



Intellectual Property Education for Business Start-Ups in Cambodia

Prepared by
ERIA



Economic Research Institute
for ASEAN and East Asia

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Acknowledgements

ERIA successfully carried out the project activities as originally planned according to the annual schedule. We extend our deepest gratitude to all the organisations that supported this project and provided invaluable assistance and cooperation.

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We hope that the successful completion of this project will contribute, even in a small way, to the acceleration of university-based start-ups in Cambodia.

Thank you very much.

Yoshitoshi Tanaka

ERIA Project Working Group Leader

Contents

Acknowledgements	3
1. Background	5
2. Objectives	7
3. Overview	7
4. Organisation	8
5. Activities	9
6. Kick-off Meeting	12
7. Tokyo Intensive Training Course	13
8. Start-up and Intellectual Property Seminars	19
9. Business Model Competition	25
10. Reflections from Project Members	28
11. Findings	29
12. Conclusion	34

1. Background

The number of patents in Cambodia is extremely small compared with other Association of Southeast Asian Nations (ASEAN) Member States (AMS). Although it has increased slightly in recent years, the number remains at about 250 in 2020 in Cambodia. In addition, all the patent applications come from overseas; there are no domestic applications. Other AMS have thousands of patents (e.g. about 3,500 in the Philippines and about 7,000 in Thailand), and the number of domestic applications comprises 10%–20% of the total in these countries, although the ratio of domestic applications is still low, at 500–1,000 cases per year (Figure 1). If the current situation continues, patents in Cambodia will be monopolised by foreign applicants, which could affect the country's future industrial development.

Aspects of the utility model in Cambodia also remain underdeveloped, with few domestic applications. In addition, 10%–20% of design and trademark applications are domestic, so it seems that the perceptions of the need for design and trademark systems are being formed gradually. This situation is expected to improve in the future.

The major issue is that the perception of the patent system, which protects technology, is still not yet formed, and education in patent fields is necessary in the future. For new start-ups in the Cambodian market, technology to support the businesses will be important. In Cambodia, where internet coverage is broad and user engagement is high, e-commerce and financial technology (fintech) have already increased in digital economic contexts, and start-ups using digital technology have begun to appear. If the Economic Research Institute for ASEAN and East Asia (ERIA) can support the education required for these start-ups, it could help to trigger further growth in Cambodia.

The most popular business model for start-ups in Cambodia is to apply digital technology to conventional business models, but new businesses required by the market should not be limited to digital technologies. Basically, the market pull strategy should be applied to business planning to understand the needs of the Cambodian market and promote start-ups that meet them. Therefore, this project considers start-up education in a wide range of business areas as a support target, rather than limiting it to start-ups that use digital technology. We also recognise the importance of responding to the results of needs surveys based on local questionnaires.

For new start-ups, the protection of research results from universities, which are usually positioned at the core of the business, is important. Advanced countries utilise the intellectual property system for start-ups to protect the results of research carried out by universities and other research institutions. In other words, a monopoly on intellectual property rights functions effectively to promote industry and academia collaboration, prevent the entry of major companies in the early stages of start-ups, and secure market share during the growth stage. However, AMS are not yet fully aware of the value of intellectual property systems. In Cambodia, understanding of the importance of patents and the utility model, which protect technology, remains underdeveloped.

Figure 1: Intellectual Property Statistics of Cambodia, Thailand, and the Philippines

Source: Data retrieved in 2023 from WIPO IP Statistics Data Center.
<https://www3.wipo.int/ipstats/key-search/indicator>

In this context, ERIA could develop educational models on intellectual property to focus on appropriate protection of research results from universities in Cambodia. We consider educational human resources to include university researchers, people engaging in start-ups, university students, and graduate students. Activities to develop human resources would be a major contribution to start-ups and innovation in the future of Cambodia. Start-ups also require education on start-up processes, legal requirements, financing, and matching of research results and market needs, in addition to intellectual property education. It is necessary to plan and practise intellectual property education as well as start-up education for start-ups to understand the importance on the interactions between them.

The need for educational models related to intellectual property and start-ups is not limited to Cambodia – it is equally important and valuable for the growth of other AMS.

2. Objectives

First, we aim to raise awareness of appropriate protection of research results for researchers in digital technology, researchers in the application of digital technology, business owners, and university students. Then, we create an educational model that is used effectively for start-ups. This educational model must clarify what intellectual property education is required in the start-up process. In other words, based on the importance of the intellectual property system, we formulate educational models for start-ups, centred on the results of universities protected by intellectual property rights. ERIA provides intellectual property education and start-up education to achieve these objectives. Ultimately, the goal is to provide educational support for Cambodian universities to protect the research results of universities and create outcomes for society through start-ups from the universities.

As described above, the purpose of this research is to support human resources engaged in start-up initiatives that make effective use of intellectual property models through intellectual property education and start-up education.

This will enhance intellectual property awareness in Cambodia to strengthen specific start-ups and contribute to consolidating the foundation of industrial development in Cambodia.

3. Overview

The project members needed to fully understand the background and aims of the project. They also needed to be aware that they should lead the start-ups not just as participants in the training, but as core members of the start-ups at their universities. In that sense, it was extremely important to align the phases of the project's aims at the kick-off meeting (Box 1).

The intellectual property education required for start-ups at the Tokyo training focused on helping them understand the relationship between start-ups and intellectual property activities. To that end, the training programme was designed to focus on helping them understand the intellectual property activities required for each start-up process. The educational materials can be combined and used for future education and capacity building.

The knowledge gained at the Tokyo training course was brought back to the affiliated universities, and educational seminars on intellectual property and start-ups were held for start-up related personnel at each university. The seminars were planned and managed by project members selected from each university to increase ownership. At each university, faculty members, researchers, industry and academia collaboration officers, graduate students, etc. were invited to the seminars, with the aim of raising the level of personnel involved in promoting start-ups in the future.

Based on the learning outcomes of the seminars at each university, specific research results were selected, and the students were tasked with formulating the business model necessary to link those research results to start-ups. Here, too, project members played a central role in creating the business plans.

Business models were selected within each university, and the winners were chosen after presentations to officials from the four universities, Khmer Enterprise officials, relevant government officials, and corporate officials at a business model competition held through this project. The business plans presented are expected to grow into real start-ups soon.

It is also expected that the university officials trained through this series of project activities will play an active role as promoters of university-based start-ups in the future.

Box 1: Project Activities

1. Phase alignment regarding the project's objectives at the kick-off meeting
2. Intellectual property education necessary for start-ups during the Tokyo intensive training course.*
3. The results of the Tokyo intensive training course were disseminated to the affiliated universities, and educational seminars on intellectual property and start-ups were held for start-up related personnel at each university.
4. Project members' efforts will raise the level of knowledge of university stakeholders.
5. Business plans were drawn up based on the research results of the four universities.
6. A business model competition was held as the final project activity.

* The materials used for the training course will be used for future educational requirements.

Source: Project leader.

4. Organisation

To advance the project, we established a project working group comprising a leader, members, and a supervisor. The working group members hold a crucial role, as they will be responsible for fostering future start-ups. As detailed in Box 2, representatives were carefully selected: one individual from each of Cambodia's four leading universities and two individuals from the Ministry of Industry, Science, Technology & Innovation (MISTI), the supervisory body for start-ups. ERIA appointed the project supervisor to oversee and guide the group's activities.

Box 2: Structure of Project Working Group

Leader: Prof. Yoshitoshi Tanaka, Honorary Professor, Tokyo Institute of Technology;
Director General, i-BIS International Patent Office

Members:

- Ms Or Vandyma and Mr Sdeung Ouksovannarith, Ministry of Industry, Science, Technology & Innovation (MISTI) of Cambodia
- Dr Ly Rottana, Cambodia Academy of Digital Technology (CADT)
- Dr Sang Davin, Institute of Technology of Cambodia (ITC)
- Mr Chhim Bunchhun, National Incubation Center of Cambodia (NICC), Royal University of Phnom Penh (RUPP)
- Mr Thuok David, National Polytechnic Institute of Cambodia (NPIC)

Supervisor: Mr Toru Furuichi, Director General for Research and Policy Design
Administration, Economic Research Institute for ASEAN and East Asia
(ERIA).

Source: Project leader.

5. Activities

5.1. Research Planning

This project aims to raise awareness by providing intellectual property education to researchers, entrepreneurs, investors, universities, and graduate students, with a view towards future start-ups in Cambodia. To achieve the objectives, we will examine a method of start-up education that utilises effective intellectual property education models. In addition, we will explore market needs and support stakeholders to plan future start-up preparation.

We selected four universities in Cambodia and will provide the necessary intellectual property education and start-up education, mainly targeting university researchers. The universities selected were not limited to digital technology, but included universities specialising in agriculture, energy, and the environment, which may become start-up business areas. The project planned a 4-day group training for universities' core human resources in Japan, as well as on-site training for stakeholders at each selected university. In planning business models for start-ups, we conducted discussions to understand the local needs in Cambodia through working group members. In addition, we discussed the possibility of utilising local experts such as investors, entrepreneurs, corporate managers, and lawyers required for start-ups. These local experts, essential for fostering start-ups, will be invited to participate in intellectual property education workshops held at each university. They will be tasked with delivering lectures on foundational aspects of start-ups, such as conducting patent prior art searches, evaluating technologies, and outlining the specific steps involved in establishing and growing a start-up. Concrete examples will be used to illustrate these points effectively. It is crucial to enhance the capacity of all

participants, not only in intellectual property expertise but also within the broader business framework necessary for the creation and development of successful start-ups.

5.2. Project Activities

This project will conduct education on intellectual property and start-ups. It will also provide the basic knowledge necessary to protect the intellectual property of the research results of each university and promote technology transfer from universities to industry.

As the first educational programme of the project, a group training course was held in Tokyo, where Japanese experts in each field were invited to provide basic training on intellectual property and university start-ups. The selection of instructors for the Tokyo training was crucial in creating an educational model.

We provided intellectual property education centred on patents and utility models as a technology protection system. In addition to education on the overall intellectual property system, we focused on the intellectual property knowledge required for each process of start-ups from universities. A start-up process based on research results from universities includes finding and selecting university research results, patent applications of university research results, intellectual property management within the university, the transfer of research results to industry, licensing, formulation of business models, and legal requirements for start-ups. Assuming the flow of procedures, fundraising, marketing, and start-ups, we must formulate an intellectual property education model for each of these processes.

5.3. Formulation of start-up education model

To develop the necessary material for start-ups, we first consider the basic mechanism of start-ups and the required knowledge of start-ups specialised in Cambodia.

The material required for start-ups includes methods for aggregating research results at universities, methods for promoting matching with businesses that utilise these research results, methods for formulating specific business models, methods for recruiting investors, the necessary legal procedures, business management, the organisational structure, sales and marketing, and other miscellaneous business activities.

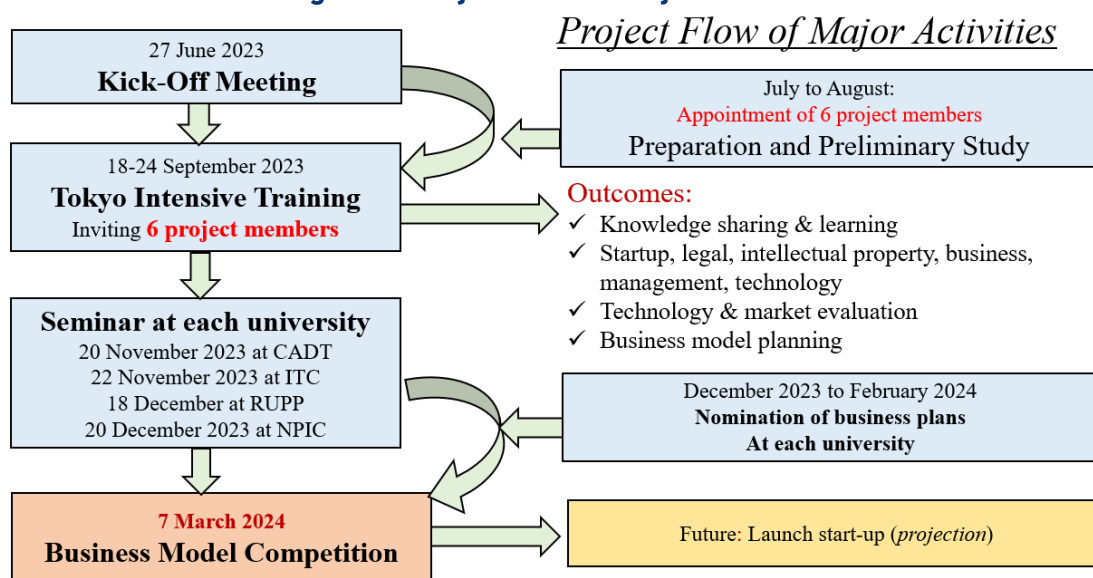
5.4. Activities at each university

Based on the results of the intellectual property education, start-up education, and local needs surveys that have already been implemented, each university will evaluate technologies that can be targeted for start-ups from their own research results. This includes conducting a patent information search and a technology evaluation based on the patent information and assessing the research and development (R&D) status of existing companies. If necessary, they must conduct advanced R&D of the technology and apply for improvement patents to consolidate the foundation for exclusive use. Next, in addition to the technology evaluation, universities will conduct an undisclosed market survey focusing on human resources engaged in industry and academia collaboration to produce a market evaluation. Based on this market research, universities will consider linking this

technology with business to create a new business model originating in the university. The business model will identify the core business technology, as well as products and services in application fields, and develop an immediate funding plan to start these products and services, a funding method, and an organisational plan for the business entity. It should also include a list of personnel needed, implementation of necessary initial investment, a sales plan for products and services, a recovery plan for the initial investment, and a policy for expanding business partners. ERIA will support the relevant university stakeholders to develop their expertise to draft business models.

Then, all universities will bring together the start-up business models discussed at each university and hold a seminar to share information on the business models that each university has considered further. Sharing this information will prompt them to rethink their own business models. Universities will compile the research results into a report, as practical examples of intellectual property and start-up education, and utilise them for the realisation of start-ups at each university in the future. Furthermore, each university will publicise and disseminate the report, and work to expand the research results of this project. The flow of these project activities is shown in Figure 2.

Figure 2: Project Flow of Major Activities



CADT : Cambodia Academy of Digital Technology

ITC : Institute of Technology of Cambodia

NPIC : National Incubation Center of Cambodia

RUPP : Royal University of Phnom Penh

Source: Project leader.

6. Kick-off Meeting

The kick-off meeting was held at MISTI on 27 June 2023. The main aim of the meeting was to share the project's objectives and activities with representatives from MISTI and Cambodian universities who will be participating in the project, and to encourage them to take ownership of the project. The meeting covered the following content:

- Background of the project proposal
- Importance of start-ups in Cambodia
- Necessity of spreading knowledge about intellectual property together with start-ups
- Annual schedule of this project
- Outline of the Tokyo intensive training course
- Recommendation and appointment of project members
- Roles and duties of the project members
- Expected outcome of this project



Twenty-one people participated in the kick-off meeting, where the background, objectives, and specific action plans of the project were shared.

Programme of Kick-Off Meeting, 27 June 2023

8:30–9:00 Arrival of participants and registration

9:00–11:00 Coffee break

Welcome remarks by H.E. Phork Sovannrith, Secretary of State, Ministry of Industry, Science, Technology & Innovation (MISTI)

Remarks by Mr Toru Furuichi, Director General in charge

- 2:00–2:40 Introduction of the four universities:
- Institute of Technology of Cambodia (ITC)
 - Royal University of Phnom Penh (RUPP)
 - National Polytechnic Institute of Cambodia (NPIC)
 - Cambodia Academy of Digital Technology (CADC)
- 2:40–4:00 Project purpose and concrete activities, introduction of Tokyo training course, role of the university in this project, etc. by Yoshitoshi Tanaka, Honorary Professor, Tokyo Institute of Technology
- 4:00 Closing remarks by H.E. Ngeth Vibol, Director General, General Department of Industry, Ministry of Industry, Science, Technology & Innovation (MISTI) of Cambodia



7. Tokyo Intensive Training Course

Based on the background and objectives of the project shared at the kick-off meeting, the project members worked on creating an image of intellectual property activities in start-ups and learning basic knowledge about intellectual property in preparation for the Tokyo training. The project invited six project members to Tokyo and conducted intensive 4-day training, from 19 to 22 September 2023.

7.1. Purpose of Tokyo Intensive Training Course

The purpose of this training course was to support the development of key persons in charge of promoting university-initiated start-ups in Cambodia.

To achieve this goal, we analysed the start-up process and focused on what kind of intellectual property activities are required for each process. We invited lecturers who fit this perspective to encourage each project member to understand the important points in the start-up process. The program focused on understanding the entire start-up process,

the importance of protecting research results with intellectual property when bringing university-based technology to market, how to overcome the difficulties of industry and academia collaboration, how to evaluate research results of universities that are the core of start-ups on a technical basis and market basis, how to create a business plan, accounting and financial knowledge necessary for start-ups, and legal issues for each process (Box 3). Additionally, the programme provided examples of small and medium-sized entrepreneurs, as well as university-based companies, and the voices of venture capitalists.

Box 3: Main Content of Tokyo Intensive Training Course

- What are start-ups and their success factors?
- Overview of intellectual property rights, focusing on the patent system
- Industry–academia collaboration and its success factors
- Patent information search and technology evaluation
- Success factors that lead start-ups from a venture capitalist’s perspective
- Learning from the start-up experiences of entrepreneurial companies
- Start-up flow drawing exercises using brainstorming and the K-J method
- Legal issues and start-up processes
- Business knowledge required for start-ups
- Business model/plan drafting, accounting, and financial management

Source: Project leader.

7.2. Participants’ Roles and Duties

Based on the outcomes of the intensive training course, the participants will demonstrate leadership as key persons in start-up education at Cambodian universities, such as holding seminars and formulating start-up business plans. The main objective of the intensive training in Tokyo was for the project members to demonstrate initiative, return to their respective universities, plan and hold in-house start-up education seminars, select research results in the universities, form start-up teams, and encourage the creation of concrete and realistic business models.

7.3. Meeting with JPO Commissioner

The Tokyo training was held at the Japan Patent Office (JPO). The JPO Commissioner provided a forum for the exchange of opinions, which helped motivate the project members.



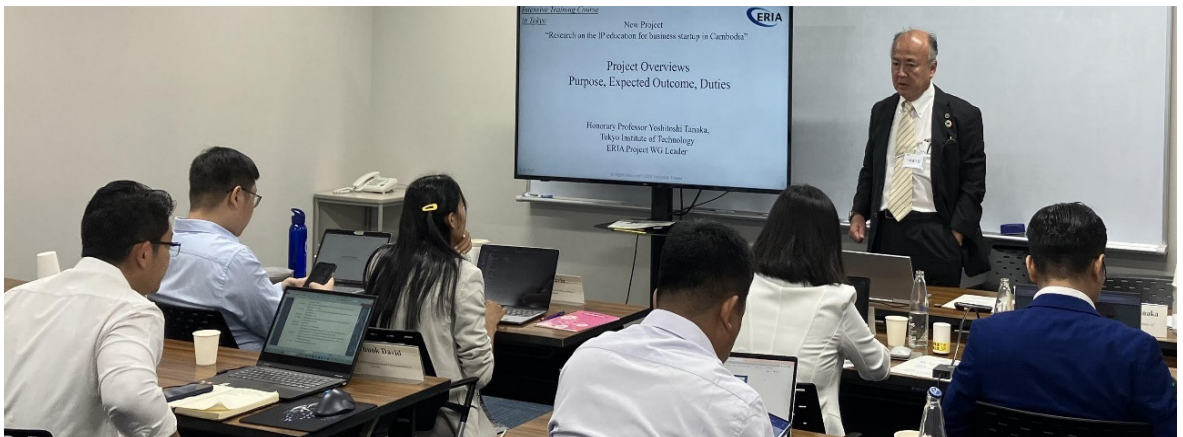
7.4. Programme Activities

Day 1: Opening, Start-Up Overview, Introduction to the Patent System and Practice

- 9:30–9:45 Welcome from Ms Sachiyo Yoshino, Director, International Cooperation Division, Japan Patent Office (JPO)
- 9:45–10:00 Welcome from Mr Toru Furuichi, Director General for Research and Policy Design Administration, Economic Research Institute for ASEAN and East Asia (ERIA)
- 10:00–11:00 Self-introduction and brief information on participants (max 8 minutes per person)
- 11:00–11:15 Photo session and break
- 11:15–12:00 Purpose of this intensive training course, expected outcomes, and duties of participants, by Prof. Yoshitoshi Tanaka
- 12:00–13:00 Lunch break
- 13:00–14:00 (Courtesy call on JPO executives)
- JPO's initiatives for supporting start-ups, by Mr Ryuta Shibamura, Deputy Director, Start-up Support Section, Policy Planning and Research Division, JPO
- 14:00–16:30 Outline of intellectual property rights, focusing on patent system (from patent application to acquisition of rights, utilisation of patent rights, etc.), by Prof. Yutaka Niidome, Chiba University
- 16:30–17:00 Practicalities by Prof. Yoshitoshi Tanaka
- 18:00– Homework at the hotel

Day 2: Industry–Academia Collaboration, Patent Information Search and Technology Evaluation, Venture Capitalists, and Start-up Companies

- 9:00–10:00 Factors for success in industry–academia collaboration (overcoming differences between industry and academia), by Prof. Yoshitoshi Tanaka
- 10:00–12:00 Patent Information Search Exercises and Discussion of Technology Evaluation Methods, facilitated by Prof. Yoshitoshi Tanaka
- 12:00–13:00 Lunch break
- 13:00–14:00 Learning from the start-up entrepreneurship experience; fundraising, marketing, business alliances with partner companies, etc., as seen by a start-up company manager
- 14:00–15:00 Success factors that lead start-ups; start-up evaluation factors, funding, organisation, path to initial public offerings (IPOs), etc., as seen by a venture capitalist of the Tokyo branch firm in Silicon Valley
- 15:00–17:00 Challenges and efforts of start-ups – from my own entrepreneurship experiences, by Mr Yoshitaro Ishihara, President CEO, Robeam Co., Ltd.
- 18:00– Homework at the hotel



Day 3: Learning Along the Flow of Start-ups

- 9:00–12:00 Start-up flow drawing exercises using brainstorming and the K-J method; problem extraction and problem solution formulation from legal, intellectual property, and business perspectives, and case teaching materials drafting, facilitated by Prof. Yoshitoshi Tanaka (exercises by all participants)
- 12:00–13:00 Lunch break
- 13:00–14:00 Presentation of a discussion on the cases (problems and solution) by two groups of participants
- 14:00–17:00 Legal issues in the commercialisation of start-ups, by Mr Yoshihiro Sugita, Toranomom Sougoh Legal Aid Network
- 18:00– Homework at the hotel

For the project members to deepen their understanding of the start-up process based on their own discussions and ideas, we adopted brainstorming and the K-J method. Based on this, the participants learned the points to note from a legal perspective that are necessary for each process.



Day 4: Business Common Sense Necessary for Start-Ups

- 9:00–12:00 Business knowledge required for start-ups, by Prof. Yoshitoshi Tanaka (business plan, accounting, financial statements, finance, funding for university ventures, growth strategy, and IPOs)
- 12:00–13:00 Lunch break
- 13:00–15:00 Development of teaching materials to be used at each university in Phnom Penh, by participants
- 15:00–16:45 Presentation of teaching materials created, and reflections by six participants
- 16:45–17:00 Closing remarks
- 18:00– Farewell party



On this last day, we reinforced the knowledge from a business perspective, which is often lacking in science and engineering human resources. We provided lectures on business plans, accounting, financial statements, finance, funding for university ventures, growth strategy, and initial public offerings (IPOs). In addition, the project members considered how to improve the educational materials upon their return to Cambodia and used this as an opportunity for each person to present their learning results.

7.5. Output of Tokyo intensive training course

Six participants – two from MISTI, one each from the Cambodia Academy of Digital Technology (CADT), the Institute of Technology of Cambodia (ITC), the Royal University of Phnom Penh (RUPP), and the National Polytechnic Institute of Cambodia (NPIC), and the Cambodia universities – participated in the Tokyo intensive training course. They worked very hard during the 4-day programme to fulfil their obligations. After the daytime training programme, they returned to their hotel and worked on their assigned tasks. Although it was a short course, it was an opportunity for intensive learning, and the participants made an effort to maximise their results.

This course was structured to focus on the aspects of intellectual property necessary for start-ups, and it allowed participants to learn about the critical points of intellectual property

necessary along the start-up process. The materials created in this programme can be used in future start-up intellectual property education at other universities in Cambodia or in other countries.

The results of this training course created an effective opportunity for the participants to demonstrate leadership and hold seminars for start-up stakeholders at their respective universities. In December 2023, the project members who participated in the Tokyo intensive training course took the initiative to plan and implement seminars at the four universities and promoted intellectual property education at each university.

8. Start-up and Intellectual Property Seminars

The four universities that participated in the ERIA project held start-up intellectual property education seminars at their universities, led by project members who participated in the Tokyo intensive training course.

The following is an overview of the seminars at the four universities:

- 20 November 2023: CADT, organised by Dr Ly Rottana
- 22 November 2023: ITC, organised by Dr Sang Davin
- 18 December 2023: National Incubation Center of Cambodia (NICC), RUPP, organised by Mr CHHIM Bunchhun
- 20 December 2023: NPIC, organised by Mr Thuok David

The following subsections provide an overview of the seminar objectives, programmes, and feedback at each of the four universities, in order of the date of the seminars.

8.1. Cambodia Academy of Digital Technology

The purpose of the seminar was to raise awareness of the appropriate protection of research results. Researchers and faculty in the digital field were invited. The expected outcome was that university researchers will properly protect their research results, create business models, and plan start-ups. This seminar was expected to raise researchers' awareness of intellectual property, promote collaboration amongst faculty and staff, promote start-ups, and contribute to strengthening the social foundation for industrial development in Cambodia. The seminar had 35 participants.

Date: 20 November 2023

Venue: Meeting room, 2nd floor, Innovation Center, Cambodia Academy of Digital Technology (CADT)

8:30–9:00	Registration
9:00–9:05	National anthem
9:05–9:10	Welcoming remarks by the Economic Research Institute for ASEAN and East Asia (ERIA)
9:10–9:15	Welcoming remarks by CADT
9:15–9:25	Opening remarks by Ministry of Industry, Science, Technology & Innovation (MISTI)

- 9:25–9:45 Coffee break
- 9:45–10:30 Presentation on patent law in Cambodia by MISTI
- 10:30–11:15 Presentation on Tech Transfer by MISTI
- 11:15–12:00 Presentation on start-up journey – experience sharing from start-up team
- 12:00–13:30 Lunch break
- 13:30–14:30 Presentation on intellectual property rights - experience sharing from ERIA
- 14:30–14:50 Coffee break
- 14:50–15:35 Presentation on research activities and university–industry collaboration at CADT
- 15:35–16:20 Presentation of Start-up Ecosystem in Cambodia Innovation team, CADT
- 16:20–16:30 Closing

The project member of CADT, Dr Ly Rottana, summarised the seminar as follows:

'During the seminar, we invited speakers from ERIA, MISTI, as well as representatives from the start-up community to share their experiences and knowledge related to intellectual property and business start-ups. After this seminar, we were able to raise intellectual property awareness among researchers and faculty members, strengthen start-ups, and contribute to further development of the foundation of industrial development in Cambodia.'



8.2. Institute of Technology of Cambodia

The key objectives of the seminar were to help universities evaluate technologies that can be targeted for start-ups from their own research results, conduct a patent information search and technology evaluation, conduct an undisclosed market survey focusing on human resources engaged in industry–academia collaboration, and share information on start-up business models and learn from each other. The seminar had 29 participants (16 from the ITC; 3 from MISTI; 1 each from the RUPP, the CADT, the NPIC, Japan International

Cooperation Agency, a start-up company, the Ministry of Commerce of Cambodia, Khmer Enterprise, and a law firm; and 2 from ERIA). Thirty ITC students from 5 faculties also joined, bringing the total to 59.

Date: 22 November 2023

Location: Building A, Room A109, Institute of Technology of Cambodia (ITC)

- | | |
|-------------|--|
| 8:00–8:30 | Registration |
| 8:30–9:30 | Cambodia national anthem |
| | Welcome remarks by the Director General, MISTI |
| | Welcome remarks by ERIA |
| | Opening remarks by the Deputy Director General, ITC |
| 9:30–10:00 | Group photo and tea break/refreshments |
| 10:00–10:30 | Patent registration procedures, by the Deputy Director, Department of Intellectual Property, MISTI |
| 10:30–11:00 | Technology transfer ecosystem by technology business development and promotion, by MISTI |
| 11:00–11:30 | Challenges and efforts of start-ups, by SUDrain |
| 11:30–12:00 | Understanding intellectual property law in Cambodia, by lawyer |
| 12:00–13:30 | Lunch |
| 13:30–14:30 | Start-up flow, by ERIA |
| 14:30–15:00 | Factors for success in industry–academia collaboration, by the Deputy Head of University and Industry Linkage, ITC |
| 15:00–15:15 | Refreshments |
| 15:15–16:50 | Results research to start-up, by ITC researchers |
| 16:50–17:00 | Closing remarks |

The project member of the ITC, Dr Sang Davin, said the following, which ERIA aimed and expected as the outcome of this project:

'I played a key role in organising a seminar on intellectual property policy at the ITC. My responsibilities included planning and logistics for presenters and participants, facilitation of discussions, and ensured smooth transitions between presentations, which allowed for a productive exchange of knowledge and fostered networking opportunities among participants and presenters on topics'.



8.3. National Incubation Center of Cambodia

The objectives of this seminar were to equip university faculty, researchers, and start-ups with comprehensive knowledge and practical insights into effectively managing intellectual property rights within the context of university-initiated start-ups; understand intellectual property and know to how to register a patent; and encourage collaboration and partnerships between universities, industry players, and government bodies, and support organisations to create a thriving start-up ecosystem. The seminar had 62 participants.

Date: 18 December 2023

Location: Room 704, STEM Building, Royal University of Phnom Penh (RUPP)

- 9:00–9:30 Registration for session and networking with coffee and snacks
- 9:30–9:35 National anthem
- 9:35–10:00 Introduction of event agenda by moderator
 - Welcome remarks by the Director General, MISTI
 - Welcome remarks by ERIA
 - Opening remarks by the Director, National Incubation Center of Cambodia (NICC)
 - Group photo
- 10:00–10:45 Topic 1: Start-up journey from research to business, challenges, and best practices, by ERIA
- 10:45–11:00 Q&A

- 11:00–11:45 Topic 2: Introduction to the NICC
- 11:45–12:00 Q&A
- 12:00–1:20 Networking lunch
- 1:30–2:30 Topic 3: Business model preparation for Cambodian start-ups, by the NICC
- 2:30–2:45 Q&A
- 2:45–3:00 Coffee break
- 3:00–4:00 Topic 4: Patent registration, by MISTI
- 4:00–4:20 Q&A
- 4:20–4:40 Seminar summary, by the NICC
- Start-up flow (journey) from research to business, challenges, and best practices
- Start-up ecosystem
- Patent registration
- 5:40–6:00 Closing remarks and photo session (all participants)

ERIA observed that the seminar had active and positive discussions because of the efforts and open-minded behaviour of Mr Chhim Bunchhun, the project member of the RUPP. All participants collaborated with presenters from ERIA, the NICC, and MISTI. The seminar was very useful for the participants to plan their future start-up activities with knowledge of intellectual property.



8.4. National Polytechnic Institute of Cambodia

The seminar aimed to support and educate lecturers and students on intellectual property, provide advisory instructors and students with valuable information to inspire motivation in advancing their research outcomes, guide them on the appropriate ministries to approach, and prepare them for the procedural steps involved. A total of 68 participants attended the seminar.

Date: 20 December 2023

Location: Building Research and Development on Science and Cooperation Center

Room: Tour Guide Stimulation Conference, National Polytechnic Institute of Cambodia (NPIC)

- | | |
|-------------|--|
| 8:00–8:30 | Registration |
| 8:30–8:35 | National anthem |
| 8:35–9:15 | Welcome remarks and opening speech by the President, NPIC
Welcome remarks by Director General, MISTI |
| 9:15–10:10 | Welcome remarks by ERIA |
| 10:10–10:30 | Photo session and coffee break |
| 10:30–11:30 | Introduction to intellectual property, types of patent applications, benefits of technology and patents, benefits of technology and patent search engines in Espacenet, and technology evaluation, by the Head of Exhibition and Media, Research and Technology Development Center, NPIC |
| 11:30–13:00 | Lunch break |
| 13:00–14:00 | Technology transfer and intellectual property granting procedures in Cambodia, by the Chief, Bureau of Technology Business Development and Promotion, MISTI |
| 14:00–15:00 | Entrepreneurship requires skill for business development, by the Head, Department of Special Training of Foundation Year Faculty, NPIC |
| 15:00–15:20 | Coffee break |
| 15:20–15:50 | Patent registration procedures, by the Deputy Director, Department of Industrial Property, MISTI |
| 15:50–16:00 | Closing remarks |

The project member of the NPIC, David Thuok, summarised the outcome of this seminar as follows:

On 22 December 2023, NPIC held a seminar focused on The Development of Researchers (R&D) on Intellectual Property (IP) Strategies and Start-ups. During the seminar, we shared knowledge about IP application, licensing, funding, start-ups, the procedures for patent research, patent registration, technology transfer, and IP granting procedures in Cambodia. Additionally, we emphasised that entrepreneurship requires skills for business development and discussed various types of research project applications, as well as the benefits of technology and patents, technology evaluation.



8.5. Results of Start-up and Intellectual Property Seminars

As mentioned above, seminars were held at the four universities in Cambodia for researchers and students at each university, planned by each project participant. ERIA observed that the people in charge of each university that participated in this project were highly motivated and demonstrated sufficient intellectual property knowledge necessary for start-ups.

As described in the beginning of the project's aims, 'The true aim of this project is to develop human resources who, through their own initiative and leadership, understand and utilise the significance of intellectual property, and further evaluate the results of research at the university in technical and business terms to realise start-ups'. The successful implementation of the seminars at each university marked a significant achievement in advancing the stated objectives.

It is expected that the project members will continue to increase their motivation, disseminate the importance of intellectual property and the necessary knowledge within the university, and contribute to the realisation of university-based start-ups.

9. Business Model Competition

9.1. Requirements for business models

As the final goal of this project, a business model competition was held at the ITC on 7 March 2024. Several requirements were announced in advance:

- Develop a well-prepared business model presentation
- Base the business on the university's research results
- Aim to solve social issues through invention
- Utilise digital technologies to provide application software and web services, information and communication technology, etc.
- Evaluate the technical value and market value of the business
- Expect a large amount of funding from investors
- Try to estimate the future business growth with financial status
- Submit a patent application for the invention used for the business

Some of these requirements were achievable by each team, while others were difficult at this stage. Therefore, failure to meet all the requirements did not exclude a team from presenting at the business model competition; rather, the requirements were presented as a goal to be achieved. These requirements were used as material for the evaluation by the evaluation committee.

Expectations for the business model competition

The project members were expected to demonstrate maximum ownership to make the start-ups they promoted successful. They were also expected to play a central role within their universities by utilising the business, legal, intellectual property, and technology knowledge. They were expected to be friendly and open-minded to satisfy their researchers and students.

Participants of the business model competition were expected to continue their entrepreneurial thinking and activities in the future to make their start-ups successful.

9.2. Dissemination of Business Model Competition

MISTI announced the business model competition on its website, including details on how to enter. Eight groups from the four universities ultimately participated. A panel of judges (five people) was also formed, including representatives from MISTI's General Department of Science, Technology & Innovation; ERIA; Tokyo Institute of Technology; and a Cambodian enterprise.

9.3 Achievements and Output of Business Model Competition

On 7 March 2024, the business model competition was held at the ITC. Eight teams from the ITC, the RUPP, the CADT, and the NPIC participated, showcasing business models that reflected the entrepreneurial potential of each Cambodian university. The highlights of the event were the competition, career challenges, and the search for the winning team. The CADT's Team Neak Pean Health Tech won first prize, the ITC's Deepthy Oil Team won second prize, and the ITC's Eco-paver team won third prize. The university start-up business model competition event served as an important platform for the presentation of case studies, encouraging academic and industrial collaboration, and recognising excellent efforts in the field of entrepreneurship. This played a role in supporting the initiatives of the next generation of innovators and business leaders in Cambodian universities. It also greatly contributed to encouraging these participating teams and nurturing key people who will serve as central human resources for start-ups within each university.

Competition results

- First: Neak Pean Health Tech from the CADT
- Second: Deepthy Oil team from the ITE
- Third: Eco-Brick team from the ITE

Remarks by Dr Ly Rottana, CADT

From January to March 2024, we prepared the campaign for the intellectual property business model competition to promote university start-ups in four participating universities. On 7 March 2024, the competition was held at ITC with eight teams from four different universities. It was a great honour that one team from CADT won the first prize in this competition.

The business idea from the winning team is Neak Pean HealthTech, a Khmer chatbot platform that represents cutting-edge solution designed to revolutionise healthcare accessibility in Cambodia. It combines three technologies in one app: Khmer automatic speech recognition, Khmer text to speech, and Khmer chatbot. We believe that the winning team will further develop their business start-up idea after this competition and will provide a brighter solution for future healthcare in Cambodia. We also expect that there will be more business start-ups from students, faculty members, and researchers within the university.



Five of Judge committees from General Department of Science, Technology & Innovation (Ministry of Industry, Science, Technology & Innovation), ERIA, Tokyo Institute of Technology, and a Cambodian enterprise.



Winning CADT Team

10. Reflections from Project Members

Dr Sang Davin, ITC

Enhanced knowledge: My involvement in the project significantly deepened my understanding of intellectual property and its critical role in the success of university start-ups.

Skill development: Through organising the intellectual property seminar, I honed my event management skills, including planning, logistics coordination, communication, and facilitation. Additionally, I gained experience in promoting intellectual property awareness and fostering collaboration within the university ecosystem.

Networking: The project provided valuable opportunities to connect with representatives from MISTI, ERIA, and other universities. This network will serve me well in future endeavours related to intellectual property and innovation.

Contribution to ITC: I actively participated in drafting an intellectual property policy for ITC, which will play a crucial role in raising internal awareness of intellectual property and its importance for researchers and faculty members.

Dr Ly Rottana, CADT

I have gained much experience and knowledge related to business start-ups at the university and the importance of intellectual property rights for researchers and faculty members. In addition, I also must chance to bring what I have learned from this project to our faculty members and researchers. I believe that other project members also get the same experience. After this project, I do expect that that there will be another relevant project to promote intellectual property rights protection in our university. At the current stage, we are not yet ready for intellectual property registration since the registration process is complicated, and we need to pay the fee annually as well, which is not so attractive for our

researchers and faculty members. However, I believe that we can start with the intellectual property policy within the university to raise awareness of the importance of intellectual property registration soon.

Mr Thuok David, NPIC

In this ERIA project, which is very helpful for our institute, the National Polytechnic Institute of Cambodia, we aim to enhance understanding among both lecturers and students about patents education. We guide them in writing proposals related to start-up support, particularly in the field of R&D associated with intellectual property. Our goal is to disseminate comprehensive information about intellectual property to advisory instructors and students. This knowledge will serve as motivation during the development process, following their research results. Additionally, we provide guidance on ministry applications, specifically directing individuals toward the type of ministry they wish to apply for. Emphasising thorough preparation and step-by-step facilitation of procedures, we ensure a smooth progress until the patent is protected for the start-up.

Mr Sdeung Ouksovannarith, MISTI

As a participant in the collaborative project between MISTI, JPO, and ERIA, I've had the privilege of delving deep into the realms of intellectual property and the start-up ecosystem. It's been an enriching experience, especially learning from seasoned Japanese experts who generously shared their experience and knowledge and best practices with us Cambodian project members.

I've eagerly absorbed insights from these experts and have been actively implementing them in Cambodia. Yet, I recognise that the journey ahead to fully develop our intellectual property and start-up ecosystem is a long one. It's clear that further support from JPO and ERIA will be crucial for us to compete and thrive in the region.

With their continued assistance, we can continue to refine our activities and initiatives, paving the way for Cambodia to emerge as a strong contender in the intellectual property and start-up landscape. Together, we can build a vibrant ecosystem that fosters innovation, creativity, and economic growth for our nation.

11. Findings

Based on the knowledge gained from the process of promoting activities in this project, we summarise the perspectives that are important when realising a start-up based on the results of university research.

Start-up initiatives are being promoted all over the world. University research results are considered the most promising material for start-ups. However, it is not easy to transfer technology from universities to society. Transferring technology smoothly to society and realising a start-up based on the results of university research has many processes, starting from research activities at universities; intellectual property management on campus; licensing to the business field; founding a start-up company; fundraising; corporate growth management; and finally the exit of the start-up, IPO, or mergers and acquisitions. In many of these processes, it is necessary to solve issues from multifaceted perspectives of law,

intellectual property, and business. We term these processes the start-up journey. We will go into more detail about the specific process of the start-up journey later, but first it is necessary to correctly understand what a start-up is.

There is no clear theoretical definition of a start-up, but the empirical definition is a young company that:

- has been in business for less than 5 years;
- is expected to grow surprisingly rapidly; and
- can raise huge amounts of funds.

Such start-ups:

- aim to solve social problems through innovation;
- utilise digital technologies such as apps and web services; and
- acquire customers in a short period of time using information and communication technology.

Such start-ups have:

- innovative products, services, and business models;
- achieving discontinuous rapid growth as a result; and
- solve problems by getting closer to the actual site of social problems as a small organisation.

In this way, start-ups play a role that cannot be undertaken by conventional large companies. In addition, there are a lot of cases for start-ups to make full use of digital technologies such as artificial intelligence and the internet of things. The background to this is the increasing complexity of social problems, the advancement of digital technology, and the advancement of entrepreneurs. Digital technology has also been incorporated in various research fields at universities.

Furthermore, to solve social problems, it is important to make efforts to provide easy-to-understand explanations and approaches to those at the scene of the problem.

As mentioned earlier, to overcome the many challenges that start-ups must overcome, a thorough understanding of the start-up journey process from research activities at a university to the start-up's exit helps chart a thorough and steady path to start-up success.

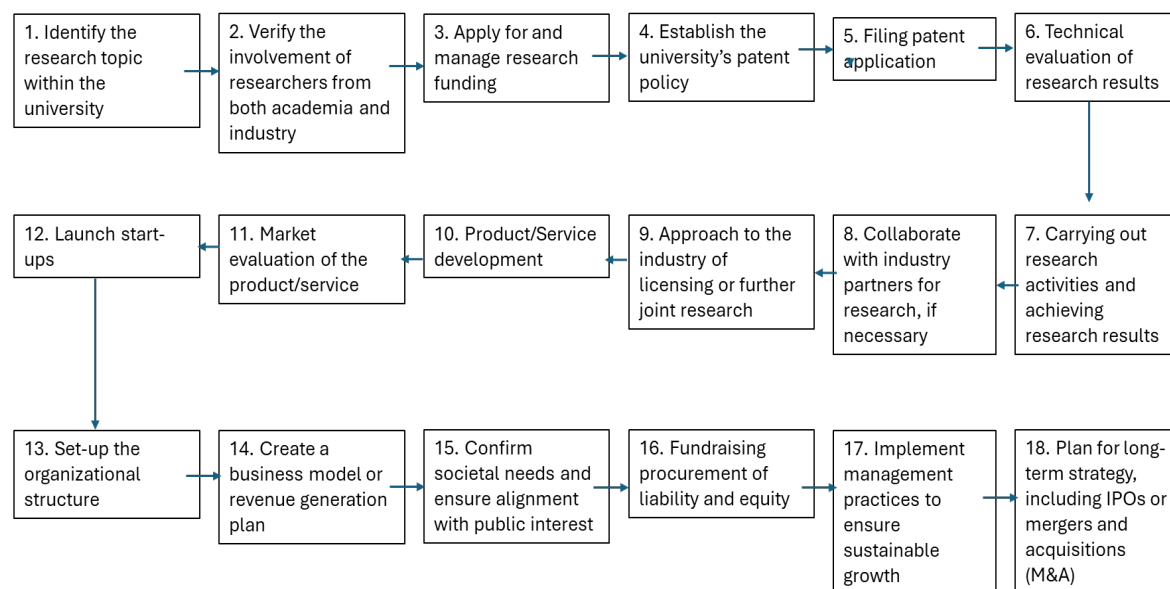
The process flow of the start-up journey (Figure 3) is as follows:

- Decide on a research topic at the university
- Identify research needs from academia and industry
- Apply for and obtain research funding
- Develop a patent policy at the university
- Undertake collaborative research with industry if necessary
- Conduct research activities and achieve research results
- Undertake technical evaluation of the research results
- Submit patent applications
- Approach the licensing industry or further collaborative research
- Develop the product/service
- Perform market evaluation of the products/services
- Identify social needs and listen to society's voice

- Create a business model/business plan
- Set up an organisation
- Launch a start-up
- Raise funds, debt, and equity
- Manage the business to achieve overwhelming growth
- Plan and prepare all the requirements for an IPO or mergers and acquisitions

This shows that there are many processes to go through. In addition, these processes must be completed as quickly as possible. The omission or lack of achievement of any of these steps could lead to start-up failure.

Figure 3: Sample Process from Research to Start-up and Exit



IPO: Initial Public Offering
M&A: Mergers and Acquisitions
Source: Project leader.

The start-up journey shown here is an example and will vary depending on the research field, research results of interest, industry field, social problems to be solved, and type of digital technology to be applied. Once the research results have been identified at the target university, each unique journey can be charted and written. It is important to share the flow from research to entrepreneurship to the end of start-ups (exit) with everyone involved.

In each step of the start-up journey, it is advisable for start-ups to follow these guidelines. They should expand their thinking to identify the problems that need to be solved and determine how to address them from the multifaceted perspectives of law, intellectual property, business, and technology (Figure 4). To lead the start-up to success, specific actions should be proposed from the perspectives of law, intellectual property, business, and technology in all processes of the journey. It is important to evaluate the technology and market, listen to the voices of people involved in social issues, and develop a business model and business plan.

Figure 4: Problems and Solutions

Processes	3 Thinking Perspective Steps		
	Legal	Intellectual Property	Business
Define research theme at university			
Confirm the researchers from academia and industry			
Apply and process for research fund			
Patent policy at university			
Joint research with industry, if necessary			
Carrying out research trials and selecting research results			
Technical evaluation of research results			
Writing and application			
Approaches to the Ministry of Economy or funding organisations			
Product/service development			
Market evaluation of the research results			
Confirm the social needs, return to the view from society			
Make a business model/revenue plan			
Organisation setup			
Launch/start-up			
Fund raising, procurement of liability and equity			
Provide management to make a sustainable growth			
Planning and positioning, all arrangements for IPO or M&A			

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IPO: initial public offering

M&A: mergers and acquisitions.

Source: Project leader.

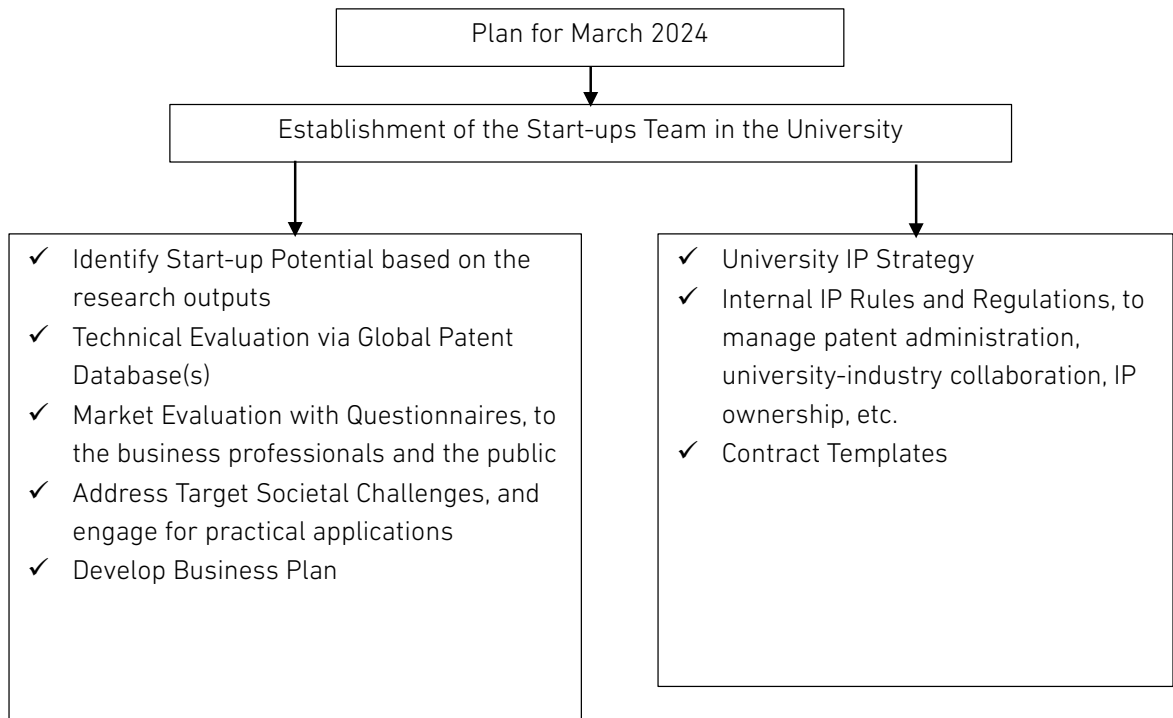
For example, when deciding on a research topic at a university, it is necessary to consider whether there is a need in the business market, keeping in mind the possibility of commercialising the topic in the future (Figure 5). Just because it is university research, it is not enough to simply listen to the voices of academia. To apply for and obtain research funds, it is necessary to have a firm grasp of research needs.

It is also important to establish a patent policy at the university as a set of regulations. It is crucial to determine in advance how to judge the appropriateness of an application, how to remunerate researchers if a right is granted, the procedure for licensing to industry, and the promotion of joint research. It will also be necessary to create rules for proposing patent applications based on research results, how to technically evaluate research results, how to approach industry at the same time as or after patent applications are filed, and how to conclude joint research contracts with companies.

In addition, based on the results of university research, many issues must be extracted and the necessary measures taken, such as how to create a business model and business plan, how to launch a start-up organisation, commercial registration, fundraising, and management methods to achieve growth.

It is expected that the universities involved will launch start-up(s) based on the results of university research, taking into full account the important perspectives for making university-based start-up(s) successful, as mentioned above, by working to solve problems from the multifaceted perspectives of law, intellectual property, business, and technology in each process of the start-up journey.

To take concrete action, the universities also need internal structures and procedures. First, establish a start-up team that expertise in law, intellectual property, business, and technology. It is then important that the members of this start-up team work together to involve relevant university stakeholders/members in creating a specific business model and develop infrastructures, such as university rules, to realise this.

Figure 5: Next Step Toward March 2024

IP = Intellectual Property.

Source: Project leader.

12. Conclusion

This project had a kick-off meeting in June 2023, and in September of the same year, project members were invited to an intensive training session in Tokyo to train key people at each university and start-up support staff at MISTI. The participants' capabilities were developed over 5 days (about 40 hours). The learning outcomes of the intensive training in Tokyo became an important step in the participants' capacity development, as they were able to absorb knowledge and practice. After returning to Cambodia, the project participants brought back the learning outcomes of the Tokyo training to each university, and in November and December, the project members held seminars at each university that they planned for start-up related personnel at the four universities. This enhanced the success factors of start-ups, such as increasing awareness of ownership and demonstrating leadership. After that, each university solicited business plans for start-ups, and eight applications from the four universities passed the preliminary screening. The business plans submitted were presented at a business plan competition held at the ITC on 7 March 2024. All eight applications were excellent business plans based on university research results and were presented in line with ERIA's requirements. Finally, the judges awarded the winners an excellence award and expressed their expectation for further research and efforts towards start-ups.

The greatest achievement of this ERIA project is that it provided intellectual property education to personnel who play a central role in start-ups at four Cambodian universities, and contributed to building a system in which the participants can demonstrate their initiative and leadership to lead university-based start-ups to success. Based on the results of this project, it is strongly expected that the participants will continue to work on start-ups and take on the challenge of further development towards the social implementation of university research results.