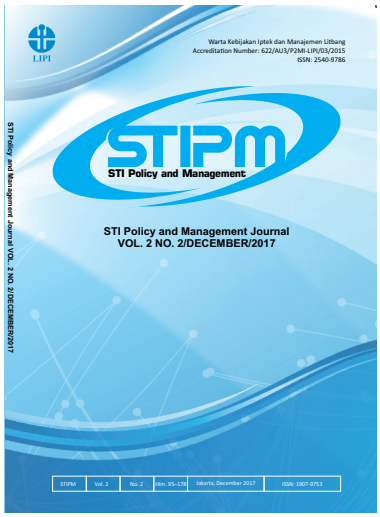

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An Empirical Study of Policy Implementation of Thailand Talent Mobility Programme

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JOURNAL OF SCIENCE, TECHNOLOGY AND INNOVATION POLICY AND MANAGEMENT (STIPM JOURNAL), Volume 02, Number 02, December 2017

FOREWORD by EDITOR-in-CHIEF

We are pleased to present the STIPM Journal Vol. 2, No. 2, December, 2017. This issue brings together research findings on the adoption of science, technology, and innovation policy and management from Thailand, Malaysia, and Indonesia. This issue also presents a theoritical review on the determinants of enterpreneurial success.

In the original articles of this issue, **Poolsak Koseeyaporn et al.** presented the Talent Mobility Programme in Thailand. It is a new programme for making relationship between the researchers, who are mostly working at Public R&D institutions and universities/higher education institutions, and companies. This programme is supporting the researchers to connect, meet, and explore the possibility of having research topics that fulfill both interests of researchers and the companies. The researchers would have a chance to be exposed to the industry's research problems as well as to obtain a level of trust from the companies.

Wati Hermawati and Ishelina Rosaira present the result of an exploratory study on the factors contributing to the sustainability of renewable energy projects in the rural areas. It was indicated that the success of energy technology implementation lays not only in good technology performance and long-term maintenance, but was also highly dependent on six key factors, namely (1) project planning and development; (2) community participation; (3) active communication and beneficiaries; (4) technology maintenance, including workshop and technician availability; (5) project management and institutionalisation; and (6) local government support and networks. The findings from this study provide useful insights to all stakeholders involved in the implementation of renewable energy technology for the rural areas in Indonesia.

Thiruchelvam presents a brief overview on Malaysia's STI achievements, salient features of the nation's national innovation system (NIS), and the key challenges of its NIS. The central theme of the paper is that success in STI is not automatic. It must be made through effective policies in promoting innovation as well as innovations in policy-making itself. Without such commitment for these two sides of innovation policy-making, pouring more resources to the development of STI will be futile.

Ria Hadiyati, et al., discussed the innovation capacity-building in the health sector in Indonesia. Current initiatives to enhance innovation capacity exists by intensifying R&D consortia in life science, especially vaccine and stem cell. The research capacity in the area of vaccines has been long started from individual research conducted by researchers. It has been continued into research organisations, and then developed into building innovation capacity through R&D consortia. In areas of stem cell, there is still lack of evidence however, efforts have been made to build innovation capacity through R&D consortia.

Emyana Ruth and Faiq Wildana compare the management of Indonesian ICT Business Incubators from the perspective of administrators and tenants. The incubation administrators emphasise the

importance of aspects of skill development, synergy, and seed capital. Meanwhile, from the tenants' perspective, skill development services are considered quite satisfying, either in government, private, or university-owned business incubators. However, emphasising on skill development aspect might lead incubators to provide oversized portion on training activities and susceptible to be trapped as a training institute.

Dyan Vidyatmoko and Pudji Hastuti propose a theoretical framework as a result of the development of theoretical framework, proposed by Kiggundu as well as Lussier and Halabi. The proposed framework is to examine factors affecting the success of entrepreneurship development in Indonesia. Three factors are discussed simultaneously, namely the entrepreneurs, the entrepreneurial firms, and the external environment. Success is represented by three indicators consisting of employment growth, profitability, and survival. Compared to both models, the proposed approach is expected to provide a comprehensive analysis of the factors affecting the success of entrepreneurship development in Indonesia. The results of the study is relevant and useful, both from the academic and practical points of view. It also has practical contribution for policy makers in terms of conceptualising and operationalising appropriate factors for the success of entrepreneurship in Indonesia.

After indexing by Google Scholar, ISJD, and IPI, STIPM Journal is now indexed with DOAJ, BASE, and OCLC World Cat. This has made the journal dissemination wider. We would like to thank all the reviewers for their excellent work and the authors who have kindly contributed their papers for this issue. We are also indebted to the STIPM Journal editorial office at Pappiptek LIPI and the publishing and production teams at LIPI Press for their assistance in the preparation and publication of this issue.

We expect that STIPM will always provide the highest scientific platform for the authors and the readers, with a comprehensive overview on the most recent STI Policy and Management issues at the national, regional, dan international levels.

Jakarta, December 2017

Editor-In-Chief

JOURNAL OF STI POLICY AND MANAGEMENT

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ABSTRACT

This paper empirically examines the national policy deployment of talent mobility programme aiming to leverage innovation atmosphere in private sector as a part of national strategy to escape middle income country status. The main policy mechanism is to facilitate universities and research institutes to develop their internal regulations in accordance with the Cabinet approval so that their talents can be legally mobilised to conduct research or project in private companies for competitiveness improvement. Moreover, clearing houses or service centres were established to eliminate the gap between industry and university, whereas training programmes were also developed for capacity building purpose, especially for staffs in those centres. Lastly, facilitation resources such as management, research fund, and compensation were mutually supported by government agencies including National Science Technology and Innovation Policy Office and Office of the Higher Education Commission. Based on data collection from the talent mobility projects executed during 2014 to 2016, key success factors and barriers were observed and subsequently the policy recommendations were proposed for improving the programme implementation in the future.

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I. INTRODUCTION

Thailand's economy can be described as export-oriented and reliant on sectors ranging from primary agricultural products such as rice, rubber, sugar, and cassava, to heavier industries including textiles, automobiles and parts, electronic and electrical components (Intarakumnerd, 2015). Growth of the latter group of industries have been supported especially by the presence of manufacturing multinational corporations (MNCs). This makes Thailand as one of the most important hosts of MNCs among Southeast Asian and developing countries (Ramstetter & Sjöholm, 2006). With the country's economic diversification strategy, Thailand has achieved an impressive growth in export. For example, exports of electronic/electrical and automotive

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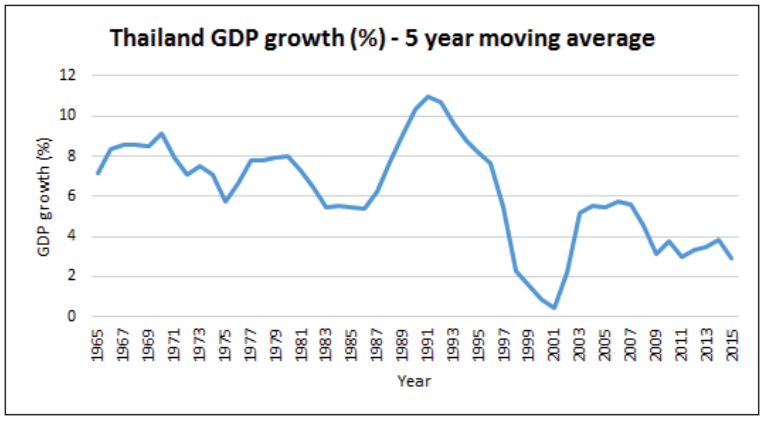
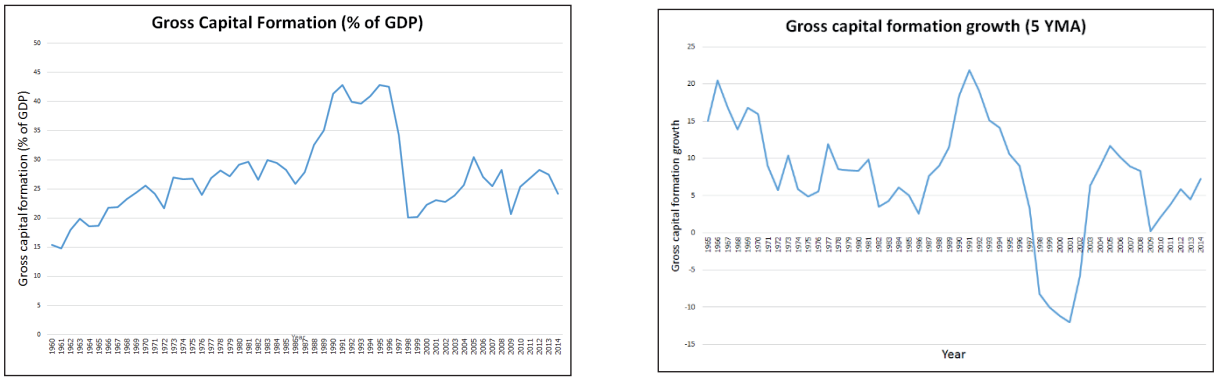
products rose from 0.04% and 0.25% of GDP in 1970 to 25.20% and 6.68% in 2006 respectively (Yusuf & Nabeshima, 2009). As a result, Thailand achieved economic growth rate of 6.1 percent per annum during 1960–2014. The country gained a status of upper-middle income country from the World Bank later in 2011 (Jitsuchon, 2012).

However, the economic growth rate has been slowed down recently. The growth rate of GDP, investment, and exports in Thai economy have been slowed down after 2001 compared to growths before the Asian Financial Crisis (See Table 1, Figures 1, 2a–b and 3a–b). Thailand has been facing a risk to fall into the so-called middle income trap. This means while the country is no longer able to rely on cheap labor and compete with the low-wage, labor intensive countries in the region in the low-skill based jobs, it also struggled to move up the value chain to produce technology-intensive product (United Nations



Source: World Bank (2016) (Calculated by authors)

Figure 1. Thailand GDP Growth during 1965–2015



(a) (b)

Source: World Bank (2016) (Calculated by authors)

Figure 2a–b. Thailand Gross Capital Formation during 1960–2014

Table 1.
Compound Annual Growth Rate (CAGR) of GDP, Investment, and Export in Thailand

Compound Annual Growth Rate-CAGR (%)	1960–2014	Sub-periods		
		1960–1996	1996–2001	2001–2014
GDP	6.1%	7.6%	0.3%	4.1%
Investment	6.4%	10.4%	-15.0%	4.6%
Export	9.6%	11.1%	8.7%	6.1%

Source: World Bank, 2016 (Calculated by authors)

(a)

(b)

Source: World Bank (2016) (Calculated by authors)

Figure 3a–b. Thailand Exports during 1960–2014

Conference on Trade and Development, 2015). This is because Thailand has been facing labor shortages of both medium and high-skilled levels. This issue will be worsened by future demographic changes which would increase average age of workers and consequently decrease overall labor productivity of Thai economy. Also, only a limited number of large, multinational corporations have adequate technological capability to climb up the global value chain, while a majority of small and medium-sized firms are still locked into low levels of innovation (Jitsuchon, 2012). Thai industries are also being pressured by the implementation of minimum wage policy which would significantly increase the production cost. As a result, the industries must improve their productivity and move towards higher value-added production (National Economic and Social Development Board, 2015). Therefore, an adoption of science, technology, and innovation policy to enhance productivity of industry is a key to drive the Thai economy towards such goal.

The private sectors are the driving force of an economic system. Hence, it is crucial for the government to enhance innovative capability and increase research, development, and innovation activities in the private firms. In 2013, the gross expenditure in research and development (GERD) in Thailand accounts for 0.47 percent of gross domestic products (GDP) (National Science Technology and Innovation Policy Office, 2016). This figure is far behind other industrialised nations in Asia, such as Japan (3.35 percent) and Singapore (2.04 percent) in 2012 (National Science Technology and Innovation Policy Office, 2014). In 2013, the Thai private sectors contributed to 47 percent of R&D expenditure and this figure increased from 41 percent in 2006, while the same figures for Japan and Singapore were 77 percent and 61 percent respectively (National Science Technology and Innovation Policy Office, 2016). Although it looks promising to see an upward trend of private sector R&D investment in Thailand, the rate of increase is very slow and this will make it difficult for Thailand to be on par with those developed industrialised countries.

The number of R&D personnel in Thailand has also been very low. In 2012, the number of R&D personnel per 10,000 population (Full Time Equivalent–FTE) for Thailand was only 10.05, while the figures for Japan and Singapore were 68.1 and 74.3 respectively. The majority of R&D personnel of Thailand (64 percent FTE year) are working in the public sector, higher education institutions, and nonprofit organisations (National Science Technology and Innovation Policy Office, 2014). Some of them are required by Thai Government scholarship conditions to work for the public sector after completion of their study. As a result, only one-third of R&D personnel are in the private sector. However, it takes 2–8 years to develop a high quality R&D personnel. Therefore, formal training to increase the number of R&D personnel in the private sector may not be a feasible option in a short run.

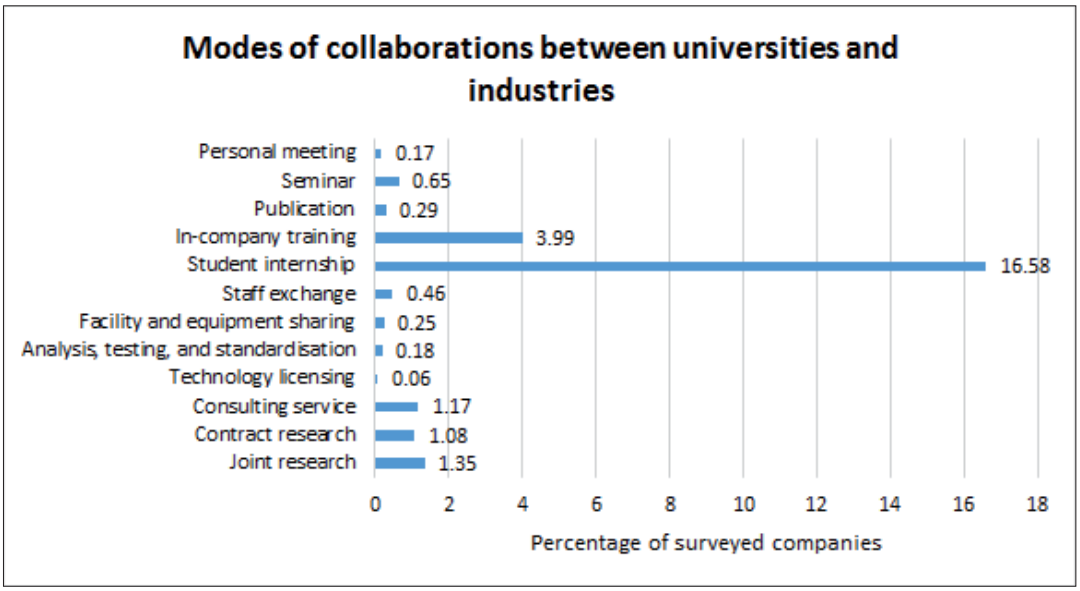
Thai firms are not actively working with universities in research, development, and innovation (RD&I) activities. According to a 2015 survey conducted by National STI Policy Office, only 26 percent of the surveyed firms have collaborations with universities in these activities. The main mode of collaborations are internship for university students and this accounts for 17 percent of the surveyed firms. In addition, joint activities which enhance firms' learning capability, such as joint research programmes, exchange of academic staffs, and staff training are very low (National Science Technology and Innovation Policy Office, 2015a).

To alleviate all these issues, the National Science Technology and Innovation (STI) Policy Office, a government agency responsible for formulating and driving science, technology, and innovation policy in Thailand, has initiated a programme called "Talent Mobility". The programme's objective is to facilitate the mobilisation of R&D personnel from public research institutes or universities to work in private company. The Cabinet of Thailand has approved that participation in the programme can be counted as working hours of the participants' original affiliation.

II. TALENT MOBILITY POLICY: A CONCEPTUAL FRAMEWORK

World Economic Forum (WEF) defines talent mobility as "the physical mobility of talent within or across organizations and industries as well as the professional movement of workers across occupations or skill sets" (World Economic Forum, 2012). It is a mechanism contributing to the creation and diffusion of both codified and tacit knowledge. Talent mobility is especially relevant for the transfer of tacit knowledge, any form of knowledge that cannot be codified and transmitted as information through documentation, academic papers, lectures, conferences or other communication channels. The transfer of this form of knowledge is more effective through interactions among individuals with a common social context and physical proximity (Co-operation, O.f.E. and Development, 2008).

Talent mobility is not a goal in itself, but is often linked with sustainable economic growth objectives. A study by WEF describes talent mobility as a policy instrument to achieve balance within global human capital markets and to stimulate national economic growth (World Economic Forum, 2012). Also, a study by the European Commission sees inter-sectoral mobility as a



Source: National STI Policy Office (2015)

Figure 4. Modes of Collaborations in Research, Development, and Innovation Activities between Firms and Higher Education Institutions in 2014

tool that enables a transformation of research results into globally competitive products. Therefore, talent mobility can promote research and innovation as well as increase employability and promote career development for researchers (European Commission, 2006).

WEF categorized talent mobility practices into four groups according to their levels of collaboration as summarized in Table 2 (World Economic Forum, 2012). However, this paper will focus mainly on inter-sectoral talent mobility (Levels 2 and 3 of collaboration), particularly a mobilisation of professionals from universities and public research organizations to industries, rather than the other way round.

The government of many developed countries have encouraged the mobilisation of public researchers to work in industries as a measure to promote knowledge diffusion within the national innovation system. The programmes in different countries vary in several aspects including duration of mobilisation, financial incentives, target groups, focused sectors, etc. In Singapore, Agency for Science, Technology and Research (A*STAR), a leading public research institute in Singapore, initiated the Technology for Enterprise Capability Upgrading Initiative or T-Up. The programme allows A*STAR research scientists and engineers to work in local entreprises for at least 30 percent of their working hours and up to two projects per year. The programme supports up to 70 percent of the seconded researchers' salary if they work for small and medium entreprises (SMEs).

Table 2.
Four Types of Talent Mobility Practices

Level of collaboration	Descriptions	Examples of key practices
1. Collaboration within the organization	Collaboration across functions, units and geographies within an organization to develop employees close information gaps and better balance internal supply and demand.	- Forecasting the supply and demand of critical talent; - Career and leadership development focusing on building critical skills; - Integrated diversity and inclusion strategy; - Global mobility philosophy aligned with talent development strategy; - Strategic succession; planning; - Promoting internal mobility across business units and job functions.
2. Collaboration across organizations within a country	Collaboration among different organizations to source and develop talent locally.	- Seconding employees to other organizations; - Partnerships between companies, governments or educators on training, developing, and deploying talent; - Public sector initiatives on sharing information on labour supply and demand; - Programmes led by the public sector to mitigate brain drain and facilitate immigration.
3. Collaboration on an industry or regional level	Public-private partnerships designed to foster talent mobility and skill development, as well as industry associations working closely with the public sector to attract and develop talent	- Strategic talent assessment, development and deployment on an industry level; - Matching supply and demand through job fairs, job portals, and university visits; - Shaping academic curricula through participation on university advisorycouncils; - Subsidized internship programmes - Industry specific training programmes and workshops.
4. Collaboration on a global or multi-stakeholder level	Sectors, governments, international organizations and academia across multiple countries and regions work closely together to solve complex talent mobility issues.	- Private companies talent sourcing to educational institutions, governments, and NGOs in multiple countries; - International development initiatives in skill development and trade agreements.

Source: World Economic Forum (2012)

In France, the National Institute of Health and Medical Research (INSERM) introduced a secondment programme which allows their researchers to work in hospitals, universities or industry in the same network for 3–5 years. INSERM will pay two thirds of the researchers' salary, while the partner institutions will support the rest (European Commission, 2006). Similarly, the Government of Spain developed a programme to support R&D activities of SMEs by subsidising 75 percent of researchers' salary for a period of up to three years. Another project called Marie Curie Industry-Academia Partnerships and Pathways (IAPP) is one of the European Union (EUs)′s projects which supports researchers to mobilise from universities or public research institute of EU member countries to work in industries, especially for SMEs. The programme supports 100 percent of researchers' salary.

For the case of Thailand, National STI Policy Office has recently proposed a policy to allow researchers from public research institute or universities to mobilise to private companies. The mobilised researchers would conduct the following activities in the private companies including 1) research and development; 2) technical problem solving; 3) standardisation and testing; and 4) innovation management. The programme requires the researchers to work in the companies for at least one day per week, from the period of three months to up to two years. If the partner companies are SMEs, the programme will compensate for the absence of the mobilised researchers to the researchers' home organisation during the researchers' secondment. However, the large entreprises are responsible to pay for this cost to the researchers' organisation and will not receive this support from the programme. Additionally, the programme also provides monthly allowances to undergraduate and graduate students who work as a research assistant attached to the mobilised researchers under this project. Understanding the evolution of talent mobility in Thailand is the unique contribution of this study.

III. EVOLUTION OF TALENT MOBILITY IN THAILAND

In 2010, National STI Policy Office started studying the possibility of implementing talent mobility policy for the first time. The programme has officially been launched since 2013 with continuous improvement in four consecutive implementation phases, as shown in Table 3. The required conditions of the programme as discussed earlier remain unchanged throughout all phases. The details of each implementation phase are explained as follows.

Table 3.
Evolution of the Talent Mobility Project

Phase	Implementing Bodies	Financial Support
I	National Science and Technology Development Agency (NSTDA)	Up to 70% of the project budget, but not exceeding 400,000 THB
II	Clearing Houses (CH)	1) 1.5 times salary of researchers compensated to universities 2) 8,000–12,000 THB for research assistants' monthly allowances
III	Clearing Houses (CH) and other universities	1) 1.5 times salary of researchers compensated to universities 2) 8,000–12,000 THB for research assistant's monthly allowances
IV	Office of the Higher Education Commission (OHEC)	1) 400,000 THB based on FTE of researchers 2) 200,000 THB for testing and materials The project can receive financial support from both OHEC and National STI Policy Office

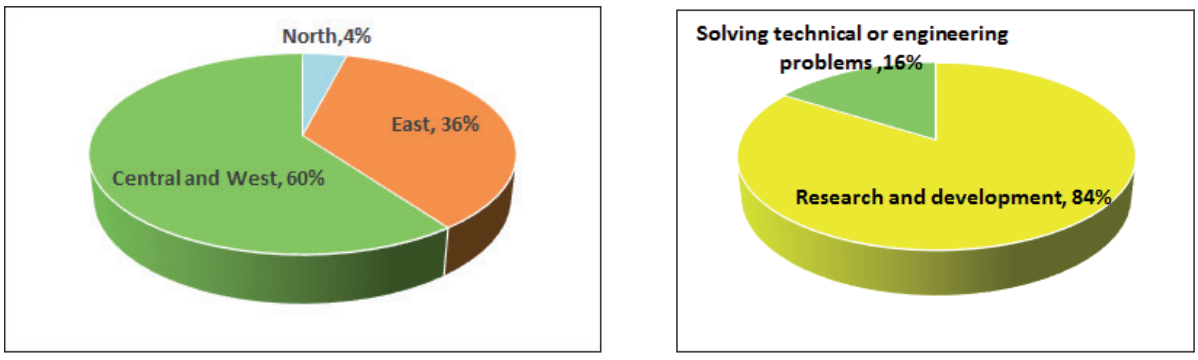
Source: National STI Policy Office (2016)

A. Phase I: An Experimental Phase by National STI Policy Office and NSTDA (2013–2014)

For the first stage, National STI Policy Office started the project by collaborating with Industrial Technology Assistance Programme (ITAP) under the National Science and Technology Development Agency (NSTDA), a leading government research organization in Thailand. The programme has a mandate to enhance productivity of SMEs by providing expert consultancy and matching fund to help them develop product or process. By then, ITAP had already established links to science and technology experts, so-called Industrial Technology Advisors (ITAs), and a mechanism for facilitating mobilisation of these experts. ITAs work with the companies and help them solve technical problems. ITAP supports SMEs by providing matching fund of up to 70% of the total project cost with a capped amount of 400,000 Baht. The program requires that the ITAs must contribute at least 20% of their working hours and spend from three months to two years working for the project. During this period, 25 projects from 18 SMEs and four large enterprises were completed with helps from 53 talents (only researchers). It should be noted that the projects mainly came from central area of the country which were the locations of industrial parks and the projects were focused largely on research and development, as shown in Figures 5a and 5b.

B. Phase II: Clearing House (mid 2014 to present)

After experimenting the programme to the ITAP system, it became known that the programme had targeted researchers who, without the programme, would mobilise and work with private firms under other existing government supporting schemes. During Phase I, universities or public research institutes had not yet developed a mechanism for facilitating the mobilisation of their staffs to private company openly. The programme under Phase II was therefore aimed to establish a broader enabling system by introducing internal regulation revision to allow inter-sectoral mobilisation of researchers, recruiting talent facilitators to connect researchers and private companies in mindset aspect, communication, and intellectual property matters. National STI Policy Office thus established "clearing houses" inside universities in four different regions. This corresponds to the demands of private companies in accessing talent resources from universities in the same region. These clearing houses would facilitate the universities in co-creating vision in talent management in response to the demand from the industries. In addition, the clearing houses could construct a talent network by establishing cooperation to other universities in the same region. These four clearing houses were located in the northern, southern, north-eastern, and central regions. Moreover, STI Talent Mobility Unit was established as a coordinator linking all four clearing houses to national talent mobility committee.



a) b)

Source: National STI Policy Office (2016)

Figure 5. a) (left): Project Location; b) (right): Types of Projects

C. Phase III: Expanding a network of universities (late 2014 to present)

After implementing the programme for a while, it was frequently reported that demands from prospective companies could not be met by the limited supply of researchers from the partner universities. To respond to the demands more adequately, National STI Policy Office agreed to sign Memorandums of Understanding (MOUs) with more universities around the country, including technological universities and comprehensive universities. Most of these universities are located in the central region and the number of partner universities was increased from four to twenty. Therefore, the programme could become more efficient in satisfying the increasing demands of firms in the central area to join this programme. During this period, regulations related to talent mobility were adopted by universities. These regulations vary in degrees of restriction and flexibility which depend on different perception, culture, and the types of universities, whether they are public or autonomous.

D. Phase IV: Talent Mobility with OHEC (mid 2015 to present)

In the latest period of policy implementation, Office of the Higher Education Commission (OHEC) stepped in to play a role in providing research funding to SMEs which would otherwise face financial constraint to implement the whole project. Currently, both OHEC and National STI Policy Office are working closely together in planning future implementation of the programme, especially on budgeting. The budget would support the universities and clearing houses' activities, including staff employment, matching universities and firms, programme evaluation, capacity building, awareness campaigns, etc. Moreover, additional funding from OHEC has well complemented the programme by compensating the universities for the seconded researchers, supporting allowances for researchers, students as well as providing support on research equipments and materials.

IV. PROGRAMME ANALYSIS

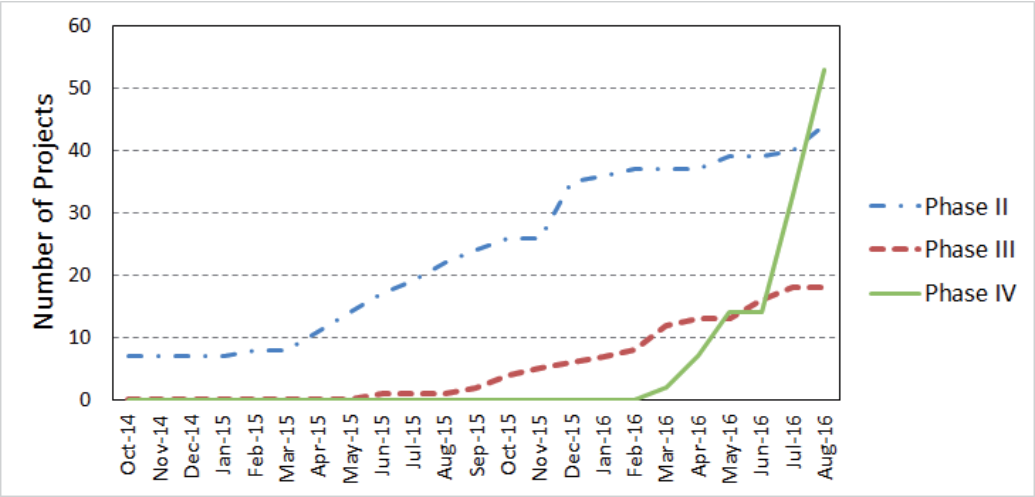
As illustrated in Figure 6, the programme has been continuously developed and improved over the course of implementation. The programme was scaled-up significantly after the cabinet resolution on Feb 18th, 2015. The number of projects was increased from nine to 44 projects and 95 researchers and 122 research assistants were mobilised to the private companies. Despite long and complicated process in joining the programme and revising regulations, other universities without the clearing houses have also increased the number of mobilised talents.

For the implementation in Phases II and III, the mobilisation process starts by matching researchers to private companies. Then, the proposal would be submitted to National STI Policy Office for an approval which takes only a week. To the private firms, starting a project as soon as possible is highly desirable. The matching process in the Phase IV is slightly different. OHEC calls for proposals from researchers every 2–3 months.

The implementation under OHEC supporting scheme has shown a very remarkable progress with a large number of project proposal. This is probably because university researchers are familiar with the process of writing proposal to research funding agency. Also, from the perspective of university researchers, obtaining funding from government agencies is much less demanding than that from private companies, which often requires higher level of industrial experience from the researchers as well as higher level of trust. Therefore, the OHEC scheme is more favorable for the researchers who already have connection with the private companies and may not systematically strengthen university-industry linkage at institutional level.

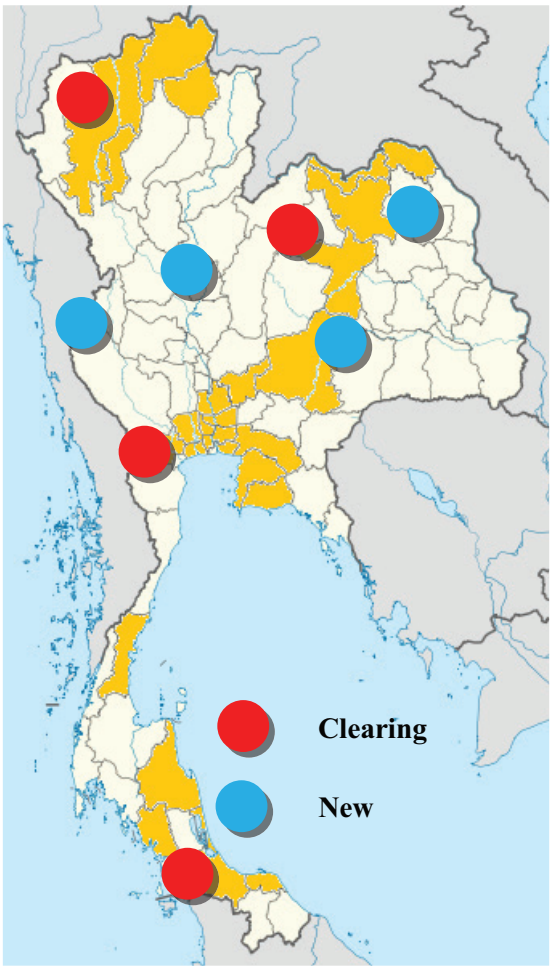
Consequently, mobilisation of talent will not continue in a long term and an increase rate of mobilised talents will stagnate quickly. This concludes that adopting both approaches at the same time would accelerate the rate of talent mobilisation in a short run, but also ensure sustainability of the programme in a long run.

After two years of programme implementation, 240 researchers and 157 research assistants



Source: National STI Policy Office (2016)

Figure 6. Comparison of Project Growing from Phase II (Clearing House –CH), Phase III (Non-Clearing House), and Phase IV(OHEC)



Source: National STI Policy Office (2016)

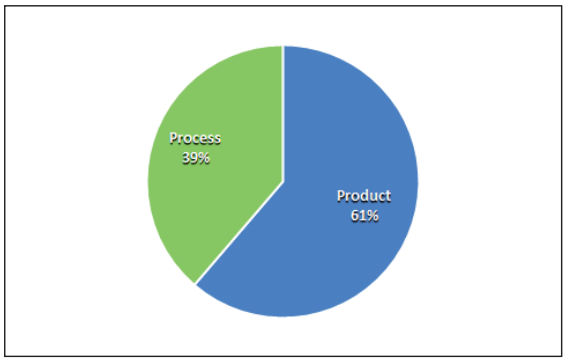
Figure 7. The Destination Provinces That the Researchers Mobilise to and Work with Private Firms. (Yellow provinces = already participated in the programme, white provinces = not participated in the programme yet.)

had been mobilised to the private companies within 27 provinces around the country. Nevertheless, according to survey by STI, the number of private companies which express interest in joining the programme had reached 1,374 which far exceeds the programme capacity (National Science and Technology Development Agency, 2015). To overcome this demand surplus, convincing more universities to join the programme should be a major priority.

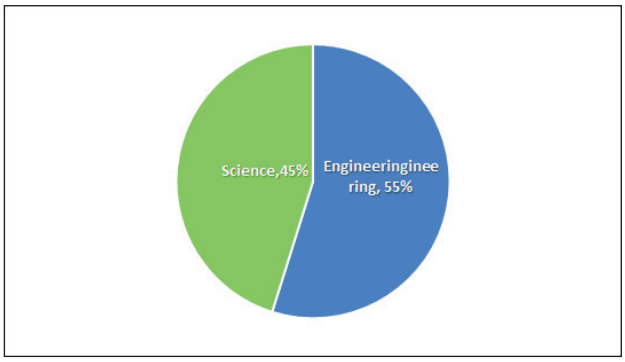
A. Characteristic of the Projects

Based on the data collection within two consecutive years, it is found that the number of projects focusing in product development is higher than those focusing on the process improvement. This is a good sign which shows that a majority of participating firms have innovation culture. By comparing the project types, there is no significant difference between the number of science project and engineering project.

According to Figure 9, it is shown that most of the projects were submitted by companies in the central region, whereas the second largest group is those from the northern region. Based on our observation, the active involvement from industries in the central areas were contributed by at least two main factors; clearing house characteristics which are autonomous in nature and the location of industry which are mainly



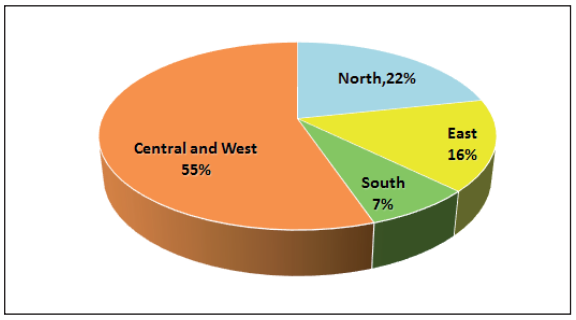
(a) Process and Product Projects



(b) Science and Engineering Projects

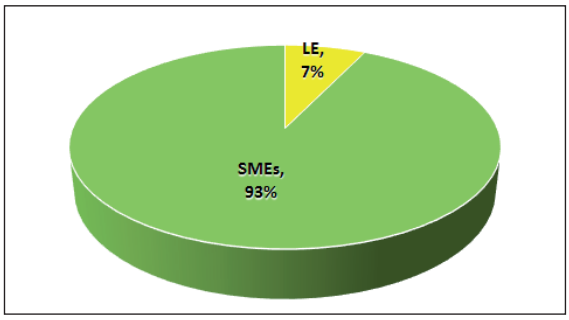
Source: National STI Policy Office (2016)

Figure 8a (left) and Figure 8b (right). Characteristics of the Project (Phases II, III and IV)



Source: National STI Policy Office (2016)

Figure 9. Sources of Project Proposal by Location of Industries.



Source: National STI Policy Office (2016)

Figure 10. Sources of Project Proposal by Company Sizes

concentrated in the central region. For the northern region, the success could be due to a strong network of university professors and researchers which could satisfy demands from industries efficiently.

B. Characteristics of the Participating Organizations

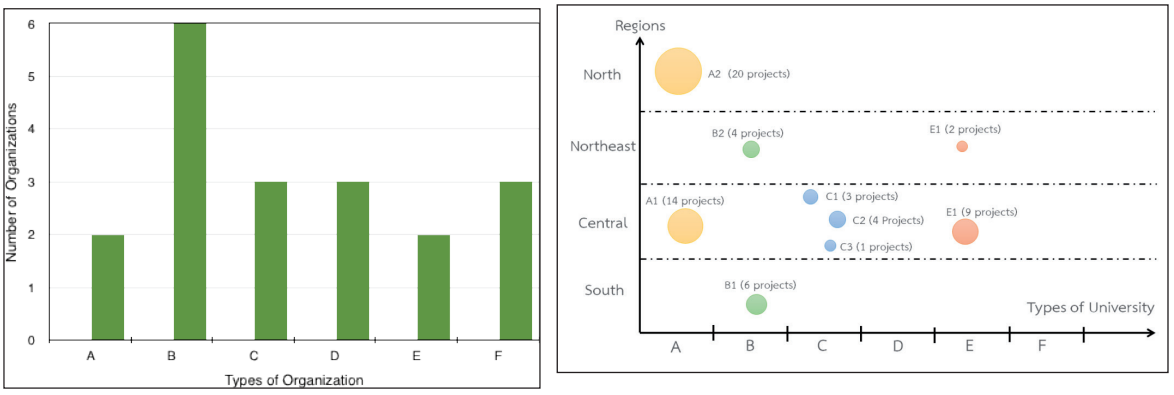
Figures 11a and 11b show the distribution of projects from different regions and different types of support units. The latest statistics shows that a support unit which provides the highest number of projects is located in the northern region. However, the central region is among the regions contributing the highest number of projects. This is consistent with the fact that most of industries are located in this area. It is very clear that very active and flexible business units (A1 and A2) performed very well in establishing linkages between universities and industries. This is because they have received the support from at least three universities or research institutes within the same region. One unit has a very strong academic network, whereas another has a very strong network with the industries.

It is worth noting that the science park-based operating units (B1 and B2) were established in Phase I, whereas the rest are about to operate in Phase IV (see Figure 11b). The type-C operating units basically have a well-known university-industry coordinating unit, such as academic service unit connecting researchers to private companies. Nonetheless, the number of projects delivered by them is not comparable to those delivered by the autonomous business units. This is because policy of the parent universities emphasises more in boosting academic research publications and increasing university ranking. This policy contradicts with talent mobility policy which aims to transform the role of universities to become more industry-oriented. As a result, these type of universities may not be interested

Table 4.
Distribution of Projects by Types of Universities

Types of universities	Number of projects	Number of researchers	Numbers of students
Research university	36	75	48
Technology university	40	69	63
Comprehensive university	24	63	46
Community college (in progress)	-	-	-

Source: National STI Policy Office (2016)



a b

Note: A = autonomous business unit, B = science park, C = research or academic service /technology licensing office, D = under the president or vice president office, E = under faculty office, F = not clearly assign or about to establish a new unit.

Source: Talent Mobility project, STI (2016)

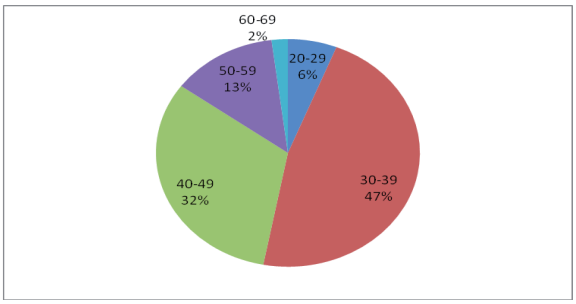
Figures 11. Distribution of Talent Mobility Operating Unit Types

in setting up a unit to support university-industry linkage. Fortunately, some universities actively responded to the government policy by establishing talent mobility unit under the vice president office (case D) or the faculty office (case E) even before the revision of regulation had been done.

Some universities are not ready to launch the project (cases D and F) even though the enabling systems such as a service operating office, a staff training system, and appropriate regulations are already in place. One of the technological universities in the case E has been very successful in implementing the talent mobility programme since the programme strongly aligns with current policy of the university in supporting industrial internship for its students and professors. In addition, this university has already applied talent mobility as a Key Performance Indicator (KPI) for all faculty members.

C. Characteristics of Participant Researchers

The age of the programme participants varied widely as shown in Figure 12. However, majority of the participants are young researchers aged between 30–39 years. According to in-depth interview, these young researchers revealed their enthusiasm in working with the private companies. The more experienced researchers whose age fall between 40–49 years are the second largest group. Based on the researchers' observation, many of them have participated in similar programmes, such as ITAP or other joint research programmes with industries. From the researchers' point of view, the talent mobility programme can help them gain insightful knowledge in industries and make them better understand demands from the industries. Furthermore, the programme could also lead to an increasing number of researchers in the private sectors.



Source: National STI Policy Office (2016)

Figure 12. Age of Programme Participants

D. Regulation Flexibility Comparison

Appropriate regulations within universities or research institutes is one of the key components for successful implementation of the programme. To facilitate mobilisation of talent, universities and research institutes have to create or revise the relevant regulations as well as to formulate a clear standard operating procedure for participating in the programme. This standard guideline should include criteria on monitoring and project evaluation.

Information on the regulations related to talent mobility are available only from six universities. Table 5 provides a comparison of these regulations in various aspects including a governance model (a chair of board committee, size of the board committee, an inclusion of a private sector representative in the committee), the maximum age of the participant researchers, required work experience, the duration of mobilisation, and extendability of the programme. Each set of regulations is represented as R1, R2,.. to R6.

According to Table 5, it can be seen that most universities have introduced regulations to enable successful implementation of the policy, while some are very conservative at adopting new regulations. The case of R1 is the most conservative and rigid type of regulation. It requires the participant researchers to have a prior work experience of at least six years and sets the age ceiling at 55 years. Additionally, the allowed maximum duration of mobilisation is only one year. Furthermore, it also obligates the returned participants to undertake a service bond for two years. On the other hand, some cases such as R3 and R4 provide less restricted specification on the programme participants, hence more flexible than the others.

In terms of programme governance, most of the talent mobility programmes are overseen by a board committee chaired by a University Vice President, except for the R1 case which is chaired by the President. The number of members ranges from five to eleven persons. Some models also include a representative from the private sectors into the committee. Some universities have set up neither special operating unit for talent mobility nor a talent mobility committee. Instead, they simply implement the programme through an existing administrative system which often makes the process of implementing projects complicated and inefficient.

The duration for mobilisation ranges from one to three years. One of them explicitly allows an extension of the secondment to the researchers, while the rest do not mention this aspect in the regulations. Two of the cases, R5 and R6, require the partner firms to compensate the universities for their seconded staffs. The rate of compensation ranges from 1.5 to 5 times salary of the seconded person. The university with the R5 type of regulation requires particularly high level of compensation from the firms. This is probably due to the university's reputation and its high global ranking. Therefore, they highly value their academic staffs and set the compensation rate very high.

Although the Cabinet has approved that the participation in the talent mobility programme can be considered as a part of service bond for the recipients of Thai government scholarship, such Cabinet Resolution may not necessarily overrule the university's regulations. One of the partner universities still does not comply with this approval and this is probably due to a concern on potential brain drain to other sectors.

Beside these, many partner organisations have requested for the support for other mode of talent mobility, especially a mobilisation from the private sectors to the universities. However, these regulations have not provided a framework for this mode of mobility. This issue may be considered a future policy study.

Table 5.
Characteristics of Talent Mobility Regulations from Different Universities

Characteristics	R1	R2	R3	R4	R5	R6
A chair of board committees	University President	University Vice President	None	University Vice President	University Vice President	University Vice President
No. of committee members	11	11		6	7	5
Allow private member	Yes	Yes				
Maximum researcher age	55 years					
Mininum prior work experience	6 years					
Maximum duration	1 year	3 years	2 years	-	2 years	3 years
Extension					Yes	
Required compensation					3–5 times	1.5–5 times
Bonding	2 years					

Source: National STI Policy Office (2016)

V. POLICY EVALUATION

The talent mobility programme has successfully connected universities and research institutes to private companies around the country. The programme has facilitated the mobilisation of researchers from the public sector—mainly universities—to take part in research, development, innovation activities in the private firms. The companies received technical support from the mobilised researchers in developing product or process improvement.

The operating units have been widely established in all the regions. Some of these units were newly established to specifically take up the mandate in this programme while the others were developed from the existing platforms, which have provided similar services previously. In an early stage of implementation, the programme received financial support from the government to compensate for the universities' mobilised manpower and to provide allowance for the research assistants. However, the clearing houses in some universities carefully spent some amount of this budget on facilitating the mobilisation to ensure a successful execution of the research projects. In the latest phase of implementation, an additional amount of budget for the programme was channeled through OHEC which ensured that all the programme partners would benefit from the programme.

There are two main concerns related to the process of implementation. The first issue is a weak alignment of objectives between National STI Policy Office and OHEC. In Phase IV of implementation involving OHEC, a project proposal from the researchers have to be screened and received an approval from both National STI Policy Office and OHEC. While this is a requirement, National STI Policy Office and OHEC still view objectives of the programme differently from each other due to different organizational missions. As a result, an approval on the proposal from one partner will not guarantee the approval from another. Furthermore, frequencies of opening for proposal submission in the two agencies are different. However, Phase IV is still in an early stage and deserves a more careful planning for future implementation.

The second concern is a long process for matching the researchers's and the companies's concerns. These concerns were particularly raised by some large entreprises. The matching process often takes longer than if the companies themselves directly outsource the research activities to the researchers. Perhaps, this is because large entreprises set very high requirements for the qualified researchers, including the high number of working hours per week and a long duration of research project. The universities therefore become more reluctant to approve their staffs to participate in the programme. Consequently, negotiation process will take a long time and will end up with unsuccessful matching, unless the companies provide the universities with a satisfactory level of compensation.

VI. KEY SUCCESS FACTORS AND A MAIN OBSTACLE

Although it is too early to evaluate outcome of the programme at this stage, this study is able to discuss factors which can contribute to the success of this programme. This includes various aspects, such as organizational management, regulations, networking, and industrial development in the regions. Regarding the organizational management, it was found that the clearing house's staff members play an important role of handling the mobility services ranging from matching, to budgeting, evaluation, etc. Also, the operating units which are specifically designed for running the talent mobility project are more able to devote its full capacity for this programme. Therefore, the success cases during the beginning period of implementation was surprisingly not from science parks which have their tremendous amount of activities and limited staff capacity for the programme. Rather, the success cases came from an autonomous unit inside universities which can efficiently allocate resource to the programme, have flexible and supporting regulations, and have senior and young faculty staff members working together in the unit.

The second success factor is the network of clearing houses. One clearing house has been established as a new faculty which has its own academic network around the region and the members of this network are mostly young university professors. Another network is also under a new facilitating centre which has a special purpose on linking university and industry. A manager of the centre also has relevant experience in the ITAP so he or she can apply the same approach to operate this centre.

Industry-oriented perception among the university executives (such as the president or dean) is one of the key success factors. In one of the partner universities, the president adopted talent mobility programme to all faculties of the university and adopted the number of mobilised talents as a KPI for each faculty. Faculty members in small-sized technology universities are more likely to participate in the programme than those in the bigger universities due to a less complicated administrative system. Another reason is that the smaller universities are often less popular among prospective students. Hence, they tend to receive lower quality of student input. They are also facing with the aging society issue resulting in a lower number of application from students each year. Consequently, the universities need to develop other strength to attract best students to their programmes. One of the strategies is to strengthen linkages with industries. This is particularly the case for young faculties from universities of technology who often seek to work in a short-term research programme with the industries during summer vacation.

Availability of industrial development in the regions is another factor contributing to the quality of the programme. It is obvious that projects with content in the more advanced science and technology are mostly from the projects around central area of the country. This is related to locations of industry and research universities concentrated in the central region.

Despite all of these success factors, the main obstacle for the success of talent mobility programme is a career path of university professors which does not take into account of a collaboration with industries. Some universities have a vision to become a national research university. The government also supports them by providing an additional amount of research funding. These group of universities have to increase the number of publications and improve their academic research performance in order to elevate their global ranking. Therefore, their academic staffs are required to improve their research performance and increase their academic rank in a timely manner. Although university professors are allowed to take up academic service which includes giving technical services to industries, these services are often more demanding and more time-consuming compared with academic work. Moreover, contribution from the academic service can account for only ten percent of their workload. As a result, researchers in universities become less motivated to work with the industries.

VII. CONCLUSION AND POLICY RECOMMENDATIONS

1) For the researchers, research funding is an attractive point of the programme. Therefore, integrating research funding from other agencies would give a large impact on the programme.
2) The process of seeking permission from the researchers' department or faculty takes very long, sometimes up to several months. This is highly undesirable from the business point of view. Given the high demand of researchers to participate in this programme, the pre-approval process can possibly be made prior to the project proposal submission. Activities in the pre-approval process may include, for example, a checking of workload and available working hours of the prospective researchers. Hence, this should be implemented before the beginning of each university semester.
3) Due to a huge demand from the industries, many more universities should participate in the programme. Since this programme was initiated by National STI Policy Office, the support was therefore limited to only science and technology activities, while problems from private companies may include other aspects. Hence, other funding agencies, such as OHEC and Thailand Research Fund (TRF), should look forward to setting another similar programme for the nonscience and technology talent mobility.
4) Business confidentiality is a potential barrier for a university-industry collaboration. Some private companies can be very careful in allowing outside researchers to work inside their organisation for a long period of time. Therefore, it is crucial to develop mutual trust between universities and industries. Hence, the Pre-Talent Mobility programme, a new programme for making relationship between researchers and companies, should be developed. This programme will support researchers to connect, meet, and explore research topics with companies before drafting the research proposal. The researchers would have a chance to be exposed to the industry's research problems as well as to obtain a level of trust from the companies.

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