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Internationalization of Science Parks: A case study of Thailand Science Park

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Executive Summary

Due to globalization and rapid changes in business practices, a science park, as a physical place for conducing R&D of multinational firms and nurturing technology startups or technology based firms, may effect and involve purposely and intentionally with the internationalization's process of those firms. However, the study of internationalization of science parks is still limit. The objective of this paper is to investigate the concept of science park's internationalization, determine key components of internationalization, and apply these key components to explain internationalization by using a case study of Thailand Science Park (TSP). The results show that TSP has implemented all components of internationalization but only several components have been actively executed more than the others. From our findings a primary set of measure and indicators are proposed and discussed.

Keywords: Internationalization Science Parks

I. Introduction

Globalization and the evolution of the knowledge-based economy have caused dramatic changes in increasing diversity workforce, shifting in scope of working environment from local to international markets, increasing numbers of mergers and acquisitions among cooperation from different countries (Gibson, 1995; Nakata and Sivakumar, 1996). Science parks, as physical places for conducing R&D of multinational firms and nurturing technology startups or technology based firms, may involve purposely and intentionally with the emerging internationalization of those firms located in the parks. That is those multinational firms increasingly relocate, construct of new plants or set up their R&D based/facilities in science parks. While some local SMEs/startups located in the park need to expand their business internationally, they need many services such as consultants to help them to access international market, searching for business partners and so on (Bengtsson and Löwegren,2000). For this reason, science parks, as equipped with S&T infrastructure and full range of value-added services, have to prepare themselves to response to localization and internationalization of those firms located in the parks. Internationalization could be benefit to science parks in bringing more resources such as international finance, international collaborative projects, or international talents to the parks. Science parks may link those various international resources and facilitate their clients/firms located in the parks to get benefits from those resources, and stir them with many activities to generate and product new ideas and innovative products. However, only few studies have explored internationalization of science parks. Thus, the objective of this paper is to investigate the concept of science park's internationalization, determine key components of internationalization, and examine these key components to explain internationalization of Thailand Science Park (TSP). Our paper starts with the theoretical part which includes the definition of science park, and internationalization. Then we determine the key components of internationalization science park and apply these key components with a case study of TSP. Finally, findings are discussed and recommendations given for moving toward to internationalization of science park.

II. Science Park and Internationalization Concept

According to IASP, a science park is an organization managed by special professionals whose aim is to increase the wealth of community by promoting the culture of innovation and the competitiveness of its associated business and knowledge-based institutions. With the above definition, a science park could have a diverse role in developing and nurturing technology businesses. It facilitates innovation and enhances the competitiveness of firms, encourages the formation of innovative and hi-tech firms,

attracts leading hi-tech companies from around the world and creates clusters that accelerate economic growth (Pleaksakul,2004). Thus, it could be claimed that the diverse role of science parks in promoting innovation and business endeavor may involve with internationalization's process for example bringing in foreign direct investment and serving hi-tech startups to expand market internationally.

From the previous literature review, there is no definition of internationalization in science park context. In general, internationalization is defined as a "the process of integrating an international, intercultural, or global dimension (e.g. a perspective, activity or program) into the purpose, functions or delivery of the organization" (modified from Knight, 2003, p. 2). Welch and Luoustrarinen (1988) defined internationalization in the business context as the process of increasing involvement in international market both inward processes (e.g. importing raw materials) and outward processes (e.g. exporting, licensing out, franchising and foreign direct investment (FDI). In terms of internationalization activities in science parks, Bengtsson and Löwegren (2000) have analyzed and investigated internationalization in Nordic and Baltic science technology parks by applying many aspects such as having plans for internationalization, creating activities supporting firms' internationalization, having business advice capacity, having multinational and foreign firms, and international networks in science parks. In addition, Sanz (2005) mentioned in his paper that there are occasions in which the internationalization process of a larger corporation actually affects Science Technology Parks in the cases of corporate, relocation, construction of new plants or facilities, or acquisition of smaller companies by the big players. Sanz (2005) also suggested that science parks should consider some internationalization aspects in order to develop adequate support services for SMEs located in the parks such as international commercialization, partnerships in international projects, international joint ventures, international capital (equity /shareholders), and international workforce.

From the above definition of internationalization and the previous literatures, internationalization of science parks relate to the large firms and small firms located in the parks. Internationalization could be defined in terms of process of increasing internationalized science parks by setting strategies, creating programs/ activities to support internationalized science park. Therefore, the key components of internalized science park should be (a) having plans or strategy to internationalize (b) attracting international firms to locate in the park, (c) creating ecosystem for international firms (d) creating activities for local firms to develop their internationalization (e.g. international commercialization, partnership in international projects, international joint ventures, international capital and international workforce) and (f) building international networks. These proposed key components might be essential for indicating the level of science park's internationalization.

III. Internalization of Thailand Science Park in Practices

Thailand Science Park (TSP), the country's first science park, had been established in 2002 by the National Science and Technology Development Agency (NSTDA) on 80 acres in the northern outskirts of Bangkok. As a key component in driving S&T of Thailand, TSP's vison is "a premiere platform in Southeast Asia on which knowledge-based entrepreneurs and businesses start, grow and prosper". Its mission encompasses the development of technology- based startups to accelerate technology commercialization and industrial development. TSP offers a world class and well equipped S&T infrastructure and full range of value- added services to nurture technology based startups and facilitates establishing firms in creating values through science and technology. To achieve these vision and mission, TSP' strategy is to internationalize science park by populating the park with multinational firms as key players in driving our international positioning. Currently, we have around 80 technology companies (both international and local companies) operating in TSP. Among these international firms in the park, three are the companies listed in the Fortune 500.

In order to illustrate the internationalization of TSP, we apply the four key components of internationalization from previous studies to be framework in this paper. That are (a) having plans and strategy to internationalize (b) attracting international firms to locate in the park, (c) creating ecosystem for international firms (d) creating activities for local firms to develop their internationalization (e. g. international commercialization, partnership in international projects, international joint ventures, international capital and international workforce) and (f) building international networks. The details and practices of key components are discussed as follows;

1. Having Plans and Strategy for Internationalization of Science Parks

The first component will be discussed on internationalization in terms of planning and setting strategy of Science Park in the international arena. As TSP is governed and managed by NSTDA which is government agency, we have mission to support nation direction. Thus, TSP's internationalization strategy aligns with the country's strategy focusing on Foods, Automobiles/ Auto-parts and Electronics clusters which generate high GDP to the country. TSP has initially planned to attract the private sectors that are multi-national firms and large local firms in those focused clusters to set up their R&D based, pilot plants or facilities in the park. With this approach, Thailand could gain benefit from not only high investment of multinational firms but also their advance knowledge diffused to the small local firms participating in value chains or in those

focused clusters. Therefore, our target's customers/companies in high R&D investment are such as Japanese, German, and USA companies.

2. Attracting Multinational Firms to Establish and Locate in the Parks

After planning and setting strategy for internationalized science park, next is attracting multinational firms to establish and locate in TSP. In order to internationalize science parks, attracting the multinational firms is one of the most important component. There are many approaches that we have actively implemented to find the right customers/ firms. First approach, alliance with intermediate Thai agencies or international associations in Thailand could help TSP to access to targeted customers/countries by jointly implementing marketing activities together. For instance, every year we attend and participate particular tradeshows, exhibitions, seminars and international conferences such as BIO in US, Foodex in Japan, Nanotech Japan. In all of these international events, we set up country seminars jointly with government partners (e.g. Board of Investment) and invite targeted customers to attain in the seminars. Currently, we have international companies in our science park referred by BOI namely RPD Thailand, Co. Ltd. from Spain, Bio Talk Technology (Thailand) Co., Ltd. from Taiwan, and Heron Diagnostics Co., Ltd. from Germany.

In addition, we continuously organize a group of international organizations promoting trade and investment to visit our facilities and capabilities at TSP. These organizations are such as Japan External Trade Organization (JETRO), Die Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), British Council, The Chamber of Commerce, and government agencies such as Board of Investment Thailand (BOI).

Another approach to expose our science park internationally and attract more multinational firms is marketing communication in mass media both online and offline. Our TSP's website has Thai, English and Japanese's versions. We publish English articles and public relation management interview regularly appearing in industry magazines, journals, and newspapers (e.g. scoop, interview, newspapers both in English and Japanese languages) to raise awareness of our park and attract more international companies.

According to planning and active operation in many approaches in attracting multinational firms since 2011, TSP has 15-20 international firms located in the park as shown in Figure 1. International firms account for 29 percent, mostly from Japan, the US and Germany. While Bengstsson and Lowergren (2000) investigated multinational firms in Nordic and Baltic science parks, they found that there were 25 multinational firms located in DTU science park in Horsholm but the other parks had very few multinational firms. This proportion of multinational firms located in the park represents

the level of internationalized parks. In summary, there are 20 multinational firms (29%) located in TSP, it could be claimed that TSP reaches into the internationalized science park.

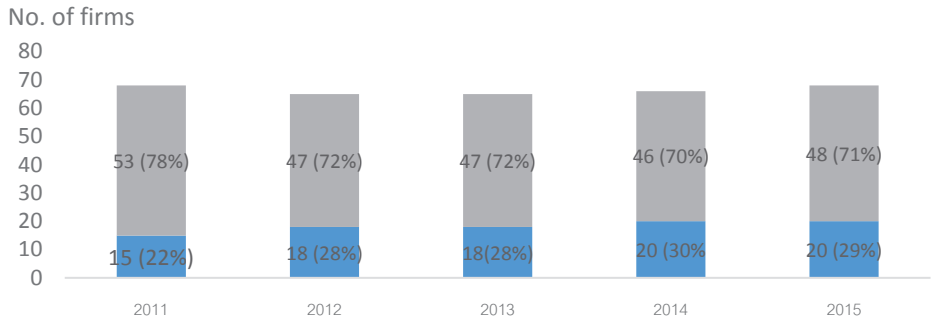

Figure 1: The number of multinational firms in TSP

3. Creating Ecosystem for International Firms

It is crucial to have international companies in the park and it is also vital to keep them and support them to develop more innovation and encourage them to collaborate with local companies and research institutes in the park. To do so, we must create culture and ecosystem for diverse companies to live, work and play together through infrastructure development and tenant club. In terms of infrastructure development, our building which is automatic control system was designed for working 7x24 serving people in to work around the clock (12 p.m. in Bangkok or 12 a.m. in US) and supporting work-life integration in the park. There is over-night stay room on the top of building to facilitate researchers who want to monitor and follow up their experiments 24 hours.

In addition, tenants club is an activity serving all tenants both foreign and local firms to gain benefit of innovation and business endeavor in the park. Tenant club's activities encourage and link amongst tenants and connect between firms and research institutes through organizing the tenants' meetings hold in every two months, a short visit within the park, and group discussion to explore further collaboration. Tenant club organizes club's meeting as well organizes tea-talk by bringing experts and well known speakers to share their knowledge and best practices in various topics with the people in science park's communities.

4. Creating Supportive Activities for Firms to Develop their Internationalization

In terms of creating additional program for local firms to internationalize, Sanz (2005) suggested 5 aspects that science parks should consider to develop support services that are (1) international commercialization, (2) partnership in international projects, (3)

international joint ventures, (4) international capital and (5) international workforce. However, in our practices, we bring our outstanding local firms and startups to participate in the international exhibits and events. This program not only provides them with international exposure and technology trends but also give them opportunities to collaborate with international partners. We also nominate our local firms to international competition in Geneva, Korea, Taiwan, and etc. For example, KEEEN Limited is a local manufacturer of products for oil spill clean-up operations located in TSP in 2009 (Company Interview, 2015). The company's products are the results of collaborative projects between BIOTEC, public research institutes, and KEEEN Limited. Later, the founder, Dr. Watson Ariyaphuttarat, joined incubation program in 2012. Under this program, KEEEN had opportunities to enter a number of innovation competitions and proudly earned several awards such as gold medal from 8th Taipei International Invention Show & Technomart, Taiwan in 2012. Currently, KEEN Limited has expanded their business internationally with distribution to over 10 countries.

5. Building International Networks

The last component is discussed on how international network is an essential component indicating to the internationalization of science park. Science park, as a bridging agent, promotes innovation and business opportunities for multinational firms and small local firms. However, serving tenants' businesses is not scoped only in one specific country but it may extend to other countries as we are in the globalization. Both local and international networks is vital component for Science parks. Therefore, being a member of international networks and collaborating with other science parks could provide many benefits to science park's tenants such as sharing information about science park development, accessing to international experts, searching for business partners, finance, talents, technical knowledge or soft-landing program. Those resources are vital for both science parks and firms located in the parks.

Currently, TSP is a member of International Association of Science Park (IASP) and Asian Science Park Association (ASPA) which both international networks provide knowledge sharing in science park's development and offer business opportunities for science park's tenants through e.g. news, and POINT @ IASP created to search for technological collaborative channel.

In addition, TSP has an agreement to collaborate with others science parks such as TUS park in Beijing and Innopolis Foundation in promoting exchange information in science park development and management, enhancing staffs' capabilities, and collaboration amongst key stakeholders both in business and technical supports.

As a result, an overview of current networks indicates that TSP majority gains benefit in developing science park and knowledge sharing from those international networks. It may be because most local firms in TSP are in the stage of developing their products and lunching in the local market. Most of them are not ready due to lack of financial support in going international market.

IV. Conclusion

This paper has investigated the concept of internationalization, and determined four key components contributing to the internationalization of science park: a) having plans or strategy to internationalize (b) attracting international firms to locate in the park, (c) creating ecosystem for international firms (d) creating activities for local firms to develop their internationalization, and (f) building international networks. In addition, this paper has discussed on how Thailand Science Park, as a case study, has implemented in each component contributing to internationalization. The results show that TSP is already internationalized. It is because TSP has implemented nearly all components of internationalization components. Three components (attracting multinational firms to locate in the park, building international network, and creating ecosystem for international firms) have been actively executed more than the other components. This could be reasoned that the internationalization is part of science park's strategy. However, each science park has to decide its own way depending on science park policy, objectives, availability of resources, need of science park's customers. In addition, it is very interesting to develop a primary set of measurement in internationalization aspect. These indicators are as follows;

1. Having plans and strategy to internationalized science park.

2. The number of international firms in science parks. The number of multinational firms may indicate to the level of internationalization of science park. The more multinational firms located in science park, the higher level internationalized science park. However, there is no minimum proportion of having multinational firms located in the park. In general, it may argue that science park should have 15-20% of multinational firms located in park. It is due to having various different knowledges and technological backgrounds of people (both foreign and local firms) including facilitating platforms/activities supported by science park could generate flow of knowledge, innovative ideas and bring these diverse ideas into new products.

3. The number of activities created by Science Park to support science parks' communities.

4.The number of programs/activities created to support internationalization of local firms. The number of programs and activities should have at least one or two programs to support/help local tenants to exposure internationally and give them opportunities to collaborate with international partners. In addition, further indicators should be concerned such as (1) the number of local firms participating in the international events/seminars, (2) the number of successful local tenants go internationally in terms of revenue, and (3) the amount of fund raised by foreign venture capital.

5. The number of international memorandum of understanding (MOU) or agreement. Having signed MOU or agreement indicates the collaboration in the near future. Furthermore, the number of co-organizing international conference/seminars should be considered to be another indicator to measure the internationalized science park.

These proposed components and a primary set of measurement can be a very useful tool to indicate the level of internationalization of science parks. However, the primary set of measurement should carefully apply to identify the level of internationalization of science parks. It is because moving to internationalization requires a new mindset, commitment, resources, cooperation from various stakeholders, and the level of internationalization science park needs to accomplish. Lastly, we hope that this paper could provide some information and ideas for science parks to move toward to internationalization.

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