

# Patent Information Utilisation to Promote Innovation in the ASEAN Region

By

Yoshitoshi Tanaka

## Patent Information Utilisation to Promote Innovation in the ASEAN Region

Economic Research Institute for ASEAN and East Asia (ERIA)

Sentral Senayan II 6<sup>th</sup> Floor

Jalan Asia Afrika No. 8, Gelora Bung Karno

Senayan, Jakarta Pusat 10270

Indonesia

© Economic Research Institute for ASEAN and East Asia, 2024

ERIA Research Project Report FY2024 No. 01

Published in May 2024

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means electronic or mechanical without prior written notice to and permission from ERIA.

The findings, interpretations, conclusions, and views expressed in their respective chapters are entirely those of the author/s and do not reflect the views and policies of the Economic Research Institute for ASEAN and East Asia, its Governing Board, Academic Advisory Council, or the institutions and governments they represent. Any error in content or citation in the respective chapters is the sole responsibility of the author/s.

Material in this publication may be freely quoted or reprinted with proper acknowledgement.

## Table of Contents

	List of Author	iii
	Acknowledgements	iv
	List of Figures	vi
	List of Tables	vii
	Executive Summary	viii
Chapter 1	Background and Project Purpose	1
Chapter 2	Research Promotion Organisations and Research Methodology	3
Chapter 3	Research Results	8
Chapter 4	Conclusion and Recommendations	29
	Appendices	30

## List of Figures

Figure 2.1	Basic Flow of Workshops and Invention Business Contests	5
Figure 2.2	Model Workshop Programme and Invention Business Contest Schedule	6

## List of Table

Table 3.1	Number of Survey Responses Received	8
Table 3.2	Patent Information Databases Used by IPOs	10
Table 3.3	National Patent Information Databases	11
Table 3.4	Language of National Patent Information Databases	13
Table 3.5	Reasons for Patent Information Searching	14
Table 3.6	Survey Responses from Universities	17
Table 3.7	Linear Regression for University Survey Results	18
Table 3.8	Survey Responses from Private Companies	22
Table 3.9	Linear Regression for Private Company Results	22
Table 3.10	Linear Regression for Law Firms Responses	24
Table 3.11	Workshops and Contests Schedule	26

# Chapter 1

## Background and Project Purpose

### 1. Background

The patent system has been established as a global standard, and around 3.4 million patent applications are filed annually around the world (WIPO Intellectual Property Statistics, 2021). The amount of patent information<sup>1</sup> issued far exceeds the number of academic research publications devoted to it; expectations for the effective use of patent information are increasing. For patent information, many databases are available, such as Espacenet from the European Patent Office, DEPATISnet from Deutsches Patent und Markenamt (German Patent and Trademark Office), Patentscope from the World Intellectual Property Organization (WIPO), and J-PlatPat by the Japan Patent Office.

At present, international cooperation on mutual exchange of patent gazette data issued in Association of Southeast Asian Nations (ASEAN) Member States (AMS) and that issued elsewhere has not progressed sufficiently. Indeed, many overseas companies have requested improvement of search systems of patent gazettes issued in AMS.

As an educational activity for patent information retrieval, a patent information retrieval competition began in 2007 in Japan. In January 2022, the Tokyo Institute of Technology held a patent information retrieval workshop and patent information retrieval competition in Manila, Philippines, beginning education, training, and dissemination activities for patent information retrieval overseas. A total of 160 students took part in this workshop and competition. There, a team imparted the importance of patent information, demonstrated search methods using Patentscope and J-PlatPat, and held a full-scale competition for patent information retrieval.

### 2. Project Purpose

At private companies and higher educational institutions – like universities – in AMS, patent information retrieval activities are nascent, and few people have been trained in it. To encourage local innovation, patent information retrieval systems must be promoted as

---

<sup>1</sup> Patent information includes prior art search at the time of patent filing, as well as for future technology predictions, national policy making, competitiveness measurements between companies, corporate management strategies, research and development strategies, corporate value evaluations, explanations to shareholders and investors, and research themes at universities and research institutes.

well as guidance on patent information analysis. Thus, first, the needs of private companies and universities regarding patent information retrieval activities in each AMS must be understood. A questionnaire for intellectual property offices (IPOs), companies, and patent attorneys regarding patent information retrieval systems in AMS was created and distributed under this project.<sup>2</sup> Results sought to detail how entities in each AMS use patent information search systems, the current state of each country system, and specific problems faced by users.

Second, patent information utilisation workshops and patent information retrieval competitions were held throughout ASEAN. By inviting representatives from private companies and universities as participants and providing opportunities for practical education in patent information retrieval, the associated needs in each AMS were revealed. This knowledge will now make future education, training, and other support more productive. Such activities are also useful for building a network of those involved in patent information retrieval, thus expanding the flow of patent information.

---

<sup>2</sup> Due to the COVID-19 pandemic, an online interview survey was conducted to expand on parts of the questionnaire.

## Chapter 2

# Research Promotion Organisations and Research Methodology

### 1. Research Promotion Organisations

The Patent Information Search Education, Training, and Dissemination Working Group was established for this project. Yoshitoshi Tanaka, Director General of i-BIS International Patent Office, was the leader of the working group. It was composed of three members: Fumihiko Moriya, visiting professor, Kanazawa Institute of Technology; Yoriyisa Katsunuma, intellectual property manager, Ajinomoto; and Takashi Koyama, attorney.

### 2. Research Methodology

The following points were considered when creating the questionnaires:

- (i) status of the construction of national databases in AMS for patent information;
- (ii) possibility of searching such databases in English;
- (iii) future policies and financial arrangements for building the national databases;
- (iv) human resources development status for patent information searchers;
- (v) utilisation, significance, and needs for patent information of universities;
- (vi) utilisation, significance, and needs for patent information of private companies;
- (vii) utilisation, significance, and needs for patent information of law firms;
- (viii) usage status of overseas patent information databases by universities, private companies, and law firms; and
- (ix) problems faced by users regarding patent information searches.

The answers helped reveal the composition of each AMS's patent information search system, current state of each system, and specific problems faced by users.

#### 2.1. Current Status of Knowledge Regarding Patent Information Search

The full text of the questionnaire for IPOs is attached as Attachment 1. The main questions are:

- (i) What kind of patent database does your IPO use?
- (ii) Did your IPO build its own patent database?



- (iii) If you have built your own patent database, please note the characteristics of that database.
- (iv) How does your IPO provide information to the public?
- (v) Regarding the database, is the operating language, search language, and display language English or another language?
- (vi) Is there a charge for providing patent information?
- (vii) What are your opinions on plans for building a patent database in your country, budget measures involved, training of human resources specialising in patent information searches, and future challenges?

In addition, questions on 16 items were evaluated on a 5-point Likert scale, including the use of patent information, significance of patent information searches, relationship between patent information searches and invention creation, relationship between patent information searches and business strategy formulation, and relationship between patent information and innovation.

The full text of the questionnaire sent to universities is attached as Attachment 2. Universities were asked about their experience regarding patent information searches as well as use of patent information, significance of patent information searches, patent information searches and invention creation, commercialisation of research results, and patent information searches and start-ups. A total of 58 questions were posed.

The full text of the questionnaire for private companies is attached as Attachment 3. Private companies were asked about their experience searching for patent information, use of patent information, significance of patent information searching, relationship between patent information searches and business activities, and patent information and innovation. A total of 46 questions were posed.

The full text of the questionnaire for law firms is attached as Attachment 4. Law firms, intellectual property agents, and intellectual property consultants were asked about their experience searching for patent information, use of patent information, significance of patent information searches, relationship between patent information searches and invention creation, and patent information searches and consulting activities. In total, 27 questions were asked.

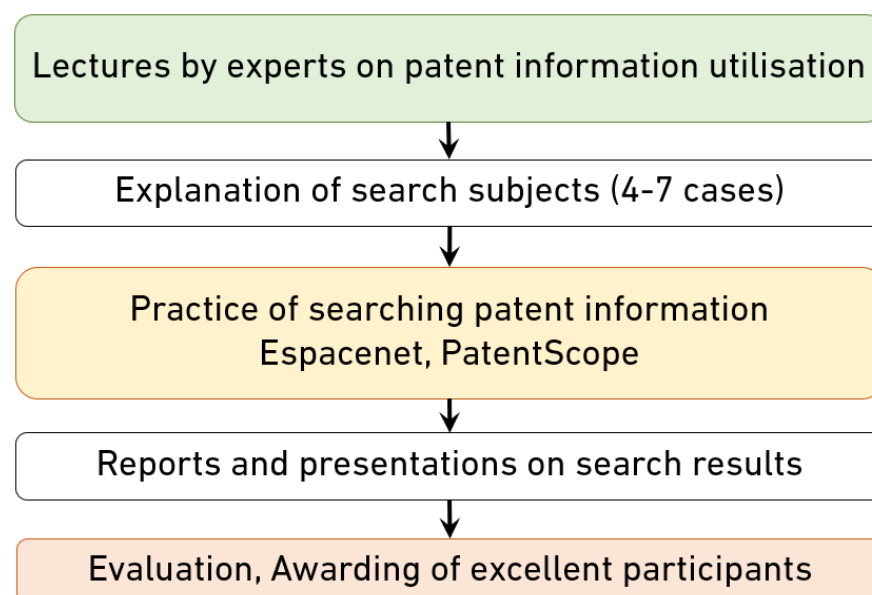
## **2.2. Patent Information Utilisation Workshops and Invention Business Contests**

Patent information searches help find valuable information for examining patent applications; moreover, technical information obtained from the results of patent information searches can be a source for new inventions. International support and cooperation that emphasise the importance of patent information searches to stimulate innovation are thus needed throughout ASEAN.

Patent information search workshops and invention business contests were held in most

AMS as practical education/training and awareness-raising activities for patent information searches.<sup>3</sup> Invention business contests were also held in each AMS, with local IPOs serving as main organisers. At the beginning of 2021, during the COVID-19 pandemic, it was difficult to travel to the sites, so the working group provided support online. In mid-2022, the working group began traveling to each AMS to hold the workshops and invention business contests.

**Figure 2.1. Basic Flow of Workshops and Invention Business Contests**



Source: Author.

The workshops covered topics such as the importance of patent information for industrial development, current status of patent information search systems, how to use global databases such as Patentscope and Espacenet, and practical exercises on search systems. Lectures were also given by local IPOs and representatives from the Economic Research Institute for ASEAN and East Asia (ERIA). Local universities sent faculty members with extensive experience as users of patent information searches. The workshops helped gain the necessary knowledge in preparation for the invention business contests.

During the invention business contests, participants were given the task of searching for patent information and had to submit their search results within a set time. Participants simultaneously accessed the database system from the internet during an online-based conference, so it was necessary to ensure the speed and capacity of internet access.

---

<sup>3</sup> Due to various circumstances, events in Myanmar and Singapore could not be held. Workshops and invention business contests were held at nine institutions in the eight other AMS, however.

English teaching materials were created on several technical topics as well.

**Figure 2.2. Model Workshop Programme and  
Invention Business Contest Schedule**

<b><u>Day 1: Workshop - Knowledge Sharing</u></b>	
Educate participants on patent information retrieval through lectures and questions	
Lecture:	"Basic Understanding of a Patent and Patent Search"
Lecture:	"Introduction of Patent DB"
	"How to use Espacenet and Patentscope"
Lecture:	"Utilising intelligence of patent information for revenue business models"
<b><u>Day 2: Invention Business Contest:</u></b>	
Lecture:	"Information and instruction of invention business contest"
Lecture:	"Introduction of the technical subjects for patent searching"
Patent searching exercise	
Reporting work	
Presentation by participants	
Evaluation of the contest results	
Awarding & closing ceremony	

DB = database.

Source: Authors.

This educational system of workshops and invention business contests is similar to the patent information search competition held every year in Japan noted previously. In the future, it is hoped that this event will become a regular practice in AMS.

The materials provided to local IPOs for implementation of the workshops and invention business contests were as follows:

- (i) proposal of workshop and invention business contest (Attachment 5),
- (ii) 'What We Should Understand about Patent Information Searching' (Attachment 6),
- (iii) toolkit ( Attachment 7), and
- (iv) 'Report Form for Contest Participants' (Attachment 8).

In addition, seven examples of target technologies for patent information searches were prepared:

- (i) Super-repellent glass coating on car windshields,
- (ii) removable razor cartridges with magnetic elements,

- (iii) methods for producing microwave-resistant sheets for heat-insulated foam paper containers,
- (iv) written instrument case,
- (v) beverage ingredient capsules with a structure to reduce the risk of residual liquids and/or solids leaving the capsule after the completion of the beverage production process,
- (vi) methods and compositions for affecting the flavour and aroma profiles of consumables, and
- (vii) automatic lacing system.

The main presentation materials from the working group at the workshops are attached as follows:

- (i) Yoshitoshi Tanaka, 'Information and Instruction of Invention Business Contest' (Attachment 9);
- (ii) Takashi Koyama, 'Basic Understanding of a Patent and Patent Search' (Attachment 10);
- (iii) Yoriyisa Katsunuma, 'When and for What Purpose Should We Search for Patent Information' (Attachment 11);
- (iv) Fumihiko Moriya, 'Utilising the Intelligence of Patent Information for Business' (Attachment 12); and
- (v) Yoshitoshi Tanaka, 'Patent Information Searching' (Attachment 13).

## Chapter 3

### Research Results

#### 1. Questionnaire Results from IPOs

To confirm IPOs' intentions to hold workshops to popularise patent information searches and invention business contests, surveys of the needs of IPOs regarding patent information were completed first. Regarding surveys of universities, private companies, and law firms, statistical analyses were conducted after collecting the responses. While it was possible to analyse survey responses from IPOs at an early stage, it was decided that analyses of survey results from universities, private companies, and law firms would be conducted at the end of the project.

The number of responses from all surveys is shown in Table 3.1. IPOs from 10 AMS responded. A total of 187 responses from universities were received and then detailed through statistical analysis. Regarding responses from private companies and law firms, a sufficient number of responses were not obtained, but a general trend for the statistical analysis could be discerned.

**Table 3.1. Number of Survey Responses Received**

	IPOs	Universities	Private Companies	Law Firms
<b>No. of Questionnaires</b>	39	58	46	27
<b>Country</b>	<b>Responded X</b>	<b>Number of Responses</b>		
Indonesia	X	32	1	3
Singapore	X	0	0	4
Thailand	X	6	27	2
Malaysia	X	6	5	13
Brunei Darussalam	X	25	1	0
Lao PDR	X	29	0	3
Myanmar	X	20	0	0
Philippines	X	30	3	9
Viet Nam	X	21	4	11
Cambodia	X	18	0	3
<b>Total</b>	<b>10</b>	<b>187</b>	<b>41</b>	<b>48</b>

IPO = intellectual property office, Lao PDR = Lao People's Democratic Republic.

Source: Authors.

Regarding the kinds of databases that IPOs use, the responses are shown in Table 3.2.

AMS that conduct substantive examinations of patent applications may use WIPO's Patentscope, but AMS that do not conduct substantive examinations may also utilise these databases for administrative needs.

Table 3.3 shows the results of further questions about databases. According to this survey, IPOs from four AMS have national databases: Malaysia, Philippines, Singapore, and Thailand. In addition, Viet Nam is believed to have a well-developed ability to search for patent information, but because it has not built its own database, searching for patent information issued domestically is insufficient.

Table 3.2. Patent Information Databases Used by IPOs

	Indonesia	Singapore	Thailand	Malaysia	Brunei Darussalam	Lao PDR	Myanmar	Philippines	Viet Nam	Cambodia
WIPO Patentscope	X	X	X	X	X	X	X	X	X	X
ASEAN Patentscope	X	X	X	X	X	X		X		X
WIPO IPAS	X		X		X	X		X	X	X
Local IPO database	X	X	X	X	X			X	X	
Other		X	X	X			X	X	X	X

ASEAN = Association of Southeast Asian Nations, IPAS = Industrial Property Administration System, IPO = intellectual property office, Lao PDR = Lao People's Democratic Republic, WIPO = World Intellectual Property Organization.

Source: Authors.

Table 3.3. National Patent Information Databases

	Indonesia	Singapore	Thailand	Malaysia	Brunei Darussalam	Lao PDR	Myanmar	Philippines	Viet Nam
Own Database		X	X	X				X	
Name		IP <sup>2</sup> SG	e-Patent System	MyIPO				IPOPHL Patent Search	
Characteristics		<ul style="list-style-type: none"> <li>• Receives and processes patent applications</li> <li>• Receives and sends correspondence from/to applicants</li> <li>• Searches patents/ published patent</li> </ul>	<ul style="list-style-type: none"> <li>• Contains patent data</li> <li>• Can do a simple or complex search</li> <li>• Can conduct an int'l patent search</li> </ul>						



	Indonesia	Singapore	Thailand	Malaysia	Brunei Darussalam	Lao PDR	Myanmar	Philippines	Viet Nam
		appli- cations filed  • Can view history of trans- actions  • Contains dossiers							

IPO = intellectual property office, Lao PDR = Lao People's Democratic Republic.

Source: Authors.

For these national databases, English is used in Singapore, Malaysia, and the Philippines. In Thailand, searches can occur in Thai, making it difficult to search from overseas in English for the information on patents issued in Thailand.

**Table 3.4. Language of National Patent Information Databases**

	<b>Singapore</b>	<b>Thailand</b>	<b>Malaysia</b>	<b>Philippines</b>
<b>Operating database</b>	English	Thai	English	English by default; Tagalog
Keyword searches	English	Thai	English	English by default; Tagalog
Display for bibliographic items	English	Thai	English	English by default; Tagalog
Display for abstracts	English	Thai	English	English by default; Tagalog
Display for patent claims	English	Thai	English	English by default; Tagalog
Display for patent specifications	English	Thai	English	English by default; Tagalog
Publication started and price	2014; free	2011; free	Charge	2018; free

Source: Authors.

Regarding the construction of national patent information databases, see Attachment 14 for details. The main points are as follows:

- (i) For internal use, data warehousing must be enhanced for better and more accurate retrieval of statistic reports to develop future products.
- (ii) As many use WIPO IPAS, related problems must be fixed as appropriate.
- (iii) Patent databases will always be in accordance with WIPO data standards to efficiently implement WIPO IPAS and WIPO Publish.
- (iv) Website platforms are being developed that link to patent databases, so anyone can access patent information.

Regarding financial planning for national patent information databases:

- (i) Each year, budgets are allocated to purchase various commercial patent databases, which are accessible by the public free of charge. Government funding helps

manage and operate these databases.

- (ii) To make the databases user friendly, information on the intellectual property portal is updated as often as possible.
- (iii) Many links have been added to websites and databases to facilitate accessibility.
- (iv) Funding is limited to develop a system and database.
- (v) Financial assistance is not received from the government.

Regarding human resources development:

- (i) Training is conducted for engineers to improve their technical ability to develop better applications.
- (ii) Training is held for patent search and examination to increase the efficiency and quality of patent examiners.
- (iii) Human resources are being developed, and recruitment has begun.
- (iv) All new staff members will be trained on searches for patent information as well as other areas related to intellectual property. Moreover, there are dissemination workshops and seminars on patent information searches for agents, university faculty, and other related stakeholders.

Regarding the construction of national patent information databases, a major factor is how much IPOs recognise the importance of searching for patent information (Table 3.5).

**Table 3.5. Reasons for Patent Information Searching**

Reason	Score
Research and development	4.7
Prevent duplication of research and development	4.8
Formulate business strategies	4.4
Forecast product demand and market	4.7
Compete	4.3
Exercise a patent right	4.4
Mergers, acquisitions, and business development	4.1
Obtain freedom to operate when selling a product	4.1
Invalidate patent rights of other companies	4.2
Help select a licensing partner	4.1

Reason	Score
No charge	4.2
Develop human resources for patent information	3.9
Encourage innovation	4.5
Increase patent applications	4.1
Encourage company growth	3.8
Develop industry	4.4

Source: Author.

Patent information searches are considered most important for prevention of duplication of research and development, obtaining research and development tips, and forecasting the product market. It is hoped that these perceptions will be fully reflected in future policy planning and implementation.

IPOs from each AMS recognised the importance of patent information searches and expressed their desire for further enhancement of patent information search systems and promotion of education and training to improve patent information search abilities.

## 2. Questionnaire Results from Universities, Private Companies, and Law Firms

The responses from universities, private companies, and law firms are the results of analyses of responses from all participants in the patent information search workshops and invention business contests.

Table 3.6 shows the status of 187 responses from universities for which questions received a score of 4.5 or higher on a 5-point Likert scale. University officials feel that the following are key:

- (i) Q7: Patent information retrieval systems need to be available on the internet.
- (ii) Q12: Patent information is important for promoting research and development at universities.
- (iii) Q14: Patent information is useful for science and technology research conducted at universities.
- (v) Q53: The IPO should carry out education, training, and dissemination activities for patent information retrieval.
- (vi) Q54: Utilisation of patent information retrieval systems is important for innovation creation in the country.

- (vii) Q55: Utilisation of patent information retrieval systems will increase patent applications by universities and companies in the country.
- (viii) Q58: Utilisation of patent information retrieval systems contributes to the development of industry.

Universities felt that patent information is most useful for promoting research and development and scientific and technological research at universities, and is important for creating innovation and increasing the number of patent applications. They expect that IPOs will demonstrate strong leadership and promote education and training on patent information searches for these reasons.

Country statistics from universities are attached as Attachment 15. Descriptive statistics of responses from universities and results of linear regression analysis are shown as Attachments 16 and 17, respectively.

The main findings obtained from the results of linear regression analysis are summarised in Table 3.7.

Table 3.6. Survey Responses from Universities

Question	Total (187)	Indonesia (32)	Thailand (6)	Malaysia (6)	Brunei Darussalam (25)	Lao PDR (29)	Myanmar (20)	Philippines (30)	Viet Nam (21)	Cambodia (18)
Q7	4.6	4.6	4.3	4.7	4.7	4.1	4.5	4.9	4.6	4.8
Q12	4.5	4.5	4.0	4.7	4.5	4.2	4.6	4.9	4.4	4.7
Q14	4.6	4.4	5.0	4.7	4.6	4.3	4.6	4.9	4.4	4.7
Q53	4.5	4.5	4.8	4.8	4.7	4.3	3.9	4.8	4.3	4.8
Q54	4.5	4.4	4.7	4.7	4.5	4.5	4.3	4.8	4.4	4.8
Q55	4.5	4.3	4.8	4.3	4.6	4.4	4.3	4.7	4.1	4.6
Q58	4.5	4.3	4.3	4.3	4.6	4.4	4.1	4.9	4.4	4.6

Source: Author.

Table 3.7. Linear Regression for University Survey Results

Model Summary: Q54						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
6	0.767	0.589	0.578	0.417		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	1.002	0.277		3.617	<0.001
	Q53	0.423	0.049	0.460	8.551	<0.001
	Q52	0.255	0.047	0.299	5.406	<0.001
	Q15	0.215	0.050	0.223	4.299	<0.001
	Q13	-0.067	0.025	-0.132	-2.732	0.007
	Q11	-0.078	0.033	-0.115	-2.357	0.019
Model Summary: Q55						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
6	0.730	0.532	0.519	0.499		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	-0.264	0.349		-0.755	0.451
	Q53	0.361	0.061	0.350	5.895	<0.001
	Q14	0.160	0.071	0.134	2.249	0.026
	Q44	0.173	0.050	0.188	3.461	<0.001
	Q52	0.220	0.057	0.230	3.900	<0.001
	Q24	0.151	0.052	0.170	2.889	0.004
Model Summary: Q56						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
5	0.584	0.341	0.326	0.638		
		Unstandardised	Standard Error	Standardised	t	P

	(Intercept)	1.593	0.350		4.551	<0.001
	Q29	0.305	0.063	0.325	4.814	<0.001
	Q17	0.218	0.062	0.226	3.529	<0.001
	Q35	-0.153	0.042	-0.221	- 3.631	<0.001
	Q52	0.204	0.070	0.198	2.939	0.004
<b>Model Summary: Q57</b>						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
5	0.647	0.419	0.406	0.590		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	0.309	0.367		0.841	0.401
	Q18	0.316	0.316	0.299	4.315	<0.001
	Q52	0.254	0.066	0.250	3.833	<0.001
	Q21	0.189	0.073	0.170	2.589	0.010
	Q53	0.171	0.071	0.156	2.394	0.018
<b>Model Summary: Q58</b>						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
6	0.724	0.524	0.511	0.466		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	0.869	0.318		2.732	0.007
	Q18	0.322	0.060	0.350	5.398	<0.001
	Q53	0.243	0.056	0.255	4.311	<0.001
	Q52	0.224	0.053	0.252	4.187	<0.001
	Q21	0.219	0.060	0.226	3.627	<0.001
	Q14	-0.175	0.069	-0.159	- 2.549	0.012

Source: Author.



The results of linear regression analysis using Q54 (innovation creation) as the dependent variable are as follows.

$$Q54 = 0.361 \times Q53 + 0.16 \times Q14 + 0.173 \times Q44 + 0.22 \times Q52 + 0.151 \times Q24 - 0.264 \quad (1)$$

Education on patent information searches through IPOs is important for creating innovation. The importance of utilising patent information in scientific and technological research at universities was pointed out. To this end, it is important to create an environment where patent information searches can be used free of charge and to avoid duplication of research and development activities. In particular, the importance of patent information in the artificial intelligence (AI) field was emphasised.

The results of linear regression analysis using Q55 (increase in the number of patent applications) as the dependent variable are as follows.

$$Q55 = 0.361 \times Q53 + 0.16 \times Q14 + 0.173 \times Q44 + 0.22 \times Q52 + 0.151 \times Q24 - 0.264 \quad (2)$$

Basically, the results for Q55 are similar to the regression analysis for Q54.

The results of linear regression analysis using Q56 (improvement in university rankings) as the dependent variable are as follows.

$$Q56 = 0.305 \times Q29 + 0.218 \times Q17 - 0.153 \times Q35 + 0.204 \times Q52 + 1.593 \quad (3)$$

In other words, utilisation of the patent information retrieval system is important for improving the ranking of universities. Q29, Q17, and Q52 are positive factors, while Q35 acts as a negative factor.

Patent information is useful for predicting products and markets, and basic research at universities, especially AI-related patent information, is important for improving university rankings. It is negative when universities receive warnings for patent infringement, and it is necessary to use patent information to avoid this.

The results of linear regression analysis using Q57 (corporate growth) as the dependent variable are as follows.

$$Q57 = 0.316 \times Q18 + 0.254 \times Q52 + 0.189 \times Q21 + 0.171 \times Q53 + 0.309 \quad (4)$$

In response to the question, utilisation of patent information retrieval systems is important for corporate growth. Q18, Q52, Q21, and Q53 are positive factors. It is important to promote commercial research at universities for the growth of companies, and patent information regarding AI is particularly important. Furthermore, patent information is useful for understanding the research and development status of companies in university

research areas. To achieve these goals, IPOs should further promote education and training in patent information searches.

The results of linear regression analysis using Q58 (industrial development) as the dependent variable are as follows.

$$Q58 = 0.322 \times Q18 + 0.243 \times Q53 + 0.224 \times Q52 + 0.219 \times Q21 - 0.175 \times Q14 + 0.869$$

(5)

In response to the question, does utilisation of a patent information retrieval system contribute to the development of industry, Q18, Q53, Q52, and Q21 are positive factors, and Q14 is a negative factor. For industrial development, it is important to utilise patent information to promote commercial research, as is the role of IPOs' AI information, and university research fields are important. It is also key to understand corporate activities. Furthermore, there are negative effects of universities placing too much emphasis on basic research.

Table 3.8 shows the status of 41 responses from private companies for which questions received a score of 4.5 or higher on a 5-point Likert scale. Business stakeholders feel that the following are important:

- (i) Q6: Development of a patent information retrieval system is important for strengthening the competitiveness of companies.
- (ii) Q7: Patent information retrieval systems need to be available on the internet.
- (iii) Q8: Domestic patent information retrieval systems need to be available in English in addition to the local language.
- (iv) Q9: Patent information retrieval system needs to be available free of charge.
- (v) Q43: Utilisation of patent information retrieval systems is important for innovation creation in the country.

Table 3.8. Survey Responses from Private Companies

Question	Total (41)	Indonesia (1)	Thailand (27)	Malaysia (5)	Brunei Darussalam (1)	Philippines (3)	Viet Nam (4)
Q6	4.5	5.0	4.7	4.4	3.0	4.7	4.3
Q7	4.5	4.0	4.6	5.0	3.0	4.7	4.5
Q8	4.6	5.0	4.6	4.8	5.0	4.0	4.5
Q9	4.5	5.0	4.6	4.2	4.0	5.0	4.3
Q43	4.6	4.0	4.7	4.8	5.0	5.0	4.3

Source: Author.

In particular, private companies noted that the use of patent information search systems is beneficial for creating innovation, which will strengthen the competitiveness of companies. To this end, it is important to improve the search system and to create an environment on the internet that includes search functions in English and provides them free of charge.

Descriptive statistics of responses from private companies and the results of linear regression analysis are attached as Attachments 19 and 20, respectively, but due to the small number of responses, a detailed explanation of the results of linear regression analysis will be omitted from the main text of the report.

Table 3.9. Linear Regression for Private Company Results

Model Summary: Q43						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
4	0.909	0.827	0.812	0.251		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	0.726	0.335		2.167	0.037
	Q17	0.752	0.068	0.881	11.005	<0.001
	Q12	0.226	0.070	0.248	3.228	0.003
	Q5	-0.126	0.046	-0.222	-2.756	0.009
Model Summary: Q44						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
3	0.684	0.467	0.439	0.508		
		Unstandardised	Standard Error	Standardised	t	P

	(Intercept)	1.117	0.598		1.868	0.070
	Q15	0.486	0.144	0.459	3.365	0.002
	Q32	0.277	0.114	0.333	2.437	0.020
<b>Model Summary: Q45</b>						
<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>RMSE</b>		
5	0.869	0.755	0.727	0.438		
		<b>Unstandardised</b>	<b>Standard Error</b>	<b>Standardised</b>	<b>t</b>	<b>P</b>
	(Intercept)	0.485	0.448		1.081	0.287
	Q32	0.532	0.096	0.516	5.535	<0.001
	Q24	0.309	0.067	0.456	4.613	<0.001
	Q25	-0.272	0.067	-0.393	-4.047	<0.001
	Q22	0.335	0.106	0.307	3.156	0.003
<b>Model Summary: Q46</b>						
<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>RMSE</b>		
4	0.645	0.417	0.368	0.568		
		<b>Unstandardised</b>	<b>Standard Error</b>	<b>Standardised</b>	<b>t</b>	<b>P</b>
	(Intercept)	2.987	0.497		6.015	<0.001
	Q20	0.400	0.105	0.489	3.797	<0.001
	Q38	-0.267	0.078	-0.494	-3.411	0.002
	Q41	0.175	0.076	0.333	2.299	0.027

Source: Author.

Table 3.10 shows the status for the 48 responses from law firms that received a score of 4.5 or higher on a 5-point Likert scale. Business stakeholders feel that the following are most important:

- (i) Q4: It is useful to search for patent information in advance for a patent application.
- (ii) Q6: It is useful for the law firm/agent to utilise prior art information disclosed in the issued patent information when drafting the specification of the patent application.
- (iii) Q11: When a client receives patent infringement warning from another company, it is important to search for patent information as a countermeasure.
- (iv) Q12: If the client is sued by another company for patent infringement, it is important to search for patent information.
- (v) Q13: Patent information retrieval helps the client's business.
- (vi) Q18: Education, training, and dissemination activities for patent information retrieval should be carried out more actively.

- (vii) Q22: It is important for the law firm/agent to have the ability to search patent information and to analyse and to utilise the patent information to improve the satisfaction of the client.
- (viii) Q23: The IPO should actively carry out education, training, and dissemination activities for patent information retrieval.
- (ix) Q24: Utilisation of patent information retrieval systems is important for innovation creation in the country.
- (x) Q27: Utilisation of patent information retrieval systems contributes to the development of industry.

For agents, patent information is important for writing patent specifications when receiving a request from clients to apply for patents. Furthermore, patent information is important when the client receives a patent infringement warning from another company or files a lawsuit in court. Searching for patent information is also important when a patent is used. To achieve these objectives, education and training in patent information searches are necessary, and agents also need to improve their search capabilities and client satisfaction. IPOs are expected to provide leadership in education and training activities. By promoting the above, they can contribute to the development of industry.

Descriptive statistics of responses from law firms and the results of linear regression analysis are attached as Attachments 22 and 23, respectively, but due to the small number of responses, the explanation is omitted in the main text of the report.

**Table 3.10. Linear Regression for Law Firms Responses**

<b>Model Summary: Q24</b>						
<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>RMSE</b>		
6	0.833	0.695	0.658	0.381		
		<b>Unstandardised</b>	<b>Standard Error</b>	<b>Standardised</b>	<b>t</b>	<b>P</b>
	(Intercept)	-0.025	0.572		-0.043	0.966
	Q23	0.574	0.128	0.538	4.501	<0.001
	Q6	0.197	0.081	0.234	2.448	0.019
	Q4	-0.297	0.104	-0.296	-2.853	0.007
	Q18	0.320	0.111	0.333	2.886	0.006
	Q13	0.203	0.098	0.193	2.085	0.043
<b>Model Summary: Q25</b>						
<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>RMSE</b>		
3	0.718	0.515	0.494	0.593		

		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	-1.023	0.826		-1.239	0.222
	Q23	0.870	0.145	0.636	5.991	<0.001
	Q22	0.292	0.138	0.225	2.115	0.040
<b>Model Summary: Q26</b>						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
5	0.763	0.582	0.543	0.544		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	-1.255	0.757		-1.658	0.105
	Q18	0.482	0.124	0.405	3.889	<0.001
	Q13	0.330	0.146	0.254	2.262	0.029
	Q15	0.195	0.090	0.225	2.162	0.036
	Q20	0.237	0.110	0.250	2.160	0.036
<b>Model Summary: Q27</b>						
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	RMSE		
2	0.436	0.190	0.172	0.560		
		Unstandardised	Standard Error	Standardised	t	P
	(Intercept)	2.538	0.622		4.079	<0.001
	Q23	0.440	0.134	0.436	3.283	0.002

Source: Author.

Based on the needs obtained from the results of questionnaires from IPOs conducted in advance, patent information search workshops and invention business contests were held at nine organisations in eight AMS by June 2023 (Table 3.11). The working group visited the IPOs in advance to explain the purpose, aim, and specific preparations for the workshops and contests. Some AMS decided to hold the event after holding several Zoom meetings first to improve communication. Attachment 24 is an overview of the workshop and contest schedule.

Table 3.11. Workshops and Contests Schedule

ASEAN Member State	Date	Venue	Number of Participants	Number of Contest Winners	Participant Notes
Indonesia	14 March 2022	Directorate General of Intellectual Property Office, Zoom	Workshop: 50 Contest: 13	6	Contest helped them understand the importance of utilising patent information.
Viet Nam	30 June 2023	Vietnam Intellectual Property Research Institute, Ministry of Science and Technology	Workshop: 50 Contest: 27	2, and 10 received an excellence award	Participants requested that such events be held in the future.
Lao People's Democratic Republic	1–2 September 2022	Ministry of Industry and Commerce	50	First place: 1 Second: 2 Third: 4	Interesting event that helped students, researchers, and others. Requested more workshops/training to increase resident patent applications as a main priority.
Philippines	8–9 September 2022	Adamson University, Manila	Workshop: 29 Contest: 21	First place: 1 Second: 1	Participants actively participated

ASEAN Member State	Date	Venue	Number of Participants	Number of Contest Winners	Participant Notes
				Third: 2	and learned to use the various databases introduced by the lecturers.
Viet Nam	5–6 December 2022	Ha Noi La Thanh Hotel	Workshop 100, including online	First place: 1 Second: 1 Third: 3	Practice combined with comments and assessments from organisers helped participants gain more experience, thereby improving their search skills.
Thailand	15–16 February 2023	Grand Richmond Hotel, Nonthaburi	30	3 groups	Suggested future activities, such as patent search training, patent valuation, patent drafting, business strategy, intellectual property management.



ASEAN Member State	Date	Venue	Number of Participants	Number of Contest Winners	Participant Notes
Malaysia	1–2 March 2023	MyIPO Building	22	5	Hopes the cooperation regarding patent information can be continued.
Cambodia	14–15 March 2023	Phnom Penh Era Hotel	35		Government hopes to continue cooperation for the growth and development of Cambodia.
Brunei Darussalam	7–8 June 2023	Golden Jubilee Hall, The Law Building, Attorney General's Chambers	41	3 groups	Participants had hands-on practice that helped them to apply different search techniques. BrulPO will continue to future collaborations on workshops.

Source: Authors.

After the workshops and invention business contests were held, the IPOs of each AMS submitted summary reports regarding the results of the activities of this project. Those reports are attached in the order in which they were held (Attachments 25–33).

## Chapter 4

### Conclusion and Recommendations

Only 4 out of 10 AMS are working on building their own patent information databases. Amongst the four AMS, three enable searching and display in English. Thus, AMS are lagging behind in building national databases. The reality is that patent searches are being conducted using global or commercial databases such as Patentscope, Espacenet, and Google Patent. In situations where the ratio of patent applications filed by domestic applicants is less than 10%, overseas patent information searches should be prioritised.

Human resources involved in patent searches in each country should thus give priority to proficiency in global databases. Indeed, university and corporate research and development workers prioritise gaining access to global patent information databases rather than building domestic databases. By doing so, they understand the current state of technological development and can proceed with their own invention activities.

For practitioners engaged in the substantive examination of patent applications, patent information searches mostly find prior art for determining patentability. For researchers engaged in invention creation, they are used to investigating existing technical elements necessary to create new inventions. Since inventions cannot be created without utilising existing technical elements, patent information must be gained to obtain knowledge of these existing technical elements.

Considering the trends in the number of patent applications to date, it appears that AMS have been working to spread awareness, with a focus on trademark and design rights. Yet in most, the competent authorities have not sufficiently formulated and implemented policies regarding patent rights. The majority of each AMS's patent rights comprises applications from overseas, creating a difficult situation for the domestic industry against foreign companies. If this continues, most rights will end up being monopolised by foreign companies. Therefore, there is an urgent need to increase the number of patent applications by promoting inventive activities by applicants in one's own country. To this end, providing the necessary education and training to domestic universities, companies, and law firms and popularising patent information searches will be a major step towards improving future competitiveness.

To promote the innovation of local companies and universities in ASEAN, it is also important to publish patent information free of charge. Paid publication denies innovation. In addition, if an environment that allows easy search for infringement of the rights of other companies is not established, this will hinder business and investment by foreign companies.