commercialization of SMEs	Dr. Jinseok Park, Darae Law & IP Group	Mitchel Chua, LIXIL Water Technology
4. Strengthening IP Capacity-building and IP based Technology Commercialization	Dr. Yongkyu Kim, Ms. Hwanhee Jeong, Korea Invention Promotion Association	-
<ul style="list-style-type: none"> • Senior Advisor: Dr. Joong-Kyung Choi, Former Minister of Knowledge and Economy of Republic of Korea • Project Manager: Dr. Kyoung Doug Kwon, Director, Division of Policy Consultation, CID, KDI • Principal Investigator: Dr. Yusun Park, Expert Advisor, Korea Invention Promotion Association 		

From July 15 to July 8, 2018, KDI met with the Market Integration Directorate of the ASEAN Secretariat in Indonesia to discuss the methods of cooperation and detailed topics of the project. During this meeting Dr. Kyoung Doug Kwon, Mr. Daehyun Song, and Ms. Ye-rim Kim of KDI, Mr. Kyusik Seo and Mr. Hyun-ji Song of MOEF, and Mr. Mark Andrew C Herrin, Ms. Fika Yulialdina Hakim, and Ms. Anita Konala of the ASEAN Secretariat were present. As

the requested topics of research were somewhat ambiguous, KDI and the ASEAN Secretariat elaborated and agreed on the details of the project.

With the official launch of the ASEAN KSP project, the KSP research team flew to Cambodia from November 26 to December 1, 2018 for the Launching Seminar and Pilot Study. Through the Launching Seminar, the KSP research team explained the significance of economic development through IP and the compositions and research methodology of the 2018/19 ASEAN KSP project. During the Seminar, delegates from AMS addressed the current status of IP infrastructure and the needs were concretely rectified. The KSP had meetings with delegates from AMS and the ASEAN Secretariat discussing the schedule, objective, allocation of roles and the selection of local consultants for the project. The Launching Seminar took place during the 54th meeting of AWGIPC, and senior officials from all 10 member states were present, thereby reaching the consensus on the methodology, objective, and content of the project.

In order to share the progress of the project and strengthen the IP capacity of government officials of AMS, the Policy Seminar and In-depth Study were carried out from March 17 to 27, 2019. At the Policy Seminar, hosted at the ASEAN Secretariat in Jakarta, Indonesia, government officials in the IP field from 8 member states were present (delegates from Brunei Darussalam and Singapore were absent). The following topics were discussed during the Seminar: (1) The ASEAN Patent System and the Korean Experience, (2) Application of Korean IP Education and Training in ASEAN, (3) APEC Guidebook for SMEs' IP-Business Cycle, (4) Cases of Successful SMEs IP Support Measures in Korea, and (5) 4th Industrial Revolution and IP along with the progress of the current project. On the second day, IP officials from AMS gave presentations on each member states' IP infrastructure, IP education and training, and IP commercialization policies. The mutual sessions included discussions on sharing experiences and needs of each AMS. After the Policy Seminar, the KSP research team visited IP offices and IP educational institutions in Indonesia, Singapore, Malaysia, and the Philippines for in-depth research and to conduct a survey. The meetings allowed the teams to investigate the status of the patent application process, operation of IP education and training, and IP based technology commercialization.

From April 28 to May 4, 2019, the Interim Reporting and Policy Practitioners' Seminar was held in Seoul, Korea. At this time, IP government officials from 8 member states attended (delegates from Brunei Darussalam and the Philippines were absent) along with Ms. Maslina Malik from the ASEAN Secretariat and 2 local consultants. In order to have firsthand experiences on the Korean policies and programs, delegates from AMS visited IP

organizations and institutes including the Korean Intellectual Property Office (KIPO) and the International Intellectual Property Training Institute (IIPTI) as well as KIPA. Moreover, delegates from AMS visited the ASEAN-ROK Commemorative Summit Preparatory Office, and Executive Director of the Preparatory Office Jeong-In Suh discussed the history of ROK-ASEAN cooperation and future issues and tasks between the two counterparts. In the Interim Reporting, the KSP researchers presented on the progress of the 4 topics of the KSP project and 2 local consultants shared their findings on IP education and training and IP commercialization in the ASEAN region. The policy makers and public officials of AMS expressed their interests on Korea's IP polices and commented on the progress of the project.

Finally, on July 10, 2019, the Final Reporting Session of the KSP project was held during the 56th AWGIPC meeting at Solo Baru, Indonesia. The finalized contents of the 4 topics were shared and policy proposals were made accordingly. Senior policy makers at the meeting gave their opinions and the feasibility of the proposed policies was discussed.

This project aims to strengthen the IP infrastructures of AMS and promote IP creation and IP utilization of SMEs in the region to contribute to the economic development of ASEAN. This will facilitate an environment where Korean companies in the region can effectively secure and protect their IPR, which can contribute to strengthening economic cooperation between Korea and AMS.

Executive Summary

Yusun Park (Korea Invention Promotion Association)

Executive Summary

Yusun Park (Korea Invention Promotion Association)

The 2018/19 KSP with ASEAN aims to share Republic of Korea's IP-based economic development experience with AMS and support the strengthening of IP infrastructures in ASEAN member states, and ultimately contribute to the sustainable economic growth of ASEAN.

This project consists of 4 parts, and the goals of the first chapter, "Strengthening of IP Offices: Analysis on the Current Status of IP Infrastructure of ASEAN Member States", are to overcome the development disparity in IP infrastructures among AMS and to support their harmonious economic and social development in order to create integrated IP systems. The researcher analyzed the current status of patent applications, patent laws and the roles of IP offices in AMS and identified the similarities and differences in the patent application processes of each member state. Lastly, the researcher proposed suggestions to reduce the development gap and to achieve future cooperation plans for integration. It included policies that foster resident applications, the development of common application format, the consistent interpretation of patent requirements, and the establishment of ROK-ASEAN IP Education & Training Center.

Based on the present conditions of patent infrastructures in AMS, the second chapter, "Developing IP Platforms and Infrastructure: Policy Consultation on the Establishment of the Korea-ASEAN IP Training Center", analyzes the current state of IP education in AMS and presents education policies considering the characteristics of each member state. In addition, key infrastructure and factors are necessary to operate the ROK-ASEAN IP Education and Training Center efficiently. Specifically, laws that are the legal basis for implementing IP education and training based on the Korean experience are proposed. In the education program, modules for each lifecycle of IP are organized by education level and category. Moreover, educational programs were classified to target the general public, public officials, examiners, SMEs, and instructors who are in charge of IP education. Exemplified programs were provided and methods were proposed for member states to adopt education modules

in accordance with their needs. Furthermore, AMS are classified as being in the initial stage, development stage, or innovative stage in regards to IP education, suggesting appropriate education and training to be used for each stage.

In the third chapter, “Enhancing Regional Mechanisms to Promote Asset Creation and Commercialization: Consulting on IP Creation & Utilization Policies for Technology Commercialization of SMEs”, the researcher shares successful IP creation and utilization policies of SMEs and introduces “APEC IP Business Guidebook”. The Guidebook categorizes policies and programs of various IP creation and utilization fields implemented by KIPO and Korea Invention Promotion Association (KIPA) by level of difficulty. The researcher also analyzed the current status of ASEAN SMEs and creation and utilization policies in AMS, and denotes the diversification in the role of the IP Offices beyond filing IP applications and examination. The researcher suggests the various policy measures to improve the IP infrastructure in ASEAN including cooperation between IP related ministries and affiliated departments, harmonization of the examination criteria, and establishment of the foundations of IP creation etc.

The fourth chapter, “Strengthening of IP Capacity-building and IP-based Technology Commercialization”, shares Korea’s experience of implementing IP policies and programs and shows how the policies and programs were executed through the Korean Intellectual Property Office (KIPO) and affiliated organizations. Through sharing experiences of implementing IP policies and programs for commercializing IP capacity and IP technology in Korea, AMS may learn the success factors of Korea’s IP start-up support and IP consulting for IP creation and utilization service. The researcher also suggests policy proposals for AMS to implement policies and programs related to strengthening IP capacity according to their respective circumstances. It provided a step-by-step process according to each country’s environment and situation, and recommended steps in order to strengthen IP capacity and build the foundations of IP-based technology commercialization.

01

CHAPTER

Strengthening IP Offices: Analysis of the Current Status of IP Infrastructure in ASEAN Member States

Yusun Park (Korea Invention Promotion Association)

1. Introduction
2. Current Status of ASEAN IP Infrastructure
3. Analysis and Applications
4. Conclusion and Policy Recommendations

Keywords

Patent Application Procedure, Patent Prosecution, Substantive Examination, Integrated Patent System, International Cooperation, Patent Application

Strengthening IP Offices: Analysis of the Current Status of IP Infrastructure in ASEAN Member States

Yusun Park (Korea Invention Promotion Association)

Summary

The goals of the first task, Strengthening of IP Offices: Analysis on the Current Status of IP Infrastructure of ASEAN Member States (hereafter AMS), are to overcome the development disparity in IP infrastructures among AMS and to support their harmonious economic and social development in order to create integrated IP systems. The research mainly focuses on the current status of patent applications, patent laws and the roles of IP offices in AMS and the author analyzed the similarities and differences in the patent application processes of each member state. Lastly, suggestions are proposed to reduce the development gap and to achieve future cooperation plans for integration.

The analysis of the current patent filing system in AMS calls for the introduction of policies that foster resident applications. One common characteristic among AMS is that the number of foreign patent applications is much higher than the number of domestic applications. We can therefore infer that the technological capability of AMS is still in the development stages and ASEAN is considered a very attractive investment target for foreign companies. In order to increase the technology development capability of AMS, it is recommended to adopt various policies to increase the number of domestic patent applications. Considering that MSMEs in ASEAN account for large proportions of local employment and GDP of the ASEAN region, it is important to enhance the legal system to promote MSMEs that will contribute more to the economy and trade.

In patent execution, language issues cause delays and complications on the outcomes of patent examinations. In particular, during the process of translating international applications written in English to local languages, miscommunications between the foreign applicant and agent, and the local representative and patent office, cause significant risks

due to improper responses to the Office Action (OA). Therefore, it is advisable to find measures to minimize language issues when filing patent applications.

AMS maintain their own independent patent laws and patent application procedures. Each AMS' patent laws and application procedures differ from one member state to the next. There is a substantive difference in interpreting patent requirements, patentable subject matter, and the competence of examiners. For example, AMS commonly define novelty, inventive step, and industrial applicability as patent requirements. However, when determining if the claimed invention complies with the patent requirements, the criteria of each patent office shall be determined by the scope of the prior art search, the degree and capacity of the examiner, and the understanding and discretion of the examiner's technical field. If the same invention is able to be patented in one country while not in others, it may be difficult to maintain confidence of the patent system itself. Hence, it is advisable to ensure consistent interpretation of patent requirements and patentable subject matters under patent laws. Furthermore, most AMS adopt both formal and substantive patent examinations. However, the level of the substantive examination by the patent office and its result are subject to the interpretation of the patent requirements, and to policies of the government. Therefore, even if there is a substantive examination system, the results of the prior art search and examination can vary greatly.

The duration of the patent examination also differs for each AMS. As most AMS are experiencing difficulties due to a prolonged patent pendency period and backlog, it is important to expedite the examination period by hiring more examiners. The number of examiners at the patent offices of AMS widely varies depending on the examination system and patent infrastructure of the country. Exemplifying Thailand's case, recruiting more patent examiners is definitely a useful way of shortening the examination period. However, considering the fact that recruiting examiners with professional knowledge and skills can cause various issues due to the country's budget and national policies, each IPO should also concentrate on providing systematic education and training for the examiners.

International cooperation between member states or with other IPOs can be one of the options to shorten the examination period. In fact, most AMS actively pursue international patent examination cooperation through bilateral agreements as well as the ASEAN Patent Examination Cooperation (ASPEC). As the cooperation aims to approve patent rights of another country and mutual recognition is based on the confidence of each AMS' IP system, different patent systems of AMS may interfere with its efforts to resolve the extended period of delays and backlogs.

The establishment of the ASEAN integrated patent system can make AMS a more attractive location for investment from foreign companies with superior technological capabilities. This will create more opportunities for SMEs in the ASEAN region to increase their own technological prowess. In addition, if patent laws and application procedures of AMS are harmonized, it will solve the problems of prolonged examination time and backlog by referring to prior art searches, examination results, and examination cooperation of AMS.

1. Introduction

1.1. Background

1.1.1. Background and Context of Research

Various studies and discussions are made on the effects of intellectual property (IP) on economic development in foreign patent offices, academia, and industries. In general, patents are thought to be promoting technological innovation activities in companies and consequently contributing to the production of added value and economic development of the country (Chung et al., 2004). The correlation between Korea's economic development and IP shows that two factors are closely related. More specifically, in Korea, productivity increases by 0.11% if the percentage of patent applications increases by 1%, and GDP increases by 0.11% points within three to five years thereafter (KDI, 2014). In addition, studies on the impact of IP-intensive industries on Korean economy shows that the contribution of IP to employment in Korea is 29.1%, wage premium is 51.1%, and GDP is 43.1% (Lim, 2018). IP plays the role of “intellectual currency” that promotes economic development and competitiveness of companies and supports innovation (Cela, 2016).

ASEAN is committed to political and economic integration as a single community and has consistently endeavored to peacefully resolve differences between member states under the socio-cultural context. However, there are considerable gaps in the economic and social development stages among AMS in fulfilling this objective. Moreover, in the field of IP, the level of development in IP infrastructure also differs.

Singapore maintained a well-developed IP infrastructure and has been making efforts to fulfill its role as the IP hub of the ASEAN region. Indonesia, Malaysia, the Philippines, Thailand, and Vietnam have worked on developing IP systems, but they face problems of prolonged pendency periods, weak protection of IP rights, and difficulties enforcing IP laws.

Brunei has developed its own IP system and expects further development. Cambodia is in the early development stage of IP infrastructure, Lao PDR is in the process of revising the IP law and enacting regulations, and Myanmar recently enacted IP laws and is starting to set up its infrastructure. The most fundamental difficulties of ASEAN's IP integration are the disparities in the economic and social development processes of each AMS and the level of maintenance of its IP infrastructures, which is a hurdle that ASEAN must overcome.

AMS maintain independent patent laws and application procedures. Each AMS' patent laws and procedures enacted in the decree differ from one member state to the next. The duration of examination, interpretation of patent requirements, patentable subject matter, and competence of examiners all vary. If the patent laws of AMS apply different criteria, a registered patent in one member state may not be patentable in another, and even if the patent is registered, the quality may differ. Member states may actively refer to the results of the examination and investigative reports of another member state or cooperate to facilitate rapid procedures through mutual recognition in order to prevent a prolonged application time and backlog. However, if the regulations of the patent laws and systems of the two countries are different, or if it is difficult to rely on, it will be difficult to respect the patent decisions. Furthermore, the fact that different patent decisions can be made for different member states on the same invention has a negative impact on securing predictability for applications. In particular, since mutual recognition is based on the confidence of each member state's IP system, the different patent systems may interfere with the efforts of the member states to resolve the extended delays in pendency period and reduce patent backlogs through mutual cooperation.

The integration of patent systems in the ASEAN region can benefit the AMS in various aspects. For example, if the applicant can acquire a patent right in the jurisdiction of AMS through a single patent application procedure, foreign applicants including those in Korea will be motivated to apply for a patent in the region. The establishment of an ASEAN integrated patent system can attract more investment from foreign companies with superior technological capabilities and increase opportunities for SMEs in the ASEAN bloc to increase its technological prowess. In addition, if patent laws and application procedures of AMS are standardized it will help to solve problems with prolonged examination and backlog by referring to prior art searches, examination results, and examination cooperation of AMS.

1.1.2. Scope and Method of Research

The KSP research team agreed with the ASEAN Secretariat on the scope of this research topic, to study the patent application process under the Patent Act of AMS and to study the

suitability of patent system integration. The researchers conducted extensive literature surveys, interviews and questionnaires with officials from the IP Office of the Member States to identify the current status of patent infrastructures in the 10 AMS. This study seeks to find ways to harmonize the ASEAN patent system in its development by analyzing the current state of patent infrastructures in AMS and examining its suitability.

1.2. Composition of Research

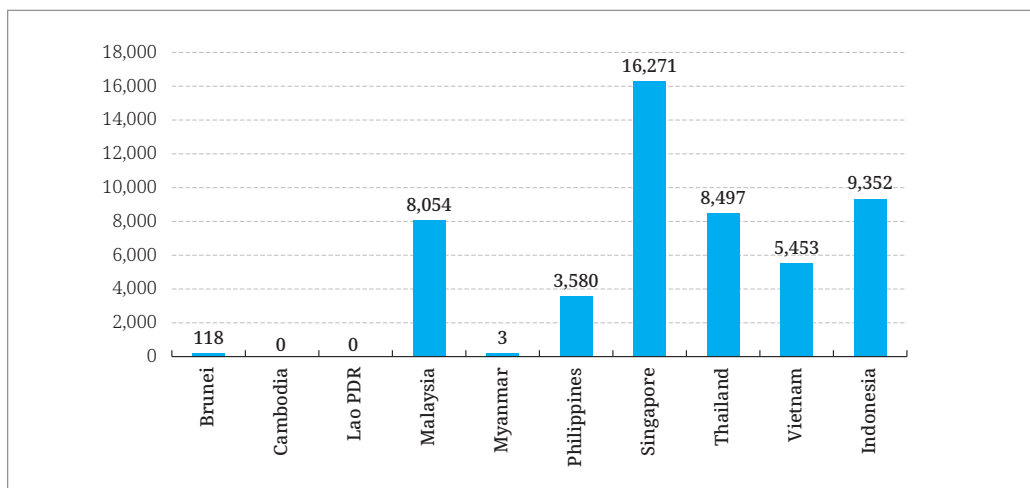
This study aims to analyze the current status of patent application in AMS, IP law, application procedure, substantive examination and patent examination cooperation in Part 2. In Part 3, it analyzes the similarities and differences between the patent systems of the AMS through the revision of its current status. Finally, in Part 4, conclusion and policy recommendations will be given for the integration and balanced development of the ASEAN patent system.

2. Current Status of ASEAN IP Infrastructure

2.1. Patent Applications by Member State

Singapore has the highest number of applications, followed by Indonesia, Thailand, Malaysia, Vietnam, and the Philippines in order, and Brunei Darussalam and Myanmar relatively have low number of applications.

[Figure 1-1] Number of Patent Applications for ASEAN Member States

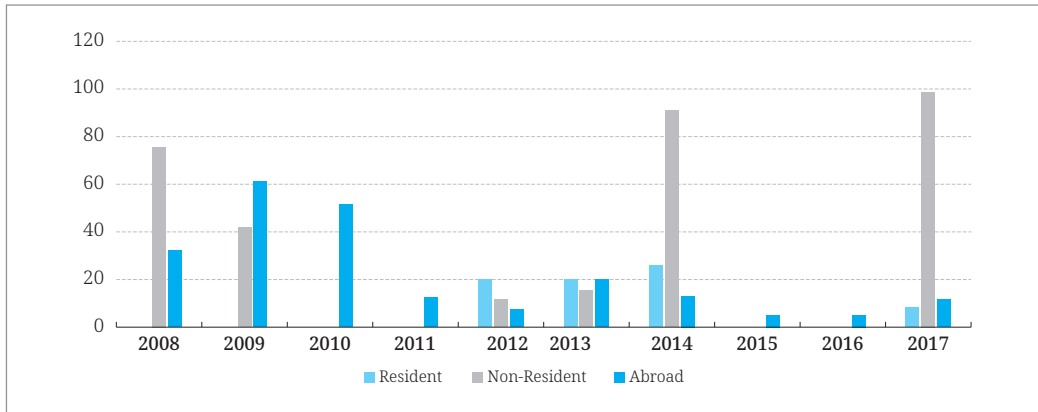


Source: WIPO Statistical Country Profiles (No record found for Brunei and Cambodia in 2017 at WIPO).

2.1.1. Brunei Darussalam

The number of patent applications filed by non-residents is significantly higher than the number of resident applications filed, and a total of 118 applications were filed in 2017, indicating that patent applications have not been active.

[Figure 1-2] Number of Patent Applications in Brunei Darussalam

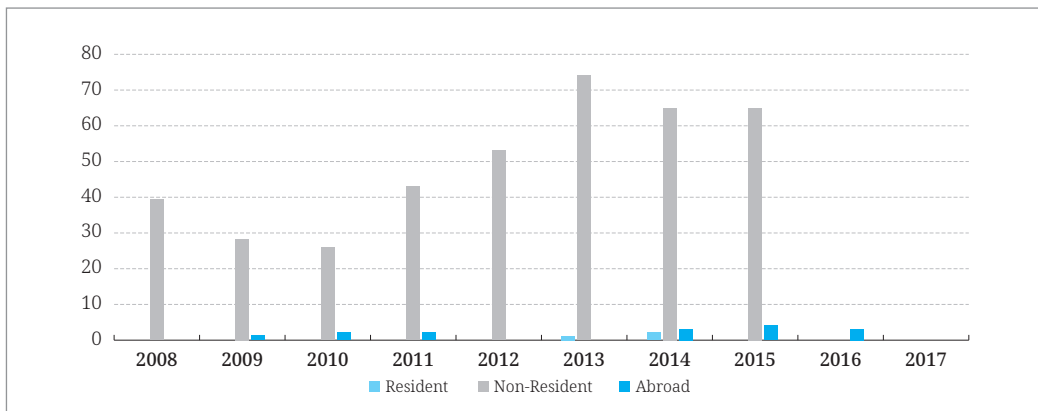


Source: WIPO Statistical Country Profiles.

2.1.2. Cambodia

In Cambodia, there were only three applications filed by residents in the last 10 years (2008~2017), and there were 65 applications filed by non-residents. It is difficult to say that patent application procedure has been established since only one non-resident application has been registered in the last 10 years.

[Figure 1-3] Number of Patent Applications in Cambodia

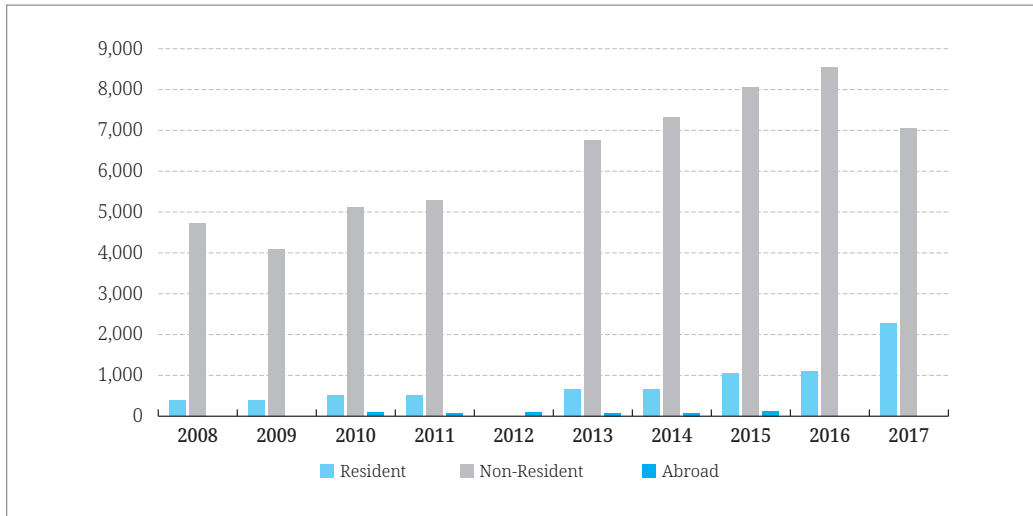


Source: WIPO Statistical Country Profiles.

2.1.3. Indonesia

For Indonesia, as with other AMS, the number of patent applications filed by non-residents is quite high. However, the number of non-resident patent applications in Indonesia dropped drastically in 2017, while the number of patents filed by residents more than doubled. The increase in the number of patent applications is due to the technological development and innovation, meaning the increased number of domestic patent applications in Indonesia can be the indicator of the improvement in the level of technology (K&K Advocates, 2017). According to the Indonesian Directorate General of IP (DGIP), the total number of applications filed in 2019 is 12,000, of which 15% are patents filed by residents (Interview with DGIP, 03/18/2019).

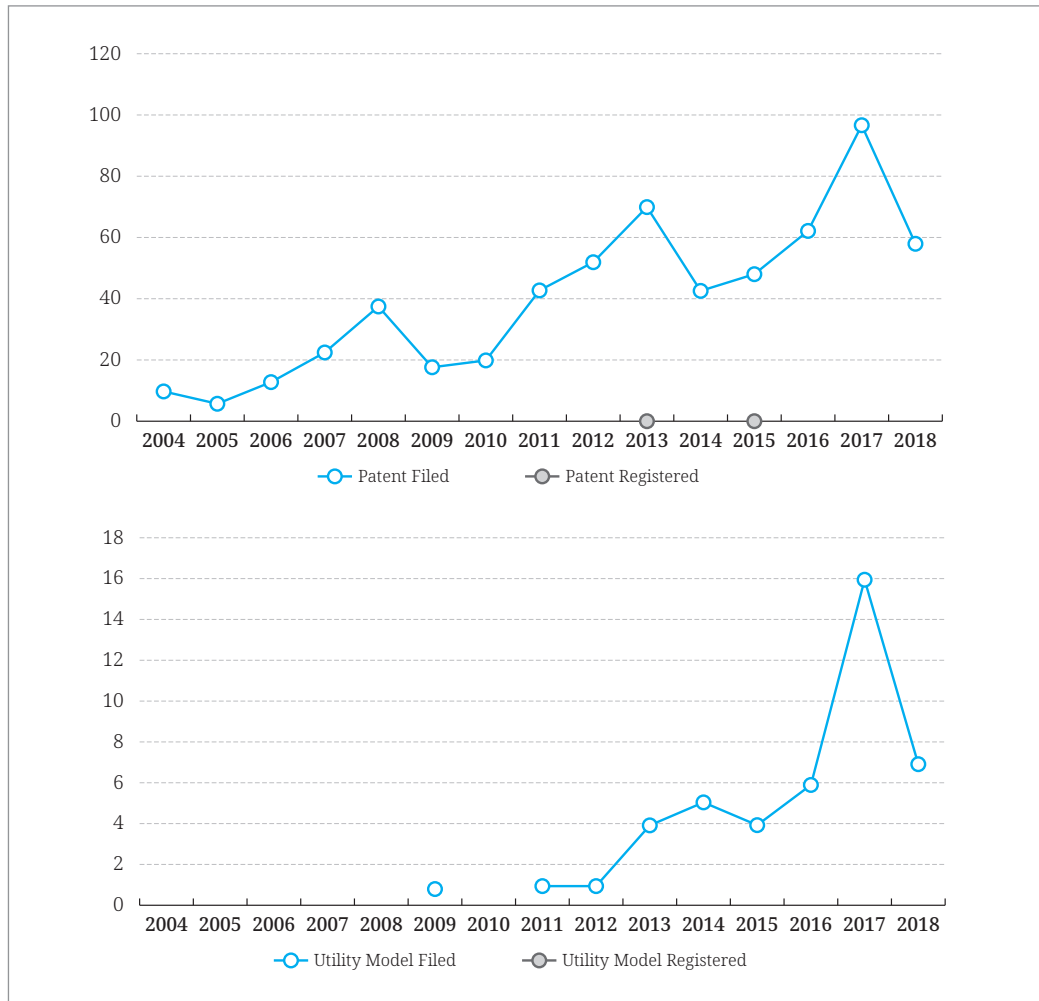
[Figure 1-4] Number of Patent Applications in Indonesia



Source: WIPO Statistical Country Profiles.

2.1.4. Lao PDR

Lao PDR is making efforts on establishing IP infrastructure by enforcing the revised Law on IP Rights in 2017. Although the number of patent applications is low compared to other member states, the number is steadily increasing. However, there were only 3 registered patents from 2004 to 2018. For other member states, the number of applications for utility models supersedes the number of applications for patents. However, in Lao PDR, not one application was registered for utility models. On the other hand, filing and registration of trademark and industrial design are actively pursued compared with patents.

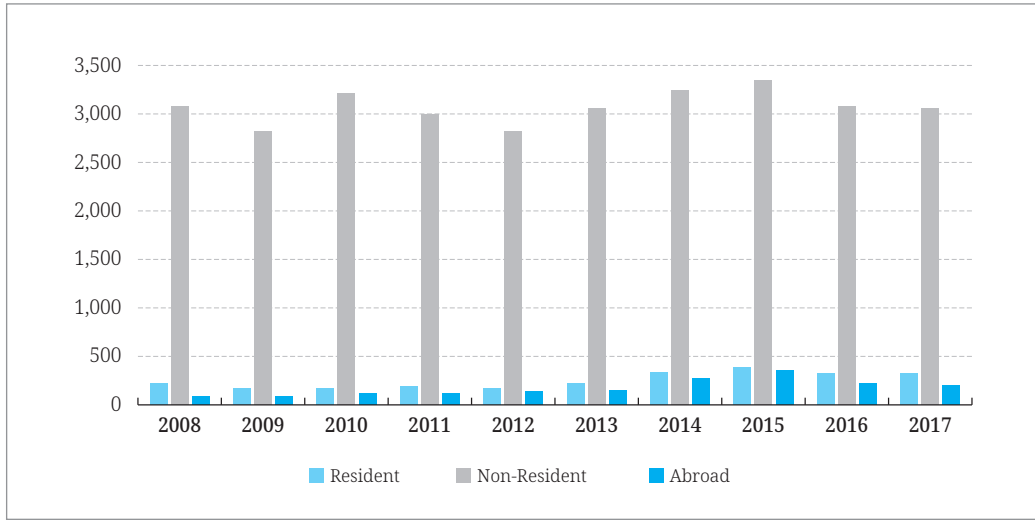
[Figure 1-5] Number of Patent and Utility Model Application and Registration in Lao PDR

Source: Reconstructed from DIP, Policy Seminar and In-depth Research from the KSP Project.

2.1.5. The Philippines

In the Philippines, the number of patents filed by residents is significantly lower than the number filed by non-residents.

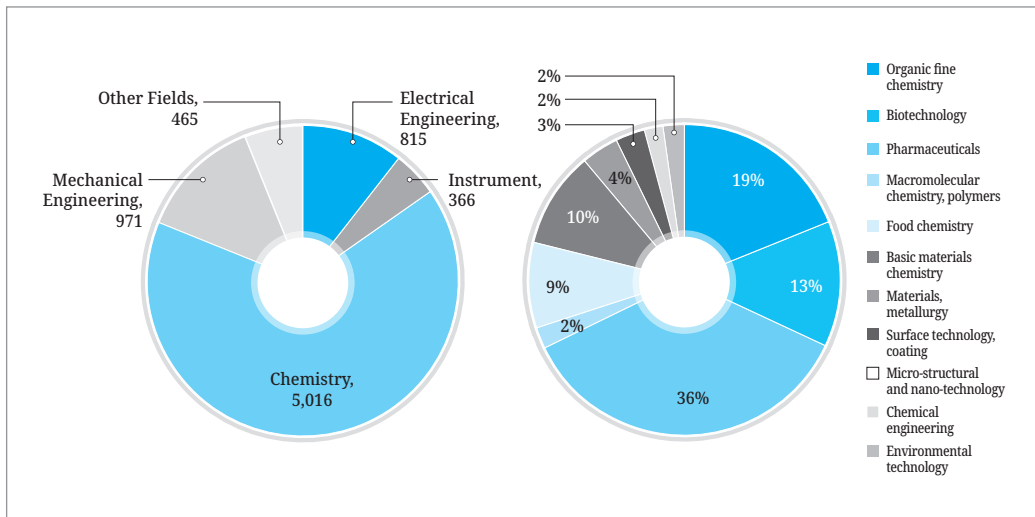
[Figure 1-6] Number of Patent Applications in the Philippines



Source: WIPO Statistical Country Profiles.

Looking at the patent filing patterns for industrial fields in the Philippines, chemical field was the highest, followed by mechanical engineering and electrical engineering. Within the chemical industry, the application rate is highest in the field of pharmaceuticals, and applications for organic fine chemicals, biotechnology, and basic chemical materials are also high.

[Figure 1-7] Number of Applications by Industrial Fields in the Philippines

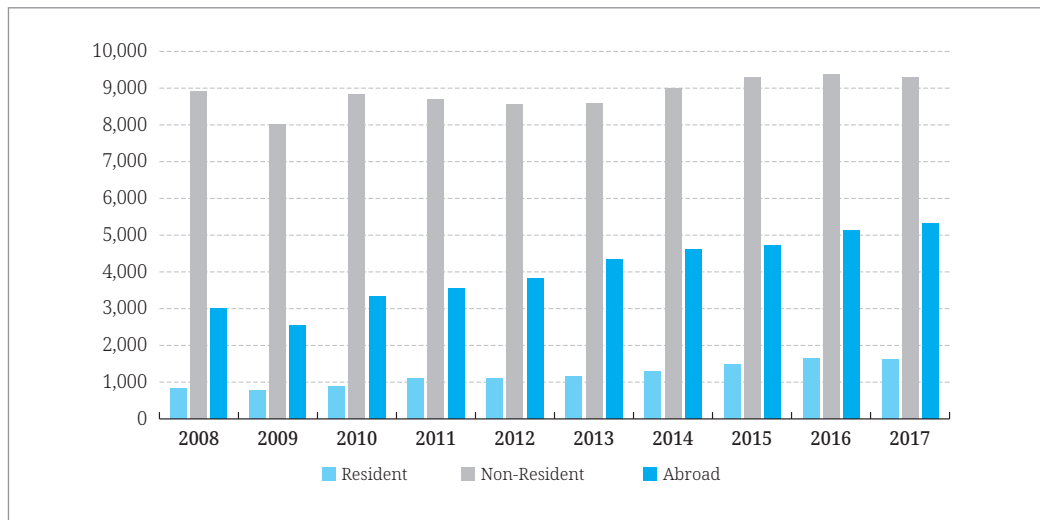


Source: Reconstruction from IPOPHL, Policy Seminar and In-depth Research of the KSP Project.

2.1.6. Singapore

As the IP hub of ASEAN, Singapore, where engagement in patent activity thrives, the number of patent applications by non-residents exceeds the number of patent applications by residents by five to six folds. Patent applications in Singapore show different patterns since the number of applications filed by overseas applications is much higher than that of other member states. Since September 2015, Singapore has been designated as the first AMS for International Searching Authority (ISA) and International Preliminary Examining Authority (IPEA) for the international PCT applications. Foreign companies seeking to enter the ASEAN region will designate the IP Office of Singapore (IPOS) as the Receiving Office (RO), and it is often the case that an international PCT application is filed with the IPOS as an entry point for the ASEAN region.

[Figure 1-8] Number of Patent Applications in Singapore



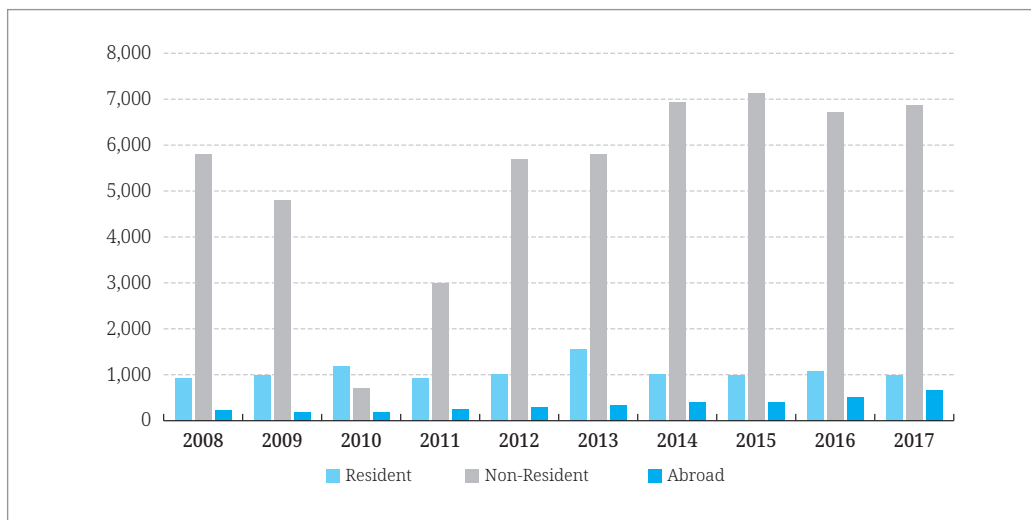
Source: WIPO Statistical Country Profiles.

2.1.7. Thailand

Thailand show similar patterns with other AMS where the number of applications filed by non-residents is significantly higher than the number of resident applications and the rate of patent registration by non-residents is 94% while only 6% are resident registration rate. On the other hand, for utility models, the registration of residents accounted 92% of the total utility model registration (KSP Policy Seminar, 2019). Since the patent law of Thailand does not carry out a substantive examination for utility models that has undergone a formal examination, novelty is not considered a factor. For patent application, the examination

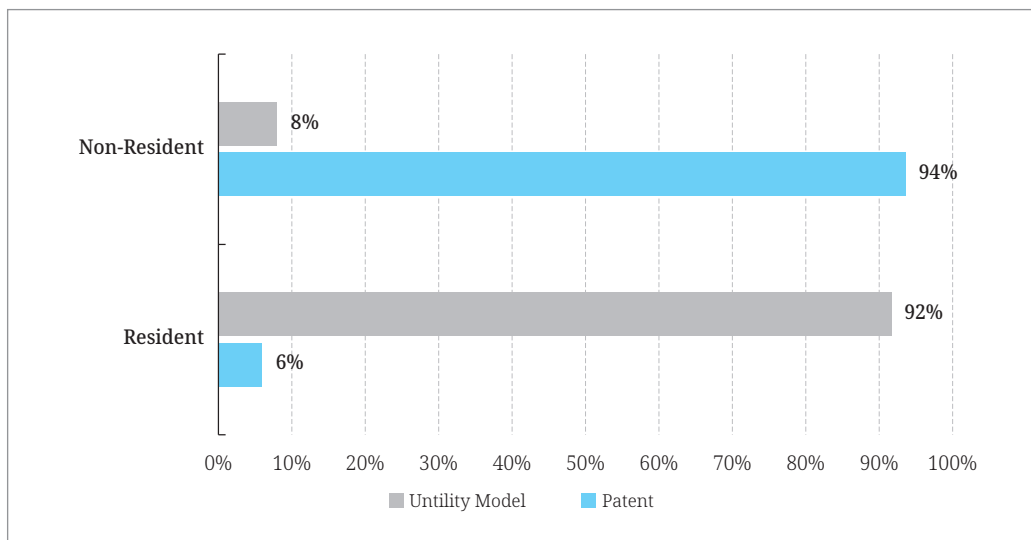
period is 8.9 years, whereas decision for the utility model registration will be given within 6 to 8 months after applying, and more than 90% of the applications get registered (KSP Policy Seminar, 2019).

[Figure 1-9] Number of Patent Applications in Thailand



Source: WIPO Statistical Country Profiles.

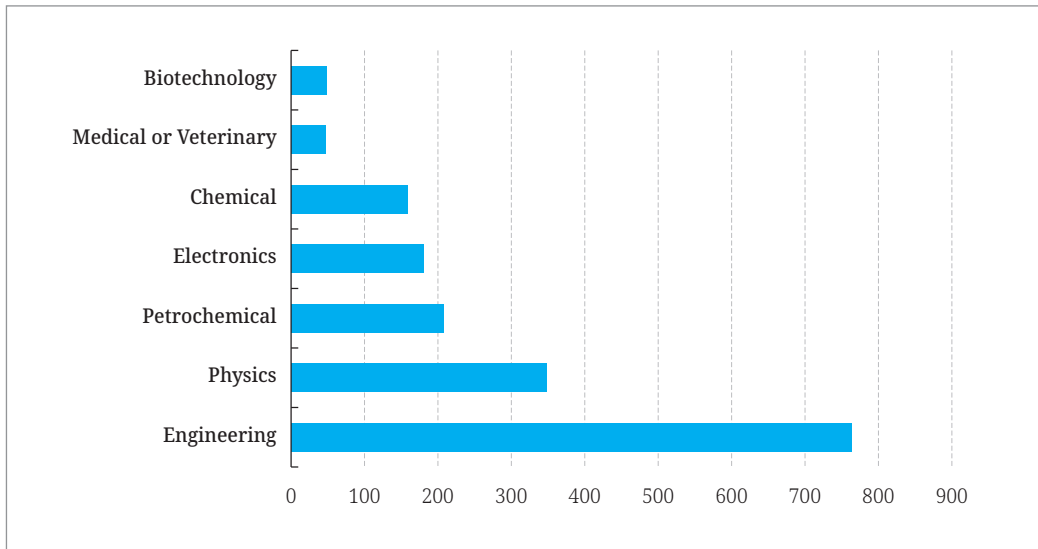
[Figure 1-10] Percentage of Patent and Utility Model Registrations in Thailand



Source: DIP, Policy Seminar and In-depth Research of the KSP Project.

[Figure 1-11] shows engineering field to have the highest number of patent registrations, and it is followed by physics and petrochemical industries.

[Figure 1-11] Number of Patent Registrations by Industrial Fields in Thailand

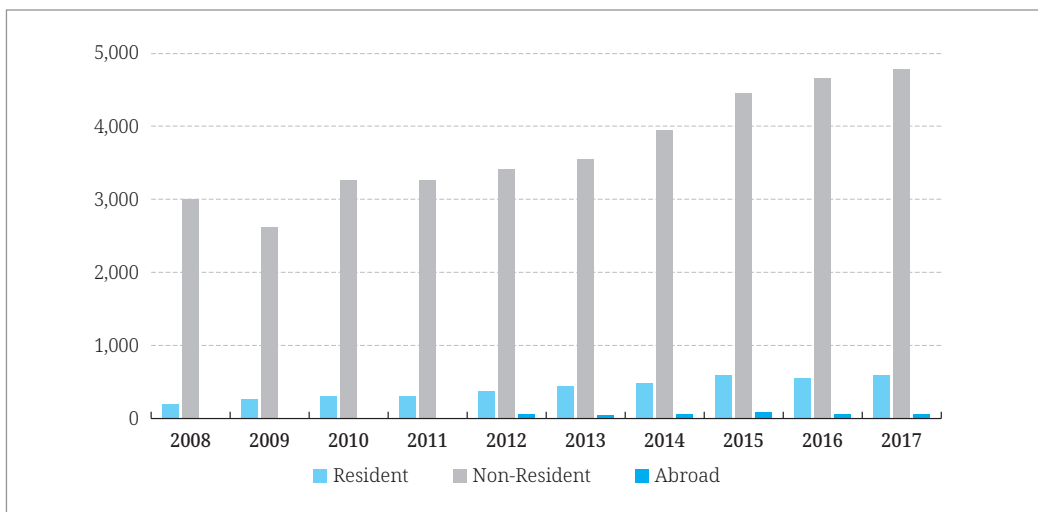


Source: DIP, Policy Seminar and In-depth Research of the KSP Project.

2.1.8. Vietnam

The number of applications and registrations of IPR in Vietnam increases every year. Most patent applications are from foreign applicants, and non-residents register more for patent registration as well. Specifically, the filing rate by non-residents is 8 times higher than residents, and the registration rate is 17 times higher.

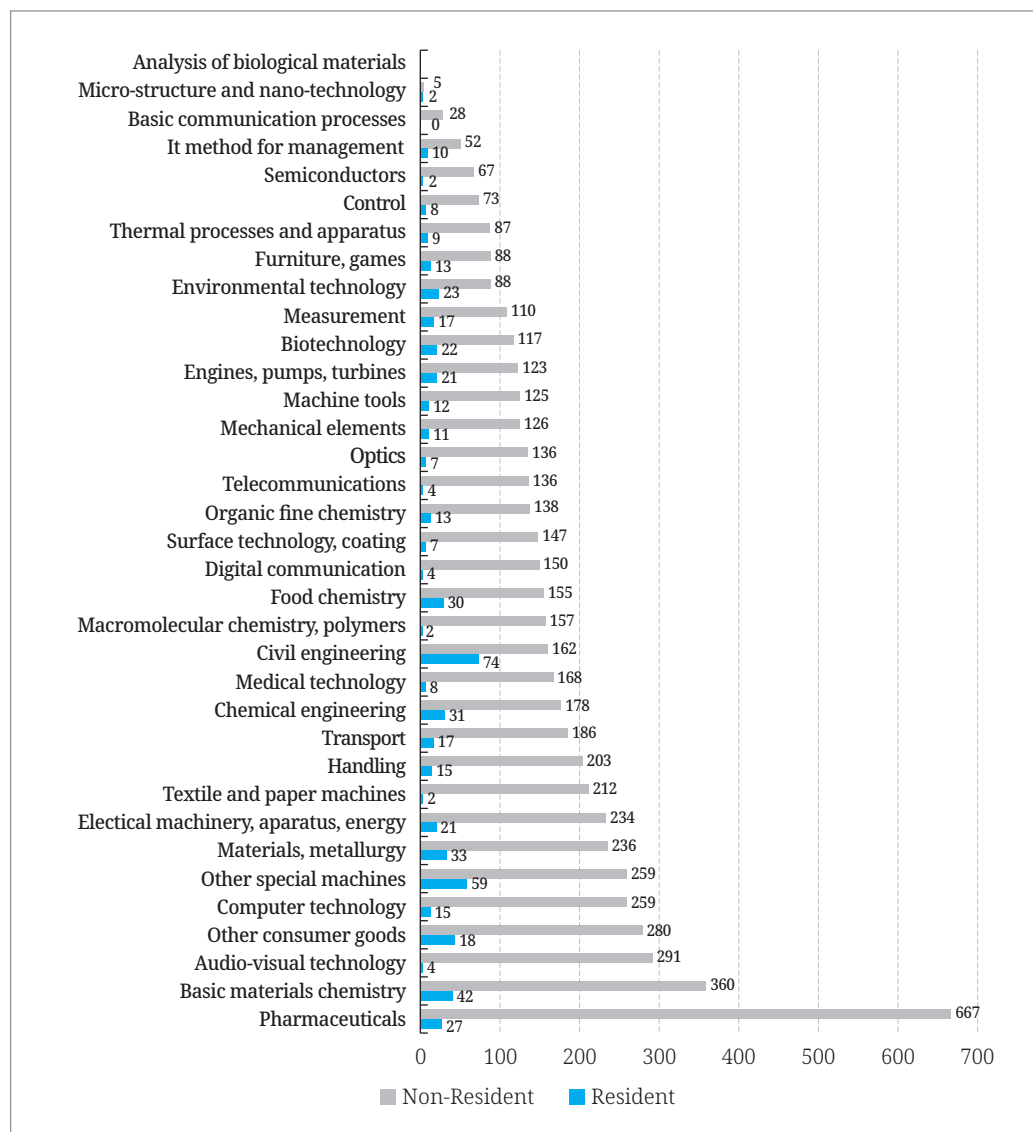
[Figure 1- 12] Number of Patent Applications in Vietnam



Source: WIPO Statistical Country Profiles.

Under technological field, there are a large number of applications in the pharmaceutical field, followed by basic chemical materials, audiovisual technology, consumer goods, and computer technology. For patent applications made by residents, more applications are from the fields of civil engineering, special machines, chemical materials, metal engineering, and chemical engineering (KOTRA, 2017, 14-15).

[Figure 1-13] Number of Patent Application by Industrial Fields in Vietnam (2016)



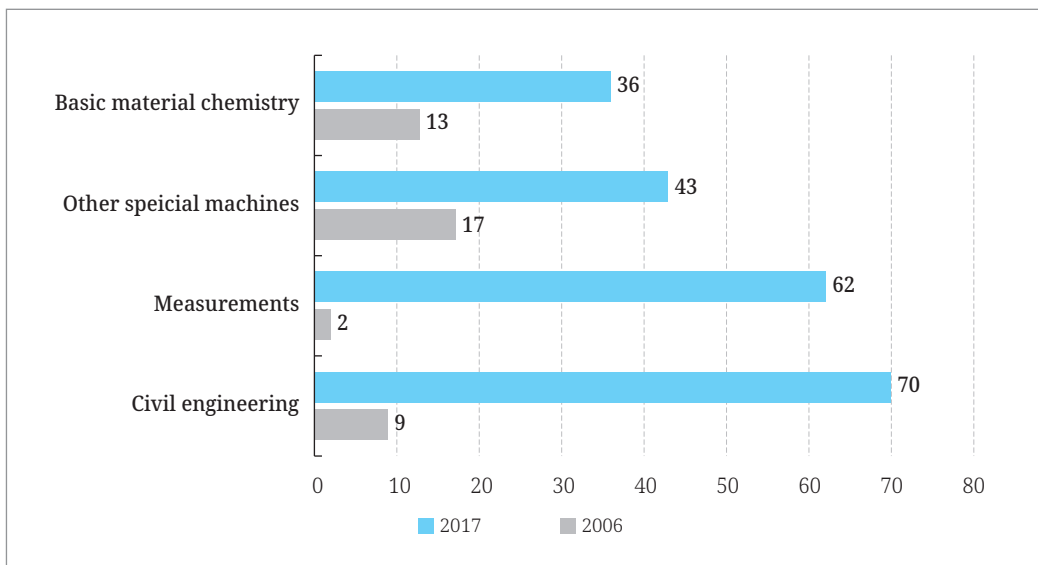
Source: Reconstruction from IP Vietnam 2016 Annual Report of Intellectual Property Activities.

Pharmaceutical sector had the highest number of patent applications relevant to the industrial structure where foreign pharmaceutical companies with outstanding technology

and capital power dominate the Vietnamese market (70%). Vietnamese people have very little confidence in Vietnamese pharmaceutical companies and the usage rate is very low at 14%. This is because Vietnamese people recognize that imported medicines have better quality than local drugs. Therefore, foreign pharmaceutical companies holding patent rights seem to be making a number of patent applications for preemption in the Vietnamese market (KOTRA, 2017, 16).

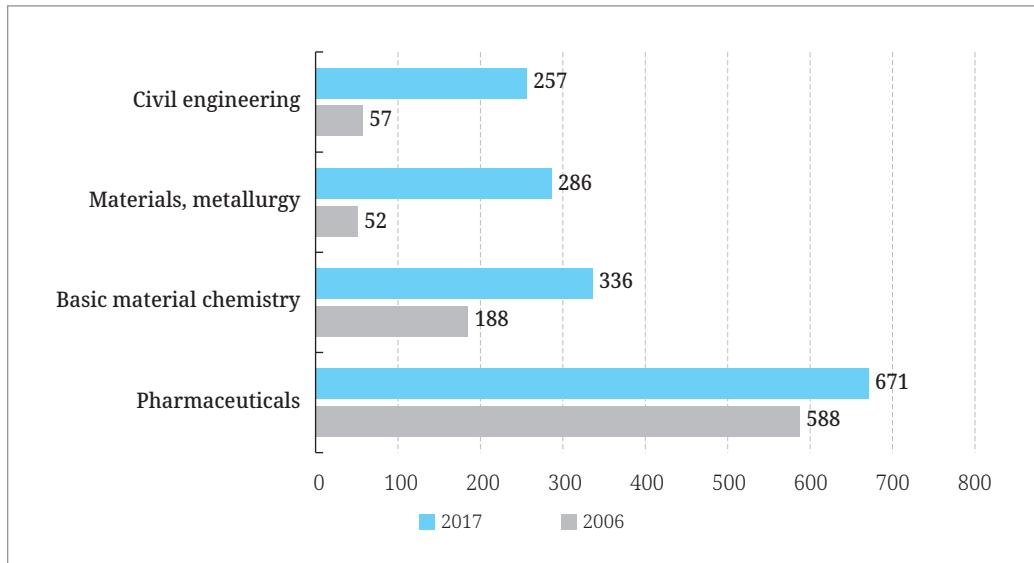
Compared from 2006 to 2017, the number of patent applications by residents in the fields of civil engineering, measurements, other special machinery and basic chemical materials has significantly increased (KSP Policy Seminar, 2019).

[Figure 1-14] Number of Residents' Patent Applications by Technological Field in Vietnam



Source: IP Vietnam, Policy Seminar and In-depth Research of the KSP Project.

The number of patent applications in the fields of medical science, basic chemical materials, materials/metallurgy and civil engineering has increased significantly between 2006 and 2017 from non-residents (KSP Policy Seminar, 2019).

[Figure 1-15] Number of Non-residents' Patent Applications by Technological Field in Vietnam

Source: IP Vietnam, Policy Seminar and In-depth Research of the KSP Project.

2.2. Present Status of Patent Laws

The ASEAN member states have enacted independent patent/IP laws that reflect the historical background, economic situation, and national policies of each country.

The IP law of AMS can be categorized into three type, where patent law exists as a single law (Brunei, Indonesia, Malaysia, Myanmar, Singapore, and Thailand), where patents, trademarks, and industrial designs are protected under the IPRs law (Cambodia), and where copyright is included as the integrated IP law (Lao PDR, the Philippines, and Vietnam).

<Table 1-1> Patent Laws and Patent Administrative Agencies of AMS

Country	Patent Act	Government
Brunei	Patents Order 2011	Brunei Darussalam Intellectual Property Office (BruIPO)
Cambodia	Law on the Patents, Utility Model Certificates and Industrial Designs 2003	Department of Intellectual Property (DIP)
Indonesia	Law No 13 Year 2016 on Patents	Directorate General of Intellectual Property Rights (DGIPR)
Lao PDR	Law on Intellectual Property No. 01/NA Date 20/12/2011	Department of Intellectual Property, Standardization & Metrology (DISM)
Malaysia	Patents Act 291 of 1983 as amended by Act A1264 of 2006	Intellectual Property Corporation of Malaysia (MyIPO)

<Table 1-1> Continued

Country	Patent Act	Government
Myanmar	Patent Law (2019/03/11)	Intellectual Property Department Ministry of Commerce
Philippines	IP Code of the Philippines Republic Act No.8293	Intellectual Property Office of the Philippines (IPOPPL)
Singapore	Patents Act (Chapter 221)	Intellectual Property Office of Singapore (IPOS)
Thailand	Patent Act B.E. 2522 (1979) As Amended by the Patent Act (No. 2) B.E 2535 (1992) and the Patent Act (No. 3) B.E. 2542 (1999)	Department of Intellectual Property (DIP)
Vietnam	Law on Intellectual Property No.50/2005/QH11	National Office of Intellectual Property of Vietnam (IP VIETNAM)

Source: Author.

2.2.1. Brunei Darussalam

Brunei's law was founded under the 1925 Invention Policy Law, which was later revised in 1956. Additionally, Emergency Patents Order, which was enforced on August 31, 1999, has been applied as a patent law (Japanese Invention Promotion Association, 2012, 4). Another patent order was enacted on January 1, 2012, and this decree is characterized by the detailed specification of the patent application process. There is no utility model system under the patent law, and the UK design system is applied with respect to design applications. Design rights granted by the UK are recognized in Brunei.

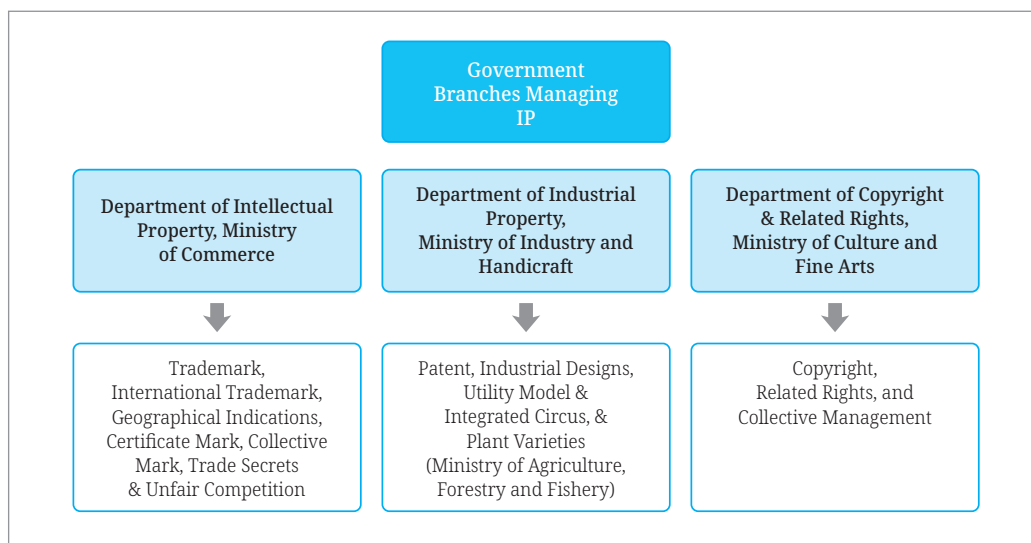
2.2.2. Cambodia

The current Industrial Property Rights in Cambodia was enacted in 2003 with the enactment of the patents, utility models, and industrial design laws. The regulation describing application procedures for patent, utility model, and industrial design was established in 2006.

Government department that manages IP in Cambodia is the Department of Intellectual Property under the Ministry of Commerce, and the department is responsible for managing trademarks, international trademarks, geographical indications, collective marks, certification marks, trade secrets, and unfair business practices. The Department of Industrial Property under the Ministry of Industry and Handicrafts (MIH) administers IPRs related to patents, industrial designs, utility models, and integrated circuit layouts. The Copyright Office under the Ministry of Culture and Fine Arts is responsible for the right

to centralize copyright and neighboring rights. The Ministry of Agriculture, Forestry and Fishery administers the rights to plant varieties (KSP Policy Seminar, 2019). Additionally, the National Committee of Intellectual Property Rights (NCIPR), which is composed of 14 IP-related departments, is established and is chaired by the Ministry of Commerce.

[Figure 1-16] Government Departments Related to IP in Cambodia



Source: Reconstruction from DIP, Policy Seminar and In-depth Research of the KSP Project.

2.2.3. Indonesia

The Indonesian Patent Law, which has been active since 2001, was revised in 2016 and implemented as of August 26, 2016. In addition to the patent law, government orders (Government Decree Number 34 of 1991 concerning the Patent Request Procedure and Minister of Law and Human Rights Decree Number M.07-HC.02.10 of 1991 regarding formation and requirement of patent substantive examination request) have been implemented. A guideline for substantive examination is currently being revised.

The major contribution from the Indonesian Patent Law in 2016 is that the Revised Patent Act of 2016 shortens the examination period of patents from 36 months to 30 months and shortens the examination period of utility models from 24 months to 12 months (Indonesia Patent Act, Article 57). Prior to 2016 revision, the utility model was limited on the type of invention, but after the revision, it could be granted to the intangible invention in the form of a new process or method (Interview with DGIP, 03/18/2019).

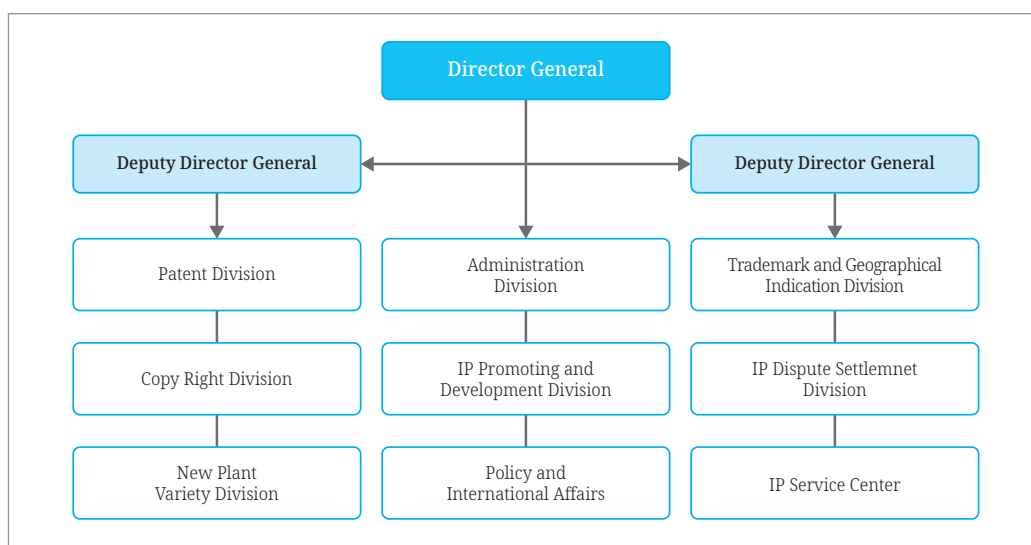
The Directorate General of Intellectual Property Rights (DGIP) under the Indonesian Ministry of Law and Human Rights is responsible for the integrated work on IP including

patent, trademark, copyright, commercial law, and industry-related license registrations.

2.2.4. Lao PDR

The Intellectual Property Rights Law of Lao PDR was first enacted on December 24, 2007 and amended twice in 2011 and 2017. The Department of Intellectual Property (DIP) was established in 2011, and is dedicated to all IP matters, including patents, trademarks, geographical indications, copyrights, and plant varieties.

[Figure 1-17] Organizational Chart of DIP of Lao PDR



Source: Lao PDR, Policy Seminar and In-depth Research of the KSP Project.

2.2.5. Malaysia

The Malaysian Patent Act was enacted in 1983 that has been active since October 1, 1986, and partial amendments were added on 2006. The Malaysian Intellectual Property Corporation (MyIPO) was established in 2003 and Trademark and Patent Registration Office (MTI) was established in 1983 as the predecessor of the Intellectual Property Office of Malaysia. In 1990, it was renamed as the Intellectual Property Division under the Ministry of Domestic Trade and Consumer Affairs (KSP Policy Seminar, 2019). MyIPO manages IP patent rights, trademark rights, design rights, integrated circuit layout design, and copyrights, and it is a subsidiary of the Ministry of Domestic Trade. This is not only for administrative purposes but it is also for the institute that is financially independent.

2.2.6. Myanmar

Myanmar has enacted legislation on IP laws, including patent laws. The Union Parliament of Myanmar passed Trademark Law and Industrial Design Law on 30th January 2019, Patent Law on 11th March 2019 and Copyright Law on 24th May 2019. They were signed by the President of Myanmar on the said date respectively. However, it still needs to be enacted and it will be effective only after a notification is issued by the President of Myanmar. The IP Office under the Ministry of Commerce oversees all areas of IP, including patent applications (KSP Policy Seminar, 2019).

2.2.7. The Philippines

The implementation of the Philippines Patent Act (Republic Act No. 165) on June 20, 1947 established the proprietary patent system. The current Philippines Intellectual Property Rights Act (Republic Act 8293), which was enacted on January 1, 1998, provides the comprehensive definition of trademarks and copyrights as well as patents, and amendments took place in 2015.¹ Intellectual Property Office of the Philippines (IPOPHL) is composed of the Bureau of Patents, the Bureau of Trademarks, the Bureau of Legal Affairs, Documentation, Information and Technology Transfer Bureau, and the Management of Information System and EDP Bureau.

At present, the amendments to its IP laws are being proposed to the Congress. Among the main contents in the revision, requests on separating its system into two new bureaus for documentation, which are information and technology transaction bureaus of the Philippines' IPOPHL into Bureau of Innovation and Business Development and IP Academy.² The amendment includes a provision that allows simultaneous application for patent and utility model to an invention so that the applicant only applies for one of the patents or utility models that they prefer and another application within one year. If the patent decision on an invention is made, the utility model registration is automatically cancelled. According to the amendment, the Director General has the authority to order a compulsory license to use the patented invention without the consent of the patent holder.

1 Prior to the revision in 2015, the Philippines adopted the first-to-invent system, but it was changed to first-to-file after the revision. The patent protection period was extended from 15 years to 20 years. The disclosure of patent application was introduced in 2015, 18 months after the first filing date. Additionally, before the revision, there was no appeal process for the patent decision. All patent applications were examined, but after 2015, the application examination system was introduced and only applications filed under the examination request procedure were reviewed <http://www.chanrobles.com/legal7code.htm#.XEfCGbB7mUk> (accessed on June 4, 2019).

2 "The Philippines: Proposed Amendments to the IP Code," <http://www.managingip.com/Article/3783844/The-Philippines-Proposed-amendments-to-the-IP-Code.html> (accessed on June 4, 2019).

2.2.8. Singapore

The Singapore Patents Act, which was enacted in 1994, was revised in 2005 and 2017 based on the 1977 UK Patent Act and the 1990 Australian Patent Act.

2.2.9. Thailand

The Thailand Patent Act was enacted in 1979, and was revised twice in 1992 and 1999. Currently, the patent law is under consideration for revisions by the Thai parliament, and the amendment includes provisions rationalizing the patent registration process, revising to comply with the TRIPS Agreement in the first stage, and revising Hague Agreement in the second stage (KSP Policy Seminar, 2019).

While current Patent Laws regulates laws on patents, utility model, and design, the revised plan seeks to enact an independent Design Law. The Design Law is in revision so that the period of rights is extended from 10 years to 15 years, introducing creativity requirements.

2.2.10. Vietnam

Vietnam's IP legislation is not integrated, but rather, there are sets of codes established by the National Assembly, decrees established by the government, Circulars established by Ministries and the IP Office of Vietnam (IPVN), and number of internal rules established by the National Copyright Office (NCO).³

Vietnam has enacted IP laws in 2005 as integrated laws that replaced existing legal provisions and enforcement regulations related to IPR. This law encompasses a wide range of IPRs, including industrial properties, copyrights, and rights on the improvement of plant varieties.⁴

3 In 1995, the Vietnamese government established IPR action plan to improve the IP protection system, which was significantly different from the protection level of TRIPs at the time of joining the World Trade Organization (WTO). The purpose of the intellectual property rights (IPR) action plan was to improve Vietnam's IP system to the level of TRIPs by January 1, 2000 and to promulgate the Civil Code of 1995 as the first step in the implementation of the action plan. Chapter VI of the Vietnam Civil Code provides the most important legal basis for the protection of IP rights, as it relates to IP rights and technology transfer. From 1996 to 2001, guidelines for the enforcement of the Civil Code were enacted and a number of legal documents were enacted, including additional provisions on trade secrets, geographical indications, and mutual and unfair competition on IP. However, since IP system still does not meet the requirements of the TRIPs agreement, the Vietnamese Parliament has continuously revised the laws of IP sector in order to promote creative activity and enhance the competitiveness of the state. On November 29, 2005, the National Assembly of Vietnam enacted IP laws consisting of 18 articles and 222 articles in total, and this law is a step for the fulfillment of the obligations of the WTO member countries and follows the TRIPs agreement standard. JETRO, "Viet Nam Under-Laws Survey" (2015), pp.4-5 [In Japanese].

4 The Vietnam Law on Intellectual Property is divided into the general provisions (Articles 1 to 12), Chapter 2, "Regulations on Copyright and Other Rights" (Articles 13 to 57), Chapter 3 (Articles 58 to 156), Chapter 4 "Improvement of Plant Variety" (Articles 157 to 197), Chapter 5 "Protection of Intellectual Property Rights" (Articles 198 to 219), and Chapter 6 "Implementation Regulations" (Articles 220 to 221).

2.3. Current Status of Patent Application Procedures

Normally, patent application procedures include a person who has the right to obtain a patent, or the successor thereof to prepare the directed application and submit it to the commissioner or director general of an intellectual property office. The IP office reviews the filed invention for a given period of time. After the decision to register is notified, the registration fee is paid to obtain a registered patent. In order to be registered as a patent, the invention must meet the patent requirements standard set by the patent laws of each country, and it should not belong to the category of non-patentable subject matter defined by the patent law.⁵ If the applicant wishes to submit a request for examination, the IP office will conduct the examination. The patent examination is classified into formal examination, prior art search, and substantive examination.⁶

The sequence for patent application procedures is as follows: formal examination of the application form, disclosure of the application, examination request, substantive examination, patent decisions, and trial and litigation. AMS have similar patent application procedures but their examinations take different forms. Therefore, there is a considerable difference in the quality of the examination by each patent office and the period of time from filing to registration. The following will discuss the commonalities and differences in the filing procedures of each member state based on the patent laws of each country.

2.3.1. Language of Application

The formality examination checks the procedural deficiencies, such as whether the required information on the directed form is filled in, whether the period is complied with, whether the certificate is attached, and whether the fee is paid. The IP offices of each AMS have similar requirements related to the patent application documents. However, regarding the language of the patent application, the written application must be submitted in the language of the applicant's country in Cambodia, Indonesia, Lao PDR, Thailand, and Vietnam. It is possible in Brunei, Malaysia, the Philippines, and Singapore to submit the written text in the official language of the country or in English.

2.3.2. Inventions that cannot be Patentable and be considered as Patents

The TRIPs Agreement specifies that each AMS's IP legislation should meet the minimum level of protection, but at the same time, it requires AMS to have discretion in the manner

5 http://www.kipo.go.kr/kpo/user.tdf?a=user.html.HtmlApp&c=10001&catmenu=m04_01_01 (accessed on June 4, 2019).

6 <https://www.wipo.int/patents/en/topics/worksharing/examination-capacity.html> (accessed on June 4, 2019).

of implementation of the Agreement or in the protection of IPR. The “flexibility” clause of the TRIPs Agreement matches with the “Target and Goals” intended with the clause, while discretionary authority is assigned in order to limit IP in developing countries. As AMS are subjects to the “flexibility” clause, there are significant differences in the patent laws of each country. For example, patented subject matter and patent law provisions of each AMS for inventions that cannot be patented are different and unclear (Wiwatwattana, 2017, 71).

2.3.2.1. Computer Programs

While computer programs are not protected by patents under the patent law of Brunei, Myanmar, the Philippines (Article 27), Thailand (Article 9) and Vietnam (Article 59), Cambodian patent laws protect several computer processes and products with patents. Singaporean and Malaysian laws do not have separate provisions for computer programs and there are no precedents for them, so it is unclear whether they are the subjects of patent protection (Wiwatwattana, 2017, 72). Indonesia has amended the Patent Act in 2016 to include inventions related to computer programs in patent applications. Currently, most countries grant patents on inventions of computer programs that embody technical ideas as computer programs. Prior to the revised Patent Act of 2016, computer programs were protected only by copyright law.

2.3.2.2. Business Methods

The Patent Act of AMS differs on the issue of patentability of business methods. While business methods are excluded in Cambodia (Article 4), Lao PDR (Article 21), Malaysia (Article 13) and Vietnam (Article 59) as inventions that are expressly patentable, Thailand and Singapore do not include business methods as an invention that is patentable. As a result, there have been some controversies (Wiwatwattana, 2017).

2.3.2.3. Inventions for Medical Methods

The Patent Act of AMS stipulates inventions that intervene in public order and standards of decency cannot be patented, and the inventions concerning diagnosis, treatment, and surgical methods for treating human beings or animals are stipulated as non-patentable (Indonesia Patent Act Article 7, Thailand Patent Act Article 9, and Vietnam IP Law Article 59). Most member states have stipulated inventions relating to human or animal medical methods as non-patentable, and Malaysia, the Philippines, Cambodia and Brunei have provisions for tools that are used in the medical methods to be patentable. The Singapore Patent Act put inventions regarding treatment methods of humans and animals as

inventions that cannot receive patents, but instead, these inventions are regulated as those that will not be used as industrial applicability, avoiding requirements for patentability (Singapore Patent Act Article 16).

2.3.2.4. Pharmaceutical Patents

Member states are encouraged to support patent registration and compulsory licensing for generic drugs (Areeya Ratanayu). Although AMS have made efforts to improve the efficiency of patent registration and marketing of pharmaceuticals and have tried to balance the standards of the FDA, pharmaceutical companies are still experiencing difficulties when registering patents in the region. Compulsory licensing is an involuntary conduct involving the production of patented products or the use of patented procedures by a law enforcement authority to a third party without the patentee's consent. For example, under the "mailbox system" of Article 70.8 of the TRIPs Agreement, Cambodia can avoid granting enforcement of IP for pharmaceuticals until 2033 (Cambodia Patent Act Article 134).

2.3.3. Disclosure of Patent Application

The disclosure of patent application was introduced to release the technological contents to the public by giving notices after a certain period of time in order to prevent postponing public notices due to delayed examination. Most AMS are adopting the filing system that allows patent applications to be made available to the public after a certain period (18 months to 19 months) has elapsed since the filing or priority date.

According to Article 24 of the Patent Act of Indonesia, filed applications shall be published in the patent gazette after 18 months from the filing or priority date and shall be disclosed to the public upon the application of the applicant even during the period of filing patent application (Article 42). Any person who has filed an objection to the application after the disclosure may submit his or her opinion in writing specifying the reason (Article 42, Clause 1). The applicant may submit a written document that explains or denies it (Article 42, Clause 3). The third party's complaint and the applicant's responses will be reviewed as additional documentation at the time of the hearing (Article 42, Clause 4).

In Lao PDR, a patent application that completed its screening will be released to the general public after 19 months from the filing date (Lao PDR IP Law Article 39).

The Malaysian Patent Act states that if the patent application date or priority date is 18 months, the contents of the patent application shall be disclosed to the public for the purpose

of public inspection. The disclosure of the application before 18 months from the filing date shall be made only by the applicant. This is allowed only if there is a written consent (Malaysia Patent Act Article 34, Clause 3). The applicant has the right to claim compensation from the person who has commercially or industrially used the invention for which the patent application was filed after the disclosure of the application (Malaysia Patent Act Article 34, Clause 6). If the patent applicant warns it in writing, the patentee shall have the right to demand compensation from the time of the warning. If this isn't the case, he or she can claim compensation from the date of disclosure of the patent application to the public (Malaysia Patent Act Article 34, Clause 6). Claims for compensation may only be exercised after the patent is expired (Malaysia Patent Act Article 34, Clause 7).

In Myanmar, the contents of the application will be disclosed to the public when 18 months have elapsed from the filing date. It is possible to oppose an application within three months from the date of publicizing the application (KSP Policy Seminar, 2019).

In the Philippines, the patent application shall be published in the IPO Gazette 18 months after the filing or priority date. The filing system in the Philippines is unique since it does not limit the contents posted on the application form. The information includes the applicant's name, the filing date, the specification, the diagram, and the abstract, but the document reflects the results of the prior art search when it is opened to the public (Philippines IP Law Article 44). In cases where a user of a technology had actual knowledge about the disclosure of the application or has had a written notice that the invention that he or she was using the subject matter of a published application, the patent applicant may exercise his right to request suspension or enforce litigation (Philippines IP Law Article 46). The right to the invention disclosed shall be granted within four years after the grant of the patent for the invention by the applicant and after the execution of the third party by the applicant. In accordance with Articles 71 and 76 of the Intellectual Property Rights Act, after the patent application is opened to the public, anyone can provide information in writing about the patentability of the claimed invention, and the submitted information is notified to the applicant. Applicants can express opinions on the provision of information. Observations by the third party are for the purpose of enhancing the quality of registered patents, and it is not only stated in the Philippine Intellectual Property Rights Act but also in the Korean Patent Law (Article 63(2)), as well as the European Patent Convention (EPC) (Article 115). Additionally, it serves to shorten the examination time.⁷ In general, the main reasons for

7 "Information Provision by Third Parties of the EPO," Belgium Embassy of the European Union to the Republic of Korea, http://overseas.mofa.go.kr/be-ko/brd/m_7571/view.do?seq=1101909&srchFr=&%3BsrchTo=&%3BsrchWord=&%3BsrchTp=&%3Bmulti_itm_seq=0&%3Bitm_seq_1=0&%3Bitm_seq_2=0&%3Bcompany_cd=&%3Bcompany_nm=&page=14 (accessed on June 4, 2019). [In Korean]

providing third party information include novelty, non-obviousness, defects in patentability of industrial applicability, unclear claims, and disclosure of invention.

Patent applications in Singapore are disclosed to the public upon application by the applicant even if the application is published in the patent gazette 18 months after the filing date or priority date (Singapore Patent Act Article 27). If the applicant does not wish to disclose the application, the applicant shall withdraw the application until one month before the expiration of the application period.

In Thailand, if the patent application does not correspond to the requirements of Article 9 and Article 17 of the Patent Act, the contents of the patent application shall be disclosed to the general public. Any person who has objected to a patent application after the disclosure of the application can raise objections (Article 29). For the purpose of disclosing patent applications under the current patent law, the Thailand Department of Intellectual Property shall notify the applicant to pay the fee for disclosure, and if the applicant fails to pay the fee, the patent application will be considered as being withdrawn (Article 28, Clause 2). Thai patent law does not specify the period for filing the application and it differs from Korean patent law since it requires the applicant to pay a fee for disclosing the application.

In the revised patent law in Thailand, the amendment stipulates that the contents of the patent application should be disclosed within 18 months from the filing date of the patent application. It abolished raising objections after the application has been revealed, and it also includes the period of application for examination, shortening from five to three years from the day the application was put into effect. With the abolishment in raising objections when the patent set-up registration is published after the patent decision, it is expected to be revised so that objections can be raised for patent application within 90 days. Moreover, since the fee for publicizing the patent applications is abolished, the current patent act that forces applicants to pay a fee for publication of the patent application and the fee from patent registration will be amended so that the applicants only have to pay one fee during registration (Vachanavuttivong, 2018).

The patent application in Vietnam is disclosed to the public after 19 months from the filing date of the patent application. Since Vietnam adopts an early publication system, it can be disclosed even during the application period (of 19 months) by the patentee's application (Vietnam IP Law Article 110, Clause 2). If an early disclosure application is made, it will be released early within one month from the date of application (Guidebook for IP Protection in Abroad: Vietnam, 2009, 37).

2.3.4. Request for Examination

The system of requesting a patent examination reduces the burden of examining all applications, and only applications that have been filed for request within a certain time are examined. The purpose of the examination request system is to look at only patent applications for the purpose of patent registration, thereby facilitating examination processing and seeking an improvement in quality. The prolongation of the examination period extends the uncertainty of the patent right which leads to uncertainty of the patent system. A lengthy examination period also shortens the time available for judging the value of the invention properly, and undermines the system when requesting for examination (Nam, 2015, 36).

In accordance with the Act on Industrial Property Rights in Cambodia, the applicant does not need to make a request for substantive examination, and an application that has undergone prior art examination will be automatically subjected to substantive examination after the application is publicized (KSP Policy Seminar, 2019).

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Indonesia has adopted the request for examination system, and the examination of the patent application is done only after the request is submitted within a certain period of time. If the request for substantive examination has not been filed within 36 months from filing date or the pertinent fee not been paid, the application is considered to have been withdrawn (Indonesia Patent Act Article 48). For simple patents, the request for substantive examination is filed at the same time as the filing of application or at least 6 months from the filing date.

Lao PDR does not provide a system for requesting examinations, but it requires the examination to be carried out automatically without the request after completing the formal examination (Lao PDR IP Law Article 40).

Under the Malaysian Patent Act, the applicant may choose between a conventional substantive examination and a modified substantive examination. In order to conduct an ordinary substantive examination, the applicant shall request for the examination of the patent application within 18 months from the date of filing (Malaysian Patent Act, Article 29A, Clause 1).

Under the Myanmar Patent Law, the applicant must file a request for examination of a patent application within 36 months from the filing date (KSP Policy Seminar, 2019).

In the Philippines, the applicant shall file a request for examination of the patent application within six months after the application was published, and shall be considered to have withdrawn the application for which no examination is requested within the prescribed period (Article 48).

When the patent application passes the formal examination under the Thai Patent Law, the examination of the application is based on the request system. The Thai Patent Office examines only the applications requested for examination within a certain period of time. The applicant may request a review within five years after the publication of the patent application or within one year after the final decision on the case where opposed opinions are received after the publication of the application. If the applicant does not file a request for examination within the given period, the application will be considered as being withdrawn (Article 29).

Vietnam adopts the application examination request system, and any person may file a request to the director general within 42 months from the filing or priority date (Article 113, Clause 1). For utility models, the request must be made within 36 months (Article 113, Clause 3).

2.4. Current Status of Substantive Examination

2.4.1. Patent Requirements

2.4.1.1. Indonesia

“Invention” under the Indonesian Patent Law is defined as “the Inventor’s idea that is poured in any activity of solving a specific problem in the field of technology, either in the form of a product or process, or an improvement and development of a product or a process (Article 1).”

The Indonesian Patent Law stipulates patentability as novelty, inventive step, and industrial applicability. The timing of novelty judgment as a patent requirement shall not be disclosed in writing, orally, or in any other way before or at the time of the patent application, either domestically or in foreign countries, and any invention disclosed before the patent application, in principle, will not be deemed patentable due to its loss in novelty (Article 3). However, any person who has the right to obtain a patent to be recognized as an exception to the loss of novelty shall notify the applicant that the invention has been exhibited at an international fair, or official domestic exhibitions that have been held in Indonesia or abroad, or if the invention is used in Indonesia by an inventor in the form of an

experiment for R&D purposes. In these cases, the patent application shall be filed within six months from the date on which the reason for the patent use has occurred (Article 4, Clause 1). Where an invention is disclosed by a person with a duty of confidentiality, the invention shall be deemed not to have lost its novelty if a patent application for an invention has been filed within 12 months from the date of publication (Article 4, Clause 2).

In Korea, in cases of exceptions from loss of novelty and whether the disclosure was the willful or unintentional act of the applicant or patentee, patent applications must be filed within 12 months before the date of the occurrence (Korea Patent Act, Article 29). However, Indonesian Patent Law is different in terms of the period as it is either 6 or 12 months.

The inventive step in the Indonesian Patent Law means that a person having ordinary knowledge in the technical field to which the invention belongs should not be able to easily invent from the prior art based on the level of technology at the time of filing the invention. The standard of judging the obviousness for the invention shall be assessed at the time of filing of the invention or based on the right of priority, taking into account the level of technology at the time the original application was filed (Article 3).

Industrial applicability in the Indonesian patent law refers to inventions that can be manufactured or used in any industrial field (Article 5), but tests, treatments, medications, and surgical methods applied to humans or animals are not considered industrially applicable.

2.4.1.2. Malaysia

Under the Malaysia Patents Act, an invention is defined as the inventor's idea to practically solve a specific problem in the technical field, and the patent requirements necessitates novelty, non-obviousness, and industrial applicability (Article 11). The novelty of the invention is defined to be unpredictable by the prior art search, and prior art is disclosed to the public by written, oral, or use at the time of patent application. The regional standard of novelty judgment is not limited to Malaysia and covers all regions of the world (Article 14).

The exception period for loss of novelty is one year. If the applicant's actions or invention is disclosed or there were abuses on the applicant's rights or actions that disclose the inventions, the patent application must be filed within one year from that date in order to not lose novelty (Article 14 Clause 3). The Malaysian Patents Act stipulates that when a patent application is pending in the UK Patent Office and the invention is disclosed due to pending

patent application processes, there are exceptions to loss of novelty (Article 14 Clause 3).

2.4.1.3. The Philippines

Under the Philippines Intellectual Property Code, a patentable invention is a technical solution to the problems that arise in the field of human activity, and it must have novelty, inventive step, and industrial applicability (Article 21). Novelty is recognized if the invention does not belong in any form of prior art (Article 23). As exceptions to the loss of novelty, if the invention is filed within 12 months before the filing date or priority date and a) has been made public by the inventor, or b) the public information is contained in the contents of another application of the inventor and has been disclosed by IPOPHL, although it should not have been disclosed, or if the third party that obtained the information directly or indirectly from the inventor is included in the filed application without the consent of the inventor who is included in the filed application, or c) if the information is disclosed directly or indirectly by a third party (Article 25).

2.4.1.4. Singapore

In order to obtain patents under the Singapore Patents Act, the invention must meet the requirements of novelty, inventive step, and industrial applicability. Deciding on novelty is based not only on Singapore but also the rest of the world, and inventions that are disclosed to the public by written, oral, use or otherwise made known to the public lose novelty (Article 14, Clause 3). Exceptions of novelty loss include cases 1) where the disclosure of an invention is made by the inventor or information made known to the person with confidentiality obligation was illegal or in breach of his or her duty that discloses the invention, 2) where the invention was exhibited at an international exhibition by the inventor, 3) where the inventor describes the invention in an article, or 4) where the inventor or a third party obtaining his or her consent publishes the invention at a conference. If patent applications are filed within 12 months from that date, it does not lose its novelty (Article 14, Clause 4).

2.4.1.5. Thailand

In order to obtain patents, the invention must meet the patent requirements of novelty, inventive step, and industrial applicability in accordance with Article 5 of the Thailand Patent Act. Most AMS extend the local standard of novelty judgment not only to domestic but also to foreign countries, and the current Thailand Patent Act stipulates that inventions that were publicly known or practiced domestically (Article 6, Clause 1) before the patent application are deemed as having lost their novelty, thereby denoting that the criteria is

limited to Thailand. The revised Patent Act that is currently pending is intended to amend it in case it is known before the application within Thailand or abroad. Hence, revisions of foreign publications or used technologies cannot be granted as patents (Vachanavuttivong, Darani, 2018).

The Thailand Patent Act stipulates as exceptions to the loss of novelty, and the novelty of the patented invention shall not be lost if the patent application is filed within 12 months from the following dates. Disclosure of the invention is made by the inventor, and disclosure of the invention was the result of illegal activities, or invention is made public by exhibiting at an international or official fairs.

The Korean Patent Act until the revised law in 2006 stipulated that novelty is if it was notified or shared domestically before the patent application. It was revised so that even if it was made public in foreign countries, the novelty would be lost. As a result, if the invention is made known to the public in foreign countries through activities like tests, exhibitions, and product launchings, the application may lose its novelty. Hence, clauses pertaining to exceptions to exhibitions were deleted. Regarding the period of exception of novelty loss, the former Korean Patent Act had an exception period of six months and was extended to twelve months in 2011 under the revised law reflecting the agreement of the ROK-US Free Trade Agreement (FTA).

2.4.1.6. Vietnam

In order to obtain patents under Article 58 of the Vietnam Law on Intellectual Property, the invention must satisfy the patent requirements of novelty, inventive step, and industrial applicability. Prior to the date of patent filing, invention disclosed to the public either in Vietnam or abroad will lose its novelty. The Vietnamese Law on Intellectual Property stipulates as reasons for loss of novelty, disclosure by document, disclosure by use, and other reasons for domestic foreign countries (Article 60).

Documentation types are justified as patent applications and public disclosures filed within Vietnam and overseas, abstracts mentioned in the official gazette of Vietnam and overseas, science and technology magazines, publications, films, non-patent documents such as Tate CD-Rom, mass media, science and technical papers, textbooks and lecture materials, and exhibition goods (Guidebook for IP Protection in Abroad: Vietnam, 2009).

The Vietnam Law of Intellectual Property stipulates that for the exception of the loss of novelty, a patent application must be filed within six months from the date of the following:

1) an invention has been published against the will of a right holder, 2) it is published in the form of a scientific presentation by right holder, or 3) it is made known to the public at the officially recognized Vietnamese exhibition or an authorized international exhibition.

2.4.2. Examination Formats

Patent examinations can be classified as 1) formality examination, 2) formality examination and prior art search, and 3) formality examination, prior art search, and substantive examination.⁸ If the competent authority of the IPO has the capacity to support the financial and human resources in order to conduct the formal examination, prior art search and the substantive examination for the entire technical field, the actual examination of the technical field may be carried out, but if not, other options may be considered.

2.4.2.1. Brunei Darussalam

Before the 2012 Patent Order, Brunei Darussalam did not have its own patent system. The patent claim was made through the Confirmation Patent having its precedence in UK patents, UK-designated European Union patents, Singaporean patents, and Malaysian patents. Therefore, UK patents and others were automatically registered and no substantive examinations were carried out before 2012. The 2012 Patent Order provides detailed regulations on the patent application process, reviews, and substantive examination. However, in order to conduct a substantive examination, the local IPO does not have examiners and it entrusts the review and examinations to the patent offices in Hungary, Australia, and Denmark.⁹ The patent examination entrusted to these foreign patent offices may have different interpretations of the examination period and examination standard, so there is a risk of examinations being delayed, and the examination result may be less predictable.

2.4.2.2. Cambodia

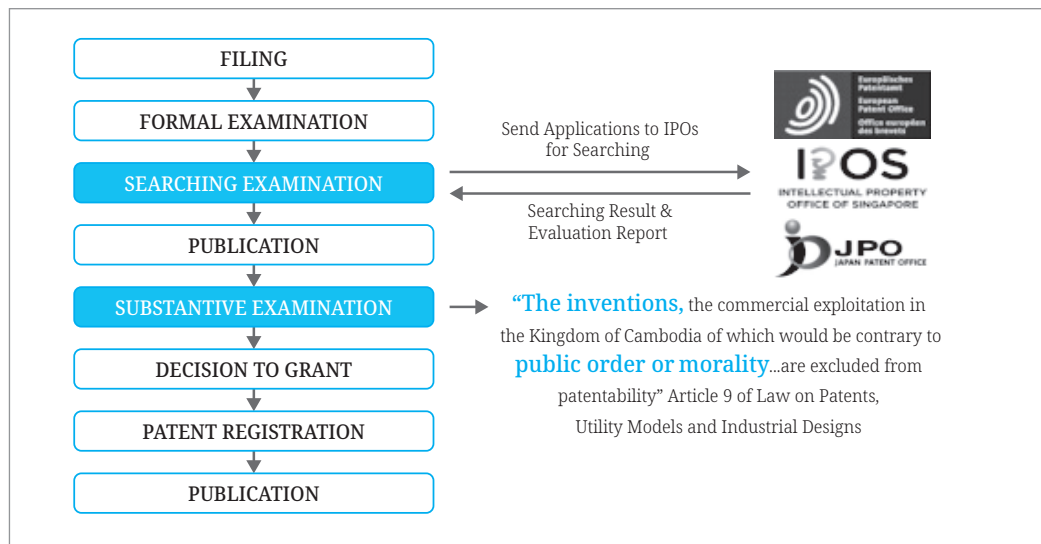
Cambodia's patent examination process takes the form of formality examination, prior art search, and substantive examination. Applications filed to the Cambodian patent office are sent to the Japanese Patent Office (JPO), the European Patent Office (EPO), and the Singapore Patent Office (IPOS) who have signed examination cooperation agreements. The offshore patent offices conduct prior art search of the invention and submit the opinion on

8 <https://www.wipo.int/patents/en/topics/worksharing/examination-capacity.html> (accessed on June 4, 2019).

9 "Patent Protection in Brunei Darussalam, Your IP Insider," <http://www.youripinsider.eu/patent-protection-brunei-darussalam/> (accessed on May 12, 2019).

the basis thereof to the Cambodian patent office for the decision on whether to register. The Cambodian patent office will make the applications public and will make patent decisions after examining whether the application satisfies the requirements of the Industrial Property Rights Act of Cambodia. The actual examination of the Department of Industrial Property of Cambodia is judged from the patent requirements under the Industrial Property Rights Act, but it differs from the actual examination of the AMS's patent offices in that it judges whether the application is abides to the social and cultural norms of Cambodia. The Cambodia Industrial Property Rights Act stipulates that if the commercial use of the invention is against the public order or morality of Cambodia, the patent cannot be granted (Article 9). The Department of Industrial Property in Cambodia judges whether the contents of the invention are against the “morality” in the socio-economic concept based on the search results of the foreign patent office. The foreign patent offices entrusted with the prior art search do not have the right to judge whether the application is registered or not, but the examination on novelty can be based on the investigation results of foreign patent offices (KSP Policy Seminar, 2019).

[Figure 1-18] Patent Application Procedure in Cambodia



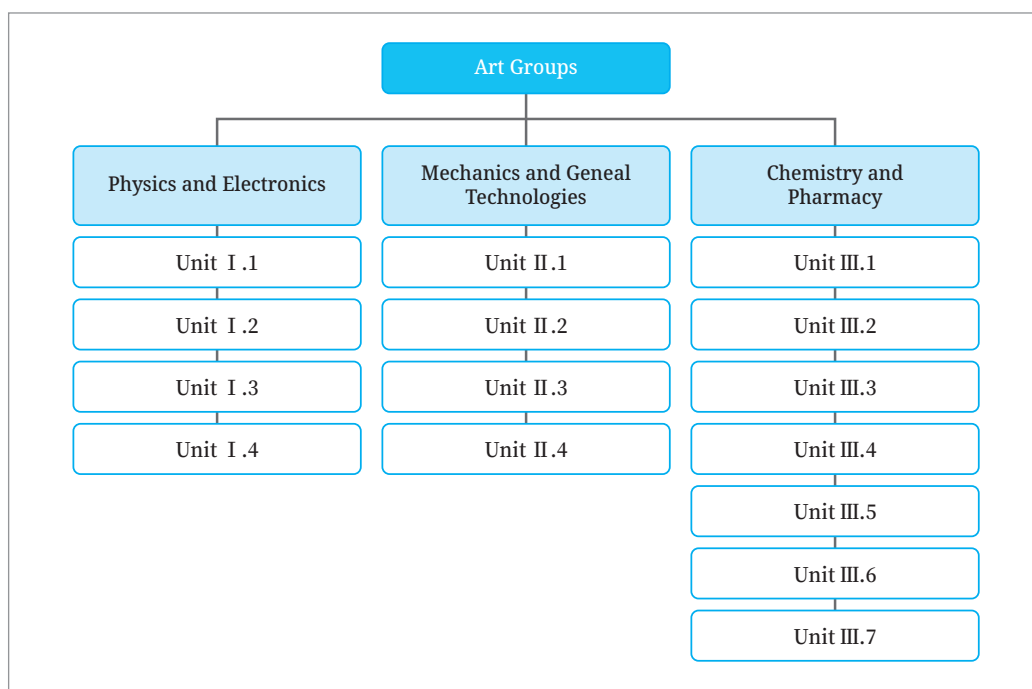
Source: Author.

2.4.2.3. Indonesia

The patent examination of the Indonesian DGIP is conducted similarly with formality examination, prior art search, and substantive examination. The examination is conducted by the examination authority of the Art Group of the DGIP. The filed application is classified according to the International Patent Classification Code (IPC) and the classified application

is assigned to the DGIP Art Group. The examiners in the Art Group must conduct prior art search and examination of the application and issue the Office Action, and the applicant must submit the written statement and the supplementary statement in response. Art Group is divided into the fields of physics and electronics, mechanical and general technology, and chemistry and pharmacy (DGIP). In October 2011, there were 32 examiners in the chemical division, 19 examiners in the electronics engineering division, and 20 examiners in the mechanical division (Syamsudin, 2018). As of March 2019, 105 inspectors belong to the group (Interview with DGIP, 03/18/2019).

[Figure 1-19] Art Fields for Indonesia DGIP



Source: DGIP, "Patent Examination Indonesia: WIPO Workshop on Effective Utilization of Search Result and Communications Derived from the Patent Cooperation Treaty (PCT) System in National/Regional Phase".

There were 8,000 backlogged applications even 2 years ago, but there are 2,000 applications now, showing that they are continuously working on resolving the issue. In particular, they aim to examine 130 cases per year and, through performance evaluations, examiners who reach their goals will be awarded with financial incentives (Interview with DGIP, 03/18/2019).

In connection with substantive examinations, the Indonesian Patent Act allows the use of outside experts or other facilities from other government agencies, and it stipulates that other national patent office examiners may assist the examinations. If necessary, it has the

provision to receive support from other experts, other institutions, and patent offices of other countries other than DGIP (Article 50). However, the examinations of external experts or the use of facilities of other government agencies can only be realized by collaborating with ministries. Hence, there are currently no examinations from external experts (Interview with DGIP, 03/18/2019).

The Indonesian Patent Law stipulates that the decision on patent decision or rejection through substantive examination must be made within 36 months from the date of the request and within 24 months for utility models (Article 54). The revised Patent Law of 2016 shortens the examination period of patents from 36 months to 30 months. For utility models, it has shortened the examination period from 24 months to 12 months (Article 57).

2.4.2.4. Malaysia

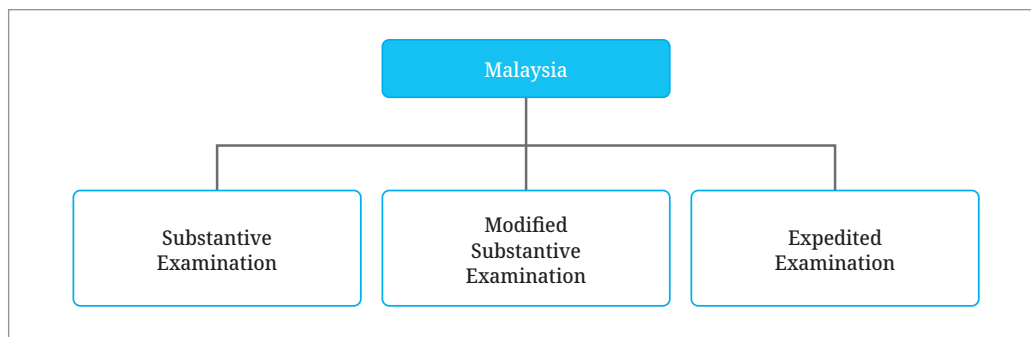
Under the Malaysian Patent Act, the applicant may choose among conventional substantive examination, modified substantive examination, and expedited examination. The revised substantive examination means that if the applicant has registered the corresponding foreign application in the prescribed patent office, he or she can request for examination of the application filed in accordance with the contents of the application specification in Malaysia (Article 29A, Clause 2). The revised substantive examination system was introduced in 1995 to address the backlog in patent examination due to the influence of Australian patent laws (Mohamad, 2011). Upon the request of the revised substantive examination, the examiner of MyIPO verifies whether the application in Malaysia is substantially the same as the patent of the foreign patent office, examines whether the relevant prior art has been searched, and satisfies the patent requirements in the Malaysian patent law. Although MyIPO examines whether the application for both substantive and modified substantive examination is related to the patent requirements of the Malaysian Patents Act when opting for the modified substantive examination, it is a very useful system since foreign applicants are able to easily obtain patents by using the results of examination in foreign countries.

The applicant may request a modified substantive examination if the patent is granted in Korea, Australia, the United States, Japan, the United Kingdom or the European Patent Office for the same invention (Malaysia Patents Act, Article 29A, Clause 2). For these purposes, the applicant shall modify the contents of the application and claims in Malaysia to be substantially the same as the counterpart patent and, if necessary, submit the patent issued by the foreign patent office together with the translation in English (Guidebook for IP Protection in Abroad: Malaysia, 2014). The modified substantive examinations have

the advantages of the prior art search for the corresponding patent having already been carried out and there is no need to conduct the prior art search again, the time period for filing the patent application is shortened, and the fees for modified substantive examination is cheaper than the conventional substantive examination. On the other hand, there is a problem where the range of non-patentable subject matters in the Malaysian Patents Act may be different, and the criteria for the unity of the patent and non-obviousness may be different.

The expedited examination is the examination system that was introduced in January 2011, and it can only be applied when the requirements in the law are met. It is based on whether the claimed invention relates to national or public interests, if a patent infringement lawsuit is in progress or there is a potential for infringement, if the invention is commercialized or has plans to be commercialized within two years, if the conditions of monetary reward is at stake, or if it is green technology. The expedited examination allows the applicant to access the patent decision within one month (KSP Policy Seminar, 2019).

[Figure 1-20] Substantive Examination System in Malaysia



Source: MyIPO, Policy Seminar and In-depth Research of the KSP Project.

2.4.2.5. Myanmar

The Myanmar Patent Law stipulates that the patent application should be subject to substantive examination. The World Intellectual Property Organization (WIPO) and the Japanese Patent Office (JPO) provide basic patent examination training.

2.4.2.6. The Philippines

IPOPHL examines whether the application submitted to the system is in compliance with the patent requirements based on IP Code of the Philippines, issues a search report, and decides whether to register or not (Guidebook for IP Protection: the Philippines, 2017).

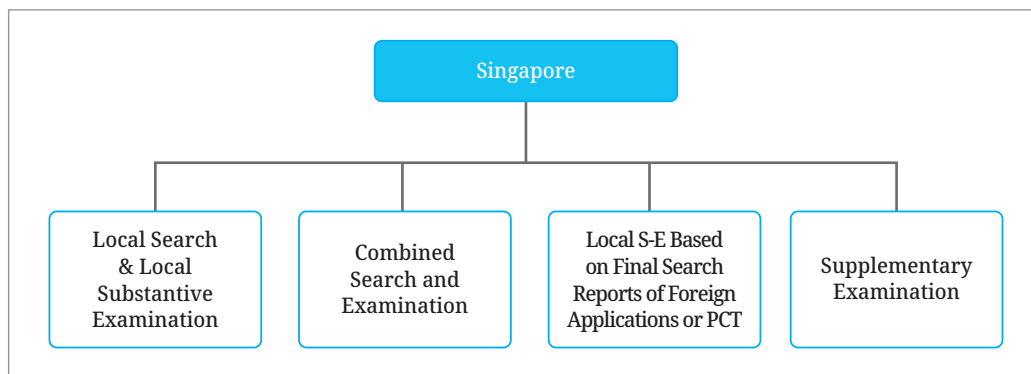
Substantive examination process in the Philippines is unique because it is possible to issue early search reports or written opinions within two to six months from the filing date for a national application if certain requirements are met. In addition, IPOPHL has a unique system for seeking opinions from universities and related industries in order to examine the patentability of the invention and to collect practical opinions of the industry on the technology (KSP Policy Seminar, 2019). It also stipulates that patents should not be granted if the efficacy has not been demonstrated in the application for medicinal products pursuant to the Cheaper Medicine Act. The decision on the efficacy of the medicinal product is made by the Food and Drug Administration (FDA) under the Department of Health, which controls the quality of medicinal product patents (KSP Policy Seminar, 2019).

2.4.2.7. Singapore

The most prominent feature of the Singapore patent examination is that the applicant has four options in connection with prior art search and examination. The applicant can choose one of the following: (1) request the search report and request the examination based on the search report, (2) request combined search report and examination, (3) request for substantive examination based on the results of the final examination of the designated foreign application or PCT international application, and (4) request supplementary examinations (Article 29). The applicant may claim prior art search by IPOS and may subsequently request substantive examination based on the search report. Requests for search reports must be filed within 13 months from the filing or priority date, and the request for examination must be made within 36 months.¹⁰ The applicant may decide whether to continue with the substantive examination in accordance with the search report. Moreover, the applicant may file a combined search report and examination within 36 months of the filing date or priority date. The applicant may claim the results of the search report and the examination request at a lower fee rather than separating search report request and substantive examination request. It is reported that it takes two to five months to receive the combined search report and the examination result, making the applicant have an advantage of promptly receiving the examination request result.

¹⁰ <https://www.ipos.gov.sg/protecting-your-ideas/patent/application-process/domestic-route> (accessed on June 4, 2019).

[Figure 1-21] Substantive Examination System in Singapore



Source: Author.

2.4.3. Examination Period and Number of Examiners

2.4.3.1. Cambodia

The period of patent application in Cambodia is 18 months from the filing date to the disclosure of the application. There is no examination request system. It takes 14 months from the start of the substantive examination to the publication of the patent decision in the patent publication. The Cambodian Department of Industrial Property Rights (DIPR) currently has two examiners (KSP Policy Seminar, 2019). DIPR plans to recruit examiners but has difficulty recruiting competent IP experts as examiners. There are many difficulties in hiring IP and technical experts as examiners due to low wage and treatment compared to the private sector (KSP Policy Seminar, 2019).

2.4.3.2. Indonesia

Under the Law No. 13 of Indonesia, patent examiner is defined as having the authority to conduct a substantive examination of an application as a public official or as an expert appointed by the Minister (Article 1 Clause 8). The Indonesian Intellectual Property Office (DGIP) currently has 104 patent examiners, and 14 examiners are being trained as future examiners (KSP Policy Seminar, 2019). It increased to 33 examiners from 2011. There are 32 in chemical field, 19 in electric field, and 20 in machinery field. DGIP continues to increase the number of examiners in each field (Syamsudin, 2018).

In accordance with Article 35 of the Indonesian Law No. 13, patent examiners are classified into four stages: “First” patent examiner, “Young” patent examiner, “Middle” patent examiner, and “Main” patent examiner, depending on the number of filed applications and

the training program including seminars and workshops they have participated (KSP Policy Seminar, 2019). Patent examiners in the future may apply if they hold a Bachelor's degree in chemistry, biology, pharmacy, electricity, physics, mechanical engineering, civil engineering, agricultural studies, fishery technology or engineering (Article 13).

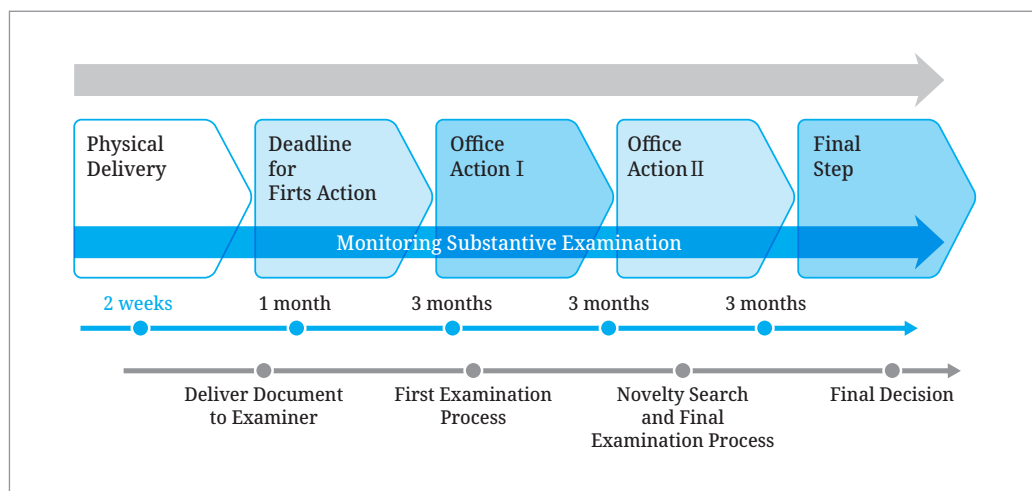
<Table 1-2> Classification of Patent Examiners in Indonesia DGIP

Types	No. of Patent Examiner	Requirements
Main Patent Examiner	35	Credit Number at least 14-25 from sub-elements professional development
Middle Patent Examiner	24	Credit Number at least 8-12 from sub-elements professional development
Young Patent Examiner	18	Credit Number at least 4-6 from sub-elements professional development
First Patent Examiner	27	Credit Number at least 2 from sub-elements professional development
Prospective Patent Examiner	14	The work performance value is at least good in the year before (one year)

Source: DGIP, Policy Seminar and In-depth Research of the KSP Project.

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[Figure 1-22] Pendency Period of Substantive Examination



Source: DGIP.

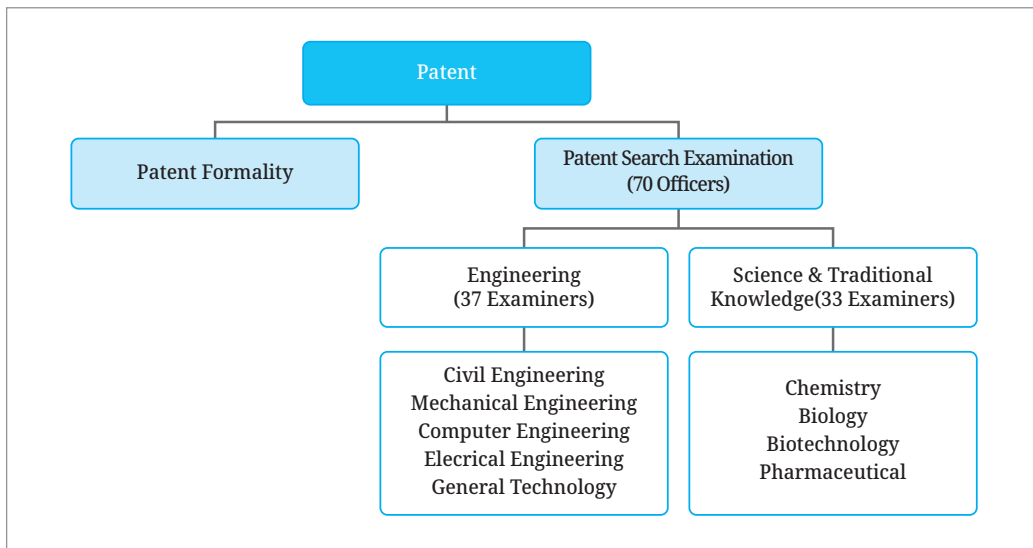
2.4.3.3. Lao PDR

There is only one patent examiner in Lao PDR Department of Intellectual Property (KSP Policy Seminar, 2019). Lao PDR is supported by foreign patent offices in terms of patent examination and training.

2.4.3.4. Malaysia

Currently, there are 70 patent examiners in the MyIPO. There are 37 experts in the engineering department and 33 examiners in the science and traditional knowledge department. Engineering department is divided into civil engineering, mechanical engineering, computer engineering, electrical engineering, and general technology, and the science and traditional knowledge branches are divided into chemistry, biology, biotechnology, and pharmaceutical fields. Along with examiners, 32 public officers conduct screening for formality check of the application form (KSP Policy Seminar, 2019).

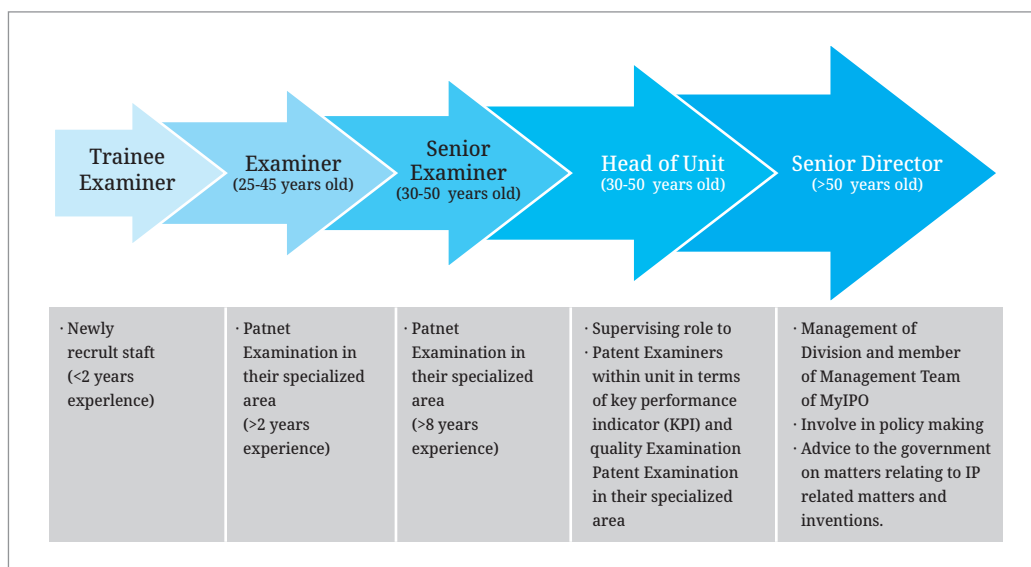
[Figure 1-23] Organization Chart for MyIPO Patent Examiners



Source: MyIPO, Policy Seminar and In-depth Research of the KSP Project.

MyIPO examiners are classified into the positions of Senior Director, Head of Unit, Senior Examiner, Examiner, and Trainee Examiner based on working experience and age. A patent examiner must have obtained Bachelor's or Master's degree in the science or engineering field, is under 35 years of age, and have an average GPA of 3.0 or higher (KSP Policy Seminar, 2019).

[Figure 1-24] Classification by Roles for Malaysia Patent Examiners



Source: Reconstruction from MyIPO, Policy Seminar and In-depth Research of the KSP Project.

2.4.3.5. Myanmar

Myanmar's IP office is in the process of establishing IP infrastructure with a total of six patent examiners or staff members.

2.4.3.6. The Philippines

The duration from filing the application to getting patent result is reported as 48 months (KSP Policy Seminar, 2019). If the examiner rejects based on the results of examination of patent application, he or she shall notify the applicant of the reason for the rejection, and within two months from the date of receiving the Office Action that notify the reason for the rejection, the applicant must request reexamination or the application shall be deemed to have been withdrawn. If it is reasonable on submitting responses, there must be reasonable period and the deadline can be extended two times that does not exceed 6 months. Currently, patent examiners at IPOPHL are required to hold Bachelor's or Master's degree in engineering, natural sciences, chemistry or physics fields.

2.4.3.7. Singapore

Generally, the period from patent application to patent registration of IPOS in its entirety is two to four years depending on the complexity of the invention (IPOS).

2.4.3.8. Thailand

The biggest problem of patent examination in Thailand is the extended examination period due to backlog. DIP has continuously tried to solve this problem, and the average patent examination period was shortened from 10.2 years in 2016 to 8.9 years in 2017. Specifically, it is reported to take 9.9 years for the rare fields, 7.8 years for the machinery field, 10.6 years for the chemical field, and 12.1 years for the medical field (JETRO, 2018, 13). DIP continuously increases the number of patent examiners to shorten the examination period. Since 2015, DIP had 33 patent examiners and 18 to 33 new examiners were hired every year. In 2018, there were approximately 108 patent examiners in charge of examinations (KSP Policy Seminar, 2019).

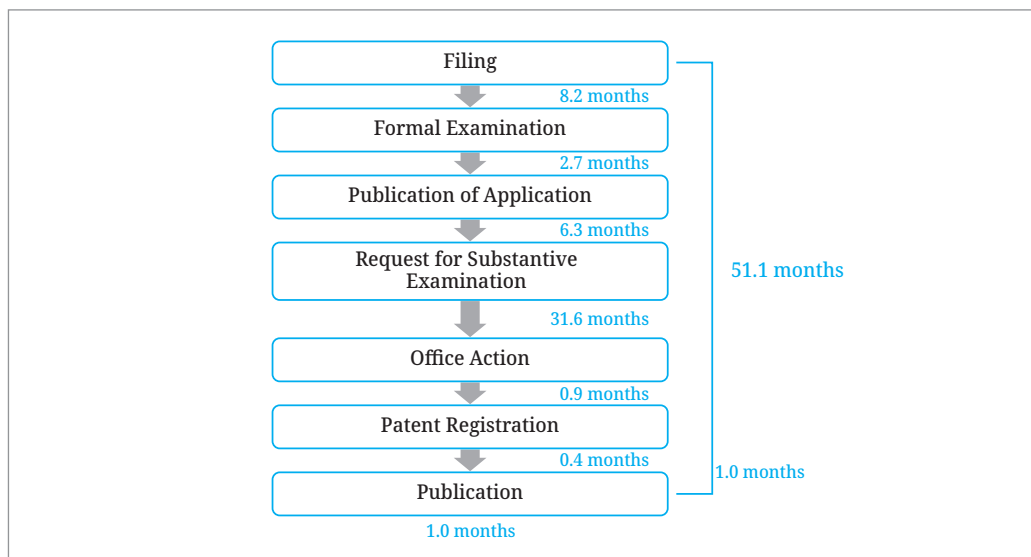
2.4.3.9. Vietnam

Under the law, the substantive examination shall be completed within 12 months from the date of filing examination request or the filing date of the patent application. The examination for the utility model shall be completed within 9 months (Article 119, Clause 2). If the examination request is filed before the date of publication for application, the period shall be calculated from the date of publication. The time limit for the substantive examination does not include the time spent by the applicant to submit the amendment. If the application is found to be either deficient in the description or lack patent requirements, the examiner shall notify the reason of the rejection, and the applicant may submit the amendment and the written opinion within 3 months from the receipt of the notice with reasons for rejection. When actual examination results are rejected, time limit for filing the amendment and comment of the applicant was 2 months in the past, but it was extended to 3 months according to the amendment of implementing regulations of the Law on Intellectual Property of Vietnam in 2018.¹¹

In actuality, the duration of period from requesting substantive examination of Vietnam to determining the results of patents is 21.8 months without revision, and with revision, it takes 36.2 months. The average period is 31.8 months, and the period it takes from patent application to registration (registration notification) is reported as 51.1 months on average (Fujita, 2013).

¹¹ January 15, 2018, Circular No. 16/2016 / TT-BKHCHN has been amended by the Enforcement Decree of the Intellectual Property Right of Vietnam, and the deadline for submitting amendments and comments has been extended.

[Figure 1-25] Timeframe for Patent Application Procedure in Vietnam



Source: Author, Reconstruction from Fujita, 2013, p. 9.

IP Vietnam currently has 70 patent examiners. IP Vietnam is constantly recruiting examiners. In 2016, it increased to 18 patent examiners, with the total of 62 examiners, and in 2017, seven more were recruited. Currently, 70 patent examiners are in charge of the examination (KSP Policy Seminar, 2019). IP Vietnam operates the Vietnam Patent Examination Training (ViPet), which is the education and training program for systematic and consistent examiner training (KSP Policy Seminar, 2019).

2.5. Current Status of Patent Examination Cooperation

2.5.1. International Patent Examination Cooperation

Due to the principles of territorial privilege for jurisdiction of patents, in principle, each country's patents must acquire patents independently to each other, so applicants that wish to obtain a patent must file a patent application for each country.¹² PCT is a system where the applicant can submit PCT application to national IPO (Receiving Office) from national or resident country. The applicant could enter the local stage to the designated country where he or she wishes to acquire a patent within a specified period of time. The filing date of the PCT international application shall be recognized as the filing date in the designated country.¹³

¹² PCT Overview of the international application system, http://www.kipo.go.kr/kpo/user.tdf?a=user.pct.info.BoardApp&c=1001&cat-menu=m08_01_01 accessed on June 4, 2019).

¹³ Ibid.

Since the patent offices of each country have autonomy and sovereignty for patent granting, it is not bounded by the opinions of PCT international investigation reports and preliminary examination agencies. It decides to grant patent in accordance with the patent requirements of domestic law. It is possible to refer the results of the preliminary investigation and the examination, so that the domestic stage can be carried out promptly and efficiently (WIPO, 2014). The PCT international applications are recognized as the filing date in 152 member countries by one application, and it is advantageous since it can pre-screen the patentability of the application through the international investigation service. All AMS except Myanmar have joined the PCT. The problem faced by AMS as members of the PCT is the reviewing process at the local level due to the filing of PCT applications by foreign applicants. As a solution, the establishment of the ASEAN Integrated Patent Office and the PCT filing through the Integrated Patent Office can be considered. At the practical level, it is necessary to prioritize the harmonization of the examination process of each country to a certain level.

Cambodia joined PCT on December 8, 2016. Therefore, if the international applicant chooses Cambodia as the designated country, the filing date of the PCT international application may be recognized as the filing date in Cambodia and enter the domestic process within three months from the priority date. Indonesia joined PCT on September 5, 1997. In 2017, 6,184 patent applications entered domestically through PCT (WIPO). Guidelines on DGIP examination strongly advises that the examiner who examines the PCT fully utilize the international preliminary examination report, written opinions, international examination report, and examination results of important patent offices, such as the EPO, USPTO, JPO, or the IP Australia. It is the principle that the judgment of patent requirements at the entry stage in Indonesia is examined by the standards in domestic law, but the Indonesian examination guidelines are based on the written opinion of the International Searching Authority (ISA) or the Preliminary Examining Authority (IPEA) (DGIP).

2.5.2. Cooperation of Regional Patent Examination

AMS use various methods when granting patent rights in its early stages. AMS implemented the ASEAN Patent Examination Co-operation (ASPEC) program to enable patent applications to be filed quickly and efficiently by sharing the results of patent searches and examinations between the Patent Offices of the respective countries. ASPEC has been implemented since June 15, 2009, and nine AMS except Myanmar, where its IP system is in the maintenance stage, have become members.¹⁴

14 ASEAN Patent Examination Cooperation (ASPEC) Program, <http://www.globalipdb.inpit.go.jp/application/6142/> (accessed on June 4, 2019). [In Japanese]

The purpose of ASPEC is to share the results of the patent office searches and examinations, thereby reducing redundant tasks, shortening time on search and examination, and improving the quality of patent examination. ASPEC has the advantage of avoiding duplicate search and examination, preventing the clash between backlogs and examination results, and improving the quality of search and examination.¹⁵ Cooperation between patent examination and among AMS is becoming more important as applications for technologically complex advanced technology, fusion, and hybrid technology have increased (Kim, Il Gyu, 2009). Since some AMS are unable to produce high levels of patent search and examination, ASPEC can improve the quality of search and examination of patent applications in these countries (KIPO, 2017).

If the application for the same patent is filed by the patent office of AMS, the office that received ASPEC application does not have to compulsorily accept the search and examination data of other countries for the patent application. However, they may decide whether to grant a patent in accordance with the laws of the country in question.¹⁶

If the applicant who submitted the patent application to one of the AMS has the results of the first patent application from the patent office, and the result of the patentability makes at least one claim, the application may be requested through ASPEC to the second member state's patent office before the final patent decision or rejection on the application has been made (South-East ASIA IPR SME Helpdesk). Specifically, the applicant must submit a copy of the ASPEC request form to the second patent office, a copy of the first patent office's search and examination report on the application, and the first patent office's patentability result document for one or more claims (South-East ASIA IPR SME Helpdesk).

Examination cooperation through ASPEC can be the means to share and simplify the search and examination results of each patent office. However, since the final judgment on the patent decision is made by each country's patent office, the problem of backlog still remains (Wiwatwattana, 2017). As of September 2018, a total of 405 requests were received through ASPEC. Most ASPEC's examination requests (325) firstly used Singapore's IPOS search and examination results, search and investigation reports are shared by Malaysia (128 cases), Thailand (132 cases), Vietnam (65 cases), and Indonesia (49 cases).¹⁷ The average length of time required from ASPEC's request to the first Office Action is reported as 8.4 months.

15 "How to Guide for ASPEC Patent Filing," South-East ASIA IPR SME Helpdesk.

16 ASEAN Patent Examination Cooperation (ASPEC) Program, <http://www.globalipdb.inpit.go.jp/application/6142/> (accessed on June 4, 2019). [In Japanese]

17 "ASEAN Intellectual Property Portal," <https://www.aseanip.org/Statistics/ASEAN-Patent-Examination-Cooperation-ASPEC-Statistics> (accessed on June 4, 2019).

<Table 1-3> Statistics for ASPEC Integrated Examination Cooperation

(Unit: Number of Applications)

Country		2nd AMS									
		BN	KH	ID	LA	MY	MM	PH	SG	TH	VN
1st AMS	Brunei										
	Cambodia										
	Indonesia					5				7	1
	Lao PDR										
	Malaysia			6						18	10
	Myanmar										
	Philippines			1		1			1	10	3
	Singapore			42		122		13		97	51
	Thailand										
	Vietnam									3	

Source: ASEAN Intellectual Property Portal: Statistics (as of September 14, 2018).

2.5.3. Bilateral Patent Cooperation

AMS seek bilateral cooperation between the patent offices of AMS and other countries in order to resolve the complications of backlog and enhance the quality of the examination.¹⁸

Mutual recognition is based on trusting each AMS' IP system. Since the gap between IP infrastructures of AMS affects the quality of substantive examination, it is difficult to establish mutual confidence in each others' IP system. This hinders mutual recognition of IP protection among member states. In addition, since the IPR laws and the enforcement ordinances of the member states are different, it is difficult to bring integrated results among AMS. This is due to the judgment of the patent requirements or the results of the substantive examination are different. Also, the differences in the rules governing the filing procedure lead to considerable differences in the length of time between the filing and registration of patent applications and the average duration of the filing.

18 <http://www.meti.go.jp/press/2017/08/2017082903/20170829003.html> (accessed on June 4, 2019).

2.5.3.1. Brunei Darussalam

The Patent Examination Highway (PPH) is used when the patent is commonly filed by implemented PPH member states that make the patent decision with the reference to the result of the examination of national patent office that were examined first.

Although the examinations may be proceeded independently, the applicant can obtain the patent right quickly or efficiently through the first or early examination. Cooperation in examination form allows burden to be reduced and quality to be improved.¹⁹

On August 28, 2017, BruIPO agreed with JPO through bilateral agreements to use the results of the Japanese patent examination in reference to the Brunei patent application. JPO has established the Patent Examination Highway Plus in order to enable BruIPO and the applicant to obtain the same rights as in Japan on the basis of the examination results of Japan when the patent application is made in Brunei. Thus, when Japanese applicant applies PPH Plus to BruIPO, patent right can be obtained within around two months.²⁰ However, it is not possible to apply PPH Plus to JPO based on the results of Brunei's examination.

2.5.3.2. Cambodia

Cambodia is seeking international cooperation in patent applications with the European Union, Singapore, China and Japan. European patent applications and patents filed on or after March 1, 2018, and international patents, including those in designated countries, will be received in Cambodia through the validation process, and essentially, the same protection will be granted as the European Patent Office. On January 23, 2017, EUIPO and the Cambodian Industrial and Handicraft Department agreed on validating the European patent, and on November 24, 2017, the Royal Kram N°NS/RKM/1117/017 was decreed. The Declaration (Prakas) N°282 MIH/2017 was adopted on December 8, 2017, to approve the validity of the European patent in Cambodia. Requests on getting approved and fees must be paid either within six months after the report is revealed at European Patent Office or during the process when entering Europe and domestic processes on the cases that are international applications (EPO). Cambodia is the fourth country recognized outside of the European Union following Morocco, Moldova, and Tunisia. The applicant must submit the Khmer translation of the patent granted by the European Patent Office.²¹

19 http://www.kipo.go.kr/kpo/user.tdf?a=user.html.HtmlApp&c=8079&catmenu=m06_07_03 (accessed on June 4, 2019).

20 <http://www.meti.go.jp/press/2017/08/20170829003/20170829003.html> (accessed on June 4, 2019).

21 <https://dcc.com/patents/intellectual-property-protection-in-cambodia/> (accessed on June 4, 2019).

European, Singaporean and Chinese patents can also be filed for approval in Cambodia. In the case of Japanese patents, patent applications can be granted in Cambodia practically with no examination (NGB Japan Technology Trade Co., Ltd, 2018). The cooperation of patent examination between Cambodia and Japan have been coined, “Cooperation for Facilitating Patent Grant” (hereafter CPG) that has been effective since July 1, 2016. As requirements for CPG application, patent application must be filed in Japan before the filing or priority date of the patent application in Cambodia. Moreover, the related Japanese patent application must have completed its examination, and all claims in the Cambodia application must be corrected to match the claims of the Japanese patent application. The CPG applicant is required to submit the following documents: 1) application form, 2) original Japanese patent publication certified by the JPO, 3) English translation of the claims and specifications stated in the patent gazette and a notarized translation of the Khmer translation, and 4) a table of claims.²²

Cambodia’s Ministry of Industry and Crafts has reached an agreement with the China Intellectual Property Office on September 21, 2017 for patent examination and cooperation, and from March 28, 2018, Chinese patents can be protected in Cambodia. The applicant must have a valid patent in China at the time of filing the application in Cambodia and the filing date of the underlying Chinese patent must be after January 22, 2003.

2.5.3.3. Lao PDR

The Lao PDR DIP has only one patent examiner, so it is supported in terms of examination and training through international cooperation with several foreign patent offices.

Lao PDR is currently cooperating with JPO and CNIPC. JETRO, CNIPA, IPOS, TIDA and SIDA From 2019, KIPO has been promoting international cooperation with Lao PDR as well (KSP Policy Seminar).

2.5.3.4. Malaysia

MyIPO has piloted PPH with JPO and EPO, and simultaneously has implemented PCT-PPH. It is also implementing PPH with CNIPC. Since the implementation of PPH, the number of application in Malaysia based on the results of the patent examination in Japan has

²² The CPG applicant is required to submit the following documents: 1. Application form, 2. Original Japanese patent publication certified by the Japanese Patent Office, 3. English translation of the claims and specifications stated in the patent gazette, Notarized translation of the Korean translation, and 4. Table of Claims Validation of patent in Cambodia (Validation), Yuasa-hara law patent office.

increased sharply, and the number of applications for PPH, which was only 17 cases in 2014, increased to 249 in 2018. Since the implementation of the PPH with the EPO, the number of applications for PPH, which was only three in July 2017, has increased to 22 in 2018, and four applications for PPH based on the Chinese patent application have been reported (KSP Policy Seminar).

A patent holder in Singapore can re-register for the same patent in Cambodia based on the type of patent. To achieve this, the patent must be valid in Singapore at the time of application for re-registration and must be filed on or after January 22, 2003, and must meet the patent requirements of the Cambodian Patent Act. In addition, the applicant may request the Singapore Patent Office (IPOS) to submit a copy of the investigation and the search results to the Cambodia Patent Office together with the patent specification of the patent while applying for a patent in Cambodia.²³

2.5.3.5. Thailand

DIP is pursuing international cooperation with JPO, USPTO, IP Australia, and EUIPO.

2.5.4. Reference to Other Contracting Party's Investigation and Examination Report for Applications of Prioritized Claim

Even if it is not through a bilateral agreement, many Patent Offices utilize search, examination reports, and other useful information on patent applications of other national patent offices for the domestic application examination of the patent. Some countries' patent laws require the applicant to submit foreign patent application examination results and related information on the patent (WIPO, 2014, 14).

2.5.4.1. Cambodia

The Cambodian Law on the Patents, Utility Model Certificates, and Industrial Designs requires the applicant to provide information on the date and application number of the overseas application to the patent office upon request of the Cambodian DIP when the applicant has applied for the same invention as the invention applied in Cambodia (Article 30). Accordingly, the applicant must submit a copy of the search and examination results connected with the overseas application and a copy of the patent certificate granted in the overseas application (Article 31). In addition, if a patent granted on the overseas application is invalidated, the applicant shall submit a copy of the invalidation decision upon the

²³ <https://dcc.com/patents/intellectual-property-protection-in-cambodia/> (accessed on June 4, 2019).

request of the Director General in DIP. DIP of Cambodia requires international search report, international preliminary examination report for the international application filed under the PCT, investigation and examination results of the overseas application submitted by the applicant, and invalidation decision of the patent are referred to examination of the patent application in Cambodia (Article 37).

2.5.4.2. Indonesia

“Law No. 13 Year 2016” on “Patents of Indonesia” stipulates that at the request of the Director General of DGIP, priority claims applicant must submit documents related to the examination of the application filed by the overseas patent office, If prior application has granted the patent, a copy of the document related to the granting of the patent, a copy of the related document upon its rejection, a copy of the document concerning the invalidation decision if a patent granted in a foreign country is invalidated, and other documents necessary to evaluate if the invention meets the patentability requirements of novelty, non-obviousness, and industrial applicability (Article 28, Clause 2).

2.5.4.3. The Philippines

IP Code of the Philippines stipulates how the Director General of IPOPHL can require the applicant to provide information on overseas applications such as filing date and application number at the request of the patent office when the applicant has already applied for the same invention abroad (Article 39).

<Table 1-4> Reference to the Investigation and Examination Report of Other Member States

Country	Summary
Cambodia	<p>Article 30. The applicant shall, at the request of the Registrar, furnish him with the date and number of any application for a patent filed by him abroad (“foreign application”) relating to the same or essentially the same invention as that claimed in the application filed with the Ministry in charge of industry.</p> <p>Article 31. The applicant shall, at the request of the Registrar, furnish him with the following documents relating to one or more of the foreign applications referred to in Article 30 of this Law: (i) a copy of any communication received by the applicant concerning the results of any search or examination carried out in respect of the foreign application; (ii) a copy of the patent granted on the basis of the foreign application; (iii) a copy of any final decision rejecting the foreign application or refusing the grant requested in the foreign application.</p> <p>The applicant shall, at the request of the Registrar, furnish him with a copy of any final decision invalidating the patent granted on the basis of the foreign application referred to in the 1st paragraph of this Article.</p> <p>Article 37. The Registrar shall take into account, for the purposes of Article 36 of this Law, as following: (i) the results of any international search report and any international preliminary examination report established under the PCT in relation to the application; and/or (ii) a search and examination report submitted under item (i) of the 1st paragraph of Article 31 of this Law relating to, or a final decision submitted under item (iii) of the 1st paragraph of Article 31 of this Law on the refusal to grant a patent on, a corresponding foreign application; and/or (iii) a search and examination report which was carried out upon his request by an external search and examination authority.</p>
Indonesia	<p>(2) The Directorate General may request that an application filed with priority right shall be supplemented with: a. an official copy of the documents pertaining to the substantive examination of the first patent application overseas; b. an official copy of the patent documents which have been granted with respect to the first patent application made overseas; c. an official copy of the decision concerning the rejection of the first patent application made overseas in case such application is rejected; d. an official copy of the decision for the annulment of the relevant foreign patent which has been issued overseas in case such patent has been annulled; e. other documents which may be required in order to facilitate an evaluation that the invention for which a patent has been requested is a new invention and actually involves an inventive step and is industrially applicable (Article 28).</p>
Philippines	<p>The applicant shall, at the request of the Director, furnish him with the date and number of any application for a patent filed by him abroad, hereafter referred to as the “foreign application,” relating to the same or essentially the same invention as that claimed in the application filed with the Office and other documents relating to the foreign application. (Article 39)</p>

Source: Author.

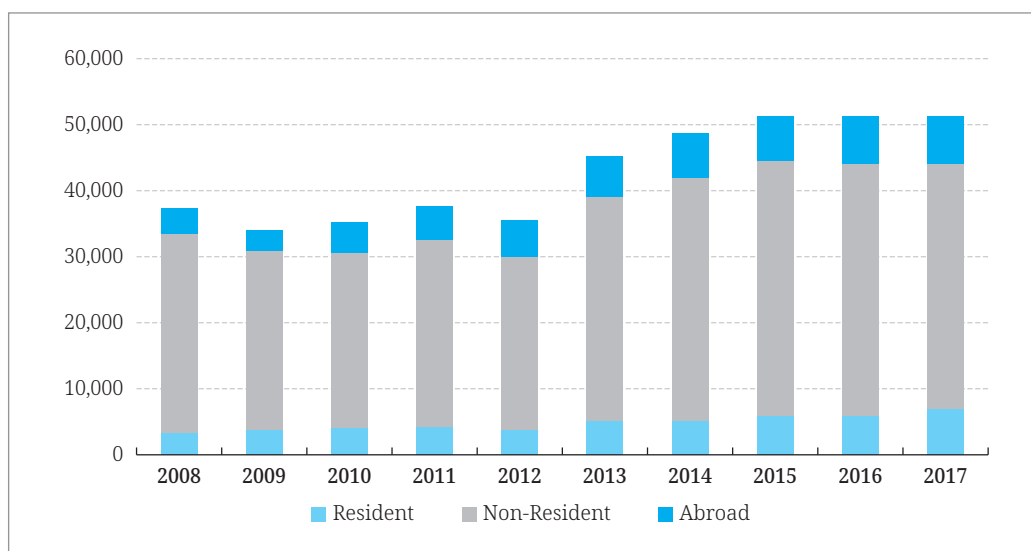
Under the Myanmar Patent Act, the applicant may submit the results of foreign patent examination and relatable information if the applicant filed the application overseas (MOST, KSP Interim Reporting, 2019).

3. Analysis and Applications

3.1. Status of Patent Applications

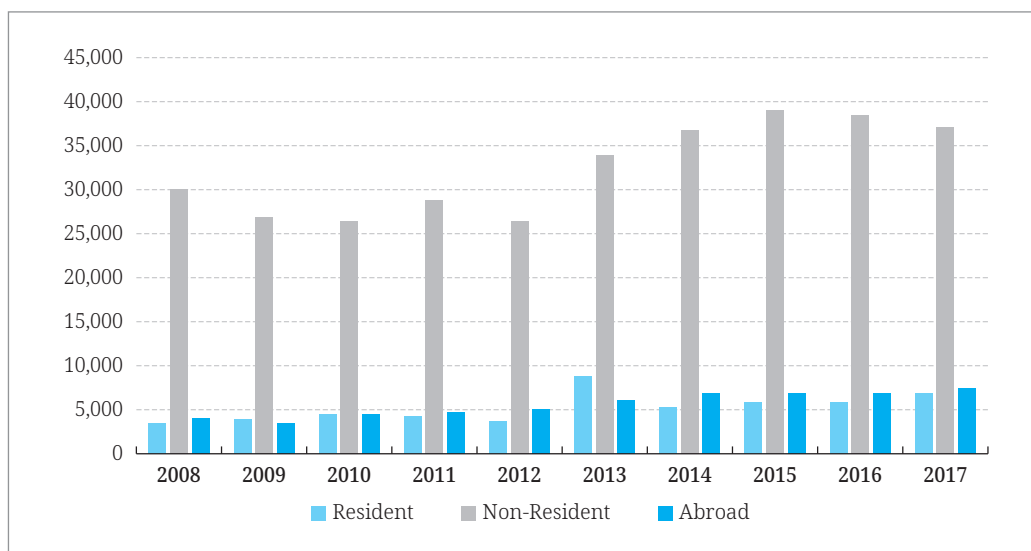
The total number of patent applications filed by AMS is increasing, but the number of patent applications filed by foreigners has increased slightly during 2016-2017 year. The number of foreign patent applications is much higher than the number of domestic applications. The number of patents filed by residents is proportional to the ability of the country to develop technology, and the number of applications filed by non-residents is proportional to the importance of the country to foreign companies (Matsuo, 2015). Having a high number of patents by non-residents in all AMS compared the number of patents by residents means that the technology development capability of AMS is still in the development stage and ASEAN is considered a very attractive investment target for foreign companies. However, the increase in the number of non-resident patent applications in certain fields also implies the possibility of securing AMS as export markets and securing monopolistic production rights in the region, which would hinder domestic technology development.

[Figure 1-26] Total Number of Patent Applications Filed by AMS



Source: WIPO Statistical Country Profiles.

[Figure 1-27] Number of Patent Applications Filed by AMS



Source: WIPO Statistical Country Profiles.

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The percentage of patents filed by AMS is low because research institutes and universities, which are the subjects of the inventions, tend to present inventions as papers or research results rather than patent applications. Moreover, researchers are not accustomed to making patent applications like specifications, and are reluctant to disclose the contents of inventions. Also, even if a patent application is filed, there are no incentives given to the researchers and this hinders the motivation for resident patent applications. Moreover, the institutional devices that give economic benefits to strong and good patents are weak and there are no guidelines for them.

If the classification of patent and utility model applications in Indonesia is based on the size of the applicant's companies, 1,428 applications were filed by large companies in 2018, and for MSMEs,²⁴ there were 267 applications. On the other hand, 614 utility model applications were filed by large corporations, which are less than 914 applications for SMEs (KSP Policy Seminar). From 2017 to 2018, the number of patent applications filed by large corporations is rising, and the number of utility model applications filed by MSMEs has increased sharply (KSP Policy Seminar). In the Indonesian economy, the proportion of MSMEs is 99%, contributing 89% to private sector employment and 60% of GDP.²⁵

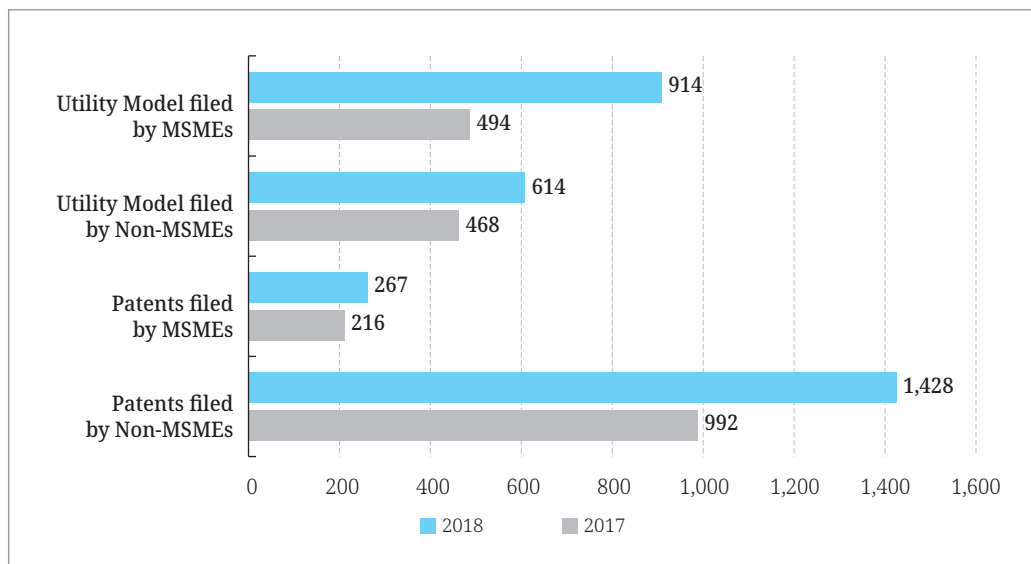
24 The small and medium enterprises (MSMEs) in Indonesia are classified according to its annual revenue. If the annual revenue of enterprises are smaller than IDR300M, they are classified as micro, if the revenue is in between IDR300M and IDR2.5B they are classified as small, and if the annual revenue is over IDR2.5B, they are considered to be medium size enterprises.

25 Indonesia has maintained a high GDP growth rate of 5.3% from 2018 to 2019 despite experiencing a potential economic downfall due to falling commodity prices. "2018 Survey of Entrepreneurs and MSMEs in Indonesia," ASIA-Pacific Foundation of Canada (2018), p. 5.

Considering the impact of SMEs on the Indonesian economy, it is necessary to provide government support to increase the number of patents and utility model applications filed by SMEs.

[Figure 1-28] Patent and Utility Model Applications of SMEs and Large Enterprises in Indonesia

(Unit: Number of Applications)



Source: DGIP, Policy Seminar and In-depth Research of the KSP Project.

3.2. Analysis of Patent Application Procedure Status

3.2.1. Application Language

Among AMS, Cambodia, Indonesia, Lao PDR, Thailand, and Vietnam are required to submit an application in the native language and if the application is written in English, the application written in the official language must be submitted within a specified period (30 days, 90 days, or 6 months).

During the patent application procedures, language requirement may affect the quality of the examination and the duration for the patent application process. In particular, communication problems can arise in the process of translating and submitting an application written in English to the local language between the foreign applicant and the foreign agent of the applicant, the local representative and the local patent office. There is also a risk that proper responses to the OA are not made (Interview with DGIP, 03/18/2019). The patent decision may vary depending on the quality of translation and the patent application period may be inevitably delayed.

<Table 1-5> Language Requirements for Patent Applications Filed in AMS

Country	Language Requirements
Brunei	English
Cambodia	Khmer (Khmer translation within 6 months after English filing)
Indonesia	Indonesian (Indonesian translation within 30 days after English filing)
Lao PDR	Lao (Lao translation within 90 days after English filing)
Malaysia	Malay and English
Myanmar	Myanmar and English
Philippines	Filipino and English
Singapore	English
Thailand	Thai (Thai translation within 90 days after English filing)
Vietnam	Vietnamese

Source: Author.

3.2.2. Patentable and Non-Patentable Invention

Since ASEAN Patent Laws have very different positions for patentable and non-patentable inventions, the patentable invention in one member state may be included in the non-patentable subject of another member state. Hence, there are difficulties and confusion in the application and protection of integrated IP in the ASEAN region. For example, computer program developers are required to claim copyright protection in Brunei, whereas in Indonesia, they are protected by patents since 2016 Amendment of the Patent Act.

<Table 1-6> Non-Patentable Subject Matters

Country	Palatability of Computer Program
Brunei	Not patentable
Cambodia	Certain computer process and products
Indonesia	Patentable (after an amendment to Patent Act in 2016)
Lao PDR	Uncertain
Malaysia	Uncertain
Myanmar	Not patentable
Philippines	Not patentable
Singapore	Uncertain
Thailand	Not patentable
Vietnam	Not patentable

Source: Author.

3.2.3. Publication of Application

AMS apply different regulations. Thailand does not specify the patent publication period and it stipulates that it will be released after the formal examination has been completed and the fee for disclosure has been paid by the applicant.

However, the Law on the Patents, Utility Model Certificates, and Industrial Designs of Cambodia stipulate that if the patent application satisfies the patent requirements of the Law on the Patents, Utility Model Certificates and Industrial Designs, the DIP shall make a patent decision (Article 36). In practice, after the formal examination and the prior art search by a foreign cooperating patent office, a substantive examination on the public order and morality will be carried out. Therefore, examination is carried out without an explicit filing period.

<Table 1-7> Period of Publication by Member State

Country	Publication of Patent Application
Brunei	18 months from filing date or priority date (Article 27)
Cambodia	No provision
Indonesia	18 months from filing date or priority date (Article 42)
Lao PDR	19 months from filing date or priority date (Article 39)
Malaysia	18 months from filing date or priority date (Article 34)
Myanmar	18 months from filing date or priority date
Philippines	18 months from filing date or priority date (Article 44)
Singapore	18 months from filing date or priority date (Article 27)
Thailand	After the payment of the publication fee
Vietnam	19 months from filing date or priority date (Article 110)

Source: Author.

3.2.4. Request for Examination

The position of AMS is very different to the request for examination of the application. In Cambodia and Lao PDR, an application that went through the formal examination will automatically move on to a substantive examination without a request for examination. In Indonesia and Vietnam, the patent office is required to examine only the applications requested for examination within a certain period after the filing date. Malaysia and the Philippines also have a system for filing a request for examination, but the time for filing

the request for examination is different from the disclosure date and not the filing date. Singapore has different requirements for the period of examination according to the four types of substantive examination.

<Table 1-8> Duration to Request Substantive Examination

Country	Duration to Request Substantive Examination
Brunei	Request for a search and examination report (Article 29)
Cambodia	No request for substantive examination (Article 36)
Indonesia	Within 36 months after the filing date (Article 49)
Lao PDR	No request for substantive examination (Article 40)
Malaysia	Within 18 months after the publication (Article 29A and Regulation 27, 27A)
Myanmar	Within 36 months after the filing date
Philippines	Within 6 months from the publication (Article 48)
Singapore	Option 1: Search within 13 months + Examination within 36 months Option 2: Combined search and examination within 36 months Option 3: Examination within 36 months Option 4: Supplementary examination within 54 months
Thailand	Within 5 years after the publication or 1 year after final decision for opposition and an appeal (Article 29)
Vietnam	Within 42 months after the filing date (Article 113)

Source: Author.

3.3. Analysis of Substantive Examination Status

3.3.1. Patent Requirements

AMS commonly define novelty, inventive step, and industrial applicability as patent requirements (Article 27 Clause 1). These three patent requirements bind on all Contracting States under the TRIPS Agreement and are commonly defined in most advanced country patent laws as well as AMS. However, in determining whether the claimed invention complies with the patent requirements, the criteria of each patent office shall be determined by the scope of the prior art search, the degree and capacity of the examiner, and the understanding and discretion of the examiner's technical field. Hence, these are directly related to the quality of the patent. If the same invention is qualified to be protected as the patent in one country while not in other countries, it may be difficult to maintain the confidence of the patent system itself.

3.3.2. Substantive Examination

Most AMS adopt both formal and substantive examinations for patent examination. However, the level of the substantive examination by the patent office and the result of the examination are subject to interpret the patent requirements and the policy of the government. Hence, even if a substantive examination system exists, the results of the search and examination can vary greatly.

<Table 1-9> Types of Substantive Examination by Member State

Country	Type of Examination	
Brunei	Formality examination (Article 28)	Substantive examination (Article 29)
Cambodia	Formality examination (Article 35)	Substantive examination (Article 36)
Indonesia	Formality examination (Article 32)	Substantive examination (Article 52)
Lao PDR	Formality examination (Article 38)	Substantive examination (Article 41)
Malaysia	Formality examination (Article 29)	3 options : substantive examination, modified substantive examination, expedited examination (Article 29A)
Myanmar	Formality examination	Substantive examination (Article 36)
Philippines	Formality examination (Article 42)	Substantive examination (Article 48)
Singapore	Formality examination (Article 28)	4 options for substantive examination (Article 29) Option 1: Local search & local substantive examination based on the local search report Option 2: Combined local search and examination Option 3: Local substantive examination based on final search results of foreign corresponding applications or PCT application Option 4: Supplementary examination
Thailand	Formality examination (Article 28)	Substantive examination (Article 30)
Vietnam	Formality examination (Article 109)	Substantive examination (Article 114)

Source: Author.

3.3.3. Duration of Examination and Number of Examiners

The period of patent examination of AMS differs from each other. During the stage of building IP infrastructure, the number of patent applications is low. However, the number of examiners is very low, and it takes about 3-4 years because of the problems with IT system and examiner's capacity for substantive examination. Indonesia, Malaysia, the Philippines and Thailand have a considerable number of examiners, but it takes an average of more than 5 years to complete the examination, and in Thailand, it takes 8.9 years. Singapore, which has the best IP infrastructure among AMS and is already in charge of the search and

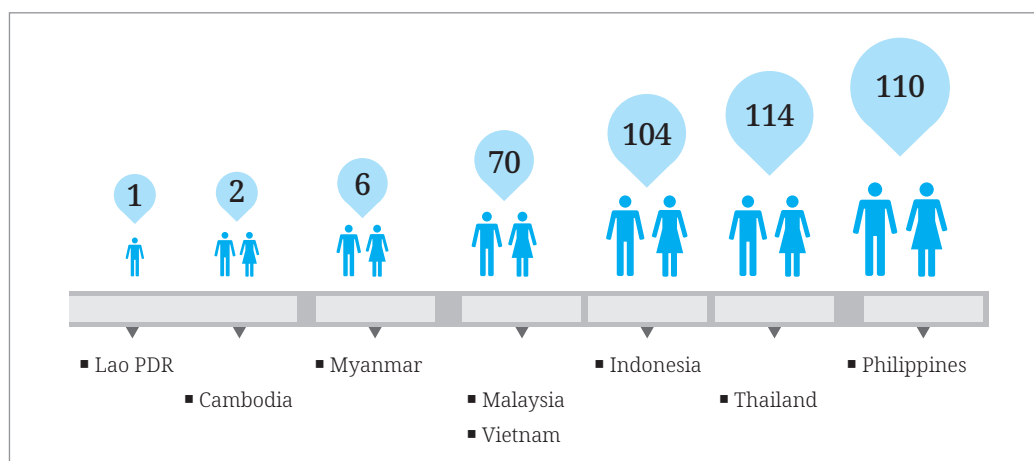
examination of ISA and IPEA, is reported to take three to four years (KSP Policy Seminar, 2019). Indonesia has reduced the number of backlog from 4,828 applications in January 2018 to 5,408 cases in December 2018 and has been continuously trying to shorten the examination period with the target of 3,120 backlog applications until this year.

<Table 1-10> Average Number of Patent Examination Periods and Examiners in AMS

Country	Duration for Patent Examination	Pendency of Patent Application	No. of Patent Examiners
Brunei	-	-	-
Cambodia	3 years	6 to 9 months (IP application)	2
Indonesia	5.61 years via normal process, 4.92 years via PCT	10 months 2 weeks	104 (+14 prospective examiners)
Lao PDR	4 years	-	1
Malaysia	5.5 years (1.6 years via fast track without objection, 2.15 years via PCT)	3.5 years	70
Myanmar	-	-	6
Philippines	4 years	-	110
Singapore	3-4 years	-	-
Thailand	8.9 years	-	114
Vietnam	2-3 years	18 months (from filing to first OA)	70

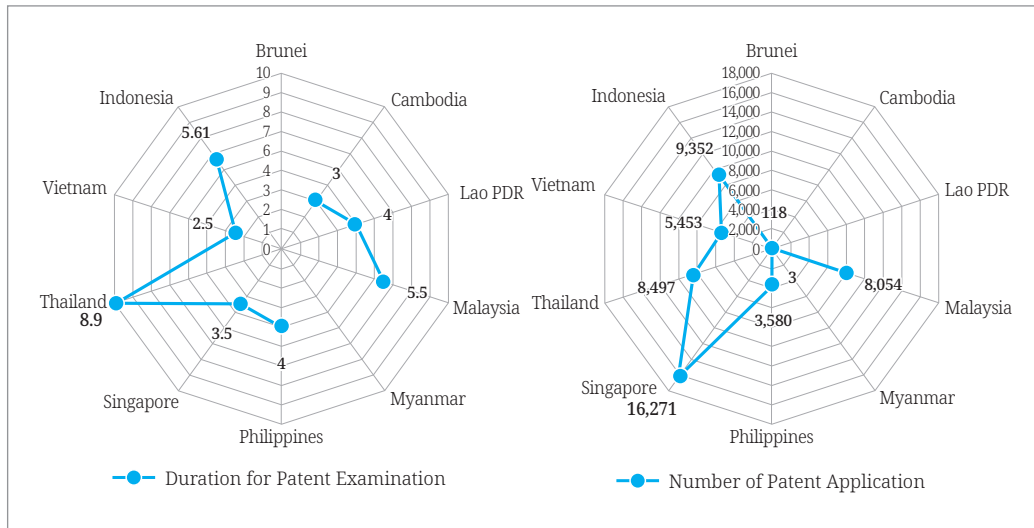
Source: Author.

[Figure1- 29] Number of Examiners in AMS



Source: Author, based on interviews and presentations at Policy Seminar and In-depth Research of the KSP Project.

[Figure 1-30] Number of Examination Offices and Examiners by Country



Source: Author, based on Interviews and presentations at Policy Seminar and In-depth Research of the KSP Project.

The number of examiners at the patent offices of AMS differed depending on the patent examination system and patent infrastructure of the country. Brunei Darussalam, where it makes patent decisions by examination cooperation with the foreign patent office and the bilateral patent cooperation, has no examiner. Malaysia had 8,054 applications and Vietnam has 5,453 applications in 2017, but the number of patent examiners in the two member countries is 70. DIP of Thailand currently has the longest patent application period of 8 to 9 years, despite the fact that 114 patent examiners have been conducting substantive examination and its efforts to continuously increase the number of examiners to resolve the backlog.

3.4. Analysis of Patent Examination Cooperation Status

The ASEAN Patent Examination Co-operation (ASPEC) program is a useful method of patent examination and cooperation in the region that supports rapid and efficient patent applications by sharing the results of patent search and examination between the patent offices of each country. There were 405 applications filed through ASPEC in 2018, which is significantly higher than 91 applications in 2016. However, it is still insignificant compared to the total number of patent applications in AMS.

Most of the ASPEC applications are submitted to IPOS as the first patent office and search and examination results are shared with Indonesian, Malaysian, and Thai patent offices. There are no examples of ASPEC's filing office being existent in Brunei Darussalam, Cambodia, Lao PDR, or Myanmar that are in their initial stages of development or Thailand

where there is considerable backlog to examinations. Also, there were no cases where the results of the searches and examinations were used as the results of the examinations of Brunei, Cambodia, Laos and Myanmar.

3.5. Issues and Challenges for Strengthening IP Infrastructure of AMS

3.5.1. Analysis from Interview Results of AMS IP Officials

The shortage of human resources indicates that public officials lack IP capabilities, and there is an absence of patent attorneys or IP lawyers who can support the application procedure in the private sector. It is difficult to expect IP to disperse to the public unless the public officials in the IP field are aware of this and enhance their IP prowess. Strengthening IP capacity is very important for public officials in areas where public officials with expert knowledge in relevant fields, such as patent examination, should be secured. Furthermore, if there are difficulties in recruiting experts in the field as examiners due to wages or recruitment conditions, this should also be solved. In the private sector, the market where patent attorneys and lawyers can support the application process should be formed. If the applicant is not able to receive legal support due to high fees, it will be difficult to activate the patent application.

Legal terms used in the patent application are not only unfamiliar to the general applicants but it also requires the application to be supported by legal experts in order to meet legal requirements. If the application written in English is translated into the local language or the application written in the local language is translated into English for overseas applications, the result of the patent applications may vary due to the quality of the translations. It may also delay the filing procedure between the local patent office and the law firms, while the requests for translation of the application are submitted.

Based on the interviews and questionnaires of AMS' IP policy makers, the problems and challenges faced by AMS in strengthening their IP infrastructures include the general public's poor IP awareness, insufficient numbers of patent examiners, and public officials' lack of competence. Furthermore, lack of IT infrastructure to support patent applications and the difficulty of cooperation between various ministries related to IP was pointed out. In addition, it is reported that the limit to government budget support for IP sectors and lack of strong IP enforcement and protection systems have negative impacts on strengthening the infrastructure.

<Table 1-11> AMS' Challenges for Strengthening IP Infrastructure (1)

Country	Challenges for Strengthening IP Infrastructure
Cambodia	<ul style="list-style-type: none"> • Lack of IP management • IT Infrastructure • Lack of information sharing • Languages (Technical Words) • Budget constraint • Lack of human resources, especially capable officials • Limitation of capacity in receiving of Technical Assistant (TA) and cooperation of some Agencies
Indonesia	<ul style="list-style-type: none"> • Budget constraint • Limited examiners and public officials related to IP • Modernization in IP technology is important but it must be useful for people or society in remote area • Coordination among Ministerial/Agency is sometimes sectoral since there are many different authorities that related to IP. There for the same vision in actions is needed • Various level of education in the society affects the level of IP understanding. In case of micro economy, some SMEs only sell their product without trademark, because of the lack of understanding of the importance of branding value added for their products
Lao PDR	<ul style="list-style-type: none"> • Lack of IP expert • Lack of IP experience and skill among IP officers • Limited public awareness • Low level of IP enforcement and infringement measures
Malaysia	<ul style="list-style-type: none"> • Difficulty in recruiting patent examiners • Higher turnover rate of patent examiners • Low number of patent application by resident (Research institutes & universities depending on government grants) • On-going amendment of Patents Act & Regulation • Improvement of IT System for stability and reliability
Myanmar	<ul style="list-style-type: none"> • Developing patent system (patent registration) • Encouraging innovation and creativity • Promoting to utilize IP (importance of IP, utilizing patent information) • Attracting to IP related stakeholder • Patent training for government officials and the public (drafting, classification, searching) • Filing patent application domestic applicant • Lack of infrastructure to establish patent system
Thailand	<ul style="list-style-type: none"> • Publishing of academic papers rather than technology transfer or patent application • Lack of understanding of importance of IP

Source: Author, based on Interviews and presentations at Policy Seminar and In-depth Research of the KSP Project.

3.5.1.1. Cambodia

The difficulties faced by DIP in Cambodia include lack of IT infrastructure to support patent search and filing procedures. Due to the absence of technical equipment, it is difficult to perform prior art search or online filing procedures, and there are limits on sharing IP-related information to the applicants or the public. Cambodia's DIP has been

delegated to investigate JPO and EPO applications. However, due to language differences, it is difficult to interpret and translate the survey results accurately. It is difficult to carry out the examination of the application because there are only few public officials who have sufficient understanding and competence on IP, and there is lack of technical assistance due to the insufficient capacity of public officials. Above all, budget constraints of the government are the problem that DIP should fundamentally overcome to strengthen IP infrastructure. Additionally, Cambodia has 14 separate government departments related to IP, which constitute the National Committee of Intellectual Property Rights (NCIPR) to manage IP separately. Hence, cooperation among relevant ministries is also a challenge (KSP Policy Seminar, 2019).

3.5.1.2. Lao PDR

As inferred from IP application and registration trends, the problem that Lao PDR is currently facing is the lack of proper protection for local products due to low IP awareness. For example, local specialties of Lao PDR such as tea and coffee are frequently sold and exported as raw materials without trademarks, brands, and sometimes without packaging. Therefore, it is necessary to provide legal protection for trademarks and geographical indications for local products, and to support packaging and branding of products. In addition, education and training are needed to strengthen the competence of IP officers and experts in the private sector.

3.5.1.3. Malaysia

There are currently 70 patent examiners in MyIPO. Considering the high application rate, it is difficult to say that there is enough number of examiners. Also, since the applications filed in 2015 and 2016 are being examined in 2019, it is necessary to increase the number of examiners to resolve the backlog. However, most of the engineering majors want to work in the practical field, so it is difficult to hire them as examiners, and even if they work as examiners, they tend to leave the public sector after a certain period of time. Malaysia especially faces the challenge of solving the problem of low number of resident patent applications compared to non-resident applications. The research of patent institutes and universities tends to depend on government subsidies, so government-led IP creation policy is very important to encourage resident patent applications. It is also necessary to provide support to improve the stability and reliability of the IT system of MyIPO (KSP Policy Seminar, 2019).

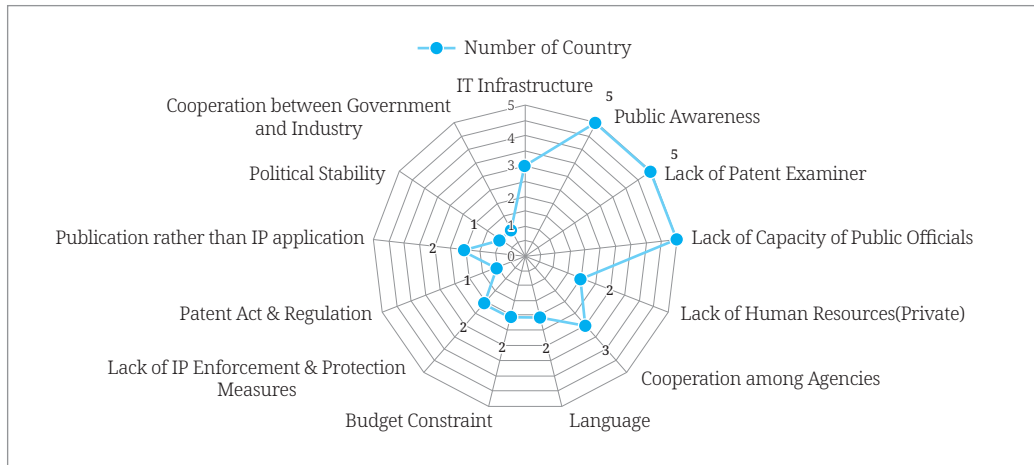
3.5.1.4. Myanmar

Myanmar, which started to build IP infrastructure starting from legislation on IP law including patent law, is challenged with the establishment of patent registration system, creation of patents through invention and innovation, raising public awareness of the importance of IP, and the general activation of IP.

3.5.1.5. Thailand

The problems facing Thailand's strengthening of its IP infrastructure are the low rate of resident patent application. This is because scientists in universities have traditionally given more importance to the technology commercialization in the private sector or have published in scientific journals rather than applying for patent protection. Moreover, requesting protection through patent applications is passive due to the cause of low IPR awareness. In order to develop IP-based industry, close cooperation between government and industry is needed, so the relationships between government and industry, as well as political stability, are very important. Furthermore, in order to protect registered patents, IP enforcement and protection mechanism are areas that need to be solved in order to promote the creation of IP.

[Figure 1-31] AMS' Challenges for Strengthening IP Infrastructure (2)



Source: Author, based on Interviews and presentations at Policy Seminar and In-depth Research of the KSP Project.

4. Conclusion and Policy Recommendations

We will discuss ways to develop the patent application procedures in each AMS more harmoniously to strengthen IP capacity in AMS offices, and to expedite examinations in order to solve the extended delays and backlog of patent examinations. Additionally, based on the current status of the patent infrastructure, we will propose recommendations to increase the domestic patent application rate and establish the ASEAN IP Education and Training Center to enhance IP awareness.

4.1. Methods to Harmonize Patent Application Procedures

4.1.1. The Need to Discuss on Standardizing Common Application Style

We propose that AMS need to start discussions on developing a common application form that can be applied to all member states as a way to harmonize the patent application procedure and to ultimately unify the ASEAN patent system. Most AMS have very similar requirements for patent applications and the necessary documents. However, applicants seeking to apply for a patent in different member states must complete and submit a different application form for each country. In other words, applicants need to spend time and labor when there are duplicate forms of similar applications. In order to solve this problem, it is possible to consider ways to unify the application forms of the member states. Having standardized application forms commonly available may reduce the need for the applicant to repeatedly comply with the forms required in each country. The Common Application Format is not to uniformize the form in English, but to standardize the application form in the language of each country.

If the Common Application Format is adopted after standardizing the application form among AMS, the patent application procedure will be much smoother. Examiners will also be able to understand the application more easily when an examination is requested within mutual examination cooperation or foreign patent offices, assisting in improving the quality of the examination and reducing the examining time. Furthermore, it will also be advantageous in attracting foreign companies and foreign applicants with technical expertise to the ASEAN bloc, boosting investment in the region.

4.1.2. Seeking Harmonious Interpretation of Patent Requirements

AMS commonly define novelty, inventive step, and industrial applicability as patent

requirements. However, the substantive examination depends on the IP infrastructure of each country's patent office, the legal and technical capacity of the examiner, and the policy interpretation of the patent office. Discussions on the interpretation of patent requirements among AMS are necessary because different interpretations of patent requirements may cause differences in the quality of the examination and the reliability of the examination results among AMS. Moreover, when requesting decisions regarding prior art searches and requirements for patentability through patent cooperation of foreign patent offices, the interpretative measures of requirements for patentability in foreign patent offices might be different, so it is then necessary to improve the consistency of evaluation results.

4.1.3. Searching for Solutions to the Problems Caused by the Language in Patent Applications

Many AMS only accept patent applications in the official language of the applicant's country. Therefore, various problems occur when a non-resident applicant translates an application and the patent office conducts the examination. This is because the language requirement for a patent application is directly related to the quality and the duration of the examination.

For example, if applications are only accepted in the official language of the country where the application is filed, the non-resident applicant who filed the application in English must submit the translated application in the official language of the country within a certain period of time. Therefore, there are problems with communication between the non-resident applicant and agent, as well as the domestic agent and the examining office. Additionally, patent decisions may depend on the quality of the translated application, and it may take a long time to proceed with the application process. Therefore, it is necessary for AMS to discuss measures for standardizing the written language of patent applications. This should be carried out in consideration of the English proficiency of each member states or the examiners' competence in English. However, knowing that the patent decision has not been made due to the inability to interpret the English examination report or the examination results received from the commissioned foreign patent office, we need to take this time to make efforts in solving the problem.

The IP5 patent offices provide mutual machine translation service to resolve the difficulties of international cooperation due to language differences. Through the mutual machine translation service, users can easily understand the patent information provided by the IP5 patent offices, and it is useful to overcome the limitations of cooperation due to language differences among the patent offices. IP5's attempt to enhance mutual conformity

of the patent system could be used as a model for the integration of patent systems among AMS.

4.1.4. Research for Integration of ASEAN IP System

We aim to review the status of IP infrastructures within AMS in order to strengthen the capacity of its IP offices. Currently, policies are proposed and shared for IP education and training and technology commercialization of SMEs. AMS have expressed the need to discuss the establishment of an integrated patent office like EUIPO or EPO, but this has not been included in the scope of the study.

The establishment of an integrated patent office has various advantages, including being able to resolve problems of examination backlog due to overseas applications, but it should follow a careful process in accordance with mid- and long-term plans. It must overcome the differences between the member states and be established in a way that all AMS enjoy the benefits of the integrated patent office. The researchers for this current study hope that ASEAN will be able to conduct research for the integration of an ASEAN patent system or establish an integrated patent office based on other integrated patent offices, like EPO, OAPI, ARIPO, and EAPO.

4.2. Measures for Accelerating Patent Examination

To expedite patent examinations, AMS needs to set up mid- to long-term implementation plans for efficient and rapid patent examinations. More specifically, consideration can be given for using external experts for substantive examinations, increasing the number of examiners, and redirecting the focus of the examiner on the technical field.

4.2.1. Increasing the Number of Examiners

To strengthen the examination system, each AMS patent office needs to significantly increase the number of patent examiners. In Korea, there were 714 patent examiners in 2006. This number increased 1.2 times to 866 examiners in 2017, and the examination period (examination request to first OA) was shortened from 18.5 months in 2010 to 10.4 months in 2018. The period from patent application to registration was stabilized at 2.5 years. It is particularly necessary to focus on patent examiners in the technology field with high application rates nationwide, and examine them efficiently by utilizing professional assistants.

As experienced in Thailand's DIP where examiner numbers have surged in recent years (24 in 2015, 43 in 2016, 76 in 2017, 94 in 2018, and 114 in 2019), an increase in the number of examiners is the most effective measure for expediting the examination period (12 years in 2015, 8 to 9 years in 2019). However, since increasing examiner numbers is also difficult to decide according to national budgets and policies, and the forms of substantive examinations, it is also possible to collect opinions of experts from universities and research institutes. IPOPHL's example on hearing opinions of relevant industries in regards to the patentability of applications through the Community Review Process can be another method.

4.2.2. Applying Outsourcing Agencies in Prior Art Search

Outsourcing agencies for prior art searches can also be considered as a way to improve the efficiency of examinations. KIPO outsources prior art searches to professional organizations in order to expedite the examination process and enhance the examination quality.

As of 2019, 10 institutes are in charge of prior art searches for patent applications. Starting from 2018, a modified registration system was introduced in order to increase the participation of new agencies, allowing corporations that fulfill the conditions (must have either the possession of the DB itself on patent or utility model registration document, or possess the environment that can search by accessing the DB that holds these documents at all times and be equipped with data processing search) to register as a specialized agency of prior art search anytime. The outsourcing agency conducts prior art searches related to the application, and KIPO conducts the examination of the patent requirements based on this, in order to expedite examinations.

4.2.3. Applying Active Use of the Examination Request System

In order to improve the problem of backlogs, it is necessary to implement the examination request system in AMS. Most AMS have adopted a request system, but Cambodia and Lao PDR patent laws require the system to automatically perform a substantive examination after the formal examination without any request for examination. Although Cambodia and Lao PDR are at the stage of developing infrastructure and the number of applications is low, it is possible to conduct substantive examinations without making requests. However, it is necessary to actively utilize the request for an examination system in a country where the patent application rate is high. In particular, it is meaningless to conduct examinations on patent applications that lost their novelty due to the long period

of examination and backlog. Therefore, it is necessary to actively apply the substantive examination request system.

4.2.4. Invigorating the ASEAN Patent Examination Cooperation Program

In order to speed up the process, AMS need to actively utilize the patent examination cooperation program in the region and strengthen the use of the ASEAN Patent Examination Cooperation (ASPEC) program. Considering the number of patent applications that are filed in AMS, the number of ASPEC applications is negligible, so IP offices must cooperate to make ASPEC more active. Furthermore, it is necessary to strengthen the international patent examination cooperation with overseas patent offices, including Korea, in order to solve the examination backlogs and accelerate the examination process.

4.3. Necessity on Introducing Policies to Raise Domestic Patent Application Rate

4.3.1. Active Use of the Utility Model System

In order to improve the technological expertise of local residents, we need to find ways to use the utility model system actively. In most AMS, the number of domestic patent applications is much lower than applications made by foreigners. However, since the application rate of domestic applicants is very high in the utility model, it is necessary to use the utility model system to protect the small inventions using IPR. In Thailand, the resident utility model registration accounts for 92% of the total utility model registration, and Thai patent law does not conduct the substantive examination on the utility model after the formal examination. No decisions are made on novelty, and the registration decision is given after 6 to 8 months. In most AMS, the utility model requirement is not as strict as the patent requirements. Instead of the substantive examination, the utility model is given the rights when certain requirements are met through the formal examination. The protection period is shorter than that of the patent (usually 10 years). Hence, it is necessary to expand the protection for smaller inventions of residents. In particular, considering the regional and economic importance of SMEs in AMS, the utility model is quick and simple to register, enabling applicants to be protected from copying in a short period of time. Moreover, it can strengthen the competitive edge of small enterprises, and considering the fact that application procedures are relatively short, technology can be quickly commercialized. Therefore, it is necessary to consider fostering SMEs through the utility model system. Instead of abolishing the utility model registration system, which has only been reviewed for formal requirements, Korea introduced the substantive examination registration system since 2006

to determine whether to register utility models, so that there is not much difference between the patent application procedure and utility model application. However, the debate on how to protect small inventions has started to rise again in Korea.

4.3.2. Policies to Foster Resident Patent Applications

For patent applications of AMS, various policies need to be introduced in order to increase the low rate of patent applications from local residents. Until 1992, the number of resident (domestic) patent applications in Korea was lower than that made by non-residents (foreigners), but since 1992, the number of local residents has surpassed non-residents. The Korean government has implemented various policies to improve the skills of the domestic workforce and to strengthen IP creation and IP utilization of SMEs. Part 3 and Part 4 of this study systematically introduce successful policies for SMEs' innovation support and IP creation and IP utilization. Therefore, the policies that are introduced in this report can be used as a model for fostering resident patent applications.

4.4. Establishment of ASEAN IP Education and Training Center to Raise Awareness

For systematic IP education and training, the researchers propose establishing an ASEAN IP Education and Training Center. According to the surveys and interviews with AMS government officials in the IP field, the biggest difficulty in strengthening IP infrastructure is the insufficient awareness of IP, and education of public officers and examiners are considered to be the most urgent.

Currently, the IP academies in Malaysia and Singapore operate the most systematic IP education and training system among AMS. The IP Academy under the IPOS of Singapore establishes the curriculum that customize topics for companies that gave requests, and provides paid training for students with a subsidy in the form of discount. IP Academy of MyIPO operates a regular education program for all IP areas with government funding and operates about 60 education programs annually for different types of subjects, including government agencies, SMEs, academia, NGOs, and artists. The IP Academy in Malaysia has a large classroom that can fit around 200 students, a computer room with more than 30 computers, and a meeting room used for banquets and discussions. It also conducts prior art search sessions for AMS government officials.

In order for IP education and training in AMS to operate more systematically, establishing physical spaces and facilities capable of IP education and training are necessary,

as well as developing a curriculum that facilitates offline and online training. Through the establishment of the ASEAN IP Education and Training Center, IP education for public officials, teachers, youths, businessmen, and the public can be carried out throughout the year. The center can function as the venue for workshops and seminars held in cooperation with WIPO and foreign patent offices. Face-to-face training not only produces the highest results in terms of education, but also provides the same educational benefits to all AMS.

The International Intellectual Property Training Institute (IIPTI) of KIPO has educational facilities that include a lecture room, computer room, auditorium, international conference hall, welfare room, and resource room. This facility is used to operate regular education programs for public officials and the public. It also hosts the Invention Training Center for training and experiential hands-on education that can be a good model for establishing the ASEAN IP Education and Training Center.

The budget must be secured for this purpose and also, it needs to establish a detailed operation plan, role allocation for each member state, and ways for the 10 countries to use the IP Education and Training Center. The ASEAN IP Education and Training Center may be established through cooperation within the ASEAN region, but it could consider establishing it with the support of foreign governments or an international organization to secure funds and learn from their experience. The center can also be established as part of an ODA project supported by the Korean government. However, in order to do so, the most important consideration is how much AMS want to do this and how much support the host country can provide.

The ASEAN IP Education and Training Center must design and operate online courses as well as offline courses so that all member states, regardless of the physical location, have access to the training. In other words, the center will be responsible for the development, operation, and management of offline regular education programs and online education portal and content development management, as well as functioning as the educational venue.

For IP education and training for member states, it is necessary to design and operate an online education course that meets the needs of each member state regardless of its proximity. As part of the offline and online training courses, the researchers developed a module for each level of education by dividing the lifecycle of IP into the following categories, [Creation – IPR – Commercialization], and the specific training content into levels of difficulty. It then introduced a methodology for developing modules for each level

of education and concrete education content for each module. The education program proposed in this report is not a development of fragmented educational content, but a module-based systematic curriculum suitable for each AMS.

In addition to designing the education modules, the researchers propose developing the customized educational content tailored to the needs of each AMS. The fundamental difficulties of education for the 10 AMS are that the level of development of IP infrastructure of each member state and the level of education is different. In this study, the researchers categorize AMS as being in the development stage, growth stage, and innovation stages based on their infrastructure development and suggest a method by which member states can select and train modules that meet the demand of the respective state. More specifically, theoretical and practical education content on the development of geographical indications and trademarks (brand) should be developed for Cambodia, Laos PDR, and Myanmar that are in the early stages of building IP infrastructure. The countries in the growth phase have accumulated patent applications. Hence, researchers suggest developing content for the protection of IPR and technical commercialization, as well as strengthening public awareness of counterfeit goods or misappropriation of origins.

Also, it is possible to categorize the education modules by target audience and develop content related to counterfeit goods to strengthen the protection of IP for the general public. They must actively pursue the development of content for examination administration and practical examination education by technological fields. The development of educational content suitable for the education module can be carried out as a follow-up project based on demand and the status of IP infrastructure of the member states.

The study report on the feasibility for the establishment of EUIPO's IP Academy suggests developing education content based on five programs from "ASEAN IP Training Center for SMEs" that are currently operated from <http://aseaniptraining.org/>, which is the local IP Academy's website. Additionally, it suggests developing education modules in order to apply search tools (ASEAN TMView, DesignView, and TMClass) that apply IP information and the guidelines for examiner education of trademarks and design. KSP researchers actively accepted EUIPO's suggestion and followed the education process of the module-based system suggested above. They also developed education content for subjects based on the demand of the country which was posted on the "ASEAN IP Training Center for SMEs" website. Researchers suggest using this site as the portal for the online education process.

The 2019 ASEAN-ROK Commemorative Summit will be held in Busan on November 25-26 in celebration of the 30th anniversary of Korea-ASEAN dialogue relations. KIPO and the heads of ASEAN IP Offices will hold a meeting there on future collaborative projects. I hope that the KSP project will contribute to strengthening the IP infrastructure of ASEAN as well as the economic partnership and growth of ASEAN and Korea.

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02

CHAPTER

Developing IP Platforms and Infrastructure: Policy Consultation on the Establishment of the Korea-ASEAN IP Training Center

Seungwoo Son (Chung-Ang University)

Mark Teng (That.Legal LLC.)

1. Introduction
2. Present Conditions of Partnered Countries' IP Education and Training
3. Review and Analysis of Korea's Development Experience in IP Education and Training
4. IP Education and Training Program Proposal
5. Conclusion

Keywords

Intellectual Property (IP) Education, Intellectual Property (IP) Training, Patent Examiner Training, Intellectual Property(IP) Educational Model, Intellectual Property (IP) Education Module, Intellectual Property (IP) Curriculum

Developing IP Platforms and Infrastructure: Policy Consultation on the Establishment of the Korea-ASEAN IP Training Center

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Summary

Recently, Southeast Asia has emerged as the most dynamic region in the world, and the importance of intellectual property (hereafter IP) and the demand for IP education have increased. ASEAN Member States (hereafter AMS) recognize that IP education and training provide an important basis for national economic development, and commonly share an understanding that raising public IP awareness and IP training for SMEs are essential. However, since the 10 AMS have different IP education environments at various stages of development, it is not appropriate to have one general education policy. From the IP education perspective, ASEAN can be divided into 3 groups, “early stage,” “growth stage,” and “innovative stage.” Those in the first group need to work on raising public awareness in IP, education for public officials, and education for the expertise of the examiners. This group includes Cambodia, Lao PDR, Myanmar and Brunei Darussalam. The latter is already actively engaged in IP-related international cooperation and calls for professional IP education linked to industrial development. Indonesia, Vietnam, Malaysia, Thailand and the Philippines belong to the growth stage.

This study analyzes the current status of IP education in AMS, presents education policies that are characterized differently in each group, and draws out the basic foundations and elements necessary for effective operation of the “ASEAN IP Training Center” that will be established in the future. Particularly, in order to develop the ASEAN IP education and training model, it examined the history and development processes in the Republic of Korea and specific curriculum will be analyzed, in comparison with World Intellectual Property Organization (WIPO) and European Union (EU).

In order for IP education to be effective, it is necessary to work on narrowing the perceived difference between educational content of users and developers, and to provide

educational content integrated with the lifecycle of IP [IP creation – IP protection – IP commercialization]. When designing educational programs, clear goals for the curriculum needs to be set. The curriculum is developed based on the student’s level of education, and which stage of the IP lifecycle needs to be addressed. In addition, IP education should cover the legal system, management, and technical aspects, and be comprised of a structured theory, practice, and project that is harmonious so that it can be practically adapted.

In order to operate IP education systematically at the national level, it is important to establish the legal basis. The Korea has enacted the “Framework Act on Intellectual Property” establishing basic principles and systems for IP education, and securing a budget. The Presidential Committee on Intellectual Property established a basic plan for national IP and formed the basis of national IP education, finding measures on strengthening the IP capacity of SMEs, farmers and fishers, students, and training of IP experts. Additionally, the “Invention Promotion Act” was enacted on IP creation. This enabled the education and training of inventors to raise the general public’s IP awareness and promote inventive activities. Recently, the “Act on the Promotion and Support for Invention Education” has been enacted so that high schools and universities can systematically provide IP education.

Given the characteristics of each group, member states in the initial stages should first actively promote educational programs to the public in order to raise awareness. Additionally, those who have completed the minimum level of IP education need to be trained, such as the “Youth Instructor” system in the Copyright Commission of Korea, and then carry out active awareness raising education in the form of “outreach.” Moreover, IP education for the public can be provided through the ASEAN IP Portal. However, most of the education content being offered is for SMEs. It is therefore essential to overcome the limited range of education content and implement the IP lifecycle education in its entirety. In particular, education on patent laws and utility model laws should be strengthened considering the industrial characteristics of the countries that show concern. For export goods especially, education for brand value enhancement should be provided along with raising awareness of trademark rights. Meanwhile, countries in “the initial stage” have high demand for IP education for policy makers as such education is essential in order to establish and operate effective IP policies.

The countries in “the growth stage” show high demand for IP education connected with business and industrial development. Therefore, designing specialized education programs for start-ups and promoting SMEs such as patent information search, valuation, technology transfer, commercialization, and technology management are important. However, training

programs are urgently needed in order to overcome the lack of professional educators. We refer to the curriculum from the IIPTI, the T3 program of the Korea Invention Promotion Association, and the Youth Commissioner Program in the Korean Copyright Commission. Additionally, more international education cooperation needs to be carried out in connection with the changing industrial paradigm, and implementing policies on IP R&D is required.

The IP training center will serve as the basis for IP Education and Training in the ASEAN region; hence, there are few things to consider. First, it should be possible to operate a training program in the member states. In other words, it should be able to facilitate cooperation with other member states as well as with international organizations, to provide IP education in the region, trickling down to the public and SMEs. Second, cooperation with the Korea is necessary in order to achieve the region's goals as smoothly as possible based on the ASEAN-Korea cooperation. For successful management and education expansion for the centers, countries that have outstanding IP capability and many Korean companies that have expanded into the AMS should be considered as potential hosts. Moreover, the center needs facilities including a computer education room, lecture room, training room, auditorium, international conference hall, junior conference room and data room, as well as restaurants, dormitories, restrooms, and various athletic facilities.

Based on the experiences from the development of Korea's IP education, this study suggests methodologies to make a suitable IP education model that is specialized and suitable for ASEAN in different aspects, including the IP lifecycle, education target and level, education facilities, lecturer training, budget procurement and action plan.

1. Introduction

1.1. Background and Purpose of the Research

ASEAN, which consists of the ASEAN Political Security Community (APSC), the ASEAN Economic Community (AEC) and the ASEAN Society and Culture Community (ASCC), went through the process of becoming a single market. According to AEC 2015, it made restrictions on the movement of goods and services in the region. On December 15, 1995, in Bangkok, Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam signed the ASEAN Framework Convention on Intellectual Property Rights Cooperation and the "ASEAN Working Group on Intellectual Property Rights on IP Cooperation (AWGIPC)." AWGIPC strives to strengthen the cooperation among ASEAN member states (AMS) on intellectual property rights, technology transfers, and innovation.

Exchanges between ASEAN and Korea were constant in order to strengthen AMS' IP capacity. Article 10(2) of the "Korea-ASEAN FTA Framework Agreement" requires the exchange of information and experience on IP creation and utilization, the exchange of information and training of AMS personnel, the protection of IPRs and the promotion of education and awareness. Thus, exchanges and cooperation in IP education and training between the ROK and ASEAN constantly took place. For example, the International Intellectual Property Training Institute (IIPTI) of the Korean Intellectual Property Office (KIPO) supports seminars and training sessions on Korea's experiences in policy development of IP and supports the educational activities of ASEAN officials (IIPTI, 2015). Additionally, as the official educational institute of WIPO, IIPTI provides various international education programs by cooperating with overseas IP authorities, including "Intellectual Property (IP) Dispute Settlement Curriculum" for public officials and examiners from developing countries. Recently, in line with the Korean government's "New Southern Policy," they also have special education courses to strengthen AMS' IP capabilities (Oh, 2019).

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The Korea Invention Promotion Association (KIPA) conducts economic cooperation projects that build commerce relations, and it conducts international consulting of IP policies for AMS while simultaneously attempting to strengthen IP capability of the ASEAN region. The ASEAN-KOREA CENTRE hosted the "Korea-ASEAN Technical Cooperation Workshop" in 2015 for ASEAN public officials and civilian business stakeholders to enhance their technology development capacity and to share protection of IPRs on traditional fermented food items. During the session, 20 officials, including those who are from relevant ministries and the fermented food industry, attended the workshop to share ideas on fermentation technology. They also worked on strategies for globalization of fermented foods and protection of IPRs in fermentation technology (ASEAN-KOREA Center, 2015).

Even though IPRs has been a topic of discussion for many major global trade deals, the institutional basis of AMS remains insignificant. Moreover, the exchanges of knowledge on IP policies and systems among AMS are inactive, and no active bilateral exchanges are practiced between individual member states. As a result, international exchanges and cooperation in IP education and training are insufficient, and relevant infrastructure in ASEAN is inadequate. This, in turn, led to poor general public awareness of IP (AANZFTA, 2015).

This study examines the status of IP education and training infrastructure in ASEAN and examines the status of related policies, educational institutions, and educational programs

for each country in comparison to the exemplary cases of Korea and the international community. Based on this, action plans are suggested to effectively establish and operate the Korea-ASEAN IP Training Center that is expected to be established in the near future.

1.2. Increase in Demand for ASEAN’s IP Education and Training

ASEAN operates the “EU-ASEAN Project on the Protection of Intellectual Property Rights (ECAP)” with the European Union. Many seminars, workshops, educational programs, and other programs were held, and more than 270 IP-related personnel have participated from AMS. One of these projects was the online IP training platform ASEAN IP Training Platform for SMEs that was created in order to increase the IP capacity of SMEs in the region. However, educational content provided by this platform remain limited.

As for IP education exchanges and cooperation within ASEAN, “Common Guidelines for the Substantive Examination of Trademarks” and “Common Guidelines for the Substantive Examination of Industrial Design” were provided by the ASEAN Secretariat. Additionally, at the ASEAN Education Ministers’ Meeting (ASEM) on January 31, 2010, all participating representatives agreed on establishing the ASEAN-Korea Cyber University (ACU) and agreed on establishing and operating ASEAN Cyber University in cooperation with Cambodia, Lao PDR, Vietnam, and Myanmar. However, the IP training program has been discontinued.

ASEAN has a high demand for IP education and training. It has intermittently cooperated on IP training with Europe, Japan, and Korea, but it is now time to establish a self-reliable and suitable IP education and training model for the ASEAN region. Therefore, this study examines the current educational status in ASEAN and presents a model of IP training specific to the region. Additionally, considering the educational environment and specificity of each country, AMS will be divided into 2 groups and proposals are provided on educational policies that suit each group. Specifically, it emphasizes the importance of infrastructure in online IP education and training in AMS and highlights the necessary items for establishing and operating the ASEAN IP Training and Training Center.

2. Present Conditions of Partnered Countries' IP Education and Training

2.1. Present Conditions and Characteristics of IP Education and Training

2.1.1. ASEAN IP Training Platform for SMEs

AWGIPC operates “ASEAN IP Training Platform for SMEs”. The program is mentioned on ASEAN IP Portal (<http://asean.iptraining.org>). The goal is to strengthen the IP capabilities of small and medium-sized enterprises (SMEs) by providing information to understand why IP is a superb tool for competitive advantage in the global market. It specifically focuses on the trademark and design protection, and introduces the laws of each country. <Table 2-1> shows the details of education curriculum.

<Table 2-1> Summary of “IP Training Platform for SMEs” Curriculum

Category 1	Category 2	Category 3	Summary
The basics from the perspective of SMEs	How is IP relevant to SMEs? Guest access	Introduction	What does it take to compete in the global market?
		The Challenges Facing SMEs	Increased competition
			Pressure to reduce cost and increase efficiency
			Shorter life cycle for products
			Stricter regulation in various sectors
			More demand for accountability
			Rising customer expectation on quality
	Making SMEs more competitive	Competition	
		What is innovation?	
		How can SMEs innovate?	
	What is IP?	Introduction: Basic concepts	Introduction
			Industrial Designs
			Patents
			Utility Models
Trade Secrets			
Trademarks			
Domain Names			

<Table 2-1> Continued

Category 1	Category 2	Category 3	Summary
			Copyright
			Geographical Indications
		IP and the business cycle	Business cycle IP enhance the value of your company You can use your IPRs to secure a loan with a bank
What can be protected and why?	What are the different IP rights?	Introduction: IP around you	Introduction
		Trademarks	What is a trademark?
			What are the functions of a trademark?
			How do you choose a mark?
			Marketing and cultural considerations
			Legal considerations
		Industrial designs	What is an industrial design?
			What are the functions of an industrial design?
			How do you choose an industrial design?
			Industrial design and other IP rights
			Industrial Design and 3D Trademark, Patent
		Geographical indications	What are geographical indications?
			What are the functions of geographical indications?
		Patents	What is a patent?
			What can be patented?
			What are trade secrets?
		Copyright	What is a copyright?
What are related rights?			
How do you exploit and enforce your IP rights?	How do you avoid problems?	-	
	How do you use IP to increase your commercial success?	Marketing	
		Merchandising	
		Franchising	
		Licensing	
How do you enforce your IP rights?	-		

<Table 2-1> Continued

Category 1	Category 2	Category 3	Summary
Let's protect our IP assets	How can you protect your IP rights?	Brunei Darussalam	Guide to the IP institutions and IP laws of ASEAN Parties
		Cambodia	
		Indonesia	
		Lao PDR	
		Malaysia	
		Myanmar	
		The Philippines	
		Singapore	
		Thailand	
		Vietnam	

Source: Author (Analysis based on the contents of ASEAN IP Training Platform for SMEs).

2.1.2. Analysis of Present Conditions for IP Education and Training in Each Member State

2.1.2.1. Brunei Darussalam

The Brunei Intellectual Property Office (BruIPO) was established in 2013, and not only does the office manage the registration and protection of industrial property rights, but also develops national IP systems as well as provides education. Brunei has been implementing IP education policies for the purpose of “raising awareness of the benefits of IPR protection to promote business growth and competitiveness,” and “creating IP culture that can promote creativity and innovation (KSP Policy Seminar, 2019).

BruIPO has created a close-knit relationship with local law firms and has held Patent Workshops to assist local lawyers in familiarizing themselves with proper patent drafting procedures. This is done to assist both local and foreign businesses in ensuring that their legal IP representatives are well versed and adequately skilled to serve both local and foreign businesses. Specifically, there are IP clinics used for identifying, financing, and recognizing IPRs of local companies. There are also patent system workshops that cooperate with local lawyers (patent attorneys).

While some programs are for local businesses, there were no systematic IP education policy cases, and there were no courses on IP training programs and relevant higher education courses.

2.1.2.2. Cambodia

There are currently 2 patent examiners in Cambodia, and its government is making efforts to increase the number, but this is difficult with the lack of professional expertise. There is no independent IP education institution and training course. The government is working on making examiner education where it is managed through the cooperation of overseas organizations like WIPO. Cambodia is interested on expanding the quantity of IP education, and there is a high demand for making many more IP education contents. There are online educational contents on Department of Intellectual Property website, and there are sufficient amount of explanation that explains IP. However, since it is merely textual explanatory material, more varieties of educational content and systematic curriculum are needed.

2.1.2.3. Indonesia

Indonesia does not have its own education model, but it actively utilizes overseas education models from Korea, the USA, Australia, China, and Japan. During the 1990s, IP Education and Training programs focused on legal education for examiners and judges, but now, it promotes education for invention education, public education, and professors of engineering colleges. In particular, there are training courses for MSMEs, children, and senior high school students, and IP courses for MSMEs are operated at the regional offices. Additionally, to make it applicable on higher education, patent experts are dispatched to universities and they teach topics such as specification writing method. As a result, the number of recent applications has increased by 5 to 10%. There is a 2-week session on basic examiner training. There were six QUIZ competitions for teenagers.

Indonesia is actively promoting IP academy in the Tangerang area, targeting domestic universities, associations and organizations, and IP consulting organizations. Meanwhile, the budget for IP Education and Training in Indonesia is about 15 billion IDR. Cultivating SMEs and entrepreneurs are the top priorities for its policy, and therefore, there is a high demand for related IP education programs. They are eager to establish education facilities that are convenient for users.

2.1.2.4. Lao PDR

Lao PDR lacks the overall knowledge, experience, expertise, and infrastructure for IP. High demand for basic education exists because the public is not aware of IP. For example, Lao PDR exports organic tea grown in highland areas. It is not possible for producers to

export the goods with a trademark because they are unaware of IP. Problems occur when foreign companies purchase tea from Lao PDR and export it with its own trademark. Lao PDR hopes to increase the added value of products by teaching IP including trademark rights. Meanwhile, Lao PDR plans to sign the MOU with the Korean Intellectual Property Office in November 2019.

2.1.2.5. Malaysia

The Malaysian Intellectual Property Office (MyIPO) believes that once the planned activities to create and enhance public awareness have taken place, it will be one of the leading IP organizations acting as a strong overseer not only for the local IP stakeholders but also for the foreign IP stakeholders in the ASEAN region. MyIPO is aiming to increase the level of IP awareness to the highest level by 2020. MyIPO provides eight short training courses on IP, including patents, trademarks, designs, copyrights and prior art searches, and provides over 60 training courses each year in response to the requests made from external public training. The education targets different types of people, including public, educators, academics, SMEs and artists, and it provides customized programs according to requested institutions including universities, NGOs, government agencies, and SMEs. MyIPO also offers undergraduate and postgraduate elective courses, and provides basic IP training for approximately 200 schools for children. Currently, IP Academy (IPA) is operated by MyIPO. There are IT laboratories equipped with Wi-Fi, PA system and projector, laboratory, sports facility, and prayer room. IPA provides a comprehensive and well-balanced training for practice and theory.

The academy offers various training programs in IP related areas for a broad range of beneficiaries, whether national institutions or individuals from the public and the private sectors (policy makers, diplomats, the judiciary, academics, IP practitioners and students). Meanwhile, Malaysia does not allocate IP education budget separately, but it executes the education budget by administrative expenses.

2.1.2.6. Myanmar

Myanmar does not have a separate education and training program, and there is no budget for IP education and training. IP training is conducted by overseas (international) organizations such as JICA, USAID, WIPO, JPO, and EPO. In particular, WIPO and JPO support examiner training in Myanmar. Myanmar's first priority on target group for IP education are government officials, including examiners, patent attorneys, and judges, and IP education and training for SMEs and universities are also in need. They are interested in general IP

public education, license information research, general education on trademark, design and copyright, and IP commercialization.

2.1.2.7. The Philippines

The Philippines has a strong interest on IP education and training policies, and aims to raise social awareness of IP values, especially with the goal of “IP-Conscious Society.” IPOPHL operates the IP Academy. In 2019, many programs are being prepared, including IPOPHL IP Boot Camp, IPOPHL Summer School, IPOPHL University Road Show, IP Roundtable for Deans/Administrators/Faculty, IP Debate Competition, IPOPHL Best Paper Competition, IPOPHL IP Executive Internship Program, IPOPHL-Intellectual Property Research Colloquium, IPOPHL Journal of Intellectual Property, and Masters in Intellectual Property, but the budget has not been secured. The Philippines conducts relevant education at some higher education institutions and law schools.

Currently, the Philippines do not have its own independent curriculum, and IP education centers and programs are needed for policy realization that will raise the social awareness of IP values. In addition, it hopes to raise the level of IP awareness and to expand the base by providing education for R&D proliferation and new technologies from the Fourth Industrial Revolution. Meanwhile, the budget for IP Education and Training allocated is approximately 300,000 USD.

2.1.2.8. Singapore

Singapore has IP Academy under the Intellectual Property Office of Singapore (IPOS). IP Academy in Singapore was established in 2003 and started public sector education in 2009. In 2013, it became a subsidiary organization under IPOS, supporting more systematic education and training. IP Academy’s main target groups are corporations and features a variety of tailored training courses customized to the needs of companies. Most programs have a fee because the programs are operated without the budgetary assistance of IPOS, with the exception of the contribution from WIPO for the development education programs. However, education for students is mostly free.

IP Academy offers three-year, three-level degree programs. There is the Master’s program that is offered jointly with local universities in Singapore. The program is divided into 2 major stages depending on the subject. Tuition is 4,500 SGD, and students can get up to 4,000 SGD from WIPO as a grant. Meanwhile, IP Academy uses e-learning due to active development of the e-learning system. They conduct a wide range of IP education and

training through various programs such as Business Venture into Japan Course, Public Agency IP Program, Copyright Infringement Prevention Program, Legal Programs, and the 4th Industrial and IP Law Series. IP courses are also available at various universities. The University of Singapore, Singapore University of Social Sciences and Singapore Management University provide in-depth training for IP education, higher education and IP Law.

Singapore cooperates with other AMS, and there is no exchange or cooperation (such as MOU) with Korean universities as of yet. However, Article 17.8 of the Korea-Singapore FTA stipulates that education, workshops, and exhibitions in IP field can be jointly held for contributing to the understanding of the IP policies and experiences of the Parties. It is expected that active exchanges of IP education and training in the field will be possible.

Furthermore, Singapore announced its Smart Nation vision for “smarting up” Singapore in 2014, and planned to implement it in 2016. Singapore is pursuing a master plan for achieving a smart national vision such as the Information and Communication Media 2025 (Infocomm Media 2025) and Research, Innovation and Enterprise 2020 Plan (RIE 2020 Plan), and is committed in maintaining the world’s best start-up ecosystem. In the meantime, considering the limitations of being a city-state, the whole country is used as a living lab and test bed for the 4th Industrial Revolution. It is used as a test bed in fields closely related to transportation, housing and environment, health, and business productivity that will be applied first (KEIP, 2017). Therefore, Singapore is promoting the Productivity and Innovation Credit (PIC) system, a knowledge-based tax benefit system, and IP fund through its innovative fund of about 1 billion Singapore dollars (IP Target, 2017).

In addition, Singapore has established IP regime called the IP Hub, and as of May 2017, it revised and overhauled the Intellectual Property Hub Comprehensive Plan, thereby continuing to pursue the Intellectual Property Hub Strategy (Lee, 2018). IP Hub has great implications that share the vision and strategy that reflect the expectations of innovators on the economic and social values of IP.

2.1.2.9. Thailand

Thailand’s Department of IP (DIP) is actively engaged in international exchange of IP Education and Training. Specifically, it uses WIPO and KIPO’s e-learning education program for general public education. Moreover, there are special courses, seminars, and workshops in cooperation with WIPO, KIPO, SIPO, EPO, and JPO to train examiners.

Some universities in Thailand offer IP training, but this is only available locally.

Additionally, training is limited to IP evaluation, IP management, and patent map for experts. Thailand is working on improving the overall national IP knowledge-level through education, experts training, and R&D to raise public awareness. Meanwhile, the budget of DIP is about 1.8 million USD as of 2018.

2.1.2.10. Vietnam

Intellectual Property Office of Vietnam (IPVN) is the organization under the Ministry of Science and Technology (MOST) that works with other governmental organizations to promote IP education. For example, education on industrial property and geographical indications (GI) is provided by IPVN, copyright education by the Copyright Office of Vietnam (COV), and training related to new types of plants by the Department of Crop Production (DCP) and universities, respectively. Moreover, Chamber of Commerce, Patent Attorneys' Association, and other relevant organizations conduct its own education and training programs. Vietnam provides IP training for examiners and judges and receives support from overseas organizations, including WIPO, EUIPO, JPO, KIPO, USPTO and IP Australia. Training for patent examiners is supported by IP Australia.

There is no education on IP in basic curriculum, and general education for children and adolescents is needed. The university has established IP education courses focusing on the law and economics majors, and some universities have introduced basic IP courses as elective courses in cooperation with IPVN. In cases of specialist education, there is a six-month paid course offered by the cooperation between IPVN and universities. Meanwhile, Vietnam is struggling to develop IP Education and Training policies due to budget shortage. The budget of IPVN in 2017 was only 52,000 USD and 78,000 USD in 2018.

The training required by IPVN is for industrial sectors, and IP database search training for relevant experts and educators is required. Additionally, Vietnamese authorities are aiming at educational programs such as WIPO's Regional Patent Examination Training (RPET) for the training of new examiners. Ultimately, it aims to improve the national IP level in general and to educate policy-makers to develop enough knowledge to upgrade their strategies. Therefore, IP education and training in Vietnam focus on the following : 1) to establish IP national strategy (including IP training strategy policies), 2) to have joint activities with relevant institutions, 3) to have structural and consistent short-term education programs like IP curriculum development, brand, and design for different groups of stakeholders, 4) to invite lecturers and strengthen cooperation with institutions at WIPO, EPO, USPTO, and JPO, 5) to exchange experiences with advanced IP countries, and 6) to have programs for IP educators.

2.2. IP Education and Training Problem Analysis and Improvement

The demands for IP education in AMS are high. Public officials who are in charge of IP policy share the perception that IP education and training provide the important foundations for national economic development. As a result, demand for raising the general public's IP awareness and the educational programs that target industries to raise the voices of SMEs and startups were commonly high. Examiner education is mainly supported by overseas organizations and nations, including WIPO, the EU, Korea, and Japan.

On the other hand, as pointed out before, the educational content of the ASEAN IP Training Platform for SMEs is very limited. While providing brief descriptions of IPRs in an accessible online environment is positive, the content is lacking in detail. In addition, education is limited in SMEs since they do not provide concrete and detailed education programs.

In order to measure the level of IP development in AMS, the indices of IP needs to be analyzed related to each country. To know IP status, the number of patent applications, the number of patent applications against GDP (WIPO IP Statistics Data Center, 2017), IP infringement protection level (ASEAN IP Portal, WIPO, 2016), and the direction of IP education policy according to AMS survey are summarized, as shown in <Table 2-2>.

<Table 2-2> Indices of IP in Each Country

Country	Total Patent Applications (WIPO, 2017)	Resident Applications per 100 billion USD GDP (2011 PPP) (WIPO, 2017)	Protection and Infringement of IP	Policy Direction
Brunei Darussalam	107	26	Recent policy for improving IP awareness has been promoted.	Raising public awareness
Cambodia	N/A	N/A	Lack of IP infrastructure	Raising public awareness
Indonesia	9,303	77	Inadequate SW copyright infringement prevention system	Training of examiners, Training of IP instructors, IP commercialization
Lao PDR	N/A	N/A	Inadequate level of IP protection recognition	Raising public awareness
Malaysia	7,072	138	Inadequate international treaty for IP protection	Raising public awareness

<Table 2-2> Continued

Country	Total Patent Applications (WIPO, 2017)	Resident Applications per 100 billion USD GDP (2011 PPP) (WIPO, 2017)	Protection and Infringement of IP	Policy Direction
Myanmar	N/A	N/A	Recently, launched action to protect international IP	Raising public awareness, Training of examiners
The Philippines	3,395	41	IP remediation procedures not established	Raising public awareness, IP commercialization
Singapore	10,930	335	ASEAN's most stringent IP infringement prevention system	New-IPRs, 4th Industry
Thailand	7,865	87	Frequent trademark infringement	Improve overall national IP level
Vietnam	5,382	N/A	Inadequate level of IP protection recognition	Raising public awareness

Source: WIPO (2017), ASEAN IP Portal (2016).

The level and demand of IP education in AMS varies for each country. In terms of IP education, these 10 countries are classified into 3 groups, initial stage, growth stage, and innovation stage, and this is summarized in <Table 2-3>. The countries in the initial stage are Cambodia, Lao PDR, Myanmar and Brunei Darussalam, meaning they need basic education. This group highly demands raising public awareness of IP and education for policy makers, and requires specialized training to enhance the expertise of the examiners.

Indonesia, Vietnam, Malaysia, Thailand and the Philippines are in the growth stage. This group has surpassed the basic understanding of IP and has focused on using IP in industries. They have been actively engaged in IP-related international cooperation for a long time, and the promotion of mid-sized companies that include patent information searching, valuation, and commercialization. Also, the demand for IP education that connects with company development is high. IP education in universities is centered on law students, but these nations would like to expand higher learning to management and engineering majors. In addition, there is a high demand for systematic education for relevant public officials so that an IP national strategy can be established and enforced.

Singapore is the only country that is in the innovation stage, where it has systematic and independent educational and training programs in cooperation with companies and universities, as well as educational institutions and facilities.

All AMS lack experts who can teach IP. Particularly, countries in the growth stage need new types of education that link the business and industrial fields beyond the legal institutional perspective. Few educators can provide convergent educational platforms. Moreover, since countries other than Singapore and Malaysia do not have their own IP training facilities, there is an interest in establishing training centers. As such, each AMS possess different educational environments, so it is necessary to consider looking at the advantages of curriculum design and to present education models that are suitable for each member states.

<Table 2-3> AMS Categorization Based on Present IP Education and Training

Initial Stage	Growth Stage	Innovation Stage
Cambodia	Indonesia	Singapore
Lao PDR	Vietnam	
Myanmar	Malaysia	
Brunei Darussalam	Thailand	
	The Philippines	

Source: Author.

3. Review and Analysis of Korea’s Development Experience in IP Education and Training

3.1. Development Process of IP Education and Training in Korea

3.1.1. Success of Korea’s IP Education

3.1.1.1. History of Korea’s IP Education

At the core of IP education in Korea, is the Korean Intellectual Property Office (KIPO). In 1987, KIPO established the International Intellectual Property Training Institute (IIPTI) which provides administrative training for relevant public officials. Although it was incorporated into the National Institute of Professional Administrative Training in 1999, it returned to KIPO in 2004. IP education was centered on administrative education for public officials even before 2000. It was also geared towards generalizing IP education, especially by implementing special education on IPRs for high school students as well as targeting its applicants (KIPO, 1999) and making efforts on IP education in higher education (KIPO, 1999).

KIPO has made efforts to generalize IP education. In order to enhance the utilization of patent information, the Patent Computer Education Office was added in 1998 (KIPO, 1998). This allowed public access to the examination system, and KIPO provided training on how to use it (KIPO, 2001). KIPO therefore took the lead to make broader, cumulative educational systems in IP before the turn of the 21st century.

IIPTI has held international seminars since its founding in 1987. In 2002, the “WIPO Asia Intellectual Property Rights Educators’ Training Course” was held, leading the international exchange of IP education and training policies that included the exchange of information with experts in charge of national IPR education. In 2006, WIPO designated IIPTI as an official educational institution of WIPO, and it has since paved the way to lead the international IP education stage. In recent years, it continues to cultivate experts within the international IP field and has conducted online IP education courses in cooperation with WIPO.

Korea was on the verge of being the wasteland of industrial technology during the 1960s. This was no different for IP systems and related education, which was in ruins after the Korean War. However, after the government began its five-year plan for economic development in 1962, industries and economies began to grow and per capita gross national product (GNP) surged from less than 100 USD in 1961 to over 10,000 USD in 1995. Over the same period, the proportion of manufacturing increased from less than 15% to 30%, and exports soared from less than 1% (41 million USD) to 28% (125 billion USD) (Gang, 2000).

During this time, there was no interest in IPR policies, but with the enactment of the Technology Promotion Act in 1972, companies in Korea became aware of the importance of patents by accumulating technical skills and with the increase of overseas exports, companies recognized the importance of trademarks (Lee, 2013).

IP education policy began to center around examiner training from the 1980s. With the rapid technological development of the time, it was necessary to improve the qualifications and qualities of examiners and judges. However, there were no specialized training institutes to fulfill such needs, which eventually led to the establishment of the International Patent Training Institute (KIIP, 2012).

Since then, it began to expand training centers that targeted civilians, and it allowed Korea to become an IP educational leader. Meanwhile, the Korea Invention Promotion Association has conducted IP education that focused on invention education since its

inception in 1995, and it led public IP education by holding convergent IP education and various IP competitions.

The factors that positively influenced the development of IP education in Korea can be summarized as follows. First, the legal and institutional basis was prepared, and the policies for nurturing IP talent were planned out. As mentioned before, Korea has a systematic policy based on the “Framework Act on Intellectual Property” and institutional grounds are provided for education in IP creation, such as the “Act on the Promotion and Support for Invention Education.” In 1987, legal and policy support, including the establishment of the first special training center (IIPTI) under KIPO in developing countries with the full support of the government, were greatly influenced by the development of IP education. Second, IP education in Korea had international exchanges in mind from the start. From its inception in 1987, the International Intellectual Property Training Institute ran courses for foreigners and cooperated with WIPO to start international exchanges. This had a significant impact because the IIPTI became a recognized training institute of WIPO and led the field of IP education in the global community. Finally, IP education in Korea initially focused on training examiners and other administrative issues, but programs for students and the public were later opened. Through the design and implementation of various education programs for a wide-ranging audiences including children, school and college students, SMEs, large corporations, public officials, and educators, IP education was able to develop into the current systematic and various educational model.

3.1.1.2. Relevant Policies and Statutory Provisions for Korea’s IP Education and Training

The Framework Act on Intellectual Property decides the basic principles of policies related to the government’s IP, as well as on the direction of major policies in order to unify IP policies and enforce related principles, including inventions, trademarks, books and music albums, games, semiconductor designs, and new varieties of plants. This law aimed to foster IP development by setting up councils like the Presidential Council on Intellectual Property that establishes the basic plans on IP at the governmental level, and deliberates and coordinates related policies. It was enacted on May 19, 2011, with the goal to construct social conditions and a systematic base that will optimize IP values in our society. This law defines IP as “value of property that can be fulfilled through knowledge, information, and technology that have been created or discovered according to human’s creative activity or experience, expression of thoughts or expressions, indication of sales or objects, types of plants or genetic resources, and intangible things” (Article 3, Paragraph 1). It can include new IP types along with standardized IP.

In addition, while obliging the government to “set up and implement comprehensive measures to promote the creation, protection and utilization of IP and to establish its foundation” (Article 4 [1]), the basis for the establishment of the Presidential Council on Intellectual Property was created. The council was tasked with deliberating and coordinating matters concerning the consultation and adjustment of the National Intellectual Property Basic Plan and the Implementation Plan, thereby creating the basis to allocate resources related to IP and measures for IP creation, IP protection and IP utilization (Article 6). Moreover, it provides the basis for statistics on intellectual property and grounds for enhancing the education of intellectual property (Article 33). Accordingly, the government must ensure that IP education is in the regular curriculum of the schools in accordance with Article 2 of the “Elementary and Secondary Education Act” and Article 2 of “Higher Education Act,” and it has the responsibility to train professional workers. Thus, the Framework Act on Intellectual Property defines the core of the national IP strategy and is the basis of IP education and training of the whole nation.

Meanwhile, “Act on the Promotion and Support of Invention Education” enacted on March 14, 2017 stipulates all forms of education for invention education, thus justifying IP creation. Accordingly, the Commissioner of KIPO shall establish basic plans and implementation plans for invention education every five years (Article 4) for students and the underprivileged. Additionally, national and local governments are able to support the inclusion of industrial property rights in school curriculum deemed necessary at all levels and to support the establishment and operation of courses related to IPRs (Article 12). Furthermore, it acts as the basis of various projects for IP creation and protection in SMEs (Article 14).

The Invention Promotion Act also provides the basis of IP education. The Commissioner of KIPO is able to conduct education and training activities on inventions and industrial property rights. It is also responsible for educating women and the underprivileged, as well as the establishment of Regional Intellectual Property Centers (RIPC).

We note that many local governments in Republic of Korea are also promoting IP education through ordinances. In general, the regulations called “Intellectual Property Promotion Ordinance” or “Intellectual Property Basic Ordinance” is aimed at attracting local economy through IP creation, protection, and utilization in local governments. However, “Intellectual Property Basic Ordinance of the Seoul Metropolitan Office” puts evidence on the support projects for regular IP education for the elementary, middle, and high school students, which can be found in the regulations of 47 local governments throughout Korea.

Korea's IP education and training grounds legislation that exist under various purposes in different fields, and the government can actively support IP education for citizens and secure a budget for it. Legal grounds that exist not only at the national level but also at the local government level can contribute to the improvement of the public's IP awareness level.

3.1.1.3. Comparison of the Development Stage of IP Education and Training in Korea and the Status of AMS

In the early stages of industrialization, Korea had low interest in IP systems and policies because of its low technical abilities. However, as Korea's technological abilities improved and competitive products were produced internationally, the government recognized the importance of IP in economic development and began to strengthen its protection system. This made Korea's IP system change its role on the technological level, and it has been evaluated later to have played significant roles on industrial technology and economic development (Lee, 2002; Lee and Kim, 2010).

The industrial development stage of Korea is generally divided into four stages: “the period of foundation” (1960~1970), “the period of high growth” (1970~1980), “the period of transition” (1980~1990), and the “the period of re-leap” (after 1998). Since the 1970s (“the period of high growth”), Korea actively started research and development, and since the 1980s (“the period of transition”) has accumulated advanced and core technologies. Since then, Korea focused on creating advanced technologies such as IT/BT (KIPO, 2007).

With the phase of industrial development, the system of IPRs started to develop. Particularly in the 1970s (“the period of high growth”), as the accumulation of technical ability and the awareness of IP improved, the number of cases increased, but IP system has not been established yet (Lee, 2002).

However, from the mid-1980s, when the number of applications filed by Koreans increased drastically, the Korean government began to focus on strengthening patent rights in order to encourage domestic companies to innovate and R&D (Jung, 2004). From 1998, strong and systematic IP system was established, and IP education and training became advanced.

The development process of Korean IP system and policy lies on the divided industry development stage. In other words, the development stage of the IP system in Korea is divided into 3 phases: “introduction” (1900~1970), “establishment” (1980~late 1990s), and “advancement” (late 1990s~) (KIPO and KIIP, 2011). The “introduction” period (1900~1970)

was marked with efforts to modernize the system, and it continued until KIPO was established in 1977. During the “establishment” period (1980~late 1990s), Korea joined WIPO (1979), Paris Treaty (1980) and PCT (1984). Korea had entered the international IP system. In addition, domestic IP infrastructure was strengthened through the introduction of computerization system of IP. IP training was systematically implemented after the establishment of IIPTI (1987).

AMS were also divided into 3 categories according to various criteria. Countries in the “Initial Stage” are similar to Korea during the IP “introduction” period (1900—1970). Different types of technologies are being developed and accumulated, and IP systems are starting to materialize, but there is still limited infrastructure. The countries in the “Growth Stage” are similar to Korea during the “establishment” period (1980—1990). These countries make efforts on establishing domestic IP education and training centers, promoting computerization of IP administration and databases, and expanding IP education. Meanwhile, Singapore in the “Innovation Stage” has established various IP protection systems and education bases, and is continuing its efforts to protect high technology and new-IPRs.

3.1.2. Review of Korea’s Outstanding IP Education Model

3.1.2.1. IP Panorama and IP Discovery of WIPO-KIPO-KIPA

IP Panorama was developed jointly by KIPO, KIPA and WIPO from 2004 to 2007 through “The Joint Development of E-learning Content” project, which was established in order to help SMEs manage and leverage IP as a business strategy. In the past, most IP education materials focused on IP laws, but IP Panorama is an educational program that can be practically utilized by accessing IP from the business perspective. 10 modules were made when it was first launched, but currently, 13 modules are developed. The entire program is translated into 24 languages worldwide.

In addition to IP Panorama, KIPA provides various education programs such as IP Ignite, IP Insight, IP Xpedite and IP Xpedite Practical through the IP Discovery portal. IP Ignite is a multimedia content based on DL-101 contents offered by WIPO Academy. Lectures focus on acquiring the basic concept of IPRs from the legal point-of-view and are meant for raising awareness. KIPO, KIPA and WIPO jointly developed this program. The content is for universities, graduate schools, and corporations. IP Insight was also developed by KIPO, KIPA and WIPO, and was designed to inform young adults and SMEs about the importance of IP management and to understand them. It features a short and simple core curriculum based

on real case scenarios. IP Xpedite is a content on patent information practices and case studies from an international viewpoint created by APEC, KIPO and KIPA in 2006 and 2007 in order to help the members of APEC enhance their abilities to utilize patent information for their overseas competitiveness. IP Xpedite Practical is a follow-up to IP Xpedite, and teaches how to search patent information using website demonstrations. IP Xpedite Practical's lecture was based on 2009 APEC IPI-Facilitator online-offline blended training content and was distributed to 21 APEC member economies in 2010. Additionally, IP Discovery portal has invented games for students and learning materials for children. Detailed reference will be provided in Appendix 1.

Concurrently, these education modules and contents are used for blended learning training course. KIPA's IP Discovery uses the above education module for the completion of the training course. This is a joint ROK-WIPO program (AICC) organized by KIPO, WIPO, KIPA and KAIST, and the completion of the program is accepted after completing DL-450, IP Panorama, IP essay test, and offline courses. IP Impact Certificate Course (IPCC) jointly sponsored by KIPO, WIPO, and KIPA is also comprised of online courses, IP essay tests, and an offline session using IP Ignite and DL-101 of WIPO Academy. Additionally, students may enroll in IP Ignite and DL-101 courses with partner universities or online courses by customizing the training modules for the purpose of offline university courses.

3.1.2.2. Korea's International Intellectual Property Training Institute Academy

The International Intellectual Property Training Institute (IIPTI) is an affiliated educational institution of KIPO that was established in 1987, and it operates according to "Patent Office International Patent Training Institute Order." IP education service is provided to the public, which is the driving force of innovative growth. Also training is provided for KIPO examiners to provide high-quality judge services and examiner education. At IIPTI, there are curriculums for different targets, and the classification is explained in Appendix 2.

3.1.2.3. KIPO-IIPTI-KIPA National Intellectual Property Education Portal

KIPO-IIPTI-KIPA provides education for the public, youth, and teachers through online video lectures located in the National Intellectual Property Education Portal, and specific details to this curriculum are explained in Appendix 3.

Meanwhile, the curriculum is also designed for children, and it emphasizes on invention education. Moreover, there are curriculums for teachers as well. <Table 2-4> lists course of study for youths.

<Table 2-4> Course of Study for Youth at National IP Education Portal

Category	Stage
Beginner	Getting Creative with Pororo
	Invention in Science Curriculum - Beginner
	Exploring Invention with Pororo
	Getting Creative with Pororo
	Invention <i>Pang Pang</i>
	Invention that Changed the World - 1
	Invention that Changed the World - 2
	Invention that Changed the World - 3
	I'll Be Friends with Copyright - elementary school
	Invention Classroom
	Fake Family Honorary Grand Battle
	Creativity that Shines - 1
	Creativity that Shines - 2
	Creativity that Shines - 3
	Make a Great Invention with TRIZ
Intermediate	Invention in Science Curriculum - Intermediate
	Science <i>Tok Tok</i> - 1
	Science <i>Tok Tok</i> - 2
	Invention and Creativity
	I'll Be Friends with Copyright - middle school
Advanced	The World of Invention Using Advertising and Media
	I Am the Patent Meister
	Invention using Sound and Fusion
Teachers	Photographed on the field of excellent classrooms flip learning
	Photographed on the field of excellent classrooms flip learning
	Invention training with flip learning (backward learning)

Source: Author (Analysis based on the contents of National IP Education Portal).

Education for teachers provides many kinds of contents for the students' IP education and invention education in the education field, as shown in <Table 2-5>.

<Table 2-5> Course of Study for Teachers at National IP Education Portal

Course Name	Overview
Making Edison Project with Teacher	Finding and inventing science, inquiry and invention of science, finding out problems of everyday life, materializing idea, making creative idea, importance of idea expression, materializing idea, making creative output 1, making creative output 2, Challenging the Invention Competition, Basic Principles of Programming for Inventions, Block Coding Experience Using Entries, Establishing with Idea, How to Get Protected by My Idea, Intellectual Property, Requirements to Obtain a Patent, Determination of Intellectual Property Infringement
TRIZ to Level up my Invention Class	The TRIZ (30th class) idea creation technique (Distance Learning Training institute built by the Korea Invention Promotion Association) was a popular course with continuous demand, but the case was needed to be up-to-date.
Practice of Invention Classes Associated with Elementary Science	Based on the contents of the textbooks of the 'King of Science Invention' produced by the Korean Intellectual Property Office and the Korea Invention Promotion Association, it was reconstructed as an e-learning process.
G-Learning Invention Story to Change Classroom	G-learning (game-based learning) This course covers the contents of invention education. Understands the principle of the invention of the ten commandments for the elementary classroom and the position of invention in elementary education curriculum, Learning how to use G-learning in the curriculum, interdisciplinary and creative experiential activities through examples of in-class teaching using 'Jin'.
Practical Invention Gifted Education	It is composed of the methods needed to teach the gifted intellectuals in class operation. The learning and education model to understand the gifted education of the invention, guide and conference guidance for the invention of the gifted class.
Invention stories found in the curriculum	Invention and science (invention using electric property, invention of light, motion of object, separation of mixture, invention using state change of material, nature of gas, invention thought in living environment of creature, invention for pleasant environment), Inventions and designs (inventions hidden in color, inventions found in advertisements, human-minded designs, funny inventions and designs, designs mimicking nature, numbers/character array designs, restaurants, Invention invented and technology (hidden invention in computer, environment, refrigerator, hidden invention in a vacuum cleaner, structure, hidden invention in a material, medical device, invention hidden in a camera, invention hidden in a toy)

Source: Author (Analysis based on the contents of National IP Education Portal).

3.1.2.4. KIPA's IP Campus

IP Campus, run by the KIPA, is a specialized IP training organization. It has more than 500 professional IP lecturers and provides IP education and training programs with over 30 years of IP education expertise and systematic processes. KIPA's IP campus gives a pleasant educational environment with a capacity of 48,638 square meters that can fit 300 people at the same time.

KIPA's IP Campus provides general education, intensive education, trademark design education and international education curriculum, and it can operate corporate-customized off-site education. Currently, more than 1,000 students finish the program each year. IP curriculum and youth curriculum offered at IP campus are open to the public at various times throughout the year and it continues to develop. Specific program details are summarized in <Table 2-6>.

<Table 2-6> Major Education Curriculum at KIPA's IP Campus

Category	Job	Course Category	Course
Patent	Common	Basic	Intellectual Property Fundamentals
			From Creation of Invention to Writing of Patent Claims
	IPR Management	Basic	Judging Patentability and Beginner Patent Search
			Overseas Patent Application Cost and Schedule Management Strategy
			Patent Specification and Review Skill Up
		Advanced	Master of PCT International Application
			Patent Application and OA Procedure of Major Country (IP5)
			Trade Secret Management and Protection Strategy
	Establishing a Portfolio of IPR and Preventing and Responding to Conflicts	Beginner	Patent Portfolio Building Strategy (Basic)
			(Domestic) Step-by-step Countermeasures Strategy in the Event of Patent Dispute (Skill Up for Patent Litigation)
			(Domestic) Patent Claims Interpretation Method and Infringement Analysis
			Our Company Patent Management A to Z
			Practice of Establishing Patent Strategy of Company
			Mixed Field Patent Search for Product Innovation (Cross IP Innovation)
		Advanced	Strategy to Build a Patent Portfolio for Conflict Prevention (Advanced)
			(US) Patent Claims Interpretation Method and Infringement Analysis
			(US) Dispute prevention Application Strategies by Case Studies of Federal Court Trial
			(US) Strategies to Cope with Patent Disputes in Stages
			Latest Patent Court Trial Cases from current Judges

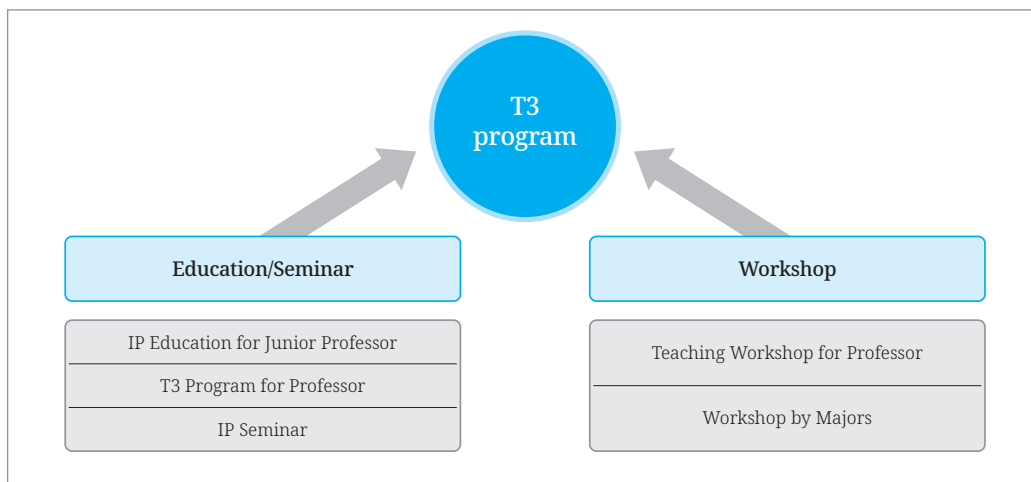
<Table 2-6> Continued

Category	Job	Course Category	Course
	IP Commercialization and Management Support and Contract	Beginner	IP Management and Commercialization Strategy
			Technology Transfer and Licensing Contract Practice (Basic)
		Advanced	Intellectual Property Valuation Practice
			Practice of Technology Transfer and Licensing Contract (Advanced)
	Employee Invention and Technology Transfer	Beginner	Strategic Utilization of Intellectual Property Tax Support System
			Understand and Utilizing the Employee Invention System
Design	Common	Beginner	Intellectual Property Fundamentals
	IPR Management	Beginner	Design Application in One Day
			Trademark Design System and Dispute Resolution Strategy
		Advanced	Master of PCT International Application
			Practice for Securing Strong Design Rights
Trademark and Copyright	Common	Beginner	Intellectual Property Fundamentals
	IPR Management	Beginner	Trademark Application in One Day
			Application and Commercialization Strategies for Strong Brands
		Advanced	Copyright for the Protection of Intellectual Property
			Copyright Licensing

Source: Author (Analyzed the contents of KIPA's IP Campus).

In addition, KIPA runs the training program called “T3 Program” for IP educators. This curriculum is mainly for university professors. It also provides opportunities to share information for IP education as well as to share the best teaching method by holding seminars and workshops, as well as training on intellectual property law and patent systems.

[Figure 2-1] Overview of “T3 Program”



Source: Author.

3.1.2.5. Korea Copyright Commission’s Copyright Education Program

The Korea Copyright Commission is an institute that carries out Korea’s copyright policies, including copyright registration, certification, dispute settlement, policy promotion and research, and simultaneously, it manages copyright education. It provides online training using the online training portal (<https://www.copyright.or.kr/education>), and there is offline training at copyright education training center located in Jinju, Kyungsangnamdo Province, and eye-to-eye level education service that sends lecturers to elementary, middle, and high schools nationwide. The specific curriculum is shown in <Table 2-7>.

<Table 2-7> Korea Copyright Commission’s Copyright Education Program

Program	Overview	Target Audience	Management Organization
Onsite Copyright Education	Customized educational service to visit schools, organizations and organizations that need copyright education	Youth (Above Gr.4) Teachers Parents Artists	Copyright Education Portal
Copyright Practice Class	Support teachers to operate experiential and activity-oriented copyright education programs for 6 hours or more per classroom	Schools	Copyright Education Portal
Copyright Practice Specialization Course (Strengthening of Awareness)	Practical case-oriented customized curriculum management to lead social awareness for civil servants, lawyers and teachers	Civil Servants (14 hours) Legal Professionals (14 hours) Teachers (2 credits, 30 hours)	Korea Copyright Commission

<Table 2-7> Continued

Program	Overview	Target Audience	Management Organization
Improvement of Copyright Field Job Ability	To improve the professional awareness of copyright practitioners, we have implemented the process of improving the competence of the copyright field on the employees of corporations who have concluded a consortium agreement with the Korea Copyright Commission and Consortium for HRD Ability Magnified Program	Employees of companies	Consortium for HRD Ability Magnified Program
Copyright Distance Learning	Operate various distance education courses for teachers, contents industry workers (broadcasting, games, SW, etc.), youth and parents, civil servants, college students and the general public so that they can receive copyright education without restriction of time and space	Teachers, Industry workers, civil servants, university students, public, youth, parents	

Source: Author (Analyzed the contents of Korea Copyright Commission's Copyright Education Program).

Correspondingly, the Korea Copyright Commission trains dispatched instructors for students learning the basic curriculum through “Copyright Youth Instructor.” Many lecturers are required to conduct 10,000 copyright lectures annually, and youth lecturers training program are for those who graduated undergraduate school and appointed as copyright youth instructor. This will eventually lead to a virtuous circle structure where instructor training spreads out to copyright education.

3.2. Success Factors for the Development of IP Education and Training in Korea

3.2.1. Legal Basis

One of the contributing factors that allowed the rapid growth of IP education culture in Korea was how institutions were loyal on maintaining the development. In accordance with the “Framework Act on Intellectual Property,” the foundation of the national IP policy and strategy was reformed when needed, and “Act on the Promotion and Support for Invention Education” and “Invention Promotion Act” provided education on IP creation and IP education for the public. Furthermore, ordinances of each local government provided matters concerning IP education. These legal grounds serve as a basis for promoting the establishment of relevant institutions and facilities and for supporting the budget. These factors were important in raising the maturity of IP awareness to the Korean people.

3.2.2. International Cooperation

IIPTI had the word “International” written in its name since its inception and began international exchange in 1987. In 2001, with the partnership of WIPO and partners in China, India, Malaysia and the Philippines, it held the IPR education managers seminar. In 2002, it held “WIPO Asia Intellectual Property Rights Education and Training Instructor Course” that led international cooperation of IP Education and Training policy to communicate with the intellectuals in charge of IP education in Asia and the Pacific. In 2006, it was designated as the official WIPO educational institution and continues to train international IP experts. This international exchange is one of the indispensable trends in globalization of IP system and the global economy.

3.2.3. Structured Life Cycle Education Process

IP education and training in Korea is very broad and universal, and it adheres to the lifecycle education system. Thus, it cultivates the ability of IP that is arranged systematically using processing roadmaps that cover everything from invention education for elementary and middle schools to university and vocational education, and corporate (social) education. This enables a smooth process for start-ups and corporate activities with IP.

Elementary and middle schools provide education that gives joy of creativity and the understanding of IP values, and high school education system provides fundamental knowledge. At the university level, it naturally leads to specialized basic education and industry-specific education. Meanwhile, there are also programs targeting women, companies, and office administration for those who work at IP law firms. Furthermore, training IP trainers continues to foster more IP educators. The diversification of the curriculum means the improvement of the accessibility of IP Education and Training, hence allowing IP education in Korea to become a very accessible program. This is a result of the double efforts made by private sectors to foster governmental policy.

4. IP Education and Training Program Proposal

4.1. ROK-ASEAN IP Training Center's Management Plan and IP Education Module's Design Plan

4.1.1. ROK-ASEAN IP Training Center

4.1.1.1. Relevant Matters on Laws and Policies

As previously mentioned before, Korea has sufficient legal basis for promoting IP. The “Framework Act on Intellectual Property” provides the foundation for IP-related education. Accordingly, the Presidential Committee on Intellectual Property established and formed basic plans for national IP, including measures for strengthening IP capacity of SMEs, farmers and fishers, and training of IP experts. Moreover, statutory maintenance plans for improvement of IP-related culture, education, and financial system are stipulated. At present, the third comprehensive plan for training IP personnel (2018-2022) has been established.

Concurrently, there are various legal grounds for education (innovative education) at the stage of IP creation. For example, the “Invention Promotion Act” raises the awareness of general public's perception on inventions as well as invention education and training (PE&A) aimed for promoting invention activities, and such education is connected with IP education (Same Law, Article 6, Clause 5). Furthermore, through the “Act on the Promotion and Support for Invention Education,” the basic plan for invention education was established, providing a systematic full cycle IP education.

To sum up, it needs to plan and execute education policies systematically along with infrastructure to have outstanding education institutes, and outstanding education contents with sufficient budget allocation.

4.1.1.2. Relevant Matters on Facilities

The International Intellectual Property Training Institute was first established in 1987, and it was located in Yeouido, Seoul, in South Korea. Since 1991, the institute has moved to Daejeon Metropolitan City. The current IIPTI is constructed on 69,320 m² and its total area is 18,867 m². The facilities include computer education room, lecture room, auditorium, international conference hall, and cafeteria. There are also dormitories, resting rooms, and

sports facilities. Additionally, special priorities are given to the institutions and organizations that are in charge of IPR-related businesses, and the facilities can be accessed with relatively low cost (about 12,000 KRW per day for a 2-person room).

Moreover, the Invention Education Center, located inside IIPTI, opened its doors in December 2015 and has facilities like maker’s lab, an invention experience room, an audiovisual room, and a research data room. There were experienced personnel such as researchers from the Daedeok Science Complex, examiners from KIPO, and invention teachers from different schools who provide intensive invention education that will pave the ways for practical intellectual training and experiential education that fosters students’ creativity and challenges them at all levels.

[Figure 2-2] International Intellectual Property Training Institute Facilities



Source: <http://iipki.kipo.go.kr/EN> (accessed on June 03, 2019).

KIPA’s IP Campus is located in Gangnam, the core area of Seoul. It is located in the Korea Intellectual Property Center building. It provides a convenient educational environment with a total area of 48,638 square meters, with 3 advanced education facilities that can fit 300 people per day at any given time.

[Figure 2-3] Current IP Campus Education Center at KIPA



Source: <https://www.ipcampus.kr/ipcampus/guide.jsp> (accessed on June 03, 2019).

As mentioned before, IP Education and Training in Korea not only needs excellent educational contents but it also needs comfortable facilities. This ultimately enhances the overall quality of education and enhances educational. Meanwhile, Daejeon Government Complex, where KIPO is located, also has facilities for welfare of the examiners as well as restaurants, cafes, sports facilities, and hospitals. These facilities can improve job efficiency by improving the job satisfaction of the examiners.

4.1.1.3. Relevant Matters on Operation

There are various educational programs for diverse group of people living in Korea. KIPO's IIPTI and KIPA's IP Campus conduct not only public education but also teacher education, examiner education, judge education, and children and youth education.

IP education in Republic of Korea has been generalized and become popular, which justifies the diversification on the education model. The diversification of education model means it improves the student's approachability in education model and it provides the environment where demand can be fulfilled. Such environment eventually leads to the quality improvement of IP education.

4.1.2. Design Plan for Education Program

4.1.2.1. Education Module for Intellectual Property's Life Cycle

The core problem of IP education system is that there is a perceptible difference between educational contents of users and developers, and there is no integrated education considering IP life cycle. To resolve this, KIPA and WIPO have co-developed IP panorama between 2004 and 2007 to suggest IP education training for mid-sized companies, sufficiently applying existing education contents that refers to various education models, while reorganizing the education process that follows the life cycle of IPRs. Therefore, educational modules related to IPRs fragmented into fields such as engineering, law, and business management are divided into stages [IP creation – IP protection – IP commercialization].

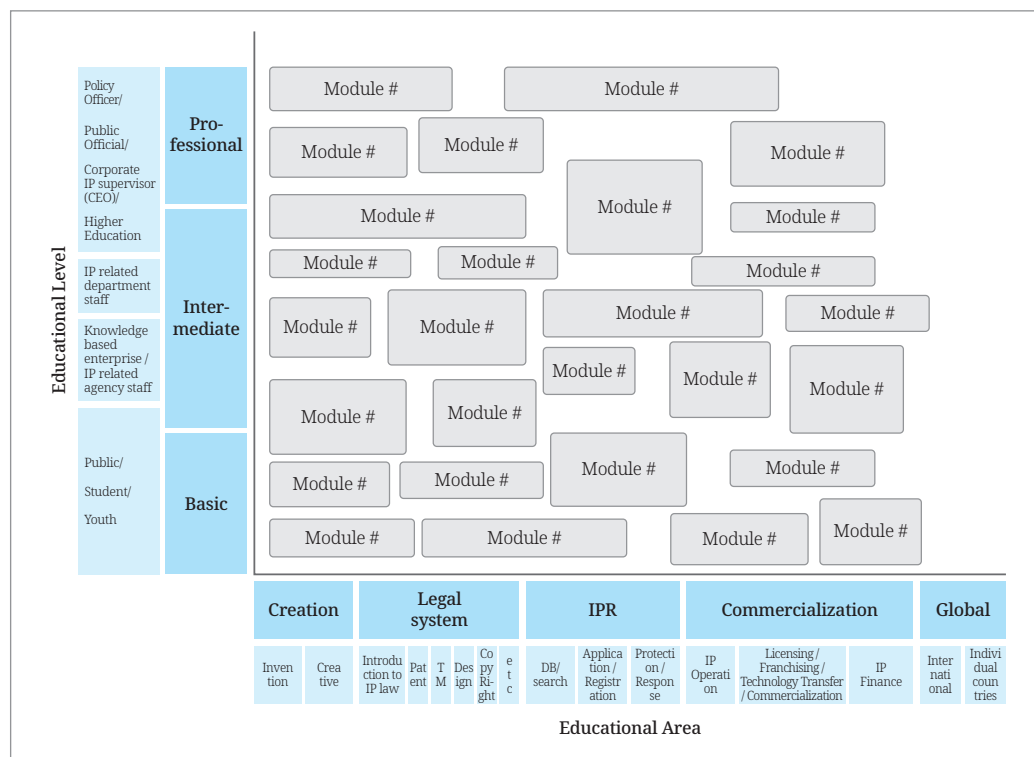
4.1.2.2. Organization of Education Levels and Education Subject

IP training will have different contents depending on who is trained. In this case, there are 3 stages, and fields are made by reclassifying the groups in details, and training modules are provided that are appropriate for the topic. Therefore, it tries to balance education theory, business, support information, and project-based practical training that relatively

have high importance and high demand. Curriculums for comprehensive IP education and training that introduced the operational status and demand analysis were developed for customized education modules.

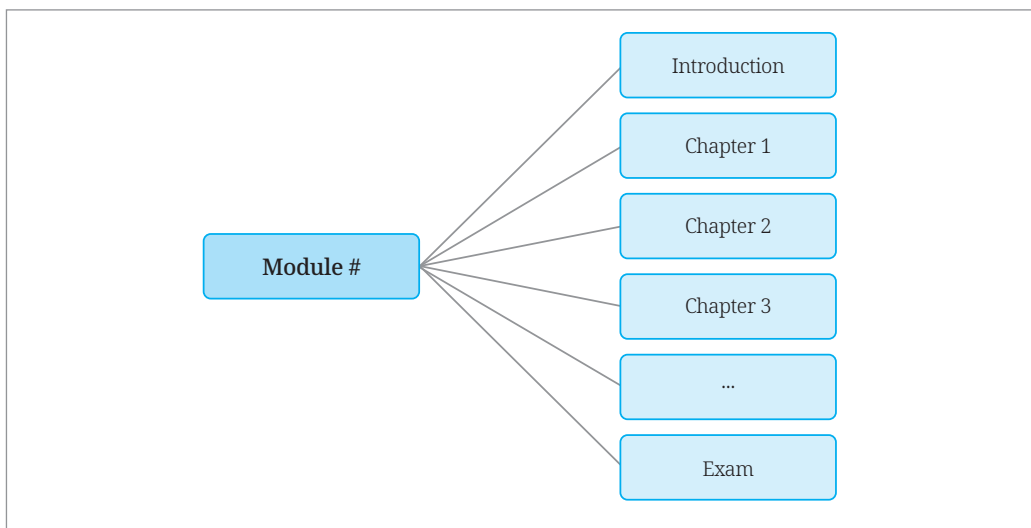
Moreover, the education field is divided into 3 stages, IP creation – IPR –IP commercialization, in accordance with the IP life cycle. These fields combine each education level to form the education module field. Each of the training modules is placed on the field.

[Figure 2-4] Module by Education Level and Subject



Source: Author.

[Figure 2-5] Concept Map of Each Module



Source: Author.

Meanwhile, specific educational targets and educational areas are shown on <Table 2-8> and <Table 2-9>.

<Table 2-8> Educational Level and Education Target on Suggested Education Model

Level	Target Audience
BASIC	General Public
	Elective Courses
Intermediate	Students / Adolescents
	Knowledge-intensive Companies, SMEs, MSMEs
	Relevant Agency Staff
	Employees of IP-related departments of enterprises
Professional	Higher education (university, MIP, etc.)
	Corporate IP leader or representative
	Relevant public official
	Policy Managers

Source: Author.

<Table 2-9> Education by Subject on Suggested Education Model

Category	Detailed Category
Creation	Invention Education
	Creativity Education
Policy	Introduction to IP law
	Patents
	Trademark
	Design
	Copyright
	Others (Unfair Competition, Geographical Indication, New Intellectual Property, etc.)
Right Claims	DB/Search
	Application/Registration
	Protection/Countermeasures
Commercialization	IP Management
	Licensing/Franchising/Technology transfer/Technology commercialization
	IP Finance
Global	International
	Individual Countries

Source: Author.

4.1.2.3. Strengthening Existing Content's Applicability and Approachability

The Korea-ASEAN IP Training Center must run specialized training and open lectures at its own facilities, but also actively utilize online education to enhance accessibility within the ASEAN community. The modularized education model can fully utilize existing education content and design to produce high quality educational results with the existing content. Additionally, the modules of existing contents are customized to meet the needs of the target audience, and resiliently according to the needs of each member states. For example, when the modules are formulated into a program, there may be insufficient topics so the program can be configured by adding the DL module of WIPO or the education module of IP Panorama, thereby customizing the proposed program. Furthermore, the ASEAN IP Training Center must provide administrative training of IP-related public officers, who share their expertise with leading IP experts.

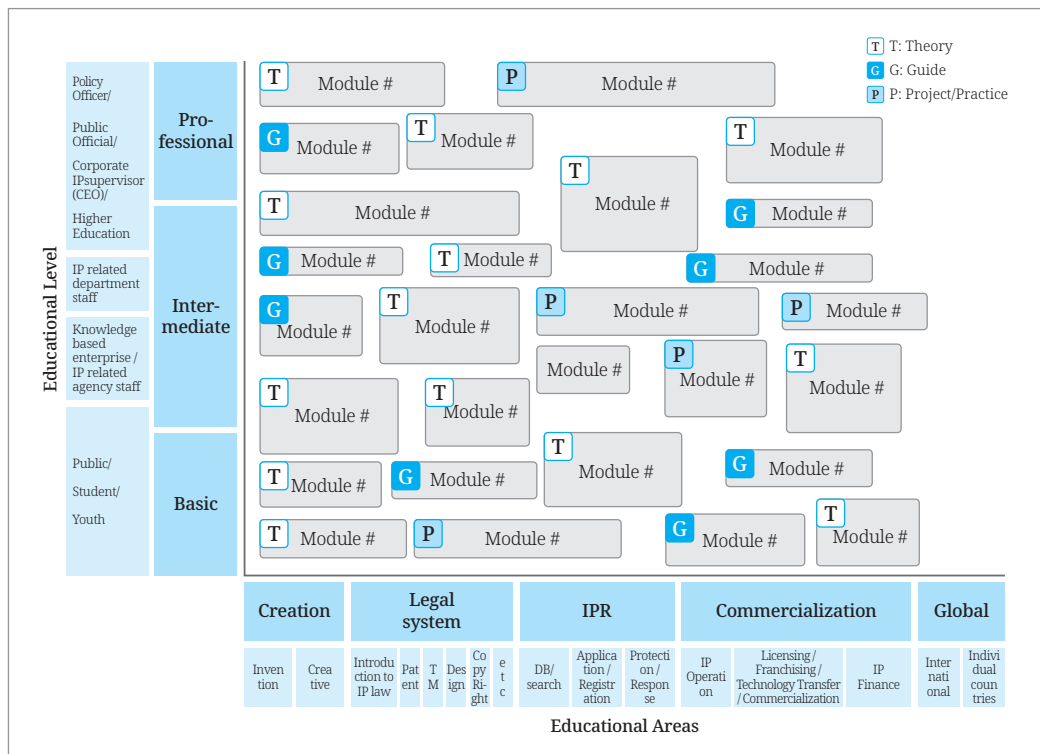
4.1.2.4. Education Module that Balances Theory, Work and Practice

IP education is based on legal and institutional aspects that are fully covered, but it should not be the sole focus and must be practically utilizable from the enterprise’s standpoint. Therefore, the educational model of the “Korea-ASEAN IP Training Center” must have the attributes of T (Theory), P (Project & Practice), and G (Guide) to maximize the efficiency of education by appropriate convergence of each.

4.1.2.5. Combination

The following fields are constructed according to the previous direction of design, and each module is placed in the education subject and area in the field. Each training module has one of the following attributes: T (Theory), P (Project & Practice), and G (Guide).

[Figure 2-6] Concept Map of Module Arrangement



Source: Author.

Each module can configure a program according to a specific topic. Modules are combined as needed or it is combined with existing training modules provided from WIPO, EUIPO, KIPO, and KIPA.

[Figure 2-7] Concept Map of Education Program

BASIC IP Law COURSE for Beginners	IPR Information COURSE	... COURSE	... COURSE with WIPO
T Module #: What is IP?	T Module #: Value of IPR Information	T Module #	WIPO DL 101
T Module #: Importance of IP	T Module #: IP systems	T Module #	WIPO · KIPO · KIPA IP Panorama
T Module #: Patent	T Module #: IP DB	T Module #	G Module #
...	G Module #: Method for Searching Patent Information	T Module #	G Module #
T Module #: International IP Systems	...	T Module #	WIPO · KIPO · KIPA IP Xpedite Practical
G Module #: Enforce your IP!	P Module #: Search in KIPRIS	T Module #	P Module #
G Module #: Write a warning letter!	P Module #: Search in USPTO	G Module #	
P Module #: Patent & TM Search			

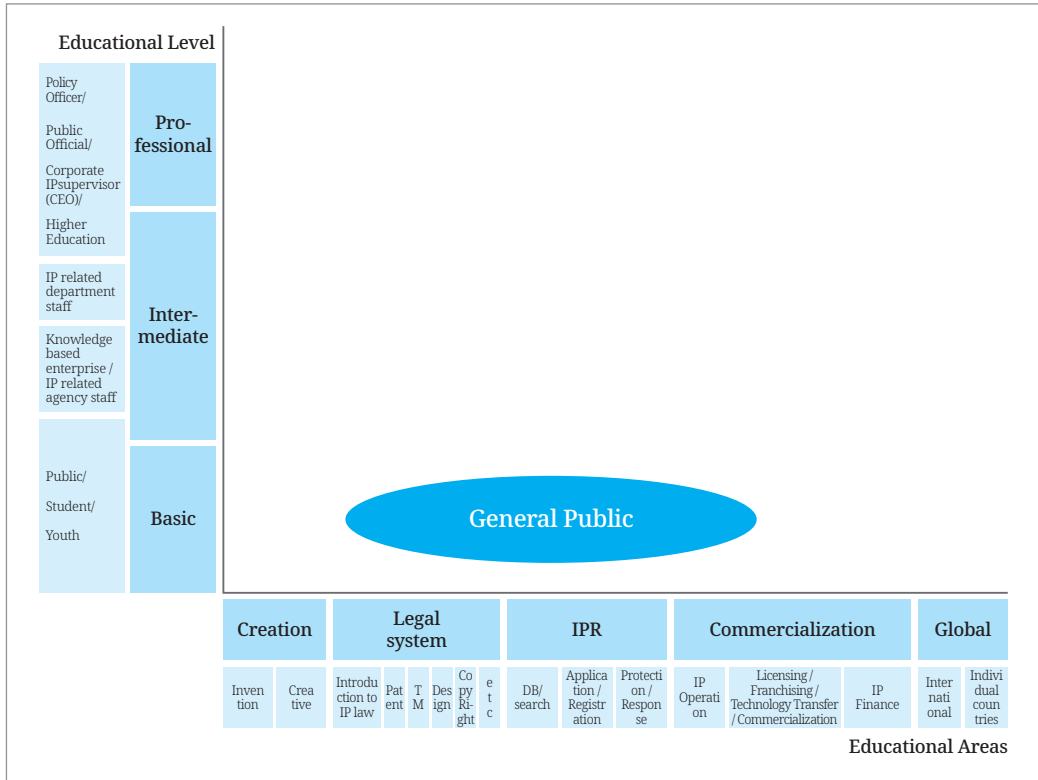
Source: Author.

4.2. Suggestions for Targeted Education Programs

4.2.1. Education Program for General Public

The program for general public education should be the level that can stimulate the interest from the public and enhance the awareness of IP throughout the main topics, and should be provided through on-line or short-term programs to maximize its accessibility. These types of programs should apply the education modules shown in [Figure 2-8].

[Figure 2- 8] Education Area: General Public



Source: Author.

<Table 2-10> and <Table 2-11> propose programs for IP awareness improvement and basic IP training programs.

<Table 2-10> Programs for Improving IP Awareness

Program	Module	Attributes	Lesson
Program for Improving IP Awareness	Module #: What is Intellectual Property?	T	The need to protect IPRs
			Types of IPRs
			International IP Protection System
	Module #: Importance of IP	T	The Impact of IP on Economic Development
			IP as an asset
			Sanctions for infringement of IPRs
	Module #: How to create IPRs?	T	Ideas and IPRs
			Application and Registration Process of IPRs
	Module #: How to Protect IPRs?	T	Exclusive rights to IPRs
			Legal protection of IPRs
			How to deal with IP disputes

Source: Author.

<Table 2-11> Basic Training Courses for General Public

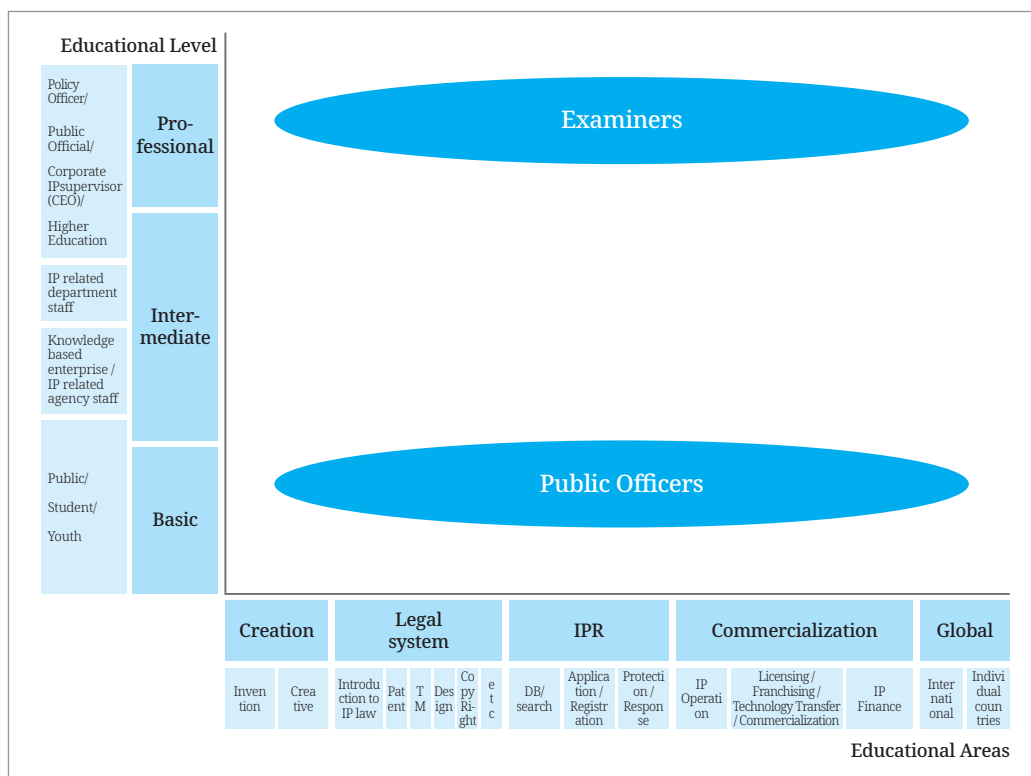
Program	Module	Attributes	Lesson
Basic Training Program for General Public	Module #: IP Protection System	T	The need to protect IP
			Domestic law protection system of IPRs
			International protection system of IPRs
	Module #: Patents and Designs	T	Patent requirements, and protection of Patents
			Design requirements, and protection of Designs
			How to use Patents and Design patent
	Module #: Trademarks and Geographical Indications	T	Trademark requirements, and protection of Trademarks
			International treaty on Geographical Indications
			How to use Trademark and Geographical Indications
	Module #: Copyrights	T	The requirements for the establishment of Copyright, and the protection of copyright and Neighboring rights.
			Copyright registration method and Effect
			How to use Copyright

Source: Author.

4.2.2. Programs Targeting Public Officers and Examiners

Programs for policy makers can be divided into IP, science and technology, programs for officials involved in SME-related ministries, and programs for examiners. These types of programs should apply the education modules shown in [Figure 2-9].

[Figure 2-9] Education Area: Public Officers and Examiners



Source: Author.

<Table 2-12> and <Table 2-13> propose programs for relevant policy makers and patent examiners.

<Table 2-12> IP Education Program for Policy Makers

Program	Module	Attributes	Lesson
IP Education Program for Government Officials	Module #: IP Protection System	T	Omitted.
	Module #: IP and Economy	T	Correlation between IP and Economic Development
			Examples of economic growth through patent strategy
	Module #: IP and International Trade	T	International IP Trade Trends
			Essential Patent and NPE
			IP Protection and Industrial Security
	Module #: Policy for fostering SMEs	G	The Importance of IP-based Business
			Domestic Industry Status
			Review of advanced policy cases

<Table 2-12> Continued

Program	Module	Attributes	Lesson
	Module #: New Policy making	P	Legislative practice
			Policy Planning and Design Practice

Source: Author.

<Table 2-13> Training Program for Patent Examiners

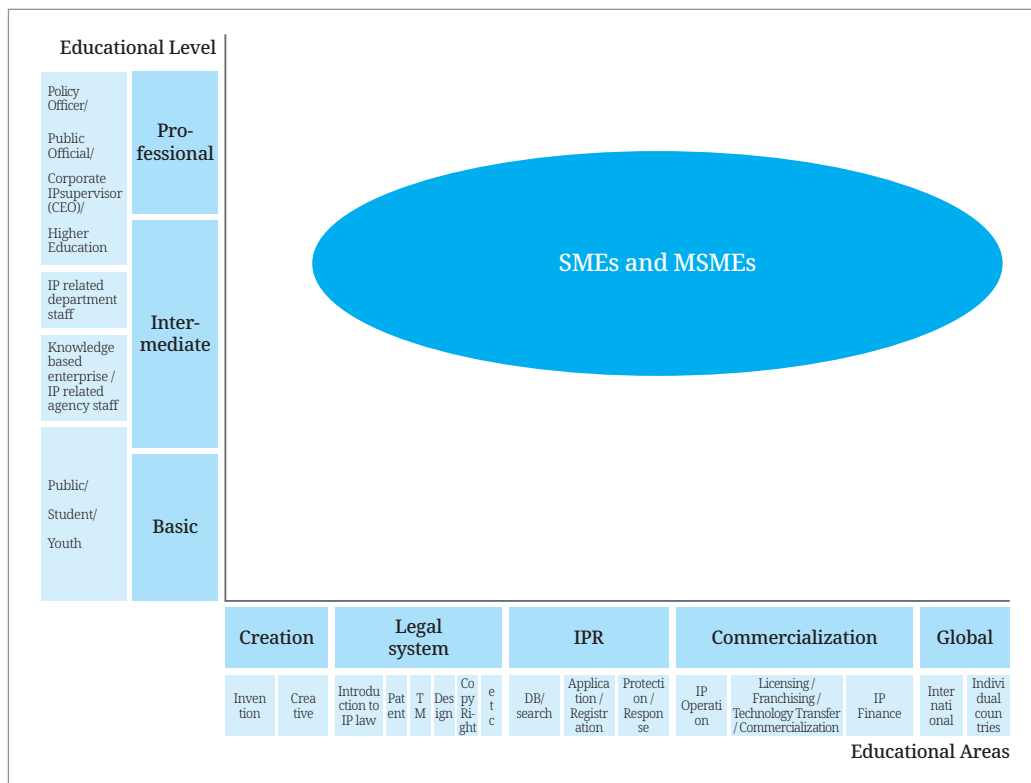
Program	Module	Attributes	Lesson
Training Program for Patent Examiner	Module #: IP Law Module	T	Omitted.
	Module #: Job Competence Module	T	English training for Interpretation of IP Terminology and Specifications
			Understanding of Technology
			Understanding IP Computing System by Country
	Module #: Examination Practice Module	T	Patent Examination Standards
			PCT
			Patent Classification System
	Module #: Prior Art Investigation Module	T	Prior art research by machinery, electrical and electronic, information and communication, chemical, and life sectors
	Module #: Examination cases	G	Domestic case
			Overseas cases
	Module #: Case of Trial and Case Law	G	Domestic case
			Overseas cases
	Module #: Practice for Improving Job Competency	P	Overseas Training
New Technology Training			

Source: Author.

4.2.3. Programs for SMEs and MSMEs

Programs for SMEs and MSMEs can be configured in various ways depending on the company's characteristics. These types of programs should apply the education modules shown in [Figure 2-10].

[Figure 2-10] Education Area: SMEs and MSMEs



Source: Author.

<Table 2-14> and <Table 2-16> propose programs on patent training for brand managers and practitioners of companies as well as creative education program for start-ups.

<Table 2-14> Basic Training Program for Brand Managers

Program	Module	Attributes	Lesson
Basic Training Program for Brand Managers	Module #: Trademark Law and Theory	T	Introduction
			Chapter 1: Characteristics of Trademark
			Chapter 2: What is Trademark?
			Chapter 3: Objective of searching trademark information
			Chapter 4: EU Free Trademark DB
			Chapter 5: WIPO Free Trademark DB
			Chapter 6: U.S. Free Trademark DB
			Chapter 7: KOREA Free Trademark DB(KIPRIS)
Chapter 8: JAPAN Free Trademark DB			

<Table 2-14> Continued

Program	Module	Attributes	Lesson
			Chapter 9: ASEAN Free Trademark DB (TM VIEW)
			Chapter 10: Practice of search_TM VIEW(BASIC)
			Chapter 11: Practice of search_TM VIEW(ADVANCED)
	Module #: G.I. Basic	T	Omitted.
	Module #: International Trademark protection system	T	Omitted.
	Module #: Foundation of the Anti-Fraud Act	T	Omitted.
	Module #: How To Handle Trademark Disputes Effectively	G	Omitted.
	Module #: Brand Counseling	G	Omitted.
Module #: Understanding and Searching Trademark Information	P	Omitted.	

Source: Author.

<Table 2-15> Patent Training Program for Practitioners of (M)SMEs

Program	Module	Attributes	Lesson
Patent Training Program for Practitioners of (M)SMEs	Module #: What is "Patent System"	T	Omitted.
	Module #: Importance of patents	T	Omitted.
	Module #: The Patent Application Process	P	Introduction
			Chapter 1: A description of an invention
			Chapter 2: Basic items of patent specification
			Chapter 3: How to create claims
			Chapter 4: How to write a patent specification
	Module #: Legal Issues of the Patenting Process	T	Omitted.
	Module #: Patent Application Practice	G	Omitted.
	Module #: Patent dispute Countermeasures	G	Introduction
Chapter 1: Patent Analysis / Analysis of Market and Damage			

<Table 2-15> Continued

Program	Module	Attributes	Lesson
			Chapter 2: Preparing warning letters and countermeasures for receipt of warning letters
			Chapter 3: Trial on Invalidity
			Chapter 4: litigation Procedure
			Chapter 5: Damages and Punishment
	Module #: Utilization of patent rights	P	Omitted.

Source: Author.

<Table 2-16> Valuable IP Creator Program for Start-ups

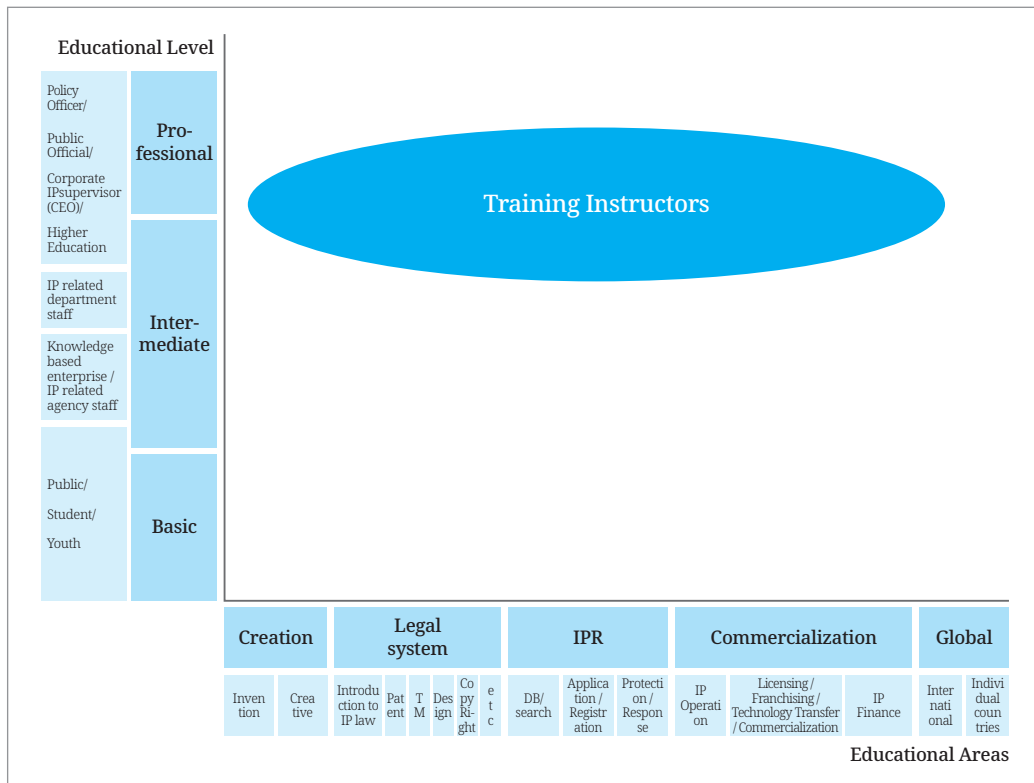
Program	Module	Attributes	Lesson
Valuable IP Creator Program for Start-up	Module #: IP and Business	T	Omitted.
	Module #: IP Excavation	T	Introduction
			Chapter 1: Brainstorming / Writing
			Chapter 2: TRIZ
			Chapter 3: Design Thinking
			Chapter 4: How to embody a creative ideas
	Chapter 5: Idea support policy introduction		
	Module #: IP and IPR	T	Omitted.
	Module #: IP Commercialization	T	Introduction
			Chapter 1: Entrepreneurship and Commercialization Plans
			Chapter 2: Business Model Development
			Chapter 3: Valuation and analysis of business feasibility
			Chapter 4: Investment Promotion Methodology
	Chapter 5: IP Finance		
	Module #: How to Determine Scope of Right	G	Omitted.
Module #: How to Make Statement	G	Omitted.	
Module #: Idea Derivation Conference	P	Omitted.	

Source: Author.

4.2.4. Programs for Training Instructors

When training IP instructors, the learning method that focuses on in-depth fields should be considered, but preferentially, training programs for instructor’s general IP education is proposed since instructors are needed for general education. These types of programs should apply the education modules shown in [Figure 2-11].

[Figure 2-11] Education Area: Training Instructors



Source: Author.

We also suggest examples of instructor training programs for intellectual property education essential to SMEs on <Table 2-17> and <Table 2-18>.

<Table 2-17> General Public IP Education Instructor Training Program

Program	Module	Attributes	Lesson
General Public IP Education Instructor Training Program	Module #: IP Life Cycle	T	Omitted.
	Module #: IP Law Module	T	Patent, Design patent, Trademark, Copyright Law
			IP Treaty
			Unfair Competition Prevention, Traditional Knowledge, Trade Secrets and Other New IP
	Module #: Creation and Protection of IPRs	T	How to grant ideas
			The Importance and protection of rights protection
			The Importance of IPRs, and How to protect them
	Module #: IP Utilization and Knowledge Management	T	Creating value through IP
			IP Trade · Licensing · Commercialization
Module #: Effective Teaching Method	G	Omitted.	
Module #: How to Write a Textbook	G	Omitted.	
Module #: Training Practice	P	Omitted.	

Source: Author.

<Table 2-18> Professional IP Education Instructor Training Program

Program	Module	Attributes	Lesson
Professional IP Education Instructor Training Program	Module #: IP Creation	T	How to find Creative Ideas
			How to shape your Ideas
			Planning Strategy
	Module #: IPRs	T	Patent, Trademark, Design, Copyright Law and Theory
			Application and Registration of Patent, Trademark, Design, Copyright
	Module #: Protection of IP	T	Application and Registration under International IP system
		Omitted.	

<Table 2-18> Continued

Program	Module	Attributes	Lesson
	Module #: IP Utilization	T	Patent, Trademark, Design, Copyright Law and Theory
			Application and Registration of Patent, Trademark, Design, Copyright
			Application and Registration under International IP system
	Module #: Knowledge Management	T	Patent Map and Portfolio
			IP Management Strategy
	Module #: IP Know-how by Field	G	Technology trade know-how for International trade
	Module #: Training Practice	P	Know-how of Copyright and Design patent for Design Industry

Source: Author.

4.3. Considerations Needed by Groups

4.3.1. Member States in Initial Stages

4.3.1.1. Strengthening Public Education

With the exception of Singapore that has already established and operates a systematic and outstanding IP education model, other AMS can be classified into the initial, growth and innovation stages regarding IP education. In the initial stage, education programs for the public must be active in order to raise awareness first. Additionally, it is necessary to provide instructor training to those who have completed levels in the curriculum like the “Youth Instructor” system from the Copyright Commission of Korea, and then carry out active awareness raising education in the form of “out-reach.” Moreover, IP education for the public can be provided through the ASEAN IP Portal, but it must overcome the limitations that the current content is mainly for SMEs and it needs to focus more on IP lifecycle education. With Korea’s experiences, education for improving public awareness of IPRs can be achieved effectively through “out-reach” education and basic online courses. However, considering the relatively low PC and internet penetration rates, it could be preferable to carry out general public education with high accessibility by referring to the above-mentioned education of students of IIPTI and the education of the Copyright Commission of Korea. It may also be effective to run a program for elementary teachers that is similar to the education given to elementary teachers at IIPTI.

4.3.1.2. IP Education and Training for Policy Makers

Countries in the initial stage have high demand for IP education for policy makers because education for public officials is essential to establish and operate effective IP policy. These countries do not have an established independent institution for operating and developing policies for IP. This role is usually performed by related governmental agencies such as Ministry of Science and Technology or is in coercion with the governmental body that manages enterprises, thereby lacking the systematic capacity for the development and implementation of policies. Therefore, it is necessary to provide basic literacy education through collective education or related civil servants. This will promote interagency cooperation on IP education policy and operate a more integrated IP education policy. It is also difficult to find a country that has its own model on examiner training in the early stages, and usually WIPO, EUIPO, or international IP education institutions gives assistance. Therefore, there is urgent need to establish ASEAN regional-specific examiner training model.

4.3.1.3. Education Tailored to Major Industries by Country

It is important to set basic education modules for IP. In particular, education on patent law and utility model law must be further developed based on industries' characteristics. For export goods, education on brand value enhancement should be provided along with raising awareness of trademark rights. On the other hand, education on utility models suitable for minor inventions of SMEs should be strengthened.

4.3.1.4. Establishment of Legal Basis

In order for countries in the initial stage to effectively execute IP education programs, efforts should be made to establish the legal basis. In the initial stages, there is very little or no budget for IP training and education, and relevant departments have undefined roles. Therefore, as Korea established the grounds for policy support of IP education for the public institutionally, such as enacting and enforcing the Framework Act on Intellectual Property, the Invention Promotion Act, and the Act on the Promotion and Support for Invention Education, effective policies can be established on the grounds of having clear budget support.

4.3.2. Member States in Growth Stages

4.3.2.1. Specialized Program

Indonesia, Vietnam, Malaysia, Thailand and the Philippines are in the growth stage. They demand for IP education that connects with business and industrial development. Therefore, it is important to design specialized education programs for start-ups and SME promotion that include patent information search, valuation, technology transfer, commercialization, and technology management.

4.3.2.2. Education for Professional Educators

However, there is also an urgent need for trainer training programs in order to overcome lack of professional educators. Examples can be based from the curriculum of IIPTI, the T3 program of the KIPA, and the Youth Commissioner Program from the Korean Copyright Commission.

4.3.2.3. IP R&D Education

It is necessary to carry out international education cooperation more professionally in connection with the changing industrial paradigm, and it is required to implement policy on IP R&D. Moreover, the countries in the growth stage are strong candidates as the base of ASEAN IP Education and Training. To achieve this goal, close collaborations and discussions among AMS are required. Additionally, IP training center is needed for education that is more specialized.

4.3.2.4. IP-NCS

ASEAN+3 Vocational Ability Development Forum and other various consultation groups are working to develop NCS model of AMS. For Malaysia, in particular, the National Occupation Skills Standards (NOSS) was developed and utilized in order to utilize the education system as the standard for job performance prepared by private sectors and government in order to upgrade its education system to the level required by the enterprises.

Therefore, the efficacy of “ASEAN IP Training Center” should be maximized by introducing Korea’s IP-NCS to ASEAN and developing IP education curriculum that harmonizes it, implementing policies such as NCS-based recruitment. <Table 2-19> summarizes our suggestions.

<Table 2-19> IP Under Current NCS Categorization

Category 1	Category 2	Category 3	Category 4	Ability Unit
05. Law · Police · Fire · Corps · Defense	01. Law	01. Legal	-	-
		02. IP Management	01. IP Management	Intellectual Property Dispute Defense
				Intellectual Property Services Practice
				Intellectual Property Overseas Law Practice
				Discovery of Intellectual Property
				Invention Notes Review
				Claiming IPR
				Intellectual Property Contract Management
				Intellectual Property Contract Implementation
				Retaining Intellectual Property
				Operation of Intellectual Property Management System
				Intellectual Property Management Practice
				Intellectual Property Management Strategy
				Creating Design Drawings
				Create Patent Drawings
				3D Modeling
				Create Design Drawing Format
				Fill out the Intellectual Property Application Form
				Writing Intellectual Property Registration Form
				Writing an Intellectual Property Judgment Form
				Drawing an Overseas Application Drawing
		Prepare the Overseas Application Documents		
		02. IP Valuation and Transaction	Intellectual Property Rights Evaluation	
			Intellectual Property Marketability Evaluation	
Intellectual Property Business Evaluation				
Derivation of Intellectual Property Evaluation Result				

<Table 2-19> Continued

Category 1	Category 2	Category 3	Category 4	Ability Unit
05. Law · Police · Fire · Corps · Defense	01. Law	02. IP Management	02. IP Valuation and Transaction	Negotiating Intellectual Property Transaction terms
				Intellectual Property Evaluation Planning
				Intellectual Property Evaluation Practice
				Finding Demand for Intellectual Property Trading
				Intellectual Property Trading Strategy Planning
				Intellectual Property Technology Marketing
				After-sale Management of Intellectual Property
				Intellectual Property Transaction Customer Management
			03. IP Information Survey Analysis	Intellectual Property Requirements Analysis
				Intellectual Property Environment Analysis
				Intellectual Property Information Search
				Selection of Effective Assets for Intellectual Property
				(skip)
			04. Patent Engineering	Invention Consultation
				Prior Art Research Analysis
				Analysis of Business Feasibility of Invention
				Application Strategy Planning
				(skip)
	02. Firefighting disaster prevention	-	-	-

Source: <https://www.ncs.go.kr/unity/th03/ncsSearchMain.do> (accessed on June 03, 2019).

4.3.2.5. Higher Education

Republic of Korea operated on guiding university for IP with the support of KIPO. It supports the budget of the course operation by selecting the university that have infrastructure for IP education and training. Moreover, there are more than 1,600 IP courses at about 64 universities and more than 20 universities have major courses for IP. The expansion of higher education can start by establishing higher degree courses in ASEAN and for engineers and

MIP (Intellectual Property Professional Degree). Moreover, the establishment of cyber-universities can be advantageous by setting online education as the extension of higher education on IP.

4.3.2.6. IP Ability Test

Republic of Korea has numerous competitions on IP that are sponsored by various organizations. It is mainly for students to distinguish excellent IP research papers, ideas, and publicity contents contests, and these can motivate IP education. KIPA also runs National Intellectual Property Ability Test (IPAT), and in 2017, there were about 30,000 applicants. The IPAT test grade is reflected on the recruitment of relevant public officials, and the level of IP education can be measured from the test.

4.3.3. Measures for Sustainable Development

4.3.3.1. Strengthen Country Characteristics using Traditional Knowledge, Geographical Indication

AMS holds its own distinctive industrial character. If the country targets its main industry on technology, patent education will be preferred. However, if the flagship industry of the country is concentrated on agricultural products, education on geographical indications or traditional knowledge is needed, while if its main exports are crafts, the education demand for design rights will be high. Therefore, each AMS puts priority to the industries and then manages education process. The countries consider first obtaining expertise of managing practical education performance and education process to expand the education program in bigger areas.

4.3.3.2. Considerations when Establishing “ROK-ASEAN IP Training Center”

The IP training center will serve as the basis for IP education and training in the ASEAN region, hence, there are few things to consider when establishing it. First, the ability to operate a training program needs to exist. It should have the capacities to cooperate with member states as well as with international organizations, to provide IP education to member states, and to spread out to the public and corporations. Second, cooperation with Republic of Korea is needed in order to achieve its duties as smoothly as possible based on the ASEAN-Korea cooperation. Previously, the AMS was largely divided into the initial stage and the growth stage, and the place where the education center is operated as the hub of ASEAN IP education should be from the growth stage. Third, the government of the country needs

to show interest on the activities regarding IP education, have legislative requirements and budgets in order manage the center, and most of all, possess the environment with social awareness and professional work force.

4.3.3.3. Improvement of Online IP Education and Training Platform

The trade in Southeast Asia region is linked with ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA). In accordance with Chapter 13 Article 9(5) of the AANZFTA Agreement on Intellectual Property, there should be cooperation to promote education, raise awareness, and strengthen IPRs.¹ At the AANZFTA IP Public Education & Awareness Community of Practice, co-organized with the AANZFTA Economic Cooperation Support Program (AECSP) held in Bangkok, Thailand in May 2013, discussions for the establishment for improving accessibility to IP information (<https://busicsentiasean.wordpress.com/about/project-timeline>) and improving local awareness has been initiated (AANZFTA AECSP, 2015).

Moreover, Strategic Goal 3 of the ASEAN IPR Action Plan 2011~2015 explains, “The interests of the region are advanced through systematic promotion for IP creation, awareness, and utilization to ensure that IP becomes a tool for innovation and development; support for the transfer of technology to promote access to knowledge; and with considerations for the preservation and protection of indigenous products and services and the works of their creative peoples in the region” (AWGIPC, 2011). AANZFTAIPPE and ACoP seem to have developed the strategy to achieve this goal. The specifics are explained in <Table 2-20>.

<Table 2-20> AANZFTA IP PE&A CoP’s Strategy

STAGE	TIMING	FOCUS	COMMUNICATION OBJECTIVE
1: Establish	8 weeks	Set objectives and priorities	Establish current PE&A situation and benchmarks.
			Establish relationships with key influencers – find out what they already know, and need to know about IP.
			Establish context of ‘why’ IP is important and ‘what’ is happening in the lead up to 2015, and ‘when’ it is particularly important to focus on IP.
			Update PE&A materials on website to match campaign key messages. If there is no AMS IP Office website – refer target audiences to ASEAN IP Portal.

1 Agreement Establishing The ASEAN-AUSTRALIA-NEW ZEALAND Free trade area, Chapter 13, Art9(5) (“The parties shall endeavor to co-operate in order to promote education and awareness and enforcement of intellectual property right”).

<Table 2-20> Continued

STAGE	TIMING	FOCUS	COMMUNICATION OBJECTIVE
2: Enhance	8 weeks	Design materials and supporting tools	Enhance message tools, activities and editorial planned for the target audience/s based on findings from Stage One.
			Gather and share information and insights with influencers, government stakeholders and Ministry.
			Create a promotional plan to record all activities, opportunities and channels.
3: Excite	20 weeks	Implementation	Communicate the value of IP and empower business to educate themselves / make changes now.
			Deliver proactive bursts of activity e.g. editorial, tradeshow, social media, across multiple channels.
4: Embed and Evaluate	4 weeks	Evaluate tactics against objectives and refine for next steps	Evaluate all activities.
			Gather and share implementation related ideas and information.
			Decide the revisions that are required for forward activities.

Source: AANZFTA AECS (2015), "Regional IP Public Education and Awareness Strategy – For Stakeholders", p.13.

Here, we set the main target of the strategy as “Business” (including trusted advisors), especially SMEs, business intermediaries, IP creators and universities, and set the main messages as shown in <Table 2-21> to explain the importance of IP.

<Table 2-21> AANZFTA IP PE&A CoP's Main Messages

Why do I need to know about IP?	AEC 2015 will mean greater market opportunities for IP savvy businesses to trade across borders.
	IP savvy businesses are preparing their IP portfolios now to gain the maximum commercial advantage from economic integration – don't be left behind!
What is IP?	IP is all about business assets. IP can take many forms – both registered and unregistered. For example, patents for inventions, trademarks for logos and names, copyright for original creative works.
	Protection of IP rights helps you protect your creative efforts from competitors and unauthorized use.
	Intellectual property rights are a key factor in the competitiveness of your business in the regional economy.
What is happening with IP protection systems in the lead up to ASEAN Economic Integration 2015?	Intellectual Property rights will help to establish your place in the market
	There is continued reform of IP systems in readiness for 2015, to address evolving demands of the IP landscape, and Free Trade Area markets.
	IP legislative reform will help businesses to access protection mechanisms for increased ability to enforce their IP, to help protect innovations from unauthorized use.

<Table 2-21> Continued

When do I need to consider IP in my overall business plan?	Reviewing IP assets should form part of any overall business management strategy. This is especially important to the business owner planning to buy, sell, or merge with an existing business.
	Identifying your IP and seeking advice on IP management issues is important prior to approaching potential investors, exporting goods and services, commencing a joint venture or signing a license agreement.
How will my business benefit?	IP can make your business stronger – create new assets, secure market share and establish new partnership opportunities.
	IP can be a valuable source of cash-flow for SMEs through licensing deals or selling IP rights.
	IP product labeling sends a signal to customers that they are buying an authentic product, tell competitors you are serious about protecting your business assets, and help to attract investors or partners.
What can I do now?	Seek out more information on IP, including from the ASEAN IP Portal www.aseanip.org .
	Seek expert advice.
	Employ an effective IP management strategy for your business.
	Include IP as part of your overall business strategy, especially if you are looking to export.
	Take advantage of systems already in place to assist businesses with managing their IP, including ASPEC (ASEAN Patent Examination Cooperation program) and TM VIEW (free searchable trademark database that is particularly useful for businesses considering exporting to Europe).

Source: AANZFTA AECSP (2015), "Regional IP Public Education and Awareness Strategy – For Stakeholders," p.17.

Furthermore, ASEAN IP PE&A Case Studies, AMS IP PE&A Contact List, Communication Channels Guide, Low Cost PE&A Activity Guide, Event Management Checklist, Social Media Guide, Media Engagement Fact Sheet, Partnerships Fact Sheet, Evaluating Your PE&A Activities, Communication Plan on a Page, Useful Links and Resources are provided as resource kit for IP PE&A.

Inside ASEAN, micro-SMEs (MSMEs) not only contribute to sustained economic growth in the region, but also form the backbone of the economy that provide the strong foundation for the growth and development of new industries. Therefore, it is very important to educate and raise awareness on IP to MSEM, and the AANZFTA IPC (Intellectual Property Committee) is preparing for the second stage program following the publication of AANZFTA IP PE & A contents. In the Request for Proposal, the following tasks are presented (AANZFTA EERD/CCPID/MID, 2018).

<Table 2-22> AANZFTA IPC's Request for Proposal

Enhancement of the ASEAN Intellectual Property (IP) Portal	Create a new section of "IP for Business"	IP identification, protection, utilization and commercialization
		IP laws and filing processes (based on Business Guide)
		Importance of IP asset management for business expansion (based on Handbook)
		IP and Innovation
		Adding a tab for the list of IP events for businesses
		Linking to ASEAN Technology Transfer Offices, IP attorneys and other experts for further consultation
Manage the compilation, editing and uploading of existing materials		Digital copies of the IP communication tools, publications, and including other project materials developed as part of the IP PE&A program including materials from Phase I
		Information about projects and initiatives by AANZFTA Parties as well as current/upcoming IP activities and developments in the region by AANZFTA Parties
		Links to relevant websites including the AANZFTA (aanzfta.asean.org)
Two IP Publications	A Business Guide to IP Institutions, Laws and Filing Processes in AANZFTA Parties	Guides on procedures/criteria to file for IP protection in each AANZFTA Party via normal routes
		Provide businesses, particularly MSMEs in the AANZFTA region, with a reference guide to the IP institutions and IP laws of AANZFTA Parties (including Patent Cooperation Treaty, Madrid Protocol and Hague Agreement)
		The Guide should have both written and graphical presentations of the process
	Managing IP Assets: Approaches to IP commercialization and strategies for Maximizing Value	Assist IP owners, especially MSMEs, understand how effective management of their IP assets can strengthen their businesses
		IP licensing
Strategic alliances using IP assets		
	IP valuation	
	Case studies of companies that successfully utilize their IP	

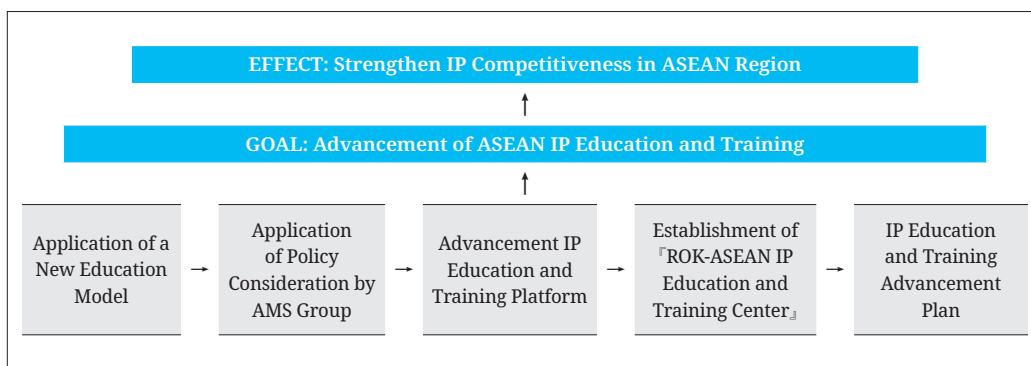
Source: AANZFTA AECS (2015), "Regional IP Public Education and Awareness Strategy – For Stakeholders," p.17.

As mentioned above, AANZFTA's efforts show that an online IP training and training portal are needed that can be accessed from the whole ASEAN region, but the educational content of the current ASEAN IP Portal needs to be improved first. The ASEAN IP Portal, which has only limited content for SMEs, should be revived as the true IP education and training platform that can be utilized by different members such as SMEs, MSMEs, as well as the public and students in the ASEAN region.

Therefore, apart from the ROK-ASEAN IP Training Center, it is necessary to redevelop the ASEAN IP Education and Training portal. AANZFTA's proposal above seems to reflect these requirements. However, we are still focusing on business-oriented IP education and training content, and we need to upgrade the ASEAN IP Portal. More specifically, it should include 1) providing education content online using videos and animation similar to IP Panorama and WIPO's DL, 2) producing in different languages that are used in ASEAN, and 3) developing easy and short education content for general education. It is possible to organize the curriculum by using the education program listed above. Such an upgrade of the ASEAN IP Portal is expected to be relatively easier to implement than establishing the ROK-ASEAN IP Training Center.

5. Conclusion

In this study, we analyzed the current status of IP education and training in the ASEAN region and looked at the successful cases of IP education and training in Korea. Through this, we presented an educational model for ASEAN IP education and training and proposed major programs for educational needs. At the same time, AMS were categorized into 2 groups, setting priorities for each group. Furthermore, proposals for various policies for advanced IP education and training in the ASEAN region were made, suggesting considerations for the establishment of the ROK-ASEAN IP Training Center, and issues to be improved for the online education platform, such as the ASEAN IP Portal, respectively. The main points of this study are summarized in <Table 2-23>.



<Table 2-23> Summary and Conclusions of the Study

Detailed Contents of Research		
Review of Current Status	Current Status of IP Education and Training of ASEAN	Review of ASEAN IP Portal
		Review by Country
	Examples of Excellent IP Education and Training	Examples of IP Education/Training Legislation and Policy in Korea
		Review and analysis of IP education/training model/ infrastructure of Korea
		Review of education and training model of WIPO and EUIPO
Education Models	New Modeling Methodology	IP Lifelong Education Model
		Modularization by Level of Education and Subject
	Independent Training Programs	Public General Education Program Proposal
		Public Official and Examiners Training Program Proposal
		Training Programs for Business Proposal
		Program for Training IP Educator Proposal
Application	Policy Considerations	Policy Considerations for the Initial Group
		Policy Considerations for the Development Group
	IP Education and Training Advancement Plan	IP-NCS Review
		Higher Education Review
		Strengthening Industrial Characteristics by Member State
		IP Education Contents Development such as Competition and Ability Evaluation
	Practical Application Approaches	Consideration for Establishment of JROK-ASEAN IP Training Center
		Considerations for Improving Online IP Education and Training Platform

Source: Author.

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Appendix 1

<Appendix Table 2-1> IP Panorama for WIPO-KIPO-KIPA and IP Discovery Curriculum

COURSE	MODULE	CONTENTS
IP Panorama	Module 01. Importance of IP for SMEs	IP is all around us
		Why IP is relevant to SME
		IP as business asset
		The value of IP assets
		Auditing your IP
	Module 02. Trademarks and Industrial Designs	Trademarks and Industrial designs to increase the Power of Marketing
		Brand building
		How to protect trademarks and industrial designs
		Trademark management
	Module 03. Inventions and Patents	Basics of invention and patent
		Patent application
		Patent infringement
		Patent management system
	Module 04. Trade Secrets	Basics of trade secret
		Trade secret management program
		Misappropriation of trade secrets
		Violation of trade secrets
		A trade secret audit
	Module 05. Copyright and Related rights	Basics of copyright
		Copyright and related rights
		Ownership of copyright
		Using works owned by others
	Module 06. Patent Information	Understanding of patent information
		Types of patent information searches
Searching patent information		
Strategic use of patent information		

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
	Module 07. Technology Licensing in a Strategic Partnership	The basic concept of a license
		Preparing to license
		Negotiation a license agreement
		Overview of a license agreement
		Managing a license agreement
	Module 08. IP in the Digital Economy	IP & e-commerce
		Creating a website
		Choosing a domain name
		Protecting your website
	Module 09. IP and International Trade	Why IP rights are important for exporters
		Checking your freedom to operate
		IP in international outsourcing
		Protection your IP rights in export market
	Module 10. IP Audit	Understanding an IP Audit
		Preparing for an IP Audit
		Conducting an IP Audit
		After completing an IP Audit
	Module 11. IP Valuation	What is IP valuation?
		IP valuation methods
		Preparing for IP valuation
How to value IP assets using DCF method: Step by step		
Module 12. Trademark Licensing	Exploiting a trademark	
	Preparing to license	
	A trademark license agreement	
	Managing a trademark license agreement	
Module 13. Issues in Franchising	Franchising	
	Preparing of franchise	
	Managing a franchise relationship	
	Termination	

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
IP Ignite	Module 01. Orientation	-
	Module 02. Introduction of Intellectual Property	What is Intellectual Property?
		Why do Intellectual Property Rights Matter?
		Intellectual Property Rights Incentives for Nations
	Module 03. Patents	What is a Patent?
		Conditions for Patenting
		How to Obtain Patent Rights
		Patent Protection
		Trade Secret Protection
	Module 04. Trademarks	What is a Trademark?
		What Characteristics are Required for Trademark Registration?
		How Trademarks are Protected?
		Collective and Certification Marks
		Famous or Well-known Marks
	Module 05. Geographical Indications	How can Trademarks be Protected Worldwide?
		What is a Geographical Indication?
		Differences Among a Geographical Indication, an Appellation of Origin, and an Indication of Source
		Protection of a Geographical Indication
	Module 06. Industrial Design	Worldwide Protection of a Geographical Indication
		What is an Industrial Design?
		Why protect Industrial Designs?
		Protection of Industrial Designs
	Module 07. Copyright	Worldwide Protection for an Industrial Design
		What is covered by Copyright?
		Are the works that can be protected under the Berne Convention restricted to the list set out in Article 2?
		What is meant by Derivative works?
		What are the rights protected by Copyright?
		Right of Reproduction
Rights of Public Performance, Broadcasting and Communication to the Public		

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
		Rights of Translation and Adaptation
		Transfer of Copyright
		Limitations on Rights
	Module 08. Related Rights	What are Related Rights?
		Rights granted to the beneficiaries of Related Rights
		Cultural Expression
	Module 09. WIPO Administered Treaties on International Registration Systems	Three Different Systems of International Registration Administered by WIPO
		Madrid System
		The Hague System
	Module 10. PCT	What is the PCT?
		What is the procedure of the PCT?
		What are the advantages of the PCT?
		What is the role of WIPO in the PCT?
	Module 11. Unfair Competition	What is Unfair Competition?
		What are the major categories of Unfair Competition?
	Module 12. Protection of New Varieties of Plants and Emerging Issues in IP	Why protect new varieties of plants?
Characteristics of protection for new plant varieties		
Protection of Biotechnology		
Traditional Knowledge		
IP Insight	Patents	The importance of Patents
		Patenting Abroad
		Enforcing Patents
	Trademarks	Introducing Trademarks
		Protecting Trademarks
		Using Trademarks
	Copyright	What is copyright?
		Who owns copyright?
		How can we use copyright?
	Design	Protection of Industrial Designs
Practical Use of Industrial Designs		

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
	Licensing	License
		Use of License
	Franchising	What is Franchising?
		IP in franchising
IP Xpedite: Open Access Course	Module 00. Orientation	
	Module 01. Value of IPR information	Why do Intellectual Property Rights matter?
		What are Intellectual Property Rights
		Case Studies: Successes and Failures of Intellectual Property Rights
	Module 02. Characteristics of IP Systems of Major Countries	International Treaties and Conventions on Intellectual Property
		Patent System
		Trademark System
		Industrial Design Rights System
	Module 03. IPR Database Source	Classification of an IPR Database
		Useful Function
		Characteristics of an IPR Database
	Module 04. Understanding and Searching Patent Information	Characteristics of Patent Information
		Objective of Patent Information
		Process of Patent Information Search
		Method for searching Patent Information
	Module 05. Understanding and Searching Trademark Information	What is a trademark and its characteristics?
		Trademark information
		Introduction of free trademark
		Exercise of search
	Module 06. Patent Indicators	What are patent indicators?
		The kind of patent indicators and its characteristics
		Introduction of organization preparing patent indicators
		Exercise of patent indicators analysis
	Module 07. Patent Map (Patent analysis)	What is a Patent Map?
		Why does a patent map matter?
		How is a Patent Map classified?

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
	Module 08. Preparation of a Patent Map	The Flowchart for Preparing a Patent Map
		Preparation of a Patent Map
		Practical Exercise
	Module 09. Advanced Searching for Patent Documents Using IPC and F-Term	Patent Classification System
		Searching Patents through IPC
		Searching Patents through F-term Code
	Module 10. International Application through the PCT System and its Strategies	Procedure Before the Receiving Office
		International Phase
		National Phase
		Tips and Strategies for PCT International Application
	Module 11. International Trademark Application through Madrid System and its Strategies	Madrid System
		Filing Information on the Madrid System
		Major Strategies for the Madrid System
	Module 12. Drafting and Interpreting Patent Documents in the US	Invention Documentation
		Parts of a U.S. Patent Application
		Drafting Patent Claims
		Interpreting Patent Claims
	Module 13. Drafting and Interpreting Patent Documents in Japan and Korea	Patent Documents in Japan and Korea
		Drafting Patent Specification in Japan and Korea
		Interpretation of Claims in Japan and Korea
Module 14. Drafting and Interpreting Patent Documents in EPO and Australia	European and Australian Patent Documents	
	European and Australian Patent Applications	
	Drafting Patent Claims	
	Interpreting Patent Claims	
IP Xpedite Practical: 1	Module 01. Patent Analysis based on Patent Information Search	Disputes Over Prior Art
		Trends in Patent Filing
		Prior Art Searching with Different Objectives
		Prior Art Searching Strategies
	Module 02. KIPRIS (Korea)	Hello, KIPRIS
		Search Skills
		Step Up

<Appendix Table 2-1> Continued

COURSE	MODULE	CONTENTS
	Module 03. IPDL (Japan)	Hello, IPDL
		Search tips using FI, F-Term
		Step Up
	Module 04. USPTO(USA)- Module 3: IPDL (Japan)	Hello, USPTO
		7-Step Preliminary Patent Search
		Public PAIR System
	Module 05. Esp@ceNet (Europe)	Hello, Esp@ceNet.
		Search Skills
		Step UP
	Module 06. [On-site Lecture] AUSPAT (Australia)	IP Rights in Australia
		IP Australia
		Australian Patent System
	Module 07. [On-site Lecture] WIPO Patentscope (WIPO)	PATENTSCOPE® Search Service
		IPC-International Patent Classification
		National Collections
IP Xpedite Practical: 2	Module 01. [On-site Lecture] KIPO's Patentability Standards Based on Precedents	Patent Judicial System
		Requirements for Patentability
		Standard for Inventive Step in KIPO
		Recent Court Cases
	Module 02. [On-site Lecture] USPTO's Patentability Standards Based on Precedents	Basis for Patent Law in the United States
		Patent Resources
		The 2-Step Patent Eligibility Analysis
	Module 03. [On-site Lecture] EPO's Patentability Standards Based on Precedents	Appeals Procedure
		Technical Boards of Appeal
		Enlarge Board of Appeal
	Module 04. [On-site Lecture] JPO's Patentability Standards Based on Precedents	Substantive reasons for refusal
		Purport of the Provision of Inventive Step
		Principle of Determining an inventive Step
	Module 05. [On-site Lecture] Trade Dress	Types of Trade Dress
		Configuration Trade Dress

Source: Author (Analysis based on the contents of IP Discovery).

Appendix 2

<Appendix Table 2-2> Classification Training of IIPTI

Topic	Category 1	Category 2	Category 3
IIPTI : Education by Subject	Education for Public Officials	For KIPO Officials	Training of experts in examiners and judges (new examiners, middle-grade examiners, judges)
			Step-by-step Examiner Practical Training (case study, trial case study, examination guidance, etc.)
			Intellectual Property Law Education (Patent Law, Trademark Law, Design Protection Law, Copyright Law, etc.)
			Administrative practice related education (new intellectual property rights, Hangul, Excel education, etc.)
		For other Public Officials	Basic intellectual property and professional education for enterprises, research institutes and other institutions
			Intellectual property rights awareness and intellectual property rights training (such as industrial property rights)
			Support for job-related special education for new affiliates and prior art researchers (such as new and advanced technology researchers)
			Practical training curriculum for employees in other intellectual property rights related businesses (writing patent specifications, preparing patent maps, searching patent information, etc.)
	Education for Teachers	Invention Teacher Training	Systematic and professional training for teachers in order to revitalize inventive education and expansion
			Educational management (Invention Training Manager) for improving education awareness of education managers (principals and supervisors)
			Basic intellectual property and case studies of excellent Instruction methods, etc. Basic training courses for teachers who start in invention education (introduction to the invention teacher, case of invention guidance)
			Enrichment from patent application to start-up Intellectual property rights training and technology convergence using 3D printer
			In-depth curriculum for teachers such as project classes (Invention teacher deepening, printer utilization, etc.)

<Appendix Table 2-2> Continued

Topic	Category 1	Category 2	Category 3
	Education for Adolescents	Student Invention Course	2 nights, 3 days camp
		Invention Experience Course	1 day course
	Education for Foreigners	WIPO's Korea Funds in Trust	Patent law and patent examination process (including OJT)
			Trademark law and trademark examination process (including OJT)
			IP SUMMER SCHOOL
			Asia Pacific Regional Seminars
		KOICA	Creative Invention Training
			Azerbaijan IPR
			Intellectual Property Policy
		Customized course	Saudi Arabian Patent Examiner Course
			Chinese Patent Examiner Course
		Instructor dispatching course	GCCPO Patent Examiner Course
			Malaysian Patent Examiner Course

Source: Author (Analysis based on the IP Training contents of IIPTI).

Appendix 3

<Appendix Table 2-3> Course of Study for General Public at National IP Education Portal

Scope	Phase	Program
Creation	Phase 1	Introduction to Intellectual Property
		Introduction to Intellectual Property (Patent Law)
		Introduction to Intellectual Property (Trademark Law)
		Introduction to Intellectual Property (Industrial Design Protection Act)
		Introduction to Intellectual Property (Copyright Law)
		Introduction to Natural Science
		Introduction to Natural Science (Understanding Science)
		Introduction to Natural Science (Earth Sciences)
		Introduction to Natural Science (Physics)
		Introduction to Natural Science (Chemistry)
		Introduction to Natural Science (Biology)
		Technology Innovation using TRIZ
		Completion of Invention Report and Review of Specification
		Copyright Overview
	Phase 2	Advanced Invention Education Theory
		Patent Specification Practice
		Patent Specification Practice (Completion of Patent Specification)
		Patent Specification Practice (Electrical, Electronics, Chemical Specification)
		Practice of writing patent specification (Writing patent specification)
Right Claims	Phase 1	Patent Law
		Patent Law (General Rules and Patent Requirements)
		Patent Law (Application Procedure and System)
		Patent Law (Effectiveness of patent rights and scope of protection)
		Patent Law (Licensing System and Infringement Requirements)
		Patent Law (Litigation and PCT)
		Industrial Design Protection Act

<Appendix Table 2-3> Continued

Scope	Phase	Program
		Industrial Design Protection Act (Overview and Design Establishment Requirement)
		Industrial Design Protection Act (Application Procedure and Registration Requirements)
		Industrial Design Protection Act (Design-specific System)
		Industrial Design Protection Act (Effect of Design Rights and Disputes)
		Industrial Design Protection Act (Hague International Application System)
		Intellectual Property that SME CEOs Should Know
		How to Write the Specifications
		Industrial Design Protection Act
		Trademark Law
		Trademark Law (Registration Requirements)
		Trademark Law (Application Procedure)
		Trademark Act (Trademark rights and infringement)
		Trademark Law (Judgment System)
		Trademark law (international Application under the Madrid Protocol)
		Phase 2
	Copyright Act (Establishment of Works and Classification of Authors)	
	Copyright Act (Copyright Effect and Restriction)	
	Copyright Act (Neighboring Rights and Copyright Law Exception)	
	Copyright Act (Copyright Infringement and Relief)	
	Copyright Law (New Case Studies of Copyright)	
	CIIP - Patent Law English	
	Practical Statement of Opinion · Preparation of Amendment	
	Points to Note when Applying for Overseas Patents	
	Practice of English Statements	
	Revision US Patent Law Completion	
IP Protection on your own		
Protection	Phase 1	Intellectual Property Litigation Practice (General Rules of Trademark Refereeing)
		Intellectual Property Litigation Practice (Trademark Registration Cancellation)
		Intellectual Property Litigation Practice (Summary of Judgment Process)
		Intellectual Property Litigation Practice (Understanding to Exercise Intellectual Property Rights)

<Appendix Table 2-3> Continued

Scope	Phase	Program
		Intellectual Property Litigation Practice (Litigation Structure and Procedures)
		Intellectual Property Litigation Practice (Civil Relief for Infringement)
		Intellectual Property Litigation Practice (Criminal Relief for Rights Infringement)
		Intellectual Property Judgment Litigation Practice (Legal Cases and Case Study on IPR Infringement)
		Intellectual Property Litigation Practice (Protection of Other Intellectual Property Rights - Copyright, Unfair Competition Prevention Act)
		Intellectual Property Litigation Practice (Case Study of Copyright and Unfair Competition Prevention Act)
		Introduction to Law
		Introduction to Law (Constitution)
		Introduction to Law (Civil Law)
		Introduction to Law (Civil Procedure Act)
		Introduction to Law (Criminal Law)
		Introduction to Law (Criminal Procedure Law)
		Introduction to Law (Commercial Law)
		Introduction to Law (Social Law)
		Introduction to Law (Administrative Law)
		Introduction to Law (Fundamental Theory of Law)
		Interpretation of Patent Infringement and Scope of Claims
		Estimation of Damages for Infringement of Patent (1 st class, onsite lecture)
		Why register trademark?
		Mr. Originals Trade Secret Story
		Strategies for Responding to IPR Disputes in Small and Medium Enterprises by Case Studies
		Trade Secret Protection Training
		Internet and Intellectual Property Law
		Internet and Intellectual Property Law (Intellectual Property Issues)
		Internet and Intellectual Property Law (Copyright)
		Internet and Intellectual Property Law (Trademark)
		Internet and Intellectual Property Law (Patent)
		Internet and Intellectual Property Law (Design)
		Intellectual Property Litigation Practice

<Appendix Table 2-3> Continued

Scope	Phase	Program
		Intellectual Property Litigation Practice (Introduction to Intellectual Property Litigation Practice)
		Intellectual Property Litigation Practice (General Patent Litigation)
		Intellectual Property Litigation Practice (Appeal Against Decision of Refusal)
		Intellectual Property Litigation Practice(Invalidation Trial of Registration and Appeal)
		Intellectual Property Litigation Practice(Trial for Correction and Appeal)
		Intellectual Property Litigation Practice (Case Studies of Appeal Against Decision of Refusal and Invalidation Trials)
		Intellectual Property Litigation Practice (Case Studies of Scope of Patent Trials)
		Intellectual Property Litigation Practice (Other Patent Trials)
		Intellectual Property Litigation Practice (General Industrial Design Trials)
		Phase 2
Utilization	Phase 1	Technology Transfer and Commercialization Strategy
		Successful Patent Pool Formation and Management
		R&D with IP
		Case Studies and Use of Technology Valuation
		Case Studies of Trademark Disputes and Trials
		Case Studies of Copyright Disputes and Countermeasures
		Technology Finance and IP Finance that Empower Corporate Loans
		Patent Information Survey and Analysis
		Investigation and analysis of patent information (Investigation of Information for Patent Invalidation and Patent Infringement Cases)
		Patent Information Survey and Analysis (Patent Map Practice)
	Patent Information Survey and Analysis (Overview of Patent Information Survey)	
	Phase 2	Advanced Standard Essential Patent
Managemen	Phase 1	Design Management and Brand Strategy (Brand Strategy Overview)
		Design Management and Brand Strategy (Marketing Basics)
		Design Management and Brand Strategy (Practice of Brand Strategy)
		Design Management and Brand Strategy (Marketing Strategy)
		Design Management and Brand Strategy (Brand Leverage)
		Design Management and Brand Strategy (Construction of Brand Net Capital Measurement and Management System)

<Appendix Table 2-3> Continued

Scope	Phase	Program
		Design Management and Brand Strategy (Design and Execution of Brand Architecture Strategy)
		Design Management and Brand Strategy (Brand Extension)
		Design Management and Brand Strategy (Brand Management Strategy and Trademark Law)
		Design Management and Brand Strategy (Importance of Design Environment Change and Design Management)
		Design Management and Brand Strategy (Introduction of Law Related to Design)
		Design Management and Brand Strategy (Overview of Design Management)
		Design Management and Brand Strategy (Practice of Design Management)
		Design Management and Brand Strategy (Conduct and Evaluation for Design)
		Design Management and Brand Strategy (The Age of Design Management)
		IP Panorama - Global IP Management Course
		Employee invention, let's know only this!
		IP Product Innovation Methodology
		Understanding Technology Transfer and Licensing
		Understanding Technology Transfer and Licensing (Overview of Technology Transfer)
		Understanding Technology Transfer and Licensing (Technology Transfer Contract Practice)
		Understanding Technology Transfer and Licensing (Understanding Copyright, Trademark, Design License)
	Design Management and Brand Strategy	
	Phase 2	Patent Management Strategies of Companies in the Changing Business Environment of IP (First Cycle, On-site Lecture)
		R&D and Intellectual Property (R&D and Rights Relationship)
		Technology Management
		Technology Management (Technology Environment and Management)
		Technology Management (Technology Management and Patent)
		Technology Management (Utilization of Information and Communication)
		Technology Management (Technology Innovation and Strategy)
		Technology Management (Venture Start-up Case Studies)
		Prior Art Search Know-How
Intellectual Property Management and Patent Strategy		
European Patent Information - The Ins and Outs of European IP Information		

<Appendix Table 2-3> Continued

Scope	Phase	Program
		Intellectual Property Management
		Intellectual Property Rights Management (Necessity of Intellectual Property Rights Management)
		Intellectual Property Rights Management (Patent Acquisition Strategy)
		Intellectual Property Rights Management (Patent Infringement Response Strategy)
		Intellectual Property Rights Management (Understanding of Standard Essential Patent)
		Intellectual Property Rights Management (Understanding of Technology Valuation)
		Intellectual Property Rights Management (Technology Transfer and Commercialization Strategy)
		R&D and Intellectual Property
		R&D and Intellectual Property (Intellectual Property Protection System)
		R&D and Intellectual Property (Employee Invention)
		R&D and Intellectual Property (Invention and Patent System)
		R&D and Intellectual Property (Research Achievements and Patent Utilization)

Source: Author (Analysis based on the IP training contents of National IP Education Portal).

03

CHAPTER

Enhancing Regional Mechanisms to Promote Asset Creation and Commercialization: Consulting on IP Creation & Utilization Policies for Technology Commercialization of SMEs

Jinseok Park (Darae Law & IP Group)
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1. Introduction
2. IP Policies in ASEAN Member States
3. Korea's Experience with IP Creation and Utilization
4. Conclusion and Policy Recommendations

Keywords

Intellectual Property (IP) creation, Intellectual Property (IP) utilization, Small and Medium Enterprises (SMEs), support policies, Intellectual Property (IP) infrastructure

Enhancing Regional Mechanisms to Promote Asset Creation and Commercialization: Consulting on IP Creation & Utilization Policies for Technology Commercialization of SMEs

Jinseok Park (Darae Law & IP Group)

Mitchel Chua (LIXIL Water Technology)

Summary

Within the ASEAN region, SMEs contribute 66.3% of employment (based on the median) and 42.2% of gross value added. Generally, along with SMEs' technological capability, IP creation and utilization promote technological innovation, stimulate market competition, and ultimately give positive impact on national economic development. To achieve this, SMEs in ASEAN region need to create and utilize their IP asset. But currently, ASEAN Member States (AMS) face problems, including the lack of understanding on IP system and IP management strategy, long consumptions of time, costly IPR acquisition process, and limitations of IP experts. These have led relatively less IP creation and utilization activities in AMS.

The experiences of economic development through enhanced IP capacity in Korea will solve the mentioned problems and help strengthen IP infrastructure of AMS. Implementing and sharing successful IP creation and utilization policies, including assisting domestic and overseas IP creation and utilization, customizing patent map analysis, dispatching IP experts, and supporting the production of invention prototypes, can provide contributions for this purpose. Furthermore, "APEC IP Business Guidebook" published in 2017 categorizes policies and programs of various IP creation and utilization fields implemented by KIPO and Korea Invention Promotion Association (KIPA) by level of difficulty. The guidebook can also be referred to when creating IP policies and programs for AMS.

From IP creation of SMEs to the utilization phase, the government's support policies are implemented in various forms. In general, steps are needed, such as raising awareness of IP, establishing and disseminating IP information, and establishing relevant examination system. Most AMS have already established national IP strategies or are in the process of preparing them, but its contents and levels are different, and most member states are faced with not having enough budget and expertise as well as having low public awareness.

By analyzing the current status of ASEAN SMEs and creation and utilization policies in AMS, this report denotes the diversification in the role of the IP Offices beyond filing IP applications and examination. Consequently, this report suggests the following policy measures: 1) In order to create and utilize more IP for ASEAN SMEs, it is necessary to cooperate with relevant ministries like Ministry of Industry, Ministry of Science and Technology, Ministry of SMEs, and other affiliated government departments; 2) More importantly, it is crucial to reduce the examination period by revising the law, expanding the recruitment of examiners, and strengthening the training of examiners; 3) In order to create and utilize IP effectively, it is desirable to harmonize the examination criteria among AMS by preparing common guidelines on the examination regarding patentability that are different in all countries; 4) When establishing the foundations of IP creation, it is essential a) to construct a patent search database for researching prior technology information, b) to operate IP library for utilizing on-line patent literature, and c) to construct IT system for computerization of patent application and examination processes; 5) When dispatching IP experts get stable, it will be necessary to extend the support work of IP experts to the TLO-wide tasks rather than just the application stage; 6) Considering that AMS need to work on its regional IP development as well as balanced development by country, establishing regional IP center is important. Another possible way to enhance IP creation and utilization of SMEs is to expand the role of TISC in WIPO in more various ways; and 7) Lastly, applicable policies within AMS are necessary that can develop IP human resource for IP valuation, customized patent maps for customers, and IP technical dictionary for the general public.

1. Introduction

1.1. Background

1.1.1. Context and Background

The ASEAN region is home to many small and medium-sized enterprises (SMEs), and although they play a very important role in the local employment market, they only account for 23% to 58% of GDP and 10% to 30% of exports. The main reason for this is that ASEAN's growth has been mainly focused on foreign direct investment (FDI), but local SMEs have not acted as suppliers to multinational corporations due to the region's low development and technological levels.

The growth of technological capability of SMEs is directly linked to IP creation and utilization. The development of patented technology generally promotes technological innova-

tion, spreads knowledge, stimulates market competition, and contributes to the production of added value to a country. Ultimately, it serves to have a positive influence on the economic development of a country.

While the number of IP applications filed by AMS is increasing, the number of IP applications is still considerably less than advanced IP countries including Korea,¹ and the ratio of non-resident applicants to resident applicants is overwhelmingly higher.² The number of patents filed by SMEs in Indonesia was half the number of patents filed by large companies during 2017-2018, and the gap widens more if PCT applications are taken into consideration.³

These obstacles are difficult for AMS because there is a lack of understanding of IP policies and strategies in IP creation and utilization of SMEs. It takes considerable time and money to secure rights (filing, translation, and etc.), and there is not enough IP experts. In order to solve these issues and strengthen the IP capacity of companies, it is imperative to share IP creation, utilization, and commercialization policies and experiences with the AMS policy makers.

1.1.2. Research Methods

By analyzing the overall status of SMEs in ASEAN countries, it is important to understand the status of policies related to IP creation and utilization in each member state. Solutions can be made based on current status and demand by 1) analyzing the opinions made by policy makers converged through local seminars and surveys, 2) referring to Korea's experience of creating and implementing policies and programs in IP creation and utilization, and 3) referring to the "Guidebook for SME's IP Business Cycle"⁴ for advice on policies regarding IP creation and utilization.

1 WIPO computed the number of patent applications in Korea for 2017, and there was a total of 204,775 applications, and the following ranks ASEAN countries in the number of applications: Singapore (10,930 applications), Indonesia (9,303 applications), Thailand (7,865 applications), and Malaysia (7,072 applications). Myanmar and Cambodia were not included. ("World Intellectual Property Indicators 2018," WIPO).

2 Strengthening IP tasks: Refer to "Analysis to Present Conditions of IP Infrastructure among ASEAN Countries."

3 PCT applications in 2017 were 6,515 applications for major companies and 15 applications for SMEs, and in 2018, the numbers of applications were 6,977 applications and 6 applications, respectively. ("Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21).

4 "Guidebook for SMEs' IP Business Cycle," March 2017, APEC. This was a project proposed during the 44th APEC Intellectual Property Expert Group (IPEG), and this is a collaborative project that was carried forward by matching APEC's business fund and Korean Intellectual Property Office's budget. This guidebook researched and analyzed IP creation and utilization support policies in Korea and IP advanced countries, introducing programs that can be applied towards APEC member's present situation. This allows the increase of IP creation, and it sets the goal of supporting the business's growth using IP. (<https://www.apec.org/Publications/2017/03/Guidebook-for-SMEs-IPBusiness-Cycle>, accessed on June 04, 2019).

1.2. Organization of Research

This chapter first examines the overall status of SMEs and IP creation and utilization policies in AMS, and then, Korea's IP creation and utilization policy experiences will be shared. Policy proposals will then be made on IP creation and utilization in ASEAN SMEs.

In Part 2, various indicators of SMEs in AMS were examined taking the current status of AMS into consideration. Furthermore, IP creation and utilization policies were analyzed that have been implemented by each member state. More specifically, IP policies and programs shared during seminars regarding current IP policies and programs of each country and questionnaires that were gathered from policy makers of each country were analyzed. With these observations, common problems were observed in order to determine their implications.

In Part 3, Korea's policies and success stories from the experiences in IP creation and utilization are examined, and suggestions are drawn for AMS. Since IP infrastructure and IP awareness among the general public are comparably low within AMS, policies are investigated in terms of financial support that can elevate IP creation and utilization fundamentally and IP expert's assistance.

Finally, Part 4 summarizes the policy proposals and presents the IP creation and utilization policies that are most fitting for AMS.

2. IP Policies in ASEAN Member States

2.1. Current Status of SMEs in ASEAN Member States

2.1.1. Overview

In most countries, SMEs account for about 90% of the economy, playing a very crucial role in economic development and growth of the country. As stated earlier, SMEs are responsible for much of the employment and gross value added in the region.⁵

In spite of lower productivity and growth rate than bigger enterprises, SMEs play a pivotal role in AMS. For example, in Vietnam, around 98% of all enterprises are SMEs with

5 "Boosting competitiveness and inclusive growth", SME Policy Index, ASEAN 2018, p.27.

approximately 500,000 enterprises as of 2017, accounting for 77% of the total employment market and 45% of GDP.⁶

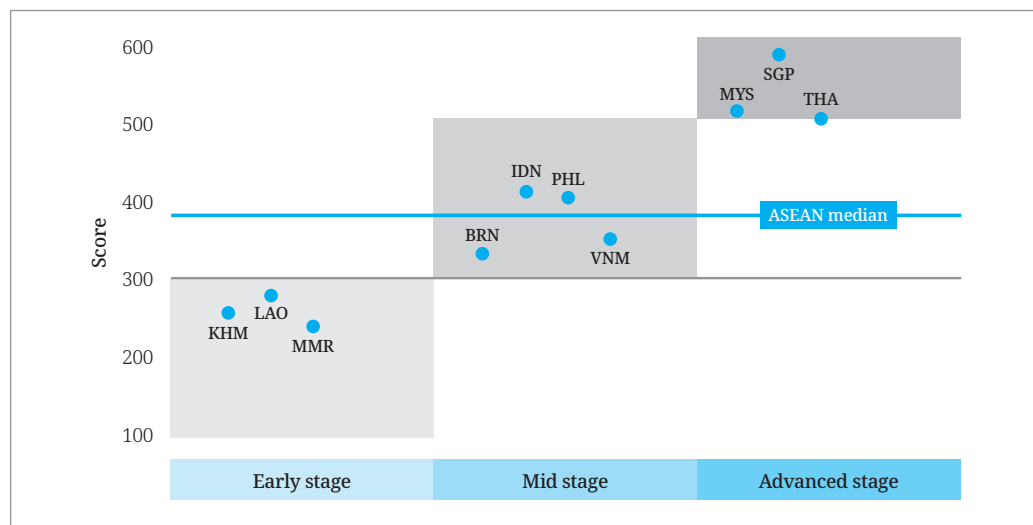
Discussions on SMEs development among AMS began in 1995, and during the 2000s, thorough strategies for SME growth have emerged. The ASEAN SME Agencies Working Group (SMEWG) has established the “Strategic Action Plan for ASEAN SME Development 2010-2015” in 2009, stating, “By 2015, ASEAN SMEs will become world-class enterprises and integrate into the supply chain in the region or the world.” Since 2016, AMEWG has extended to the ASEAN Coordination Committee on MSMEs (MSMECC).⁷

2.1.2. Analysis

According to the “ASEAN SME Policy Index 2018,” there have been some variations and gaps among AMS in policy frameworks. Given that SMEs performance in innovation has close relationship with national policies, it is recommended to look at different environments for making and implementing policy frameworks in each AMS.⁸

The report classifies each AMS into 3 groups in terms of productivity, technology and innovation.

[Figure 3-1] Weighted Scores for Dimension 1: Productivity, Technology and Innovation



Source: SME Policy Index, ASEAN 2018 (OECD/ERIA).

6 “Policy Seminar and In-depth Research of the KSP Project,” ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19~21.

7 “Interim Reporting and Policy Practitioners’ Seminar of the KSP Project,” KIPA, Seoul, Korea, 2019.05. (Cited from Presentation Material of Field Specialist).

8 “Boosting competitiveness and inclusive growth”, SME Policy Index, ASEAN 2018, p.65-66.

For example, Cambodia, Lao PDR and Myanmar are classified as early-stage countries that have just started the regional economic convergence. In addition, Brunei Darussalam, Indonesia, the Philippines and Vietnam have already created solid policy frameworks. These member states are grouped as mid-stage countries where the countries have implemented its policies. Lastly, the report indicates that Malaysia, Singapore and Thailand are advanced-stage countries that developed solid policy frameworks and typically have a set of institutions in place provide implementations.⁹

The 4th Industrial Revolution has become a very important issue in ASEAN, and there is a strong will to further consolidate the unity of AMS and improve their global competitiveness beyond the existing economic community.¹⁰ In particular, there are more internet and smart phone users in AMS now, and it is younger consumers familiar with the digital economy that lead the growth of the market. This potential for economic growth has attracted a lot of attention from all over the world. With such changes, the role of SMEs will become more important than before for ASEAN's economic activities in the 4th Industrial Revolution. IP will be the central factor to this transformation as it will strengthen the competitiveness of SMEs and attract foreign direct investment.

In fact, the AMS already recognized IPR as the key part of SME development and have established and implemented related policies. In May 2017, Singapore announced, "Update to the Intellectual Property Hub Master Plan" and named "IP creation," "IP protection," and "IP commercialization" as three key challenges for SMEs.¹¹ Thailand has established and implemented the "20-Year IP Roadmap" to enhance competitiveness on its domestic companies and products. This focuses on innovation-based IP creation, timely IP protection, and IP commercialization for creating value.

2.2. IP Creation and Utilization Policies for SMEs in AMS

2.2.1. Overview

While SMEs act as the backbone of AMS' national economy, most SMEs lack the opportunity to create patents due to its poor human resources and financial conditions for technology development. As a result, R&D opportunities closely related to creating patents have been provided more to universities and public research institutes rather than SMEs.

9 "Boosting Competitiveness and Inclusive Growth", SME Policy Index, ASEAN 2018, p 66.

10 "ASEAN made Alliance to Fourth Industrial Revolution Putting Quantum Jump in Economy," Mael Business News Korea, 2018.9.12. (<https://www.mk.co.kr/news/economy/view/2018/09/576276/>, accessed on June 04, 2019).

11 "Interim Reporting and Policy Practitioners' Seminar of the KSP Project," KIPA, Seoul, Korea, 2019.05 (Cited from Presentation Material of Field Specialist).

Consequently, the type of IP acquired by ASEAN SMEs tends to focus on trademarks and designs rather than patents, and there is more interest in the protection of geographical indications.

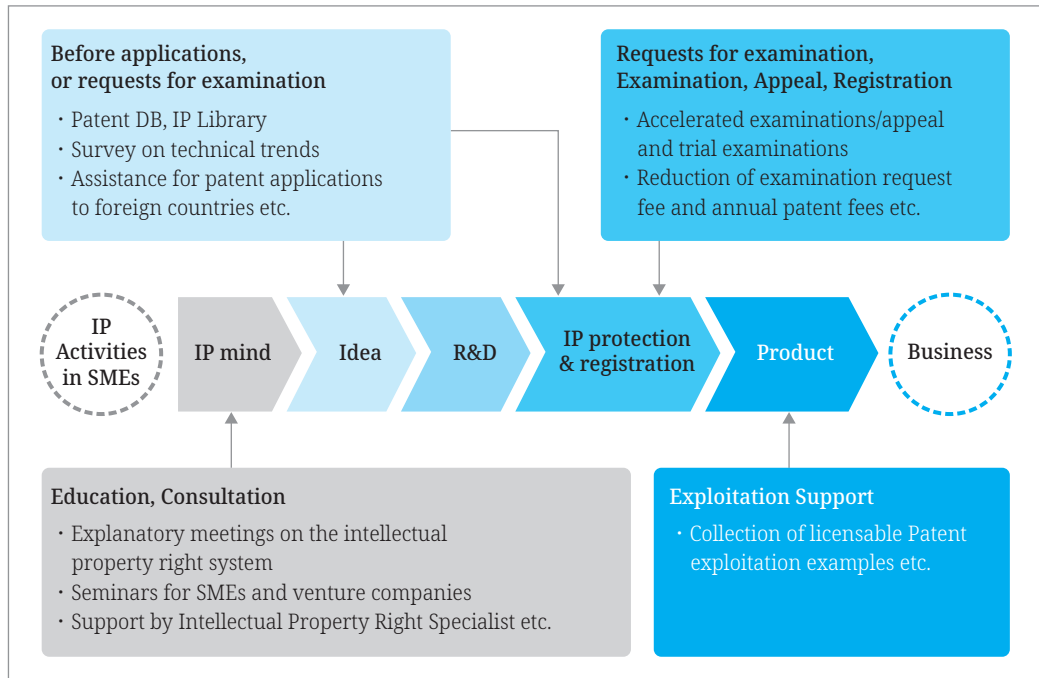
From IP creation to IP utilization stage, support policies for SMEs have been implemented in various forms within AMS.

First, as the initial stage for IP creation, IP offices offer a variety of educational programs to raise public awareness of IP, by providing seminars and IP consultation for SMEs and individual inventors. This allows potential inventors or technology developers to be aware of the value and to be interested in IP applications to secure their IP rights that include patents, trademarks, and designs.

Next, as the preparatory step for IP creation, the IP offices establish patent prior art information database to allow patent applicants and companies to access patent information, and to build an IP library equipped with IP-related books and journals. This allows potential applicants to search for patent information or to search related technical journals using online DB. Through this process, the applicant's idea in its initial stage is specified to become a full-fledged patent application. Furthermore, at this stage, patent information search enables the applicant to revise the direction of repetitive R&D, and to strengthen the inventive step of the patent application, thereby overcoming any possible rejections.

Subsequently, the next step is the examination according to the full-scale patent application. The applicant, in the process of filing the patent application for registration, may request for preferential examination in order to speed up the process. If the same application is filed in multiple countries, the first IPO may share the examination results with the second and third patent offices, shortening the review period using “global examination cooperative projects” such as PPH and ASPEC. Moreover, if the applicant is an individual or a small business, or if there is other special grounds for the reduction, patent application fee is reduced.

[Figure 3-2] Comprehensive Support Measures for SMEs



Source: "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21.

In order to enhance competitiveness of SMEs in ASEAN, using IP systems such as IP creation and utilization is one of the most important factors. Therefore, the following section examines the role of IPOs in creating and utilizing IP, and it looks to find a systematic cooperative relationship between SMEs and the industries as well as relevant governmental ministries.

2.2.2. Analysis

2.2.2.1. Policies and Activities of IP Creation and Utilization in AMS

Most AMS have already established national IP strategies (Thailand, the Philippines, and Myanmar) or have been in the process of making it (Lao PDR and Cambodia). The following sections examine the present conditions of policies and activities of IP creation and utilization in AMS.

A. The Philippines

The National IP Strategy (NIPS) was established by the government in 2017 to improve the innovative potential of IP-related industries and to increase the profits of SMEs through

the development of creativity.¹² The Intellectual Property Office of the Philippines (IPOP HL) operates the Innovation and Technology Support Offices (ITSO)¹³ and has built a network with 85 universities and research centers. These centers are directly managed by IPOP HL. After selecting and training 4 staff members, including 2 with an academic degree, they provide support on working for patent specification drafting and prior art searching. Additionally, the Philippines operate Mind2Market,¹⁴ IP Depot,¹⁵ and Inventor Assistance Program (IAP).¹⁶ If certain criteria are met, IPOP HL also provides the “Juana Make a Mark” program, which reduces 50-100% of the application fee in trademark for SMEs.

The Philippines has enacted the Technology Transfer Law (Republic Act 10055) in order to revitalize technology commercialization. This law represents ownership of created technology to the developer using government funding, and it tries to promote technology commercialization. Through this, it strives to provide incentives for SMEs and universities.

IPOP HL operates “IP Depot,”¹⁷ IP Market for IPR holders to commercialize IP assets, and IPR owners register and promote their rights for free here.¹⁸

B. Thailand

In Thailand, where the government committee is led by the Prime Minister, the Department of Intellectual Property (DIP) made IP policy measures, establishing its 20-year IP Roadmap in 2016 that will be implemented until 2036.

12 This is described in the main page of the Philippines’ Intellectual Property Office website. (<https://www.ipophil.gov.ph/releases/2014-09-22-06-26-21/597-ipophil-s-national-intellectual-property-strategy-nips-a-whole-of-government-push-for-development-through-creativity-and-innovation>).

13 In 2017, ITSO received 1,034 patent applications (including new device and design), and this is a 71% increase from the previous year. (<http://info.ipophil.gov.ph/itso/>).

14 This program aims to provide comprehensive IP service of the Philippines’ government toward researchers, developers, and mid-sized firms in the IP creation, protection and commercialization process, thereby creating synergies in the IP market. (“Policy Seminar and In-depth Research of the KSP Project,” ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19–21).

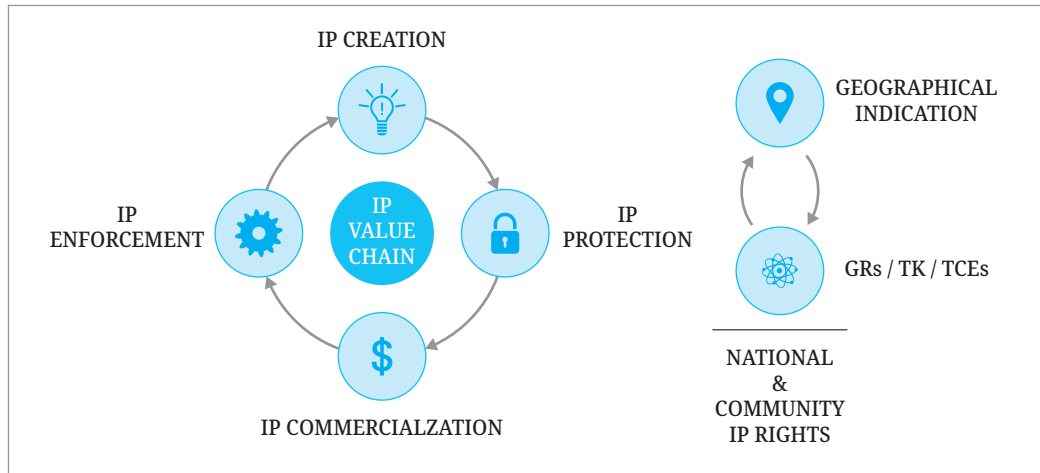
15 Online platform of the Philippines’ Intellectual Property Office connects IP holder and the industry effectively as it utilizes registered IP and promotes industries and companies that want to commercialize. (Ibid).

16 This system is designed as a joint initiative from WIPO and WEF, and it supports on finding specialists like patent attorney who is commissioned by matching inventors and small companies from developing countries that have limited resources. It began operation in the Philippines from March 2016, and Colombia and Morocco are currently having demonstrative operations. (<https://www.ipophil.gov.ph/88-services/patents/491-inventor-assistance-program>).

17 <https://ipophil.wixsite.com/ip-depot-2017/inventions>.

18 “Interim Reporting and Policy Practitioners’ Seminar of the KSP Project,” KIPA, Seoul, Korea, 2019.05 (Cited from Presentation Material of Field Specialist).

[Figure 3-3] Thailand's 20-Year IP Roadmap (2016-2036)



Source: "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21.

The committee will not only encourage IP creation, IP protection and IP commercialization through strategies such as developing a timely, convenient and internationally standardized IPR protection system, and spreading IP knowledge and actively supporting IP commercialization, but it will also make efforts to strengthen the competitiveness of Thai products and services. The strategies for national IP in these AMS are still in the early stages of implementation, and this is why it must be accompanied by reviewing comprehensive measures in order to enhance its effectiveness.

Throughout 2018, DIP set up several IP consulting services, including the Annual IP Fair to match IP buyers and sellers to SMEs and entrepreneurs, IP Mart,¹⁹ and on-site IP consulting.

Besides this, DIP launched the Mobile Application e-Library in 2017. The e-Library provides IP-related contents on relevant laws, books, magazines, and videos so that the public can access different types of IP knowledge.

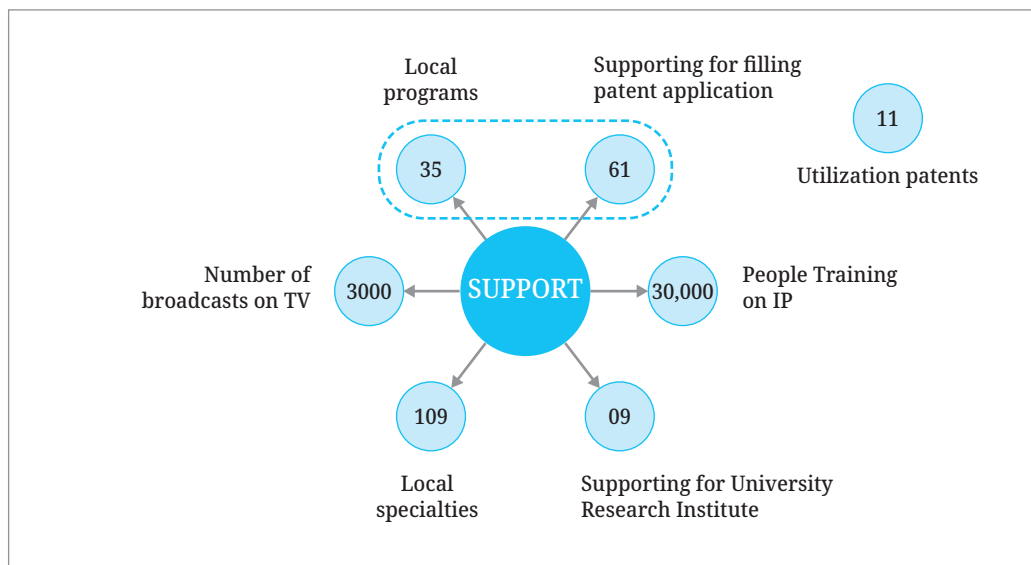
C. Vietnam

In Vietnam, "Science, Technology and Innovation Law" was enacted in 2018, and 30% of the profits that were earned from the uses in the transfer of IP rights and transfer of capitals in scientific research and technological development involved with the government were given to the inventors.²⁰

19 However, the site (<http://www.thaiipmart.com/home>) only allows display and exhibition of Thai products.

20 Based on Vietnam's "Science, Technology and Innovation Law," Article 43.

[Figure 3-4] Vietnam's CT68 Program (2011-2015)



Source: "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21.

Furthermore, along with IPO, other SME-related government departments must cooperate to develop IP business activities. Among them, the "CT68" program continues to provide governmental support for IP creation, protection, and commercialization, continuously supporting patent and utility model application and IP education in universities and research institutes, fostering experts, and providing TV commercials for IP creation, protection and commercialization.

D. Malaysia

In Malaysia, the Technology Innovation Support Center (TISC)²¹ program supported by WIPO was introduced in October 2015, serving to support technological innovation and economic growth, thereby strengthening the nation's capacity through effective use of information and knowledge. Malaysia has signed MOU with TISC members from 2016 to 2018. It provides remote education (basic and advanced courses), and members participate in patent application and analysis workshops. It proceeds with other various TISC projects (under the international level, ASEAN level, etc.).²²

21 WIPO attempts to establish TISC that targets on developing countries since 2009 in order to settle the gap of intellectual property between developing and advanced countries and to promote innovation in developing countries. Services are provided through TISC, including approach and usage education regarding patent information, patent application and commercialization support, patent search and analysis service support, education in IP awareness that were enhanced in developing countries, making approaches on patent and non-patent database, constructing network, and exchanging experiences.

22 "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21.

As for utilizing IP, the Intellectual Property Corporation of Malaysia (MyIPO) operates IPR MARKET²³ to connect individuals, investors, and companies in IPR commercialization and trading, and provides information of right holders, buyers, and updates.²⁴

E. Myanmar

Myanmar has formulated NIPS (National IP Strategy) at the government level and it is under the process of adoption to get approval by the government. Science, Technology and Innovation Law was enacted on June 25, 2018. IP department has already signed MoU with the Yangon University, Yangon Technological University, Mandalay Technological University, Yangon University of Medicine (1) and Yezin Agriculture University and Research Institutions, Department of Research and Innovation (DRI) on April 26, 2019.

F. Others

Moreover, WIPO is promoting the Enabling Intellectual Property Environment (EIE) project²⁵ in a number of countries including the Philippines, Thailand, Malaysia, Vietnam, and Indonesia through the University Technology Innovation Support Center and WIPO's TISC network. It supported on constructing IP elements of regional innovation ecosystem using university's technological innovation support network and WIPO's TISC network. The project's goal is to strengthen the competence of technological development and commercialization.

2.2.2.2. Analysis of Survey Results

A. Overview

According to the survey conducted by the AMS's IP policy makers,²⁶ most of the countries marked "Raising Awareness of IP" as the task to be solved in order to strengthen IP competitiveness of SMEs. Additionally, "Insufficient Professional Human Resources and Budget Support," "IP Education," and "IP Utilization" received high marks as well. Some AMS have implemented mid- to long-term IP government policies to promote SMEs (like Thailand's "20 Years IP Roadmap" and Singapore's "Intellectual Property Hub Master Plan"), but other countries like Lao PDR, Malaysia and Myanmar have not. However, Myanmar is actively promoting the use of IP by responding to the laws related to technology commercialization

23 <http://iprmarketplace.myipo.gov.my/>.

24 "Interim Reporting and Policy Practitioners' Seminar of the KSP Project," KIPA, Seoul, Korea, 2019.05 (Cited from Presentation Material of Field Specialist).

25 https://www.wipo.int/edocs/mdocs/aspac/en/wipo_ip_osa_17/wipo_ip_osa_17_t2.pdf.

26 Total of seven countries gave responses (Lao PDR, Malaysia, Myanmar, Indonesia, Cambodia, and Thailand).

(“Science, Technology and Innovation Law,” 2018). The following sections include detailed descriptions of responses made by AMS.

B. Detailed Analysis

1) Present Conditions to Policy Management Related to IP Creation

Regarding IP creation, most countries that responded indicated on operating related policies, such as IP funds, Enabling Intellectual Property Environment (EIE) program (Malaysia), IP’s Day and IP Training program (Thailand). In terms of IP creation support policies, Thailand, Indonesia, Cambodia, and Singapore implemented different support policies. However, it was found that Lao PDR did not implement separate support policies.

The most commonly implemented policies were on the reduction of application costs (Myanmar, Singapore, Indonesia, Cambodia and Thailand), while others included compensating employee invention (Indonesia, Cambodia, Thailand) and dispatching patent management specialists (Singapore, Cambodia, Thailand).

<Table 3-1> Policy Management Related to IP Creation in AMS

	Laos	Malaysia	Myanmar	Indonesia	Cambodia	Thailand	Singapore
Application Fee Reduction and Exemption			0	0	0	0	0
Public Patent Attorney Project		0					
Employee Inventor Compensation Project				0	0	0	
Supporting Prior Art Search and Report				0		0	
Supporting the Acquisition of IP Rights					0	0	
Patent Map Analysis				0			0
Dispatching a Patent Management Specialist					0	0	0

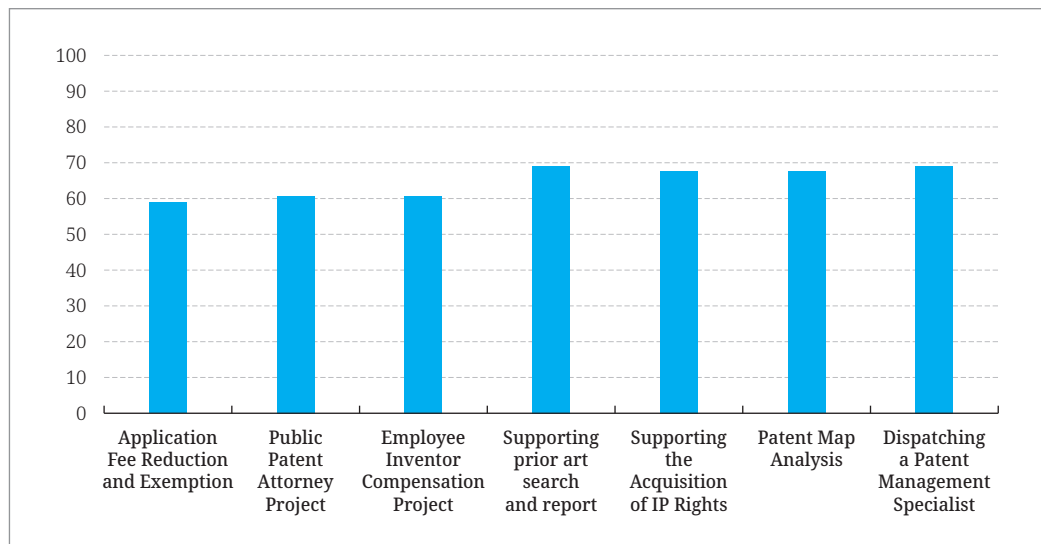
Source: Author.

With the exception of Cambodia, reporting that there were only limited consulting (IP related information) and Lao PDR with no supportive policy, most AMS reported that some form of financial support and human resources support (expert consulting) were provided together.

The countries that reported positively on the aforementioned supporting policies pointed out that the validity of government policy, sufficient budget, and abundance of experts in related fields were the reasons for their success. However, the issues that need to be solved in order to implement IP creation policy also included lack of government policy, funds, and experts. In order to promote IP creation and utilization in AMS, consistent policies must be established and implemented.

AMS selected “Supporting Prior Art Search and Report,” “Dispatching a Patent Management Specialist,” and “Patent Map Analysis” as the most important IP creation policies, whereas “Application Fee Reduction and Exemption” relatively had less importance.

[Figure 3-5] Level of Importance for Necessary Policies and Programs for IP Creation



Note: Among 11 people's response to the survey (7 countries), value was made on 1 to 7 scale regarding the importance of policies needed for IP creation.

Source: Author.

2) Policy Management Related to IP Utilization

Next, in response to IP utilization, the AMS delegates reported that the most widely practiced IP utilization policy was IP market, followed by IP transaction consulting. However, there were no marks regarding the practice on the invention of the preferential purchase

support policies.

Malaysia (IP-Market, invention value assessment, IP valuation support, and IP financing through IP valuation), Thailand (IP prototype production, IP-Market, patent transaction expert, and IP transaction consulting), and Singapore (patent management, IP-Market, patent transaction experts, and IP financing through IP valuation) responded that they have implemented various IP utilization policies and programs. Lao PDR and Myanmar responded as having “None,” whereas Cambodia (IP’s Day, IP Training Program) and Thailand (IP Champion Project, IP Valuation Projects) have several detailed programs.

<Table 3-2> Policy Management Related to IP Utilization in AMS

	Laos	Malaysia	Myanmar	Indonesia	Cambodia	Thailand	Singapore
Manufacturing IP Prototype						0	
Assisting the Preferential Purchase of an Invention							
Managing State-Owned Patent Rights							0
IP Transaction Market		0				0	0
Patent Transaction Specialist						0	0
IP Transaction Consultation Service				0	0	0	
Grading an Invention		0					
Supporting the Valuation of an Invention		0					
IP Finance through IP Valuation		0					0

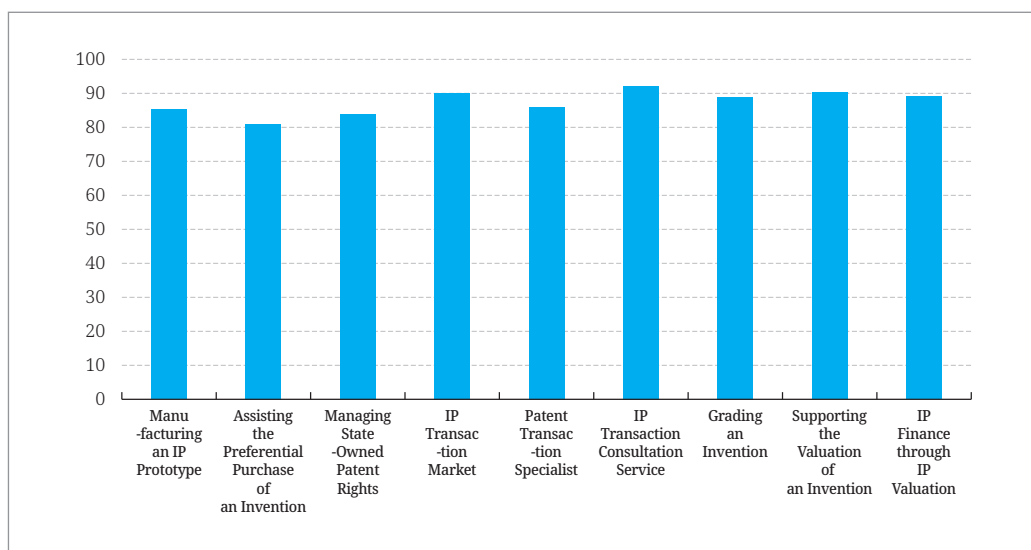
Source: Author.

Sufficient budgets and experts were factors that allowed successful implementations, while insufficient budgets, lack of experts, and the shortage of time to implement projects were the factors that disallowed the enforcement of IP policy. On the other hand, lack of willingness for SMEs to participate and lack of feasibility of government policy were indicated as problems for facilitating the policies.

As for the support programs provided by the government (or will provide in the future), “funding” was mentioned most frequently, and “consulting support” such as expert consulting or IP related information has either been provided or has been expected to be provided.

The most important IP utilization policies and programs selected by AMS were IP transfer consulting, IP market, and invention valuation support. Programs for IP financing through IP valuation and the evaluation of inventions were also considered highly required.

[Figure 3-6] Level of Importance for Needed Policies and Programs for IP Utilization



Note: Among 11 people's response to the survey (7 countries), value was made on 1 to 9 scale regarding the importance of policies needed for IP utilization.

Source: Author.

C. Challenges

1) Low Application Rate by Local Residents

As for the patents, utility model, and design applications of AMS, the average resident/non-resident application ratio of 8 countries is about 13.6% for resident applicants and 86.4% for non-resident applicants, and compared with utility models (resident 85.9%) and design (57.4%) applications, the proportion of resident applications is especially low.

According to DGIP in Indonesia, as of March 2019, 85% of the patents were filed by non-residents, while 90% of the trademark applications being filed were residents. In Thailand, the ratio of patents filed by residents was only 14% in 2016, slightly increasing from 12.6% in 2015, but resident applications remained low.

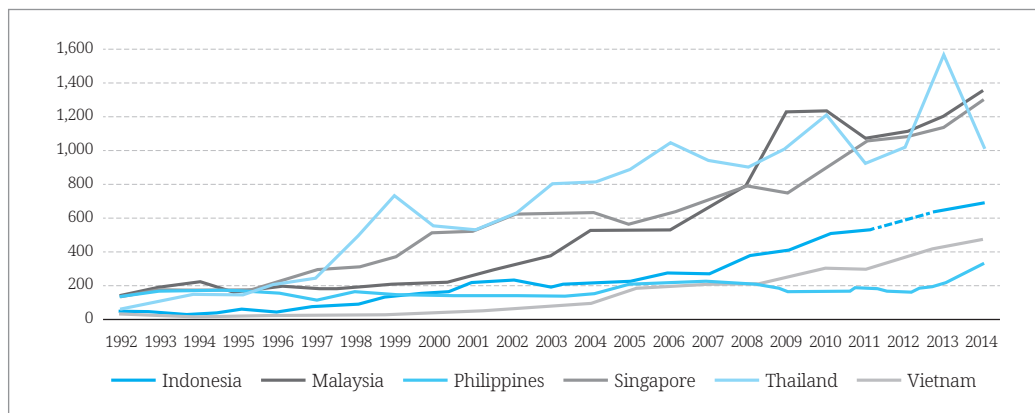
<Table 3-3> IP Applications in AMS (2013)

Country	Invention/Patent Applications			Utility Model			Industrial Designs		
	Resident	Non-res	Sum	Resident	Non-res	Sum	Resident	Non-res	Sum
Brunei	20	15	35	0	4	4	0	11	11
Cambodia	1	74	75	0	6	6	3	27	30
Indonesia	663	6,787	7,450	223	116	349	2,771	1,488	4,259
Malaysia	1,269	6,081	7,350	70	97	167	679	1,347	2,053
Philippines	220	3,065	3,285	743	35	778	887	489	1,376
Singapore	1,143	8,579	9,722	0	62	62	720	1,673	2,393
Thailand	1,572	5,832	7,404	1,561	87	1,648	2,774	1,028	3,802
Vietnam	443	3,552	3,995	226	47	273	1,362	733	2,095
Total	5,331	33,985	39,316	2,823	454	3,287	9,196	6,796	16,019

Source: ASEAN IP Portal.

Among them, the gap is bigger between resident and non-resident patent holders. The percentage of resident patent holders is only 6%. On the other hand, in the case of the utility model where only formal examination is required and the rights can be obtained between 6 to 8 months, right holders who are residents accounted for 92%, showing noticeable difference with the proportion of patent holders.²⁷ In Malaysia, the ratio of applications is about 16.6% for residents as of 2018, showing a similar pattern with other AMS. However, the number of resident patent holders increased steadily from 2014 to 2018.²⁸

[Figure 3-7] Patent Applications from Residents in Main ASEAN Countries



Source: OECD, 2014 (as cited in "ASEAN Economic Community and Intellectual Property Rights: An Assessment of Framework Conditions for Innovation" SEA-EU-NET, 2016).

27 "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19~21.

28 However, in case of Malaysia, the number of local patent applicants has increasing after 2014 until 2018. "Policy Seminar and In-depth Study" (March 19-21, 2019, Jakarta, Indonesia).

In Vietnam, the percentage of resident applications has steadily increased since 2007, but remains at a low level of 11% as of 2017.²⁹ The percentage of resident applicant in AMS that remains low shows that the main reasons come from the following: 1) low level of public awareness on IP; 2) lack of R&D investment scale to induce creation of high quality patents; 3) inadequate technical capacity for patent creation of SMEs; and 4) lengthy patent examination period.

Along with the resident's patent application, invalidation rate should be kept in mind. Given that patent dispute in AMS is not common, official patent invalidation rate has not been well known. Nonetheless, quality issue on the validity of issued patent by IPO in AMS should be discussed at some point in order to make and implement patent policies related to examination.

2) Lack of Experts and Low Number of Examiners

Another problem is the low number of IP experts, including examiners and accredited technical experts, compared to the number of received applications.³⁰ Despite having a 66% increase from 2017 to 2018 in patent applications filed by SMEs in Indonesia, the number of examiners remained limited, making one examiner to review more than 130 cases per year.

3) Others

In some countries, lengthy examination period is a problem. For example, Thailand has amended the Patent Act to shorten the substantive examination period to 3 years or less in order to resolve serious problems of backlog that created the examination period to last almost 9 years in some cases. AMS commonly recognize problems that come from lack of resources, lack of infrastructure such as the computerized examination system, lack of specialized personnel and experience, low public awareness on IP, lack of database in non-patent literature, and poor link between industries and academia.

29 "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19.-21.

30 In order to solve this, the Philippines received funding from APEC and published "2017 IP Valuation Manual."

3. Korea's Experience with IP Creation and Utilization

3.1. Overview

Knowing how SMEs influence the GDP and employment creation in AMS, one of the most effective means to increase the competitiveness of SMEs is to help SMEs effectively create IP, including patents, trademarks, and designs. This will result in SMEs creating high-quality IP under the conditions where efficient IP creation systems are established, and it will utilize the established IP under the process of commercialization and technology transfer. This, in turn, will lead to a virtuous cycle leading to economic development based on IP.

Korea has implemented various IP creation and utilization programs centered on KIPO. Hereinafter, this report will examine some implications that can be referenced in ASEAN countries based on Korea's experience in making and implementing IP policies and programs.

3.2. Policies and Programs for IP Creation

3.2.1. Support for Local and Overseas IPR Fees

SMEs lacking funding face difficulties in acquiring IPRs even though they have developed innovative technologies and have creative ideas. There are cases where companies carry out their businesses without acquiring IPRs, losing most of their market share to rival companies. The Korean IPR fee support program was introduced to support the filing of applications from SMEs that have difficulties in acquiring IP due to lack of funds. It aims to raise public awareness on the necessity of IPR by inducing interest in SMEs.

This program is operated by KIPO and local governments. The central government (KIPO) will form 50:50 matching fund with the local government to support SMEs all throughout the country. In particular, local SMEs that are less accessible and have fewer resources than Seoul metropolitan area can benefit from the program.

<Table 3-4> Information on Supporting IPR (Domestically and Internationally)

Patents	Design	Brand	International Application Fee Support
<ul style="list-style-type: none"> - Patent Map (General) - Promotion Video Production for Patented Technology 	<ul style="list-style-type: none"> - Design Map (General) - Product Design Development - Product Design Mock-up - Package Design Development 	<ul style="list-style-type: none"> - New Brand Development - Renewal Brand Development 	<ul style="list-style-type: none"> - Patent (PCT) - Patent (Individual Countries) - Trademark - Design

Source: Regional Intellectual Property Center (<https://www2.ripc.org/portal/support/s01-01.do>, accessed on June 04, 2019).

The program supports SMEs or individual inventors with patents, utility models, designs, and trademark applications. The potential applicant undergoes pre-consultations at the respective Regional Intellectual Property Centers (RIPCs) and reviews for registration possibility, applicability, business feasibility and its ripple effect perspective. Great ideas will be supported with funding, and each company will be able to apply for 2 technologies. The support package provides consulting provided by expert consultants who reside in the respective RIPCs and up to 70% of the patent attorneys' fees for patent, utility models, design, and trademark applications.

After implementing this program, local SMEs were able to access the IP creation program more easily, and the IP capacity gap between the metropolitan areas and local SMEs gradually decreased. In addition, SMEs benefiting from the domestic IPR support project exceeded the growth rates of all SMEs based on the ratios of IP application, sales, and employment growth.

Nonetheless, given the circumstances of securing appropriate funds and difficulty in locating sufficient sources of funding in AMS, financial assistance for SMEs should focus on seeking relevant sources and reasonable allocation of available funds depending on the need and urgency of beneficiaries.

3.2.2. Patent Map Customized to Users

Sustainable R&D is indispensable for companies to develop competitive new products in terms of technology and price and to create high added value. Setting unconditional R&D development makes it easy to overlap investment and to increase the length of development, and it is easy to hinder the effective performance of R&D.

In this respect, customized patent map is a program most needed in order to set up the

direction on research development in SMEs and public research institutes. It is because the use of patent information that include grasping time sequential trends, monitoring the activities in acquiring patent of competitors, and analyzing qualitatively and quantitatively on patent application of specific technical fields have important implications in IP creation and application.

Generally, SMEs tend to lack human resources, and analytical skills on patent information remain relatively weak. Patent Map program customized to users' needs can provide efficient R&D strategies as well as utilization schemes for expired patent technologies.

<Table 3-5> Main Module Organization on Customized Patent Map Report

Category	Major Areas of Support
Common Module	<ul style="list-style-type: none"> - Analysis Background and Purpose - Technology Overview and Issues - Patent Analysis Scope and Standard - Patent Technology Trend (Technical Trend of Statistical Perspective) <p>* Mandatory</p>
Optional Module	<ul style="list-style-type: none"> - Company R&D Strategy Establishment Support - Technical Issues Solution Strategy - Supporting the Establishment of Strategy to Utilize IPR of Assisted Companies - Competing Company Technology Development Trend Analysis - Establishment of Patent Risk Aversion Strategy - Strategic Technology Trading Support – Technology Provider Module - Strategic Technology Trading Support – Technology Demand Module <p>* Optional(selection minimum of 2)</p>
Common Module	<ul style="list-style-type: none"> - Comprehensive Review Opinion - Attached(main points on major patent list) <p>* Mandatory</p>

Source: Regional Intellectual Property Center (<https://www.ripc.org/agencyNotice.do?method=getBoardInfo>, accessed on June 04, 2019).

This program analyzes the technology development trends of patents by country and year for a specific technological need. The client is provided with a report that provides future R&D directions, focusing on searching for missing technologies. As the name implies, a patent map is like a map that shows the development of technology and flow of transition. It thoroughly examines and analyzes the patent information of the requested technology discovered domestically and globally, providing a final report to the company.

The customized patent map program made positive effects, where it increased the investment in R&D expenses and the number of patent applications. For example, in Korea, the number of R&D costs and patent applications filed by companies participating in the program in 2013 shows that compared to when the program started supporting the imple-

mentation of R&D expenditures and patent applications, it increased by 24.6% and 50.4%, respectively.

3.2.3. Dispatched IP Experts

The program dispatches experts of IP management to university or public research institutes in order to support technology transfer of universities or public research institutes and to establish infrastructure for IP management.

Highly experienced IP experts in IP management are dispatched to universities and public research institutes in order to improve IP regulations, to standardize the process of IPR management, and to support various IP activities, such as establishing a patent portfolio strategy.

<Table 3-6> Roles of IP Specialists

Building Infrastructure	Regulation maintenance, Establishment of business process by manual
Strengthening Capability	Counseling and advice, education, Asset realization/ regularization, Building a cooperative network
Tech. Commercialization	Promotion of high-tech and IP creation by supporting transfer of patent technology and commercialization

Source: KISTA (https://www.kista.re.kr/usr/com/prm/BBSDetail.do?&menuNo=11007005&upperMenuId=11007&bbsId=BBSMSTR_00000000537&nttId=11817&pageIndex=1&resultCnt=1, accessed on June 04, 2019).

When the number of dispatched IP experts expand, IP capacity of universities and public research institutes increases, and the role of experts in IP expands to establish technology transfer, commercialization and IP strategy formation to build on the existing infrastructure.

3.3. Policies and Programs for IP Utilization

3.3.1. Supporting Production of Outstanding Inventive Prototype

The Invention Prototype Production Support Program, which started in 1982, provides the support needed to commercialize the outstanding patents of individuals and SMEs that could be held due to lack of funds.

In order to promote the commercialization of outstanding patents and product development, the program will be applied to 3D design (components and working principles necessary for product production in 3D) and Working Mock-up (design review and product promotion before mold production).

The target of the program is individuals or SMEs with insufficient amount of money to produce initial prototypes but have patents or utility models that are considered superior in technology and business. The program supports 70 to 90% of the production cost in Working Mock-up, and the beneficiary will pay 10 to 30% of the production cost and receive development financing for up to 20 million KRW.

When selecting the beneficiary of the program, the applicant is favored if he or she operates the employee invention compensation system, if the person or company has received awards at invention-related events or if the technology received support by one of KIPO's programs.

3.3.2. Support in IP Utilization Strategies

IP utilization strategy supports the next level of IP consulting for “product problem solving” and “IP commercialization” strategy that occur during new product development. Strategic consulting on “product problem solving” provides consulting services of TRIZ, patent, and design experts to solve problems of IP-applied products.

The existing IP consultation provides consulting in terms of patent evasion design or prevention of infringement. However, IP utilization strategy support program solved product problems by utilizing patents in other technological fields and analysis of users, market, trends, and IP analysis to provide in-depth consulting to derive optimized designs.

<Table 3-7> Main Support Contents on Projects for IP Utilization Strategies

Patent Product Innovation	<ul style="list-style-type: none"> - Proposes innovative solution through patent analysis and problem solving methodology to solve technical problems of products - Designs innovative products (products, services, business models) that unite core technologies required for customers and fuse other fields of patent technology <p>* Choose 1 of 2</p>
Design Product Innovation	<ul style="list-style-type: none"> - By using the patent analysis and TRIZ methodology of other fields, suggests the strategy to improve the product's readiness by improving the function of the existing product and developing the design
IP Commercialization Innovation	<ul style="list-style-type: none"> - IP strategy: Establishes customized strategy for IP application, IP business, and etc. - 3D instrument design or working mockup <p>* Choose 1 of 2</p>

Source: Korea Invention Promotion Association (https://www.kipa.org/kipa/ip001/kw_business_0501.jsp, accessed on June 04, 2019).

3.3.3. Preferential Purchase of Outstanding Inventions

The Korean Intellectual Property Office (KIPO) recommends procurement departments

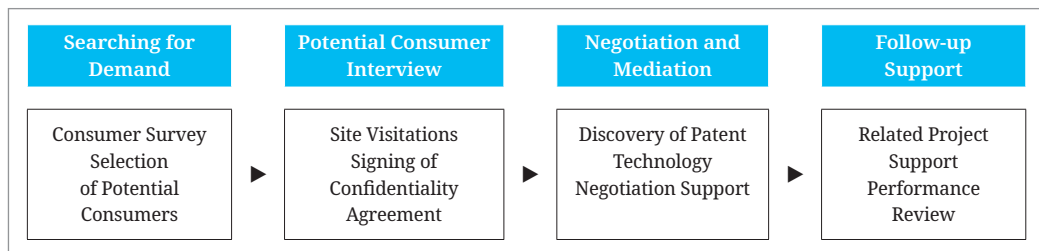
of government agencies, local governments, and public institutions to purchase outstanding inventions with patented technology. Individuals or SMEs holding patents, utility models, and design rights (including non-exclusive and exclusive licenses) registered within the last 5 years are eligible for support. If they are selected as outstanding inventions, then 1) a recommendation letter to government, local government, and public agencies will be sent for preferential purchase (which is valid for 3 years), 2) advantages are given when being considered for purchase at the Public Procurement Services (PPS), and 3) documents are made to certify the new technology in the certification of the new excellent product (NEP).

3.3.4. Support in IP Transaction

Individuals and SMEs wishing to trade IP, including IP transaction, are provided with on and off-line patent specialists³¹ and funded for transaction services, and it supports IP transaction to promote utilization of patent transaction information.

Patent transaction experts, according to each level, perform the following tasks: 1) identify customers by analyzing market and technology areas, register for IP-Market purchases and hold technical and business information meetings, 2) through interviews with customers, the company conducts business diagnoses and patent analyses of companies to establish strategies for IP trading, 3) support intermediary negotiations and contracts such as discovering and matching technologies and conducting technical meetings between firms, and support linkages with supported programs aimed at IP finance, R&D and analyzing business performances.

[Figure 3-8] Process for Applying for Patent Transaction Specialist



Source: Korean Intellectual Property Office (https://kipo.go.kr/kpo/HtmlApp?c=52202&catmenu=m05_02_02_02, accessed on June 04, 2019).

Moreover, KIPO operates IP-Market (www.ipmarket.or.kr), a national IP trading platform for IP transaction support. It is possible to search for trade experts, conduct online trading

³¹ Korean Intellectual Property Office has operated since 2006, and there are total of 17 people in technical field, and the number of Intellectual Properties that has been traded through Patent Transaction Specialists was 1,603 until 2015, and royalty was 86.89 billion KRW.

consultations (appointments), and find information on IP transactions, IP transactions, and IP commercialization.

When conducting technology transfer or IP commercialization specifically in AMS, technical assistance or transfer of know-how as well as IP licensing should be considered in view of variations in the technical capacity of ASEAN SMEs.

4. Conclusion and Policy Recommendations

4.1. Overview of Main Contents

SMEs play a pivotal role in AMS as in most countries, but the creation and utilization of IP in AMS have not yet been active due to the lack of public awareness of IP and lack of relevant policies.

From IP creation of SMEs to the IP utilization phase, the respective government's support policies are implemented in various forms. In general, governments take steps such as raising awareness of IP, establishing and disseminating IP information, and establishing a relevant examination system. Most AMS have already established national IP strategies or are in the process of preparing them, but their content and levels vary, and most of them face problems due to the lack of budget, lack of expertise, and low public awareness of IP.

In general, the development of patent technology plays a positive role in national economic development. Even if we look at the correlation between economic development and IP in Korea, the basis of Korean economic development has been backed by IP policy and implementation. Based on these experiences, Korea's IP creation and utilization policies that can be referred to by AMS include support for IP right acquisition costs, creation of patent maps, dispatch of IP experts, support for production of excellent invention prototypes, and support for IP product innovation.

When setting priorities for making IP creation policies, it is crucial to raise public awareness of IP through such measures as increasing invention classes at school, running special educational programs for talented students, and organizing invention competitions and awards. As the next step, AMS may consider introducing policies for assisting with IP acquisition fees or supporting making prototypes for excellent inventions.

The following section proposes IP creation and IP utilization policies that are applicable to AMS according to the analysis.

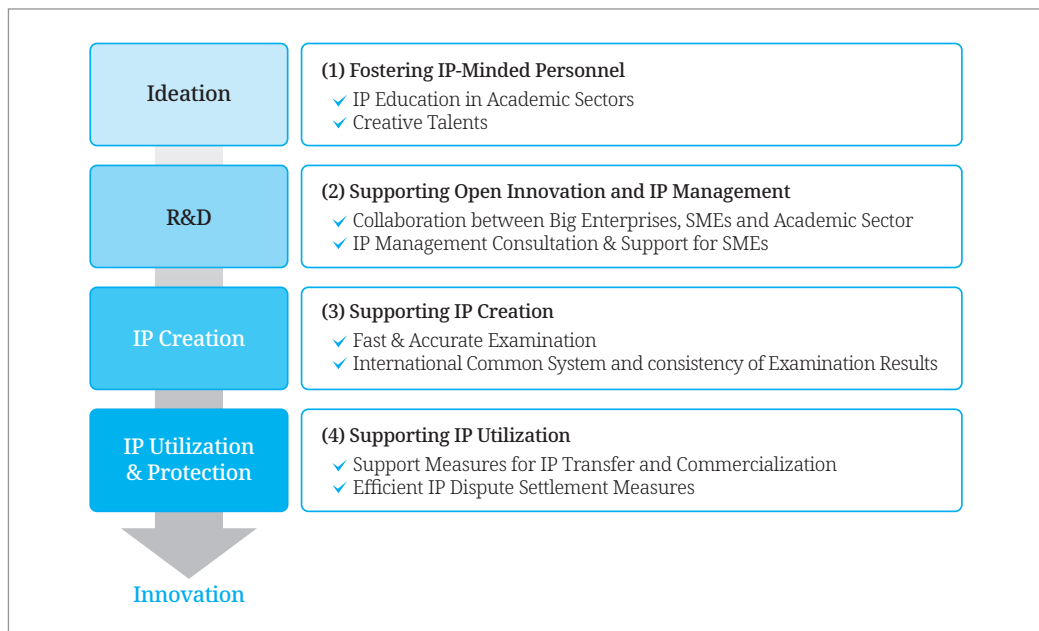
4.2. Policy Proposals

4.2.1. Expanding the Role of IPO for Innovation

The role of ASEAN IPOs needs expand as the hub for IP creation and IP utilization from the traditional role of examination of patents, trademarks, and design applications.

First, during the idea creation stage, IP training and seminars should be held for potential applicants of IP creation including universities and SMEs, and public campaigns should be held to raise public awareness. Meanwhile, the understanding of IP for the general public must be strengthened. In order to cultivate IP minds in elementary, middle, and high schools and universities, active cooperation with the Ministry of Education of AMS should be examined to develop instructional materials for invention education, to operate invention classrooms, to establish special education courses for the gifted inventors, and to hold invention contests.

[Figure 3-9] Role of IP Office in Innovation Process



Source: "Policy Seminar and In-depth Research of the KSP Project," ASEAN Secretariat, Jakarta, Indonesia, 2019.03.19-21.

Next, in order to raise the quality of IP obtained from the finished R&D product, R&D should be promoted focusing on acquisition of innovative IP without unsighted R&D implementation. It is then necessary to analyze the trends of IP application and registration by the country in a timely manner, and the direction of R&D plan must be established that is optimized on the technological development of the main player and developmental directions of the product. This way, companies and research institutes can perform R&D and acquire optimal IP according to its R&D performances, while preventing duplication of R&D activities. By linking and connecting a number of IP agents while processing R&D, the so-called “open innovation” can be pursued. Cooperation among companies, research institutes, and universities as well as cooperation between large and small companies are very important for the achievement of “open innovation.”

The following step is to create high quality IP using R&D results. It is necessary to review the introduction of preferential examination and the priority examination system in order not to cause a delay on the patent examination too often. The criteria for selection of an application for preferential examination must be objective and transparent, and this is done by establishing legal basis for the patent law or regulations. Moreover, the examination period should be predictable and applied fairly without having any distinctions between resident and non-resident applicants.

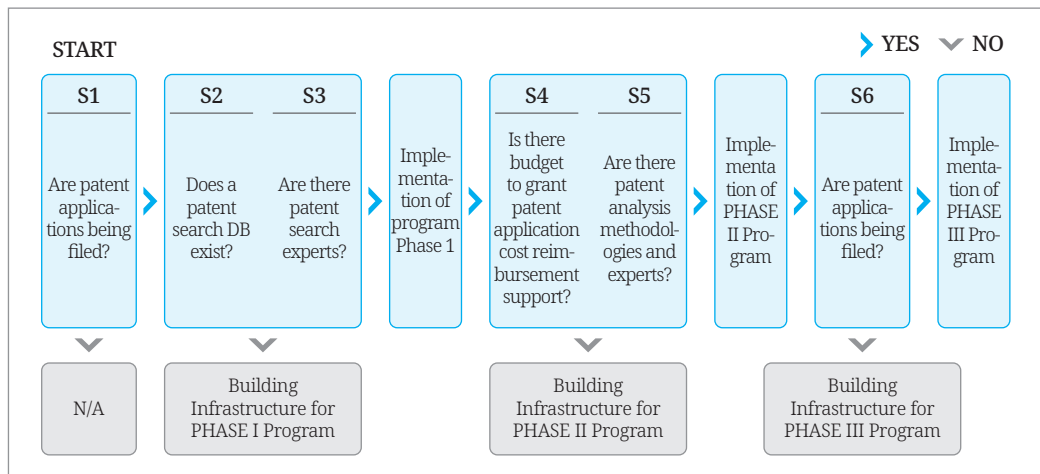
Since it is not necessary to examine all patent applications for the same period of time, it is recommended to consider introducing time-based examinations. This would include priority examinations, high-speed examinations, standard examinations, and delayed examinations, depending on the situation of AMS. Concurrently, the fee for priority or high-speed examinations should also be set. This is because the mismanagement of the priority examination system may result in further delays to the entire patent examination period.

Finally, there is no doubt that the role of the IPO is important in providing a platform for technology commercialization and technology transfer based on the acquired IP. This is because a virtuous cycle of IP creation, IP protection, and IP utilization depends on the increase in IP utilization in order to function properly. In general, most countries, including AMS, suffer from low-quality IP utilization. The introduction of an effective dispute resolution system to enhance the level of IP protection along with IP utilization will contribute to preventing unnecessary IP disputes, reducing the time and costs required to resolve disputes. It will also reduce technology disputes between large and small businesses and encourage SMEs with relatively little human and financial resources to be more interested in IP.

4.2.2. Referring to APEC IP Business Guidebook

Asia-Pacific Economic Cooperation (APEC) and KIPO jointly funded on developing the “APEC IP Business Guidebook” in 2017. The guidebook categorizes policies and programs of various IP creation and utilization fields implemented by KIPO and Korea Invention Promotion Association (KIPA) by level of difficulty. In other words, policies and programs for IP creation and IP utilization were selected as shown in [Figure 3-11]. The figure points out the relationship between the basic program (Phase I), the starting point of the policy, and the derivative program (Phase II and III), which is developed from the basic program. Phases I to III were categorized based on the difficulties of IP creation and IP utilization (depending on IP-related environment, infrastructure level, and etc.) policies and programs. In addition, each of the IP policies and programs has the following self-diagnosis list that enables a diagnosis of the situation related to the IPR system and infrastructure of the member states by creating a policy and program suitable for the situation.

[Figure 3-10] Phase Matching Flow Chart



Source: “Guidebook for SME’s IP Business Cycle” (APEC, 2017).

The guidebook can also be used as reference when creating IP policies and programs for AMS. If IP infrastructure of AMS is established following the implementation of the Phase I program, they will be able to review the implementation of subsequent Phase II and Phase III derivative programs.

4.2.3. Strengthening Inter-agency Cooperation when Establishing IP Policies

In order to create and utilize more active IP for ASEAN SMEs, it seems necessary to cooperate with relevant ministries, including Ministry of Industry, Ministry of Science and

Technology, Ministry of SMEs, and other affiliated government departments. In addition, it is crucial to provide opportunities for industry and academia cooperation. Malaysia, for example, has few ministries that promote science and technology development. Therefore, in the case of MyIPO, cooperation with independent ministries such as Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC) is being implemented. Moreover, in countries like Vietnam that conducts public R&D, it will be necessary to develop activities such as creating patents and utilizing patent information centered on universities.

While collaborating with inter-agencies, the role of the “leader” (i.e., President or Prime Minister) is one of the most important factors when stimulating inventive activities. For example, President of Korea during the 1980’s made special instructions to, exhibit excellent inventions, assist overseas filing fees, and support making prototypes of excellent inventions

4.2.4. Expanding Education for Examiners and Increasing Capability

Currently, the period of patent examination in AMS is considerably longer than that of IP5 patent offices, including Korea (on average, 9 years in Thailand, 5.5 years in Malaysia, 4 years in the Philippines). Therefore, it is necessary to reduce the examination period by revising the law, expanding the recruitment of examiners, and strengthening the training of examiners.

AMS have common issues that need to be dealt with regarding the system and operation of examiners, such as low government funding, few examiners in science and engineering departments due to the low salary, high turnover rate, and lengthy training. To solve such problems, cultivate proficient examiners and enhance the quality of examinations, it is essential to conduct active and continuous investments by utilizing excellent education infrastructure from organizations such as WIPO, as well as having online content. However, the expansion of e-learning education that includes online content is directly linked to the limited IT infrastructure in some AMS, so appropriate online and offline education and their balance will be required.

4.2.5. Efficient Examination System to Shorten Examination Period

In order to create and utilize IP effectively, it is desirable to harmonize the examination criteria among AMS by preparing common examination guidelines on the patentability that are different in all countries. The “ASEAN Intellectual Property Action Plan 2016-2025” has set on preparing and updating patent examination guidelines for each Member States, and the development of common guidelines for ASEAN. Malaysia seeks to find balances on the

criteria of patent examination among AMS by considering the level or system as well as developing the guidelines for patent examination by citing best practices.

In this regard, ASEAN is currently implementing a program for examination cooperation. Working groups can be formed that is centered around AMS. In particular, it should be accompanied by practical endeavors such as the selection of technology fields to carry out pilot projects in order to harmonize the criteria for judging the inventive step, holding examiner seminars, or inviting examiners from overseas, developed countries to share their experiences and practices of examination.

There are several examples involving Korea making an advanced examination system that can be followed by ASEAN countries. These include a cooperative project between Korea and UAE that started in 2014; the dispatch of patent examiners overseas to conduct examination work, and the recent signing of an MOU with Saudi Arabia that allows 15 dispatched patent examiners. It is therefore recommended to think of arranging for outsourcing examinations to one of the foreign Intellectual Property Offices (IPO).

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Also, in order to prevent duplicate examination efforts for the same invention, it is also possible to expand the global cooperation examination system such as PPH step by step to realize an effective IP creation and IP utilization plan. Malaysia signed the PPH agreement with Japan and EPO in 2014 and 2017, and since then, the number of PPH cases has steadily increased, and in 2018, it increased to almost 40% higher compared to the previous year.³²

Additionally, AMS have already implemented ASEAN Patent Examination Co-operation (ASPEC) since 2009. This aims to ensure that the initial OA (Office Action) is issued within 6-9 months of the request date, and applicants from AMS can submit original patent search and examination documents in any AMS. In particular, AMS that have received the examination data shall be able to refer to the relevant documents in patent search and examination work (but do not need to accept the results of other countries). For example, the demand of ASPEC offices in Malaysia has steadily increased from 7 in 2014 to 45 in 2018.

For lower level innovations, introducing the utility model system can be considered for some AMS based on the positive experiences in Germany and Japan where utility model protection have contributed to the stimulation of local inventors particularly during the initial stage of industrialization that developed minor improvements or innovations over existing technology.

32 "Policy Seminar and In-depth Study" (March 19-21, 2019, Jakarta, Indonesia).

4.2.6. Building IT Infrastructure for IP Information Utilization

Prior art searches on existing similar technologies in terms of novelty and inventive step when preparing patent applications are the first step toward creating a high quality IP. This prior technology information includes a patentability search to investigate patents similar to the target technology, invalidation search to identify competitors' patent invalidation, and a FTO search (freedom to operate search).

To establish the foundations of IP creation, it is essential to construct a patent search database for researching the above prior technology information, operate an IP library to utilize online patent literature, and to construct an IT system for computerization of patent application and examination processes. It is not easy to use a patent search database especially in non-English speaking countries due to the language barrier. Therefore, in order to promote the research of patent information, it is helpful to develop a search database that supports the language of the respective AMS in order to broaden IP users.

In order for AMS to establish a specialized IT system for IP creation and IP utilization, it is necessary to secure the required budget, train experts, establish future operating plans, and examine other IT patent systems (for example, Korea's KIPONet). Such a system will allow users to apply and register IP, and to go through the process of patent administration such as making judgments.

Moreover, expanding and building an IP trading platform that provides information on IP transactions, including information on IP supply and demand, and technology market trends, are also ways to make activate the use of IP in the marketplace.

4.2.7. Expansion of Dispatched IP Experts

Dispatching IP experts to enterprises, universities, and institutes will help activate IP creation in AMS. For example, it supports on allowing experts to reside in TISC to assist in writing patent specifications in Indonesia, or it can provide prior art search services, such as in the Philippines where they helped in achieving a more vigorous IP environment. In order to increase the expertise of dispatched IP experts, it will be necessary to extend the training of patents and trademark-related subjects to experts residing in TISC.

One of the best examples can be about supporting the preparation of patents and utility model specifications by dispatching IP experts. In Indonesia, one patent expert is dispatched to major universities in order to support the creation of patent specifications for univer-

sity professors. Thailand has staff members who handle major cities like Chiang Mai and Songkhla.

The main task of IP experts will be first to raise public awareness and to establish a solid foundation of IP infrastructure at universities and public institutions through researchers' counseling and seminars and IPR management process in the early stage of the dispatching program.

When these IP dispatchers enter the stabilization phase, it will be necessary to extend the support work of IP experts to the TLO-wide tasks (overall IP consultation including technology transfer and commercialization support) rather than just the application stage. In the beginning, IP experts should be dispatched to universities to measure their achievements. In the next stage, it will be necessary to expand the scope of support to public institutions and universities that lack IP management capabilities. IP professionals will provide in-depth support from patent application support to overall IP management. By establishing a pool of industries, academies, and institutions in the region and actively engaging in exchanges of information related to technology demand and technology transfer through cooperation with local governments, consultants for patent information and commercialization and corporations, the beneficiaries will be able to have much success in the technology transfer and commercialization.

4.2.8. Establishment of Regional Intellectual Property Center

ASEAN is a vast community where its territory is not only very extensive but also consists of quite a large population. Indonesia, for example, is the world's fourth largest Alliance of Small Island State with about 270 million people and about 18,000 islands. This is why AMS need to work on regional IP development as well as balanced development by country. In order to do this, establishing a regional intellectual property center around AMS is recommendable.

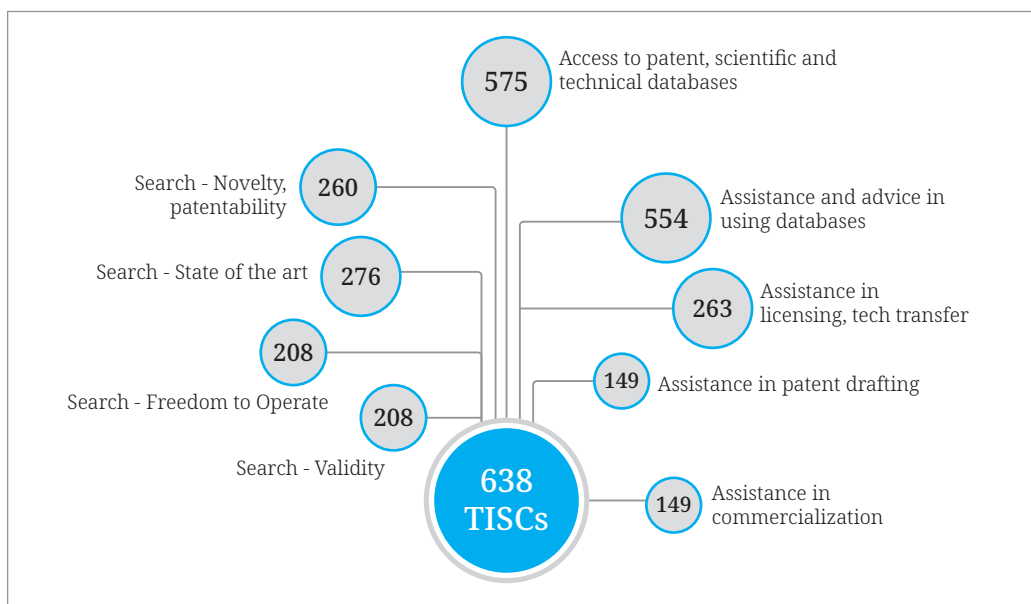
However, considering the level of economic development and the differences in IP awareness, local government, the Ministry of Industry, the Ministry of Education, and related governmental bodies must cooperate to establish regional chambers of commerce or regional IP centers within focal universities first and gradually reconstruct them into independent institutions that can function on its own activities. In the Philippines, Intellectual Property Satellite Offices (IPSO) is in operation. It is positioned in 10 major cities to support

IP application and registration.³³ In order to operate an effective regional IP center, it will be necessary to dispatch IP experts to each center and to expand gradually on the relevant roles from the application-stage support to technology commercialization and technology transfer.

4.2.9. Utilizing WIPO TISC Infrastructure

Another possible way to enhance IP creation and IP utilization of SMEs is to expand the role of TISC in WIPO in more various ways. As mentioned above, since the introduction of the TISC program in October 2015, Malaysia has carried out various activities that included distance learning, patent application, and analysis workshops. It seems that each Member State can strengthen its capacity by using TISC in different fields according to its specific circumstances.

[Figure 3-11] Number of TISCs Providing Different Types of Services



Source: Technology and Innovation Support Centers (TISCs) Report 2017 (WIPO).

4.2.10. Publishing IP Technical Dictionary

Used IP-specific words or terms should be standardized (in English), and by doing this, collection of IP technical words should be published, or working on translation will also be great ways to vitalize IP creation and IP utilization in order to improve general public's

33 <https://ipophil.gov.ph/8-transparency/362-ipsa>.

understanding particularly on newly coined words that emerged in IP field. For example, it will improve the understanding and expand expertise and knowledge with new IP system by providing supports on English translation of relevant legislations in Myanmar that was established in 2019, or by supporting translations for international treaties like the Madrid Treaty into each country's respective languages.

However, with AMS having 10 countries, such translation work should include revisions of new IP laws, and enforce as a demonstration, targeting member countries that recently registered into related treaty, and afterwards, it will be wise to expand Countries of Operations according to the demand and its effect.

4.2.11. IP Human Resources Development for IP Valuation

AMS is highly interested in IP valuation and collateralization, but as of yet, relevant rules are incomplete as evaluation manual has not been completed. With this, references will be made to IP policy cases of developed countries, including Korea, and it will be necessary to cultivate IP valuation experts and provide them education and training opportunities.

4.2.12. Patent Map Customized for Customer

Additionally, it is possible to induce technology commercialization by presenting the technology development direction of SMEs through supporting a customized patent map, trademark map, and design map. Concurrently, support should be provided for identifying trends of competing firms, IP applications, IP activity monitoring, and establishing the direction of technology development of SMEs.

In order to achieve these goals, patent map creation techniques should be developed in order to train patent analysis experts. This can be done by developing methodologies on qualitative and quantitative patent information analysis that fit with AMS' characteristics, and to run contests that will share know-how of patent specialists. These changes will expand the experience and knowledge of patent analysis and strengthen the capability of patent analysis specialists.

In the long term, it would be desirable to encourage the development of the IP service industry, which will expand the base of utilization of patent information and carry out patent information analysis processing by fostering specialized agencies that analyze patent information.

To implement a support project for a customized patent map, it is necessary to distinguish between research and analysis of patent technology trends related to the technology requested by the company and the type to establish and present the detailed strategy necessary for the company. In other words, the types of research and analysis of patent technology trends related to the technology requested by the company should mainly include the background and purpose of the analysis, the overview and issues of technology, scope and analysis standard of patent analysis, and patent technology trends. Additionally, to formulate and present strategies needed by the company, compilation of support for establishing an R&D strategy, problem solving strategies, analysis of related technology trends of IPR held by the company, global technology commercialization strategy, and analysis of strategic technical transactions must be provided.

Additionally, the government's policy support, including support for pre-patent (or pre-trade mark) research and support for SME funding, will also be an effective way to strengthen IP capacity and IP creation and utilization in AMS.

4.3. Suggestions for Future Research and on Possible Ties with Other Institutes (EDCF, KOICA, and International Organizations)

During the course of this KSP project, the representatives of major countries participating in the ASEAN seminar showed a keen interest in the possibility of utilizing Korea's policy experience directly to develop their policies and IP systems. For example, one of the representatives of AMS who attended the interim report session inquired about whether it is possible to use the experience of establishing IP Market in Korea to their home country in order to establish a similar system.

The main purpose of this KSP project is to share Korea's experience and minimize trial and error in policymaking or implement in the beneficiary countries. However, in order to ensure the utilization of KSP research results and increase the satisfaction of AMS, it is necessary to select IP policies or programs with high urgency or high priority to introduce policies and make follow up measures.

In order to accomplish this, a roadmap should be prepared to implement various policy recommendations derived from the current project, after reviewing the current Korean government's similar policies and external development assistance projects as a whole. Therefore, the Ministry of Strategy and Finance, the Ministry of Foreign Affairs, and KIPO that engage in similar projects with IP should form a dedicated working group or task force

for the follow-up from KSP while securing the necessary funding. In this process, coordination with the agencies such as EDCF, KOICA, KIPA, and other funds are also necessary. At the same time, additional cooperation with WIPO and APEC that have pursued similar programs in the past should also be pursued.

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04

CHAPTER

Strengthening IP Capacity-building and IP based Technology Commercialization

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Hwanhee Jeong (Korea Invention Promotion Association)

1. Introduction
2. Korea's Experience of IP Start-up Support and IP Consulting (Creation-Utilization) Service
3. Analysis of Korea's IP Policies and Programs and Implications
4. Conclusion and Policy Suggestions

Keywords

Intellectual Property (IP) Capacity-building, Intellectual Property (IP)-based Technology Commercialization, Intellectual Property (IP) Support, Intellectual Property (IP) Program, Intellectual Property (IP) Consulting

Strengthening IP Capacity-building and IP based Technology Commercialization

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Hwanhee Jeong (Korea Invention Promotion Association)

Summary

In the fourth industrial revolution based on ICT (Information and Communication Technology), the technology and product lifecycles have been shortened. In this era, companies can thrive by securing and utilizing IP technology capabilities. Therefore, SMEs in ASEAN member states (AMS), which account for a large proportion of AMS' economic output, should secure and utilize their IP capabilities in order to be competitive in the fourth industrial revolution. However, it is not enough for SMEs to acquire and utilize IP technology capabilities solely through efforts in the private sector, so it is necessary to support them through government policies and programs.

AMS need to implement government policies and programs in order to strengthen local SMEs' IP capabilities and commercialize their IP-based technology. To achieve this, AMS can learn from Korea's experience of implementing IP policies and programs. Chapter 4 shows how the policies and programs were executed through the Korean Intellectual Property Office (KIPO) and affiliated organizations.

Specifically, AMS could refer to Korea's IP start-up support programs, which include the valuation of invention support program, patent technology valuation support for IP loans, credit guarantees or investments, and the IP Di-dim-dol and IP Narae programs. They also could learn from Korea's IP consulting (creation-utilization) service program, including the SME Immediate IP Support Service, Regional Intellectual Property Center, IP-DESK, Patent Consulting Center and SMART3 (System to measure, Analyze and Rate patent Technology) Service.

In particular, Korea's experience of operating these programs, including the organizational structure, main tasks, support targets and methodologies, procedures and type of operations that are needed for running the programs, would help AMS to examine and adopt related policies and programs according to their environment and situation.

Through sharing experiences of implementing IP policies and programs for commercializing IP capacity and IP technology in Korea, the factors that have led to their success were identified. The three success factors of Korea's IP start-up support and IP consulting (creation-utilization) service are: the programs support the corporate growth cycle, strengthen cooperative systems, and eliminate IP regional gaps. By establishing a legal system related to IP utilization and an infrastructure for IP utilization and securing an expert group, Korea's IP-based technology commercialization could be strengthened. Analyzing the factors that led to the success of these policies and programs could be helpful for AMS when adopting IP policies and programs and formulating medium and long-term plans.

Policy proposals suggest specific methods for AMS to implement policies and programs related to strengthening IP capacity according to their respective circumstances.

AMS can establish a sound patent information research environment by building a patent information research database, securing a specialist group of patent information researchers and establishing a training system for experts. Furthermore, in order to support IP start-ups and implement IP consulting service programs, AMS could build support organizations for low-income earners and small businesses, establish IP bases for SME IP support and implement policies and programs for IP creation by SMEs. By fostering experts in various industries, raising the IP awareness of CEOs in SMEs, providing the necessary training programs for them, and linking support programs from different government arms, it is possible to provide holistic IP management support to SMEs.

For IP-based technology commercialization, AMS need to create an environment of IP transactions, valuations and finance based on their respective situations. They could establish an IP trading market both online and offline, support IP transactions through expert consultations and construct a system to train experts for IP transactions. To build an IP valuation environment, they are recommended to establish an IP valuation model, train IP valuation experts and make a legal system to utilize IP valuation. SMEs in AMS often have difficulty securing funding, so these member states need to implement IP finance policies and programs in stages through a long-term plan. They could also legislate IP-related laws and regulations, build IP valuation models and establish a fair execution agency.

1. Introduction

The technology lifecycle (TLC) and product lifecycle (PLC) are short in the information and communication technology (ICT) field. Companies face rapid changes to their business environment in the fourth industrial revolution, which is based on ICT (Ji and Kang and Kim 2017, 124).

Industry-leading SMEs in AMS are required to secure IP technology capabilities and to actively utilize them with corporate management. In fact, this has now become essential in order for firms to thrive in the fourth industrial revolution. To achieve this goal, SMEs need to make their own efforts, but there are limitations on how much can be done by the private sector alone. IP-based infrastructure and systems need to be established for companies to prepare and utilize their IP technology capabilities. However, it is difficult to build such infrastructure and systems without the support of government-level policies and programs.

In order to implement government policies to encourage SMEs in AMS to strengthen their IP capabilities and promote IP-based technology commercialization, it was necessary for Korea to share its experiences of implementing related policies and programs. We first targeted the IP representatives of SMEs in AMS as well as public officers in charge of political policies. Then, experiences were shared on how policies were executed through KIPO and affiliated organizations in order to strengthen IP capacity and IP technological commercialization.

The applicability of policies and programs was examined according to the respective situation of the AMS, and Korea's cases were used as an example when adopting the various operation processes for the organizational structure, main tasks, support targets and methodologies, procedures and type of operations that are needed for enforcing the program.

It also introduces policies and programs for IP capacity and IP-based technology commercialization in Korea, sharing the specific experiences of the program that supported the creation and utilization of IP for SMEs. Through this analysis, tailored methods are proposed for the application and execution of the policies and programs.

2. Korea's Experience of IP Start-up Support and IP Consulting (Creation·Utilization) Service

The Korea Invention Promotion Association (KIPA), which is a subsidiary of Korean Intellectual Property Office (KIPO), is a specialized institution for IP that contributes to the promotion of domestic inventions, and plays a key role in technology valuation, IP technology transaction and utilization, and promotes IP policy. KIPO and KIPA continue to support SMEs to achieve IP-based growth by promoting various policies and programs to create and utilize IP, and increase its value through commercialization.

2.1. IP Start-up Support Program

2.1.1. Valuation of Invention Support Program

2.1.1.1. Invention Valuation Institutions

IP management is an IP strategy that prepares the competitiveness of IP, and it is categorized under the activities of creation, protection, and utilization of IP (Cho and Im, 2014, 78). Therefore, even if a patent is created, it is necessary to support the diversification of utilization policies to increase the use rate and for patents to become a core strategy of enterprise management. Moreover, invention valuation institutions are designated and operated while continuously developing methodologies for valuation and dissemination of services. The designated invention valuation institutions in Korea are as follows.

- Korea Institute for Advancement of Technology
- Korea Development Bank
- Korea Invention Promotion Association
- Korea Technology Finance Corporation
- Darae Law and IP Group
- Dana Patent Law Firm
- Nice Information Service
- ECredible Co. Ltd.
- Wips Co. Ltd.
- Korea Testing Certification
- Korea Testing Laboratory
- Korea Testing & Research Institute
- Foundation of Agri. Tech. Commercialization & Transfer
- Korea Conformity Laboratories
- Korea Institute of Science and Technology Information
- Dodam IP Law Firm
- Knowledge & Tech Group Co. Ltd.
- Korea Credit Guarantee Fund

Also, in order to use valuation results in various ways, through “Commercialization Connected with Patent Technology Valuation Support” and “Finance Connected with Patent Technology Valuation Support,” these institutions provide support for analyzing technology transactions, certifications, and validating and securing company funds connected with investment and financial institutes.

2.1.1.2. Valuation of Technology through Invention Valuation Institutions

Technology valuation is the screening of technology to determine its chance of success in the market, and the process involves either an analysis to assess its chance of success or calculating its value. It comprehensively evaluates the technology’s business value, marketability, and technicality, and the results are comprised of the level, suggestions, score and amount. Thus, technology valuations are used for trade, finance, tax, strategy, liquidation and litigation as <Table 4-1> shows.

<Table 4-1> Purpose of Technology Valuation

Type	Purpose
Transaction	Estimate transaction price for purchase, sale and licensing of technology
Finance	Financial securitization of technology or setting up a loan
Taxation	Tax planning and tax payment for donation, disposal, and amortization of technology
Strategy	Establishment of long-term strategic management plan for company value enhancement, technology commercialization, and spin-off products
Settlement	Asset valuation and debt repayment planning based on corporate bankruptcy or restructuring
Litigation	Estimation of damages such as patent infringement, default, legal disputes related to other property disputes

Source: <https://www.kipa.org> (accessed on May 7, 2019).

Technology valuation is separated into technology valuation that calculates the technology’s value, business feasibility valuation that considers the business potential of the technology, and technical valuation that evaluates the skills of the main agent’s usage of technology to support the application of credit loans. It is used for technology transfers, technology transactions, technology investments and investments in kind.

Technology evaluation is used for finance, transactions, taxation, liquidation, litigation, and strategy, while business feasibility evaluation is used solely for strategy. The evaluation

committee consists of four to five professional committee members, which include patent attorneys, accountants, and Ph.D. holders. The committee evaluates the value of technology or business feasibility based on the technical value, value of rights, marketability, and business value within eight weeks. Procedures will be preliminarily assessed upon receipt of the application and the data on which the evaluation is based via e-mail, telephone, or face-to-face. The preliminary evaluation will examine the adequacy of the received data, review the business and technical aspects of the project, and form an evaluation team with expertise in the related field of technology and patent law. The evaluation is held afterwards by engineers and Ph.D. holders in engineering who assess the technological aspects, Ph.D. holders in business or accounting who assess the business aspects, patent judges and patent attorneys who assess patents, and technology transfer agents who assess technology transactions. Thereafter, only when it is deemed necessary, will a consultation be given. Then, a discussion based on the evaluation reports by the Technical Evaluation and Deliberation Committee will take place, and if the evaluation result is not agreed upon, amendments will be made. The applicant shall be notified of the evaluation result in accordance with the technical valuation report or a prescribed format.

A technology valuation is required when applying for credit loans. An expert committee consisting of two to three professionals, including patent attorneys, accountants, and Ph.D. holders, assess the technology within two weeks. Technical skills are divided into ten grades, which are important aspects used by financial institutes to decide on whether to issue the loan, the loan amount, and the loan conditions. The procedure involves the applicant company asking for a consultation with the investment organization, and then the applicant or investment organization asks for a technology review from a technology valuation institute or TCB (Technology Credit Bureau). The investor will then provide the funds based on the screening.

Technology valuations that went through the aforementioned procedure underwent assessment of appropriate value calculation, capital increase, funding for commercialization, technology productization, and computation of damages as <Table 4-2> shows.

<Table 4-2> Cases of Technology Valuation Utilization

Type	Cases
Technology Transaction	Company A needs a fair price calculation when transferring technology → Valuation of patented technology (for transaction) → Technology transfer of 560 million KRW based on valuation result
In-kind investments	Company B needs to increase capital → Valuation of patent technology (for investment in-kind) → Increases capital by 1.6 billion KRW based on valuation result
Investment Attraction	Company C needs commercialization funds after obtaining patents → Valuation of patent technology → 5 billion KRW financing from institutional investors based on valuation result
Strategy	Company D considers whether to produce patented technology → Valuation of patent technology (evaluation of business value) → Success based on valuation result → Increase in corporate value and → rise in share prices
Litigation	Company E's trade secrets are infringed → Calculation of trade secret losses through technology valuation → Used as court's evidence for judgment

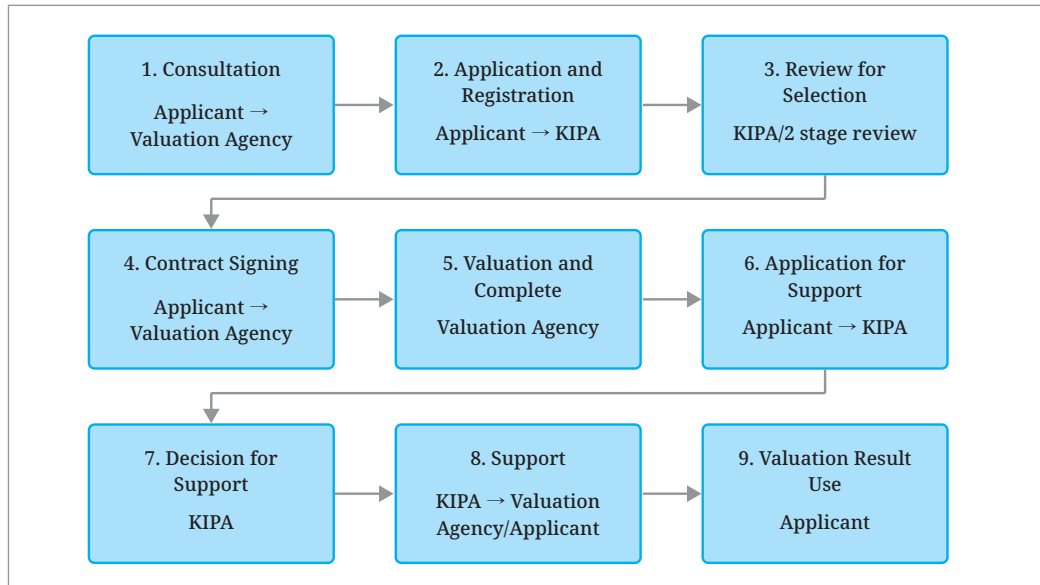
Source: Intellectual Property Valuation Center (2017).

2.1.1.3. Support of Patent Technology Valuation Connected with Commercialization

Patent technology valuation support that is connected to commercialization supports the cost of fulfilling a comparison analysis, project feasibility, and valuation and efficiency analysis for registering patents and a utility model. It aims to promote the commercialization of patented technology and it provides valuation results based on the “Patent Technology Valuation Report.” Through the designated valuation institutions of KIPO, the “Patent Technology Valuation Report” is based on the quality of rights, technicality, business feasibility and technology valuation.

The program provides up to 70% of the cost of a patent technology valuation (per case) up to a maximum of 50 million KRW (VAT paid by the applicant) to the right holder successor and the individual or SME that holds exclusive licenses. If the applicant makes an application through a consultation and completes the contract through the selection and deliberation stages, the valuation agency will proceed with the valuation and the expenses will be supported during the payment process. The details of the procedure are shown in [Figure 4-1].

[Figure 4-1] Procedures for Valuation of Patent Application Related to Commercialization

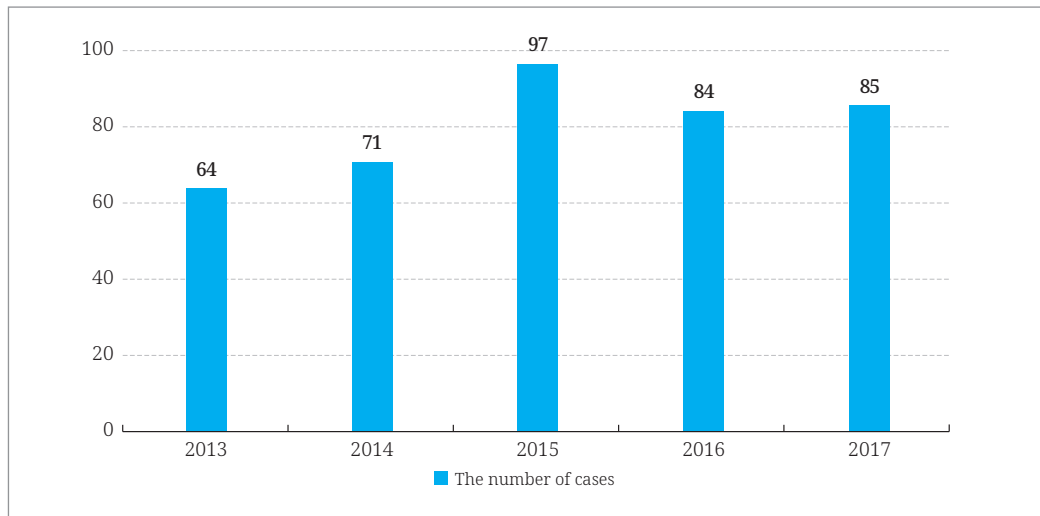


Source: KIPA, <https://www.kipa.org> (accessed on May 7, 2019).

The “Patent Technology Valuation Report” that has gone through the process mentioned above is used for reports including business feasibility, technology certification, patent technology transactions, investments in kind, asset valuations, establishment of business strategies, dispute-related litigations and more. In terms of performance, about 80 cases are supported annually, including 97 cases in 2015, 84 cases in 2016, and 85 cases in 2017 (see Figure 4-2).

[Figure 4-2] Performance of Patent Technology Valuation Support from 2013 to 2017

(Unit: Cases)



Source: KIPO (2018), 2017 White Paper on Intellectual Property.

2.1.1.4. Support of Patent Technology Valuation Connected with Finance

A. Patent Technology Valuation Support for IP Loans

“Patent Technology Valuation Support for IP Loans” is a project that supports SMEs that have commercially active registered patent rights by valuing the IPR owned by the target company, and thereby providing the finance and loans with IPR as securities. The cost of the patent technology valuation (per case) is limited to less than 5 million KRW (VAT is paid by the applicant), and 200 cases undergo this service annually.

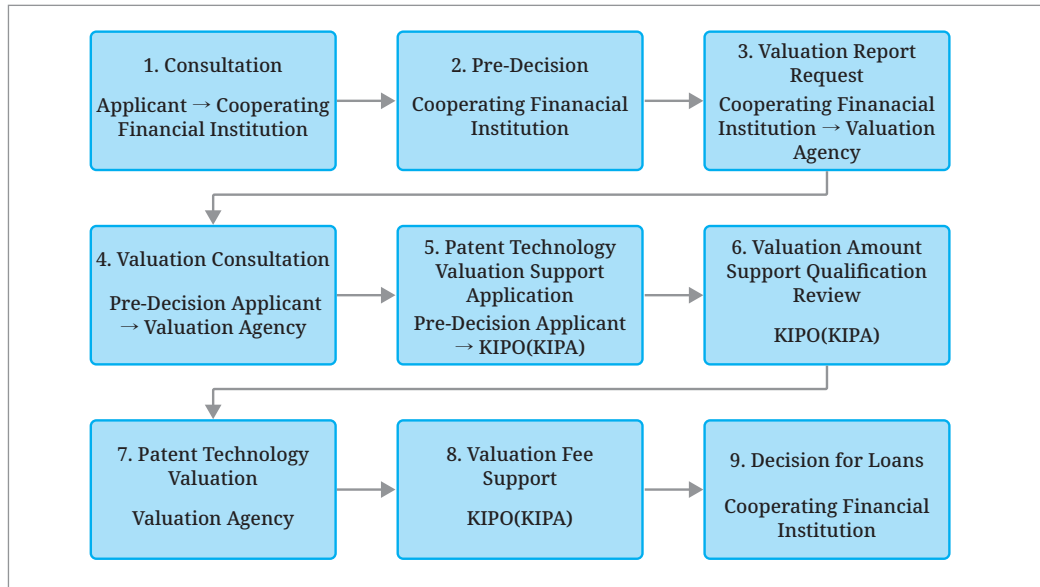
If the “Valuation of Patented Technology” is made by a rating agency of inventions that act as the executing organization, the cost evaluation will be supported after the screening. Financial institutions are then able to provide loans worth up to the amount calculated from valuation results to the applicant company.

B. Patent Technology Valuation support for Credit Guarantees

“Patent Technology Valuation for Credit Guarantees” supports the valuation fees required when evaluating the value of patented technologies owned by companies to calculate credit guarantees or loans for business funds. To SMEs that commercialize and possess patent registrations, 3 million KRW is provided for valuation costs in the case where a single patent technology valuation costs 5 million KRW. A financial institution or the applicant company pays the rest of the valuation costs. In total, there are around 400 cases of such support annually.

The valuation agency supports the costs of the valuation, and the guaranteed institution provides a maximum of 1 billion KRW up to the valued amount. [Figure 4-3] shows the procedures for guarantee-linked patent technology valuation support.

[Figure 4-3] Procedures for Guarantee-linked Patent Technology Valuation Support



Source: KIPA, <https://www.kipa.org> (accessed on May 7, 2019).

C. Patent Technology Valuation Support for Investments

“Patent Technology Valuation Support for Investments” is a program that supports the valuation costs to utilize the valuation report of the technology owned by the enterprise when an investor is considering investing in the firm.

Therefore, it supports investment institutions such as SMEs and start-up investment companies, financial institutions, angel clubs, and companies that invest in SMEs with patent registrations and commercialization. Valuation institutions provide the essential aspects of technology valuations when examining the company’s technology and providing the Patent Technology Valuation Report that is applied to the investment.

The valuation-type Patent Technology Valuation supports 80% of the valuation cost per case up to 15 million KRW, and the grade-type Patent Technology Valuation supports 80% of the valuation cost per case up to 7.5 million KRW. There are approximately 90 cases annually.

D. Performance of Patent Technology Valuation Support for IP Finance

Through the Patent Technology Valuation related to IP financing, SMEs were provided with much-needed funds. A total of 200.9 billion KRW in 2015, 303.4 billion KRW in 2016 and 366.9 billion KRW in 2017 was provided through the program, and it was able to develop further through IP (see Table 4-3).

<Table 4-3> IP Finance Support Performance

(Unit: Case, KRW million)

Category	2013	2014	2015	2016	2017
Budget	1,664	2,932	3,570	3,270	3,770
Amount	75,907	165,820	200,904	303,459	366,951

Source: KIPO (2018), 2017 White Paper on Intellectual Property.

2.1.2. IP Di-dim-dol (Stepping Stone) Program

IP Di-dim-dol (stepping stone) is a program that provides customized assistance to entrepreneurs to help them transform their ideas into IP-based products that can be the basis for a business.

Larger firms generally enjoy higher sales and rates of employment compared with micro start-ups. This background prompted KIPA to develop simple ideas for the IP Di-dim-dol program, helping to realize concepts into IP-based business items and provide the stepping stone for business success.

Interested parties can apply for the project any time without any limits to the number of applications using the Regional Intellectual Property Centers located in metropolitan cities and provinces, and applicants need to bring the application form and abstract summary as <Table 4-4> shows. The advantage is that anyone with new and creative ideas can apply for this project.

<Table 4-4> Overview and Application of IP Di-dim-dol Program

Details	Summary
Program Overview	<ul style="list-style-type: none"> Applicant: Entrepreneur-to-be Support Limit: 1.8 million KRW per idea Individual contribution: Less than 360,000 KRW per idea (can be replaced with IP start-up training)
Application Method	<ul style="list-style-type: none"> Application Period: Rolling basis throughout the year (January~November) Application Method: Consultation and application through Regional Intellectual Property Center Documents to Submit: Idea application form (Filling out application form after basic consultation)

Source: KIPA (2019), IP Creation Support Program and IP-based Start-up Promotion Program.

The IP Di-dim-dol program is carried out in accordance with the six-step procedure. The procedure includes “idea-based consultation, idea creation training, idea advancement, idea

claim, 3D model design, and start-up consulting.” In this process, it helps to secure patent rights and to establish a business plan, and it supports various matters so that the applicant can start the business utilizing IP.

<Table 4-5> IP Di-dim-dol Program Process

[Stage 1] Idea-Based Counseling	Selection of basic counseling and business support through idea counseling
[Stage 2] Idea Creation Training	Promoting basic competencies for entrepreneurs' IP and entrepreneurship through education such as patent information search
[Stage 3] Idea Enhancement	Idea enhancement consulting and prior art search analysis
[Stage 4] Securing a Right for the Ideas	Filing a patent with the enhanced idea
[Stage 5] 3D Model Design	Support 3D model design for product implementation
[Stage 6] Start-up Consulting	Establishment of business plan, business model, support for other companies' funds and prototype production

Source: KIPO (2018), 2017 White Paper on Intellectual Property.

As <Table 4-5> shows, in the stage of idea-based counseling, the program provides basic consultations for IP rights and business support. In the next stage of idea creation training, education on business item research, preparation of the business plan and prior art search training etc. are conducted. In the stage of idea enhancement, prior art search, technology trend analysis, idea refinement and advancement followed by the development of a patent specification and a patent application and registration are made for the acquisition of rights. In the next stage of the 3D model design, consultation to shape ideas in to physical entities and modeling of business items are conducted. Finally, through the start-up consultation stage, consultations with various organizations are provided for securing entrepreneurial funds, moving into a business incubation center, and so on. Applicants can also network with existing entrepreneurs and benefit from mentoring by external experts. In addition to these six stages, selected excellent entrepreneurs among IP Di-dim-dol program beneficiaries receive PCT overseas applications for business items, new brand and product design, and a patent technology publicity video.

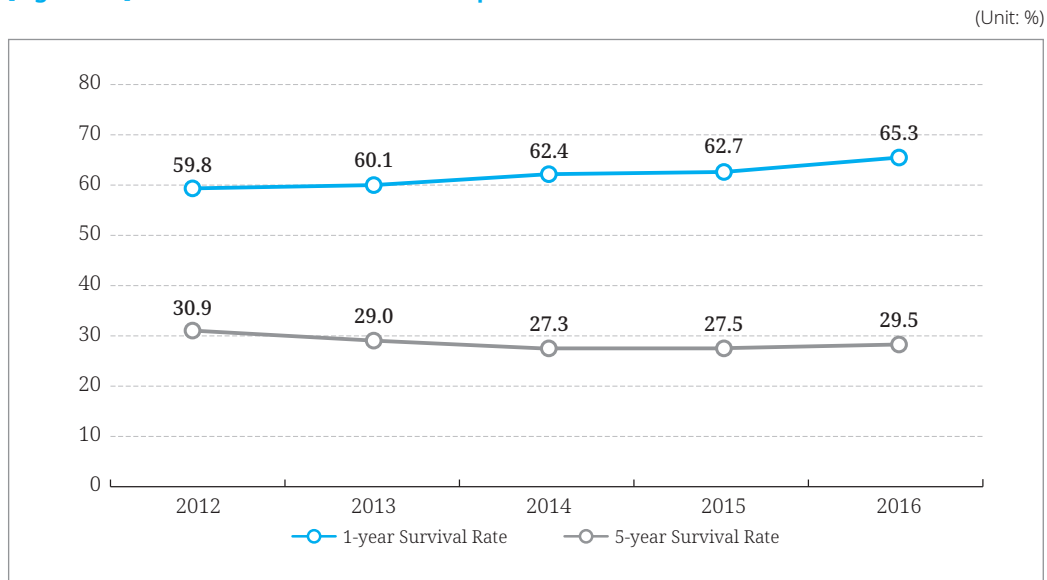
By going through each of the processes mentioned above, there were 758 great ideas in 2017 that went through IP claim and start-up consulting via the IP Di-dim-dol program, and among these, 132 innovative start-ups were established (Presidential Council on Intellectual Property, 2018, 23).

2.1.3. IP Narae (Wing)

IP Narae (Wing) is a program that provides support to help businesses established within the past seven years continuously grow. IP Narae has helped establish exclusive claims to technologies held by SMEs in order to strengthen their market competitiveness, and it also maps out the management basis of IP.

Although there are various business development policies to foster future entrepreneurs and ensure stable start-ups, if we look closely at the survival rate within 5 years for many start-ups, they face many difficulties in trying to maintain their business. Specifically, detailed data shows the survival rate of Korean companies. [Figure 4-4] shows the survival rate of domestic corporations based on data provided by Statistics Korea. According to this data, the one-year survival rate of companies that started up in 2015 was 65.3% in 2016, and the 5-year survival rate of companies that started up in 2011 was 28.5%. This confirms the tendency for firms to struggle to maintain their business for the long-term.

[Figure 4-4] Survival Rate of Domestic Companies



Source: Statistics Korea (2016), 2017 Results of Existing Companies Administrative Statistics.

With this in mind, KIPA has been operating the IP Narae program. It goes beyond providing simple financial support and offers expert IP consultations to start-ups in order to increase their longevity and to create a healthy entrepreneurial ecosystem.

SMEs that have been established within the last seven years and possess technology and SMEs that have switched to corporate status from a sole proprietor within the past 5 years and possess technology may apply to the IP Narae program. The details of eligible applicants and the application are presented in <Table 4-6>.

<Table 4-6> Overview and Application of IP Narae program

Program Overview	<ul style="list-style-type: none"> • Applicant: SMEs with technologies within 7 years of being founded or within 5 years of conversion of its business • Support Limit: Less than 25 million KRW of total project cost and less than 18 million KRW of government fund (Government fund 70%, SMEs 30%) • Program Period: Within a total of 100 days, 8 consultations • The number of support cases: About 450 cases a year
Application Method	<ul style="list-style-type: none"> • Application Period: Twice a year (February, August) • Application Method: Application through homepage of RIPC located in the applicant's region • Submission: Participation application, business plan, etc.

Source: KIPA (2019), IP Creation Support Program and IP-based Start-up Promotion Program.

The IP Narae program provides basic and detailed diagnoses related to companies. After the diagnosis, the firms can receive in-depth consultations which help the companies to make patent applications, create promising technology and establish an IP-based management strategy as seen in <Table 4-7>.

<Table 4-7> IP Narae Program Process

1. Company Basic Diagnosis	Patent Technology Perspective IP Based Management Perspective
2. Detailed Diagnosis	Possession of Technology Analysis Detailed Diagnosis of Management
3. In-depth Consulting	Securing a Right for Technology Management Consulting
4. Support Program Results	Patent Application and Development of Promising Technology IP-based Management Strategy Establishment
5. Technology & Business Convergent Management Consulting	

Source: KIPA, <https://www.kipa.org> (accessed on May 7, 2019).

The IP Narae program provides consultation services for two areas—IP technology and IP management. Firstly, IP technology consulting consists of a patent analysis of domestic and foreign competitors' patents, and follows the below procedure.

• IP Technology Consulting

- 1) Derives hopeful technology
- 2) Secures strong patent rights through prevention strategies of patent disputes
- 3) Suggests R&D strategies by figuring out recent technology trends
- 4) Builds and supports a patent portfolio through new ideas

Secondly, IP management consulting consists of an initial company diagnosis followed by the provision of the below services.

• IP Management Consulting

- 1) Suggests IP management and commercialized strategies
- 2) On-the-job training for IP
- 3) Suggests an IP utilization plan
- 4) Introduces and supports IP management certification

The IP Narae program will select a consultant from the respective RIPC to become a Chief Intellectual Property Officer (CIPO) who will provide priorities and select “8-point solutions” for the applicant’s needs for a 100-day period (under contract term).

- The 8-point solutions are as follows.
- Create strong patent laws
- Select direction of R&D
- Establish conflict prevention strategies
- IP-customized education
- Establish IP exploitation strategies
- Establish IP convergence strategies
- Establish IP management strategy, including duty invention system and business secret strategies
- Establish strategy of application and certification for IP management certification and company growth

Through the IP Narae program, customized education was provided to companies according to their IP needs and standards. Furthermore, in order to secure IP infrastructure for start-up businesses, the program supported the application of trademarks and designs related to patent application and IP convergence, and as a result, a total of 443 IPs were supported (see Table 4-8).

<Table 4-8> 2017 IP Narae Performance

Patents	Trademarks	Designs	Total
344	62	37	433

Source: KIPO (2018), 2017 White Paper on Intellectual Property.

Above all, an IP management strategy was provided to help companies grow steadily, creating a total of 274 new jobs (Presidential Council on Intellectual Property, 2018, 23).

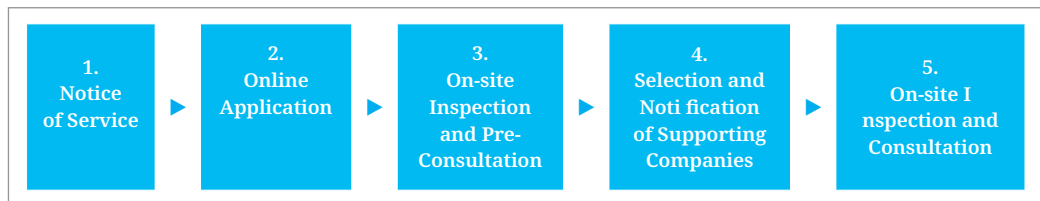
2.2. IP Consulting (Creation·Utilization) Service program

2.2.1. SME Immediate IP Support Service

SMEs located in remote provinces far from Seoul are inadequately equipped with IP capabilities and struggle to get assistance from IP experts. Therefore, it is urgent to take measures and support IP for SMEs. With regards to these problems, the “SME IP Management Support Service” is an SME support project to identify IP issues of SMEs, and to provide IP consultations, offer solutions, and eliminate barriers that hinder corporate growth.

As the need for realistic programs grows in order to respond to urgent difficulties related to IP emerging from SMEs in the management field, the project focuses on eliminating obstacles to the IP growth of SMEs. The program is processed as demanded and immediate support is provided. The IP immediate support service for SMEs is carried out through the process shown in [Figure 4-5].

[Figure 4-5] Process of SME Immediate IP Support Service



Source: KIPA, <https://www.kipa.org> (accessed on May 7, 2019).

KIPO lets applicant firms consult with company representatives known as “regional consultants,” and through this process, the respective business’s present conditions are analyzed and diagnosed. Based on this, chosen companies receive support within 2-3 months.

Supported projects include “Smart IP Care Support”, which can be categorized into “domestic and foreign IP consulting, patent and design mapping, brand development, design

development and patent technology simulation.” Each company is able to receive support for two categories, and specific information about receiving support, including the support amount, shared expenses, and limit of support, are shown in <Table 4-9>.

<Table 4-9> Overview of SME Immediate IP Support Service

Support Service	Category	Support Amount	Contribution	Support Limit per Project	Total Support Limit
Smart IP Care Support	Domestic and International IP Consulting	Within 10 million KRW per subcategory (same amount supported for each subcategory)	30% (10% in-kind + 20% cash)	Max. 2 per company	Within 20 million KRW /per same company
	Patent/Design Map				
	Brand Development				
	Design Development				
	Patented Technology Simulation				

Source: RIPC, <https://www2.ripc.org> (accessed on May 9, 2019).

Looking at the results for 2017, support programs were carried out regularly in multiple areas except for the support of the design map. In particular, about 1,000 domestic and foreign IP consulting services have been provided, helping to bridge the IP gap between metropolitan and non-metropolitan areas (see Table 4-10).

<Table 4-10> 2017 SME Immediate IP Support Service

Supported Program	No. of Cases
Patent Map	356
Design Map	5
Brand Development	212
Design Development	278
Promotional Video for Patented Technology	138
Domestic/International IP Consulting	973

Source: KIPO (2018), 2017 White Paper on Intellectual Property.

2.2.2. Regional · Overseas Intellectual Property Centers

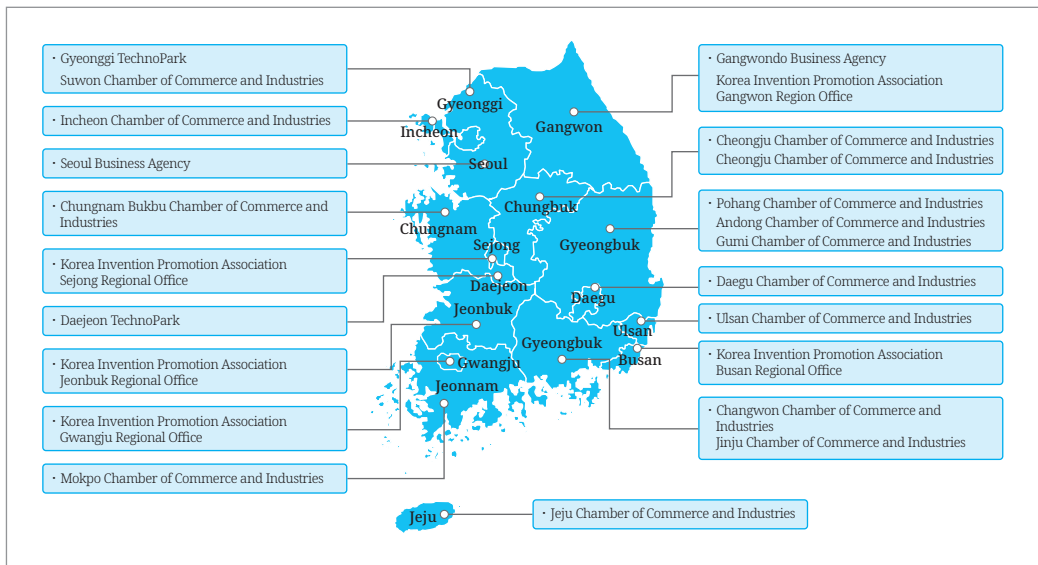
2.2.2.1. Regional Intellectual Property Centers

In order to develop the regional economy and to enhance national competitiveness, KIPO helps to cultivate the culture of invention in regional areas. To achieve this goal and develop

methods of IPR creation and active utilization so that regional IP can be created and utilized, KIPO established and operates Regional Intellectual Property Centers (RIPC) throughout Korea. These RIPC provide customized services based on the characteristics and needs of each region.

Currently, RIPC are located in 23 regions across the country. Specifically, the RIPC are located in Seoul, Gyeonggi, Incheon, Gangwon, Chungnam, Daejeon, Chungbuk, Sejong, Busan, Ulsan, Daegu, Gyeongbuk, Gyeongnam, Jeonnam, Gwangju, Jeonbuk, Jeju, Suwon, Chunchcheon, Chungju, Andong, Gumi and Jinju. The RIPC that operate in each region are shown in [Figure 4-6].

[Figure 4-6] Distribution of RIPC Execution Agencies by Region



Source: RIPC, <https://www2.ripc.org> (accessed on May 9, 2019).

RIPCs provide comprehensive IP consultations for “patents, brands, and designs” and provide civil counseling services. In order to build up the foundation of IP and manage customer value, IP information sessions and training sessions are held, aiming to satisfy the local demand for information about IPRs. Ultimately, the RIPCs have been materializing the management of customer values.

RIPCs, which create the total support system of IPRs and provide the One-Stop Service, promote the creation and application of regional IPRs to contribute to economic growth. Moreover, they promote local government and systematic cooperation with businesses, and aim to strengthen strategic support customized to the characteristics of the region. Through offering “IPR general affairs consultations, IPR comprehensive consultations, and on-site IPR

education and various cooperation projects with local related organizations,” RIPC’s helped set up 199 technology based start-ups, boost job creation through IP consultations, and increase exports by 106.4 billion KRW through IP support of exports of enterprises (Korean Intellectual Property Office, 2019).

2.2.2.2. IP-DESK

IP-DESK supports the creation of IPR overseas where Korean companies have actively entered the market. It offers services, including IPR consulting and trademark, design and patent application support to companies that are planning to operate or have been operating in overseas markets. It is operated in 15 locations in 8 different countries, as seen in <Table 4-11>.

<Table 4-11> IP-DESK Overview

Country	City	Country	City
Germany	Frankfurt	China	Guangzhou
USA	Los Angeles		Qingdao
	New York		Xi’An
Vietnam	Ho Chi Minh		Hong Kong
India	New Delhi		Beijing
Indonesia	Jakarta		Shanghai
Japan	Tokyo		Shenyang
			Thailand

Source: www.kotra.or.kr (accessed on June 25, 2019).

MSMEs in Korea may apply for the services through the website if they plan to operate or are already operating in the regions where IP-DESKS have been established. Through IP-DESKS, companies can receive information on IP systems and policies, filing and registering IP. They may also receive information on the costs of steps to trademark, design, and patent applications and other IPR related.

2.2.3. Patent Consulting Center

The Patent Consulting Center belongs to the Korea Intellectual Property Protection Agency (KOIPA), and is a project commissioned by KIPO in order to protect the industrial property rights of the socially underprivileged. It provides services such as documentation assistance, litigation for cancellation of a trial decision, dispute resolution, civil litigation fee support, and more.

When the application is submitted, it will be reviewed to decide if the center will provide the support service. Those who are eligible to access Patent Consulting Center services are as follows.

- National basic income recipient
- Near poverty groups
- People of distinguished service during special missions and their bereaved families or families
- Democratic Men of Merit for the May 18th Democratic Uprising and their bereaved families or families
- People of distinguished service to the state and their bereaved families or families
- Patients suffering from actual or potential aftereffects of defoliants and second-generation patients suffering from actual aftereffects of defoliants
- Small individual inventor with monthly income of less than 2.2 million KRW (Excluding written documentation service)
- People between the age of 6 and 19
- Students (except for special graduate students)
- Registered handicapped people
- Small businesses
- Medium-sized companies in dispute with larger companies over industrial property rights
- Combat police officers
- Military service personnel (the personnel for secondment including public service personnel, obligatory fire-fighting personnel, etc)

The duties of the Patent Consulting Center include the following, “consultation on IPR, preparation of documents related to acquisition of rights, agent for litigation for overturning a judge or trial decision, fees for civil cases related to infringement lawsuits in business property rights, support of dispute conciliation related to industrial property rights, and education related to industrial property rights.” More details are shown in <Table 4-12>.

<Table 4-12> Services of Patent Consulting Center

Services	Details
Industrial Property Rights Consultation	Visits, letters, phone calls, website bulletin boards, etc. Provides counseling and consulting through RIPCs
Preparation of Documents Related to Acquisition of Rights	Provides related documents to be registered as industrial property rights
Representation for Trial and Examination etc.	In the case of disputes related to industrial property rights, offers support for legal proceedings

<Table 4-12> Continued

Services	Details
Civil Litigation Costs for Industrial Property Infringement Litigation	In the case of infringement of industrial property rights, offers support for agency expenses and assistance in industrial property rights
Arbitration and Mitigation Support for Industrial Property Rights	In the case of dispute settlement of industrial property rights, support for the dispute settlement is provided by the dispute settlement committee through consultations and guidance on how to prepare an application for reconciliation
Education and Training Related to Industrial Property	Providing education related to intellectual property rights of public service attorneys through on-site visits if RIPCs, schools, corporations etc. request education related to industrial property rights

Source: Patent Consulting Center (2016), Intellectual Property Guide, KIPO.

There is IPR legal aid offered to low-income citizens in which patent attorneys from the Patent Counseling Center aim to overturn the judge and trial decision. The number of such cases has steadily increased in recent years, with 53 in 2015, 109 in 2016, and 120 in 2017. It is considered to give real assistance to low-income citizens and small businesses (Yonhap News, 2019).

2.2.4. Others (System to measure, Analyze and Rate patent Technology)

SMART3 (System to measure, Analyze and Rate patent Technology) is an online patent grade evaluation service. It provides quantitative and objective patent information to domestic companies and institutions as seen in <Table 4-13>. Since the evaluation is performed by the system, it is characterized by providing objective patent information at low cost and in real time.

<Table 4-13> Services of SMART3

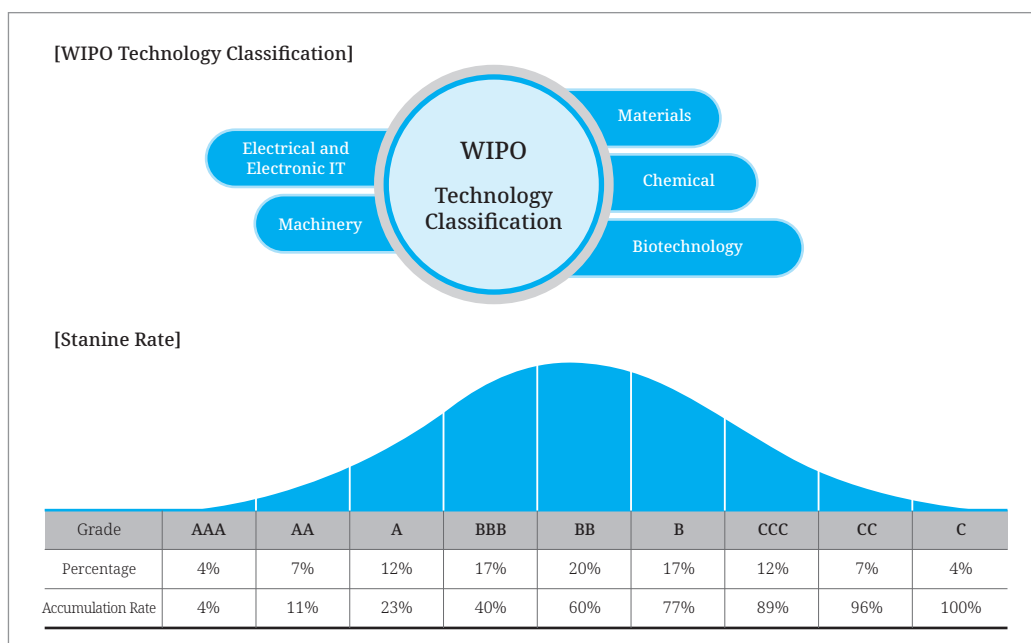
Patent Evaluation	Offered Services
Patent Evaluation Services	<ul style="list-style-type: none"> • Evaluation of individual patents • Confirmation of patent evaluation • Detailed patent evaluation report • Summarized patent evaluation report
Patent Analysis Services	<ul style="list-style-type: none"> • Claim analysis map • Citation map • Patent family map • Analysis of corporation patent competitiveness

Source: SMART3, <https://smart.kipo.org> (accessed on May 8, 2019).

In April 2010, the SMART3 system started offering evaluation services for registered patents in Korea, and analyzed the patent portfolio in 2011. The coverage was expanded by adding US registered patents in 2013 and European patents in 2016. In 2015, a service that links evaluation information with financial institutions (APT) was provided, and in 2017, the SMART3 system was linked with the technology finance database.

SMART3 provides the patent rating and analysis information of Korea, USA and Europe and 9 tiered (AAA~C) evaluation rating information through relative evaluation among patents (see Figure 4-7). It provides evaluations of patent and portfolio analysis by analyzing multiple patents in real time at a low cost. Evaluation models have been established for the following five technologies: 1) electricity, electronics and IT, 2) machinery, 3) physics and materials 4) chemistry and 5) biotechnology sector.

[Figure 4-7] Technical Classification and Relative Evaluation Criteria



Source: SMART3, <https://smart.kipa.org> (accessed on May 8, 2019).

Through objective and quantitative information of patent applications and registrations, patent examinations and decisions, an evaluation level and score are given on the strength of patent rights, quality of technology and usability as seen in <Table 4-14>. Moreover, an analysis of potential demands for similar patents and companies, competitors and prior art is provided.

<Table 4-14> Evaluation Indicators and Factor Condition

Details		
Evaluation Indicators	Strength of Patent Rights	The degree to which you can maintain exclusive status in a patent dispute with a third party
	Quality of Technology	To match or lead technology trends
	Usability	The degree and availability of business
Evaluation Factor Condition	Objectivity	A completely independent nature from personal supervision
	Quantitativeness	Quantify statistical observations, including mathematical meanings
	Completeness	The information that makes any patent eligible for evaluation

Source: SMART3, <https://smart.kipa.org> (accessed on May 8, 2019).

Therefore, the SMART3 system enables the establishment of strategies for patents, measures competitiveness, prioritizes large quantities of patents, and selects patents that are most likely for technology transfer as <Table 4-15> shows.

<Table 4-15> Purpose of SMART3 System Development

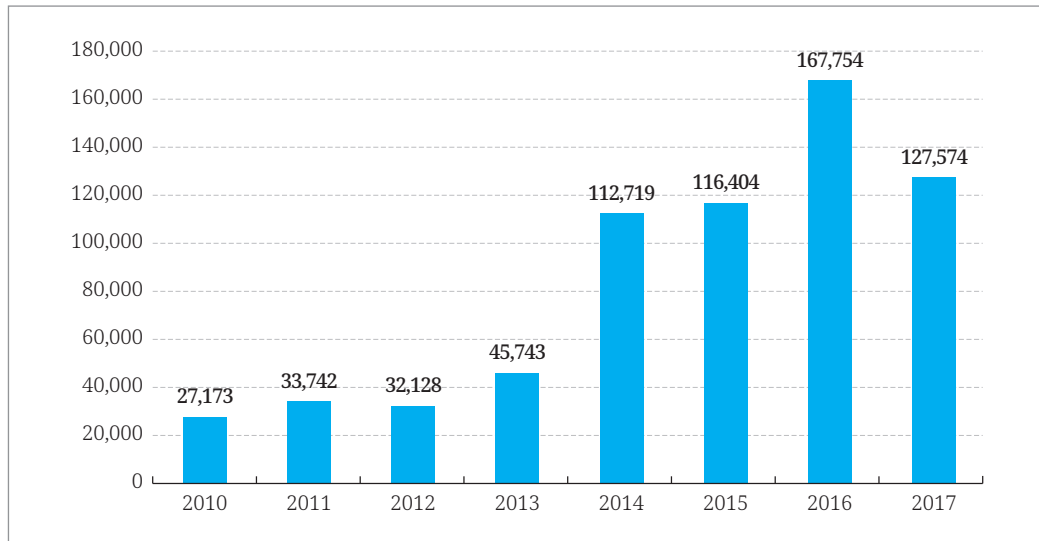
Patent Strategy Development	Establish a patent portfolio and R&D strategy in line with the business strategy
	Support the establishment of patent strategy through competitiveness of competent patents, search for competitors and potential customers
Patent Competitiveness Measurement	Provide analysis information on corporate patent competitiveness to help investors make investment decisions
Early Selection from Large Portfolio	Effective support for patent management decision making, such as patent retention / abandonment
	Establish a basis for fair value evaluation of patents
Discovery of Transferable Patents	Selection of universities, public institutions and enterprise transferable patents
	Support technology transfers and commercialization by selecting the best patents required by the customer

Source: KIPA, <https://www.kipa.org> (accessed on May 7, 2019).

As a result, private transaction institutions and patent law firms, corporations, universities, public institutions, and other organizations have used the services provided by the SMART3 system. It has been consistently used in recent years, with 116,404 cases in 2015, 167,754 in 2016 and 127,574 in 2017 (see Figure 4-8).

[Figure 4- 8] Patent Analysis Evaluation System Usage

(Unit: Cases)



Source: KIPO (2018), 2017 White Paper on Intellectual Property.

3. Analysis of Korea's IP Policies and Programs and Implications

If SMEs possess their own core technologies, they will have the right to act and create value through commercialization, thereby laying the foundations for the enterprise to develop. Therefore, securing IP in the enterprise is very important. In the previous section, experiences of implementing IP policies and programs for commercializing IP capacity and IP technology in Korea were shared. This section will cover the factors that have led policy and programs to succeed.

3.1. Analysis of Korea's IP Start-Up Support and IP Consulting (Creation·Utilization) Service

We looked at how the IP Di-dim-dol and IP Narae programs support IP-based management and described which tasks were being supported. Additionally, Korea provides IP support services for SMEs which offer IP consulting and problem solving strategies for IP issues. Moreover, through RIPC's that are located in each region of the country, Korea provides customized services tailored to the characteristics and needs of each region. We examined the experience of providing counseling related to industrial property rights through the Patent Consulting Center and how it helped to solve related problems. Through this process of shar-

ing IP creation policies and program implementation experience, we were able to identify the characteristics of the IP policies and program systems in Korea, and the reasons why Korean SMEs were able to strengthen their IP capabilities.

3.1.1. Support the Corporate Growth Cycle

Firstly, Korea's policies and programs have a system that supports corporate growth cycles from the creation of a company to the management of IP. The IP Di-dim-dol program supports the development of ideas into domestic start-up businesses, and IP Narae helps develop the start-up companies that were created within the last seven years and put the focus on IP business. Through these services, various problems such as employment, low economic growth, investment costs and loss of effort that hinder start-ups' stability and survival have been prevented. It seems Korean policies and programs have helped SMEs to strengthen their IP competitiveness as well as helping companies to survive and grow.

3.1.2. Strengthening of Cooperative Systems

Secondly, the cooperative system has strengthened, which not only links KIPO and its affiliates, but also with other governmental departments. Specifically, the IP Di-dim-dol program offers entrepreneurship consulting for various entrepreneurship support projects in other governmental departments and helps them to settle in the market by creating entrepreneurial funds and prototype products. IP Narae has prepared a device to connect with IP immediate support services of SMEs in preparation for companies that have difficulty in deriving IP convergence and multiple strategies within the support period of the program. By providing support projects that enable enterprises to develop quantitatively and qualitatively through such follow-up services, it is necessary to eliminate the obstacles to the growth of SMEs and to create an environment and foundation for more active use of IP. This is considered to be a critical success factor.

3.1.3. Eliminating IP Regional Gaps

Finally, Korea continued to implement projects that contribute to addressing the IP gap between the metropolitan and non-metropolitan areas through cooperation with the regions. Compared with SMEs located in metropolitan areas, SMEs located in the provinces have inadequate intellectual property capacity, and it is difficult to get help from IP experts. In order to overcome these problems, Korea reduced the IP gap between regions, especially between the metropolitan area and non-metropolitan areas, by providing practical programs to cope with difficulties related to IP identified at the management sites of SMEs

through nationwide RIPC.

Through the RIPC, programs such as “IPR general affairs consultation, IPR comprehensive consultation, and on-site IPR education and various cooperation projects with local related organizations” enabled the establishment of a comprehensive infrastructure that functions to support the creation of IP in the regions. Measures were made and applied to create IP in the regions, distributing nationally to meet the demands of regional companies and to contribute to the strengthening of SMEs’ IP capacity.

3.2. Analysis of Korea’s IP-based Technology Commercialization Program

Part 3 and 4 shows Korean IP policy and programs. Through this, we saw that Korea was able to strengthen the IP-based technology commercialization of SMEs by establishing an environment for IP and IP-based technology commercialization. We will examine each element in detail to see what kind of environment Korea has built.

3.2.1. Establishment of Legal System Related to IP Utilization

Firstly, related laws and systems have been established to enable IP-based technology commercialization and utilize the results of IP valuation. In order to promote the utilization of technology, relevant laws have been enacted, including: Article 35 of the Act on Transfer of Technology and Promotion of Commercialization; Article 28 of the Invention Promotion Act; Article 6 of the Special Promotion Act on the Promotion of Venture Businesses; Article 15 of the Industrial Technology Innovation Promotion Act for financial support; and Article 28 of the Technology Credit Guarantee Fund Act (Cho and Im, 2014, 37). Through the enactment of relevant laws and regulations, IP valuation’s applicability was established, and the basis of making IP valuation long-term and its contribution to expansion and development was provided.

3.2.2. Establishing an Infrastructure on IP Utilization

Second, it promoted the use of IP by SMEs through the creation of various environments that can activate IP-based technology commercialization. In the case of IP transactions, Korea established an online and offline market for IP transactions by linking IP-Market and patent transaction specialists in order to establish a foundation for transaction activities. Therefore, the base of the IP trading market was expanded through IP-Market, and IP trading for SMEs was actively promoted through IP transaction specialists.

Since IP valuations can be used for various purposes, the valuation method was established and the infrastructure was built by making it possible to objectively present the economic value according to the objective. These objectives include procuring business funds, creating the basis of technical certification, assessing contributions in kind, reviewing business feasibility, and more. In this way, Korea created an infrastructure to utilize IP for IP transactions and IP valuations, along with the environment to enable SMEs to increase their IP utilization value.

3.2.3. Securing Expert Groups

Third, relevant experts were secured to enhance the professionalism and expertise of related work. In the case of IP transactions, it is difficult to make transactions only by providing information. Organizations also often faced problems when trying to find consumers and suppliers, and when carrying out various tasks related to areas such as pricing, conditions, and contracts. As a result, the patent transaction specialists were consulted in regards to IP transactions to ensure that SMEs and governmental organizations lacking manpower can get help.

In the case of IP valuation, a dedicated expert organization in charge of IP valuation was set up by allowing organizations to operate through experienced IP valuation experts. This has contributed to the promotion of IP utilization by achieving qualitative growth through the relevant expert group.

3.3. Implications of Possible Application to AMS

We examined the factors that strengthened IP capacity and IP-based technology commercialization of Korea's SMEs by analyzing Korea's IP policies and programs. The emphasis is on how policies and programs for strengthening IP capacity were supported in cycles before the growth of SMEs, strengthened the related systems of the Korean Intellectual Property Office, related institutions and other departments, and resolved the IP gap among different regions. These steps were necessary in order to support start-ups that are based on pre-founders' technology, allowing them to survive, grow and develop. It was also important for Korea to close the gap among regions.

Furthermore, the IP-based technology commercialization policy has established a relevant legal system and infrastructure to facilitate the use of IP and secured a group of relevant experts. This means that Korea's IP environment and IP-based commercialization phase

have long-term plans to build a legal system, create relevant infrastructure to build an environment that is conducive to IP commercialization, support SMEs through expert groups, and provide a reliable valuation when required.

Thus, Korea has been able to strengthen the IP-based technology commercialization of SMEs in accordance with Korea's economy, business situation, and IP infrastructure environment, which requires SMEs to acquire IP rights and activate IP-based technology commercialization. Therefore, in order to apply and enforce Korea's policies and programs in AMS, they should also strengthen the IP capacity of SMEs in accordance with the circumstances, environment and conditions of each member state and strengthen measures for IP-based technology commercialization.

4. Conclusion and Policy Suggestions

Through Korea's experience of strengthening its IP capacity and commercialization of IP technology, we examined which roles can be played through government policy in order to lay the foundations for securing IP rights. Based on this experience, a plan to strengthen IP competency and IP-based technology commercialization in AMS will be proposed. However, as we have already seen through the content analysis, implementing the policies that are appropriate for each country's environment is of the utmost importance.

Therefore, since the economic situation, IP status, and environment of each AMS are different, it is necessary to propose policies that can be implemented according to the current situation of each country rather than a general proposal. Hence, by referring to the "IP Business Guidebook for SME Innovation Support of APEC Countries", which provides a step-by-step process according to each country's environment and situation, we suggested policy recommendations covering chapter 3 and chapter 4 of this report. Specifically, we recommended steps in order to strengthen IP capacity and build the foundations of IP-based technology commercialization according to the current situation and environment of each member state.

4.1. A Proposal for Strengthening the IP Capacity of ASEAN Member States

Large conglomerates and global enterprises are systematically securing IP for core products and technologies. Additionally, they are leaders in IP as they conduct prior art searches

and patent analyses. However, compared to these large conglomerates, SMEs lag behind in terms of IP acquisition and IP in general. In AMS, there is a great need for the government to support IP programs for enterprises, organizations, and individuals that have difficulties in developing their IP capacity due to technical or financial issues.

4.1.1. Establishing a Patent Information Research Environment

The first thing to consider when creating IP is patent information research. The IP process begins with developing new technology and verifying that similar technologies or products do not exist. Therefore, before R&D or patent applications, the direction of research should be decided in detail and a prior art search should be conducted to determine the possibility of patenting the invention.

Therefore, AMS need to establish a patent information research database for IP creation, to secure patent information research experts and to establish a training system to nurture patent information research experts. The measures required to achieve such goals will depend on each member state's current IP environment.

• Step 1: Establishment of Patent Information Research Database

In order to proceed with the patent information research, a patent information research database should be established. It is recommended that the database is built at the government level, rather than the individual or SME level, due to the high costs involved. In Korea, the Korea Intellectual Property Rights Information Service (KIPRIS) provides a free patent information research database in Korean. Therefore, in accordance to each situation of AMS, it is necessary to establish a similar database supporting the local language to increase the number of individuals and companies conducting patent information research (Korean Intellectual Property Office, 2017, 95).

• Step 2: Securing a Specialist Group of Patent Information Researchers

Secondly, it is necessary to nurture patent information research experts. In general, patent information research is limited to the technical fields under investigation. This is because if a particular invention or idea is about to be filed, the applicant will only research if there is similar prior art associated with it. However, patent analyses similar to patent maps have a wider research range when investigating about applicable technology. They do not include applicable technology but they also need to analyze patent trends that are related to the technology field, and so a thorough investigation and analysis is needed to determine technology's range (Ibid, 95). Patent information research is a specialist field which requires

experts with prior knowledge and experience. Therefore, expert groups need to be secured in order to conduct a patent information survey due to such technical characteristics.

• Step 3: Establishment of Training Programs for Patent Information Research Experts

A training program should be established for patent analysts. It is recommended to provide opportunities for analysts to accumulate expertise and to use channels that offer educational services with high accessibility. Therefore, organizing a systematic program and providing education through online and offline training courses will be the fastest way to train patent analysts. Furthermore, training programs will provide an opportunity for patent analysis lecturers to share their skills and knowledge with students. Based on this, the competence of patent analysts can be strengthened (Ibid, 96).

4.1.2. Execution of IP Creation Policies and Programs

• Step 1: Build Supportive Organizations for Low-income Earners and Small Businesses

Among AMS, those initially developing IPR lack IP experts who can support SMEs. However, there are difficulties in deploying experts in SMEs, while small firms often struggle to afford the services of external IP experts.

Therefore, IP centers such as Korea's Patent Consulting Center which protects the industrial property rights (IPR) of the socially underprivileged can be set up in AMS. The centers could provide consultations on IPR, prepare documents related to the acquisition of rights, and offer IPR education. They could also act as an agent for helping overturning a judge or trial decision, provide fees for civil infringement lawsuits related to business property rights and offer support for dispute conciliation related to IPR.

• Step 2: Establishment of an IP base for SME IP Support

AMS that are in the process of establishing IP infrastructure need to strengthen the IP capacity of SMEs, which play a key role in their local economies, by establishing IP base institutions. Korea's RIPC strengthens the competitiveness of SMEs and venture companies through their customized business development program for small businesses. SMEs that are supported by RIPC enjoy significant benefits, such as increased employment and new overseas export deals (Kil, 2016).

Therefore, each AMS may wish to establish regional IP bases similar to the Korean RIPC. These organizations can strengthen IP education for individuals and businesses, help establish and operate intellectual property policies and programs, and eventually could research methodologies for regional SMEs to create and utilize IP.

• Step 3: Implement SME IP Creation Policies and Programs

In AMS where IP systems are well maintained, it is necessary to implement programs that support SMEs' technology and IP-based products when examining the proportion of SMEs in ASEAN and their importance to the local job market. Therefore, it is possible to tailor programs such as IP Di-dim-dol and IP Narae for AMS.

For example, in Thailand, various programs are run to cultivate businessmen. College graduates, those preparing for employment, and those with a Master's degree or higher also have the opportunity to build their careers as entrepreneurs. Furthermore, these programs help entrepreneurs to resolve the initial difficulties they can often encounter when starting a business (Park and Joo, 2013, 115). Therefore, it is possible to provide IP-based entrepreneurship in connection with the existing programs.

The IP Di-dim-dol program in particular plays a key role in helping future entrepreneurs who cannot realize their ideas into products. This in-turn plays an important role in creating new jobs. However, if a company that has been established through such a process cannot survive, various problems arise, such as a fall in employment, low economic growth, and a loss of effort. Hence, implementing the IP Narae program in succession is recommended so that start-up companies can maintain stable operations with a foundation for growth.

4.1.3. Strategies for Strengthening IP Capabilities of SMEs

• Step 1: Training Experts in Various Fields

Experts will be needed in order to implement policies and programs related to IP creation and utilization in AMS. Therefore, if AMS are planning IP creation and utilization policies and programs for SMEs, they should be accompanied by a plan to train experts in various fields.

In Korea, there are programs to strengthen the IP capacity of SMEs, technology-based start-ups, and IP management consultations. These include programs related to technology commercialization, IP finance, and patent technology valuation support, as well as IP Di-dim-dol and IP Narae. The success of these programs was due to having experts in various fields,

including R&D, IP, management, law, and finance, and such experts are required to support IP creation and utilization. Therefore, AMS should provide education and training on R&D, law, finance, and management, as well as IP-related aspects, in order to create education and training programs or related centers on IP.

• Step 2: Raising IP Awareness of SMEs' CEOs and IP Training

Even if the government implements the policies and programs to strengthen the IP capacity of SMEs, such policies and the programs will not be successful if SMEs do not recognize the importance of IP management. Unlike large conglomerates that have relatively multi-layered processes for decision making, SMEs often determine the direction of their operations depending on the will and capability of their CEOs. Therefore, in order to strengthen the IP capacity of SMEs, CEOs' awareness of IP must be increased.

To this end, AMS need to implement policies and programs to raise the IP awareness of SMEs' CEOs. In Korea, there is the "IP Management Club," a voluntary group organized by companies that recognize the importance of IP and introduce it into corporate management. The "IP Management Club" regularly meets for lectures on IP management, shares management know-how and best practices, and finds solutions to current issues. The club can be used as a reference if AMS intend to raise the IP awareness of SMEs' CEOs through IP-related meetings and seminars, and provide training sessions for them. If regular meetings on IP are formed among CEOs through this process, it will provide an opportunity to exchange information and ideas on company growth.

• Step 3: Establishment of Links Between Support Programs

In order for SMEs to stabilize themselves in the market through IP management, it is necessary to link support programs according to the stage of development or needs of SMEs. Furthermore, IP management support programs for SMEs in IP related government departments can be linked with SME support programs from other governmental divisions.

In Korea, a device was created for companies that have difficulty in deriving IP strategies by linking the IP Narae program and IP support service for SMEs. Furthermore, the companies that received start-up support from the IP Di-dim-dol program were able to receive support for financing and prototyping the product through other governmental support programs. As such, unlike temporary IP support programs, the links with other projects or other programs that support SMEs will inevitably help the SMEs to settle in the market and grow quantitatively and qualitatively through IP management.

4.2. A Proposal for IP-based Technology Commercialization of ASEAN Member States

4.2.1. Establish Environment for IP Transactions

In order to promote IP utilization, it is important to create an environment that can support IP transactions. The foundations for transactions must first be established so they can be performed safely. The steps to creating a sound IP transaction environment include establishing an online and offline IP trading market, supporting IP transactions through experts and consultations, and building a system to train IP transaction specialists.

• Step 1: Establish an IP Trading Market Both Online and Offline

IP transactions, like other transactions, involve a buyer and a seller. Following the proliferation of the internet and smart devices, it is now possible to make online IP transactions and easily access information anywhere. In particular, users can access a large amount of information online. Through the online IP trading market, it is possible to secure a large number of subscribers and to provide IP transaction information in various forms.

The offline market has the disadvantage of space constraints which makes it difficult to provide information to many people at the same time. Nevertheless, the offline IP trading market has the advantage of providing more detailed and specific information to visitors in a face-to-face environment. It also offers visitors the chance to meet with IP trading specialists and receive customized assistance that fits their situation. Therefore, it is recommended to create an opportunity to vitalize IP transactions by combining the advantages of the online and offline markets (Korean Intellectual Property Office, 2017, 326).

• Step 2: Support IP Transactions with Experts and Consultations

Even if there is online and offline infrastructure in the IP market, it is also important to create the right environment for IP transactions to take place. Unlike trading ordinary goods, it is very difficult for IP transactions to take place because there are many aspects to the negotiation process. First, it is difficult to find a seller and a buyer, and even if a meeting between the supplier and the consumer is arranged, the negotiation can be long and complex. It involves “calculating the appropriate price, determining the contract conditions, noting the matters in the contract, and processing tax.”

Therefore, it is vitally important to develop programs that support IP transactions by securing IP transaction experts who can provide consulting services. These IP transaction ex-

perts should be experienced and offer consultations on all the processes to help SMEs close IP transactions (Ibid, 327).

• Step 3: Establishment of a Program to Train IP Transaction Experts

As there are not many IP transaction experts, it will be difficult to secure enough lecturers to train more experts. It will also be very important to have different methods to actively train such personnel in public institutions. For example, a public institution could recruit personnel who can take charge of and perform IP transactions. This method has the advantage of being able to train professional manpower in a short period of time.

In the long term, the workforce at the public institution will have the opportunity to expand the market for IP trading directly. In other words, the workers can accumulate knowledge while performing IP transactions, and later can establish a private technology trading organization based on their experience. If this happens, not only will the field of IP trading expand from the public to the private sector, but it will also be able to fully expand its capabilities (Ibid, 327).

4.2.2. Construction of IP Valuation Environment

There is a need for more various ways to utilize IP beyond IP transactions. It is important to visually show how successful a business can be with IP, or how much economic value and goals businesses can achieve through IP. In the past, the use of IP was limited mainly for the purpose of product development or production. However, IP utilization methods are becoming more varied, and IP has been used recently for business fund raising, technical certification basis, investments in-kind, and business feasibility studies. Therefore, it should be possible to evaluate IP based on certain criteria and present quality IP based on it.

IP is an intangible asset, making it difficult to value. An IP valuation is further complicated by the fact it determines the item's value considering its future worth, not its current profitability. In addition, it is difficult to achieve consistent and objective valuations because it is necessary to review and examine an item's value from various viewpoints, including technicality, quality of rights, marketability, and business feasibility.

Moreover, in the early stage of introducing related programs, standardized and reliable IP valuation models are not available and the number of experts is very low. Therefore, it is necessary to establish support for IP valuations and to build infrastructure. Specifically, we will look at the stages of establishing an IP valuation model, nurturing IP valuation experts,

and establishing legislation to utilize IP valuations.

- **Step 1: Build an IP Valuation Model**

Before constructing an IP valuation model, research should be carried out into the relevant country's IP situation and detailed policy goals should be drawn up. This research can be outsourced to a dedicated research team, which should consist of IP experts such as patent attorneys, technical experts, economists, accounting experts, and management experts. Each expert should develop an appropriate IP valuation model following collaboration with others (Korean Intellectual Property Office, 2017, 410).

- **Step 2: Training IP Valuation Experts**

Secondly, education programs on all aspects of the IP valuation model should be developed to train an IP valuation expert group. In addition, a dedicated public organization could be established so that the experts can carry out IP valuations and accumulate relevant experience. In the case of the IP valuation education program, it can be developed through the accumulation of experience in IP valuation or by the training of experts who have completed the IP valuation model training (Ibid, 410).

- **Step 3: Establish a Legal System to Utilize IP Valuation**

Thirdly, in order to utilize and disseminate IP valuation results, it is necessary to establish a statute and system to mandate or specify the purpose of using IP valuation results. These efforts should be made by public institutions to establish designated laws and rules on the practical use of IP valuation results. Moreover, various bases need to be established for propagating, expanding, and developing IP valuation in the long-term (Ibid, 410).

In Korea, there are the following laws regarding IP valuation: Article 35 “Designation of Technology Evaluation Agencies” of the Technology Transfer and Commercialization Promotion Act; Article 28 “Designation, etc. of Institutes for Evaluation of Inventions” of the Invention Promotion Act; and Article 6 “Special Cases Concerning Contributions of Industrial Property Rights, etc. of the Act on Special Measures for the Promotion of Venture Businesses. It requires legislation to institutionalize the utilization of IP valuation results.

4.2.3. Establishment of IP Finance Foundations

If the environment and infrastructure for IP valuation are established among the AMS through the proposed steps, then IP finance can be considered. However, AMS must consider

whether they have an adequate IP environment to support IP finance. Therefore, Malaysia, the Philippines, Vietnam, Thailand, and Indonesia, which have relatively well-established IPR systems among the AMS, should proceed step-by-step through a long-term plan to implement IP finance.

The reason why AMS need to implement IP finance is because local SMEs often encounter difficulties securing funding. In the Philippines, businesses are required to go through convoluted, complex and demanding procedures to obtain funds from banks. Financial institutions require an asset for loans, but often loans were refused as SMEs were unable to provide assets for the long-term (Seo and Binh, 2016, 97). Malaysia accounted for only 20.3% of the total financing from financial institutions (Ibid, 72). Meanwhile, Thailand is striving to make it easier for SMEs to access finance. It is encouraging banks to lend to the corporate sector and the SME Development Bank provides funds and guarantees on the establishment, expansion and improvement of SMEs (Ibid, 115). However, in Indonesia, approximately 60% of SMEs have difficulty securing loans (Ibid, 50). It is clear, therefore, that many SMEs in AMS have difficulty raising the necessary IP finance.

In order to revitalize IP finance, it is necessary to enact relevant laws and regulations, establish a tailored IP valuation model, and set up the necessary institutions. The following section takes a closer look at these steps.

• Step 1: Establish Laws or Regulations

It is necessary to determine the financial institutions that will cooperate or enact a regulation for the issuance of the loan, guarantee or investment, and decide on the procedures, methods, and support content to utilize the IP valuation results (Korean Intellectual Property Office, 2017, 411).

In Korea, there are the following laws regarding the use of IP valuation results by financial institutions: Article 15 (2) 4 “Subsequent Development of Projects for the Development of Industrial Technology and the Facilitation of Technology Financing” and Article 15 (2) 5 “The Facilitation of Loans Secured by Technologies Based on the Results of Evaluation of Technological Capabilities” of the Industrial Technology Innovation Promotion Act; and Article 28-4 “Guarantee-Linked Investment” of the Korea Technology Credit Guarantee Fund Act. It is necessary to provide statutes and regulations for financial institutions to utilize IP valuation results.

• Step 2: Establish an IP Valuation Model According to Purpose

Moreover, an IP valuation model should be constructed for the purpose of IP financing. In the case of IP investment, the expected future profit from IP commercialization is an important factor. However, in the case of IP loans, since the loan is executed with IP as securities, whether or not the loan amount can be recovered is important. Therefore, the amount that can be secured through IP technology set as securities should be evaluated. Hence, the valuation model of IP financing should be constructed differently depending on whether it is for investment purposes or loan purposes (Ibid, 411).

• Step 3: Ensure Fair Execution Agency

The valuation agency should establish a fairer and more reliable valuation process. The results of the IP valuation will have a significant impact on the interests of SMEs. If an valuation is deemed to be unfair, it will be difficult to trust the valuation process and the result, as well as the valuation specialist and valuation performing agency. This lack of trust will obviously be problematic (Ibid, 442). Since loans and investments are made to SMEs on the basis of IP evaluations, consistent standards should be applied so that the agency performing the valuation can make a fair valuation.

4.3. Conclusion

So far, we have looked at how AMS can utilize government policies and programs to lay the foundations for strengthening IP capacity building and IP-based technology commercialization through tailored step-by-step proposals. For strengthening IP capacity building, AMS can establish a sound patent information research environment by building a patent information research database, securing a specialist group of patent information researchers and establishing a training system for experts. Furthermore, in order to support IP start-ups and implement IP consulting service programs, AMS could build support organizations for low-income earners and small businesses, establish IP bases for SME IP support and implement policies and programs for IP creation by SMEs. By fostering experts in various industries, raising the IP awareness of CEOs in SMEs, providing the necessary training programs for them, and linking support programs from different government departments, it is possible to provide holistic IP management support to SMEs. In particular, this chapter examined what to consider when introducing IP valuations, transactions and finance in ASEAN countries. For IP-based technology commercialization, AMS need to create a customized environment for IP transactions, valuations and finance. They could establish an IP trading market both online and offline, support IP transactions through expert consultations and construct a system to train experts for IP transactions. To build an IP valuation environment, they are

recommended to establish an IP valuation model, train IP valuation experts and make a legal system to utilize IP valuations. SMEs in AMS often have difficulty securing funding, so these member states need to implement IP finance policies and programs in stages through a long-term plan. They could also legislate IP-related laws and regulations, build IP valuation models and establish a fair execution agency. The IP creation and utilization capacity of AMS can be realized by implementing tailored policies and programs and by establishing the related infrastructure.

Korea is the first country in the world that transformed itself from an official development assistance (ODA) recipient country into a donor country. This transformation was achieved through foreign direct investment promotions and manufacturing-based economic growth. Since then, it has successfully changed into an IP-based economy. Within half a century, Korea has become a member of the IP5 while achieving industrial economic development. Similar to Korea, AMS have achieved economic growth through foreign direct investment and developing manufacturing-based economies. By sharing Korea's knowledge and experience, it will help AMS emulate the Korean experience. However, until the policies and programs are stable in the AMS, it is possible they will face difficulties throughout the process, especially during the introductory phase. Nevertheless, considering that Korea also experienced numerous trials and errors, if AMS continue to devote their efforts to implement a customized version of the shared policies and programs, they will be able to achieve economic development based on intellectual property.

Additionally, in March 2018, a meeting of ROK-ASEAN IP heads of offices was held, and a Memorandum of Cooperation was signed. The parties agreed to strengthen cooperation on the creation, protection, utilization, and commercialization of IPR, and establish a forum for a regular meeting such as the IP heads of offices meeting. If Korea and AMS closely cooperate to manage such a consultative group, researchers expect that these suggested IP policies and program will be carried out successfully within the AMS.

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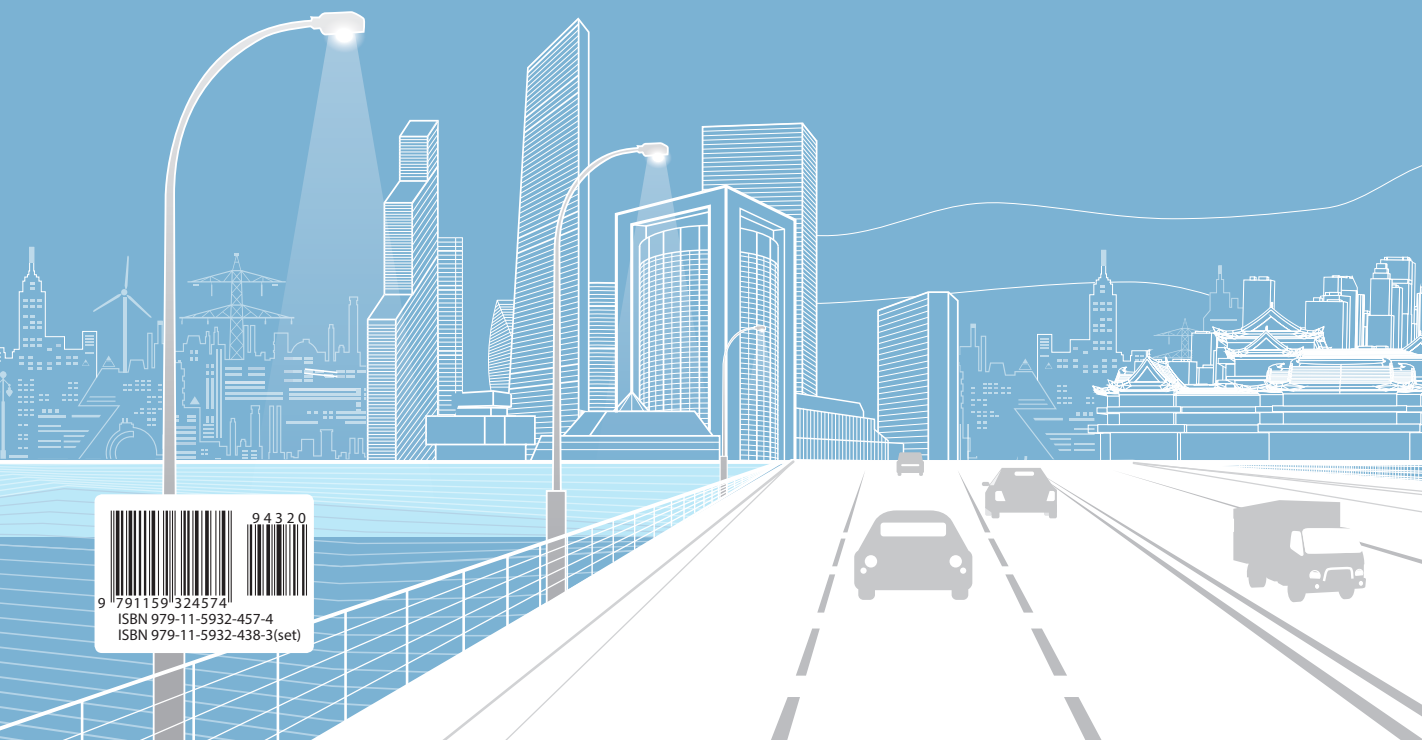
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