The Role of Multinational Corporations (MNC's) in Developing R&D in Thailand: the Knowledge Flow Between MNC's and University

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Abstract: During the last decade, the Thai government has recognized that Thailand needs to move toward an economy not only based on the cheapness of labour but also based on its intellectual capital and innovation capability. Therefore, the country has set up initiatives and specific policy to attract multinational corporations that could contribute to raise the research and development capacity of the country. Several studies have been undertaken to evaluate the role that Multinational corporations could play in knowledge creation, technology diffusion and development of potential R&D within South East Asia. Amongst the several approaches investigating the factors fostering Innovation in developing countries, one strategy would be to strength the Universities-Industries (UI) relationship. The success and failure of the University-Industry linkage has been widely discussed, but there is still a need to understand the dimensions impacting on the willingness of multinational corporations to share knowledge with Thai Universities. This paper discusses the balance of factors (industrial characteristics, firm characteristics and business models) that can play a substantial role in enhancing the knowledge sharing mechanisms.

Keywords: knowledge sharing, triple helix, Information communication technology, culture, empirical knowledge sharing investigation

1. Introduction

The 10th National Economic and Social Development Plan (2007-2011) of Thailand highlights that in order to foster Innovation, it is crucial to identify the mechanisms contributing to sustaining strong economic performance, and to facilitate private investment from both national and international companies. Facing fierce competition from neighboring countries such as Malaysia, the Philippines, Vietnam, and Cambodia, Thailand needs to move toward an economy not only based on the cheapness of labour but also based on its intellectual capital and innovation capability. Hence, Thailand needs to attract multinational corporations that will contribute to raising the research and development capacity of the country.

Studies have been undertaken in order to evaluate the effects of Multinational Corporations (MNCs) on developing countries (Abdul-Gafaru, 2006, Meyer, 2004). In the last two decades, globalization has contributed to significant increases in foreign investment in developing countries, and thus bringing some of them more political and structural stability. In addition, it is commonly admitted that MNC's play a role in creating new kind of jobs and therefore can contribute to economic growth and the increase of welfare. As well, the infiltration of MNCs in developing countries has a potential to augment the salary level of employed people, hence increasing the buying power of the local citizens, which in turn will lead to increased tax payments. The availability of more resources will allow the government to spend more money in social welfare areas such as education, health care, and infrastructure building.

The investments by foreign companies make the developing countries more receptive to social and economic changes as they enter in the global market and they have to adopt modern values and business practices. The host country should facilitate the operations of MNCs because their direct investments are much easier to obtain than funding from traditional channels such as the World Bank, national development organizations, or non profit organizations.

There is a growing recognition that MNCs could potentially impact several dimensions that are crucial for developing countries aiming at improving their competitiveness. These dimensions include capital, competences/skills, exports, technology/processes and infrastructure—see Figure 1.

ISSN 1479-4411



Figure 1: Five dimensions of competiveness

Capital represents an essential economic asset in developing countries. Foreign Direct Investment (FDI) provided by MNCS contributes to a large extent to the flow of needed resources.

Infrastructure is a key element to attract potential foreign investors. A poor infrastructure presents many impediments to progress. The host countries are often engaged in improving their infrastructure in terms of road building, telecommunication, easier access to some parts of the country, and so forth.

Building *Export* capacity is very important for developing countries if they want to benefit fully from international trade and investment opportunities. Therefore, the government must seek to develop a regulatory framework that could assist local and regional areas in designing and implementing active policies for building export competitiveness. For example, many foreign companies in Thailand are offered to settle in a free trade zone, with some economic benefits and tax incentives, in order to facilitate exports.

Technology development and work processes improvement needs differ greatly in developing countries, and even in some cases between regions. For example, Bangkok or the South of Thailand is more developed than some Northern areas. Building industrial capabilities requires technology cooperation between local and international companies, government and research/education institutions. For instance, in order to deliver state-of-the-art manufacturing technologies, basic services such as electricity, water, raw material and work practices, are needed before sustainable industries can be put in place. MNCs contribute greatly in providing the foundation for technological development and industrial growth providing examples to indigenous companies or subcontractors that might need to use state-of-the-art equipment or more efficient technology.

Building Competence/skill of local workers has proved to be essential to the successful transfer and diffusion of technologies and knowledge. Whenever it is possible, MNC's prefer to hire local people than use expatriate employees. However, the lack of an adequately skilled workforce in the operating region presents a challenge to overcome. Low education levels of potential employees are a particular impediment to maximizing a local employee base. MNCs are often engaged in capacity building efforts and sometimes deliver education and training to groups in order to help them increase production levels and to perform work routines more efficiently. There is a recognised need to adjust approaches to education and training based on local conditions and local knowledge and skill levels. There are clear benefits to engaging local based trainers, and thus local Universities should be seen by MNCs as a good pool of competences that will help ensure the sustainability of the technology transferred. Universities and R&D institutions understand the local context and possess the knowledge that is valuable to MNCs. As well, they should be considered as the right partners for conducting joint research projects for technology maintenance or improvement, leading in some cases to new and innovative products or services.

However, although the recognised potential benefits of such partnerships between Thai Universities and MNCs exist, there are too few relationships, or they are strictly limited to providing some internship to students as part of a social contribution to the Thai society.

Thus, our study seeks to better understand the above factors impacting the willingness of MNCs to establish research collabouration with local Universities and to exchange knowledge. Based on Figure 1, Technology Development and Work Processes, and Competences/Skills, are the two main dimensions contributing to play a significant role in enhancing the R&D capacity in Thailand.

Toward this end, this paper seeks to empirically examine the factors which influence the intention of MNCs to share knowledge with Universities in Thailand. In addition, success factors and barriers to motivate MNCs to cooperate with Thai research and education institutions have been investigated.

The present paper focuses on identifying organizational factors impacting the knowledge sharing process between Universities and MNCs.

The next section of this paper presents a literature review on knowledge sharing concepts. Section three outlines the organizational context of study, and the adopted research methodology. The last section draws a model of MNC inclination to share knowledgewith a special focus to factors impacting Technology Development and Competences and Skills.

2. Background

It is well recognised today that knowledge is one of the most competitive resources for the dynamic global business environment (Sharif et al., 2005). Indeed, in recent years companies have strongly focused on organising creating, transferring, searching, sharing Knowledge under the roof of so-called Knowledge Management (Hildreth P.J., 2002). On the other side, the multidisciplinary academic world such as philosophy, sociology, computer science have generated a large amount of publications on various perspectives and dimensions of knowledge management (Davenport T. H, 1996), (Davis J., 2002).

It is acknowledged that knowledge sharing is a somewhat nebulous concept, very important for harnessing knowledge (Petersen N. J., 2002), (Little and Ray, 2002) and thus benefits from adopting a holistic approach. Studies have focused either on knowledge sharing between organizations (Husman and Brandt, 2001) or between units in a firm (Davis J., 2002).

Knowledge sharing is not well defined in the literature partially because the research area has not been very active (Dixon, 2002), (Bircham-Connolly H, 2005). (Davenport T. H, 2000) define knowledge sharing as providing one's knowledge to others as well as receiving knowledge from others (the supply side and the demand side of knowledge sharing). A more pragmatic description of knowledge sharing is "the process through which one unit is affected by the experience of another" (Argote et al., 2003). We adopt the following definition of (Willem and Scarbrough, 2002), "Knowledge sharing process is defined as exchange of knowledge between at least two parties in a reciprocal process allowing reshaping and sense-making of the knowledge in the new context".

Today many organizations are concerned about how organizational members share their knowledge and accordingly have set up some incentives to motivate them to make their knowledge available to the organization or to retrieve knowledge stored in the corporate repositories when needed (Gupta and Michailova, 2004).

The literature shows that they are several models for knowledge sharing (Petersen N. J., 2002), (i) on one hand, sharing knowledge forms direct interactions between people as stated in Lederberg's model involving informal presentation to colleagues and community reaction, or Nonaka and Takeuchi's model (see Nonaka and Takeuchi, 1995) involving sharing tacit knowledge (e.g., through apprenticeship), and on the other hand (ii) with indirect interaction through document creation such as the drafting and delivering of reports.

However analysis of knowledge sharing practices shows that reluctance to share is dominating the organizational reality (Husted and Michailova, 2002).

Factors affecting the behaviour of knowledge sharing have been quite heavily investigated, (Constant et al. 1994), (Wasko et al. 2000), (Ardichvili et al., 2003), (Lee et al. 2003), (Politis 2003), however studies have focused either on social or technological dimensions, or concern individuals within the same organization.

Knowledge sharing between multinational corporations and a host country through local education and research institutions, the aim of this research, has not yet been investigated.

Our research study focuses to investigate the willingness of automotive industry multinational corporations to share knowledge with Thai Universities.

3. Case study of automotive industries in Thailand

3.1 Context of study

Most of the developing countries consider that the automotive industry will move the country toward an intensive industrialisation by creating a large set of related businesses. Thailand aims to be regarded as the Detroit of Asia. The country has engaged in the last few decades in the development of the automotive industry, with a special focus on domestic auto-assembly. Thailand is the world's second largest pick-up truck market after the U.S., and it is ASEAN's largest automotive market and assembler. Today all leading Japanese car producers as well as BMW, Mercedes Benz, General Motors, Ford, Volvo, and Peugeot, assemble cars in Thailand along with their group of subcontractors and suppliers. Thailand has become the main production base for auto exports in South East Asia.

Thailand is considered as one of the most attractive countries for automotive investments mainly due to factors such as the good and growing domestic market size, the relative political stability, liberal trade and investment policy, and the lack of a "national car program".

The automotive industry is Thailand's third largest industry, employing an estimated total workforce of about 225,000 employees, and with a total production capacity of around 1,270,100 cars and trucks per year.

Japanese-make automobiles have dominated the local auto market; with nearly 90% market share but other global vehicle manufacturers' investments are growing consistently, creating a very dynamic industry. New global parts manufacturers are in the process of relocating some of their operations to Thailand.

Thailand has 16 vehicle assemblers; most of them are large-scale foreign owned or joint venture enterprises. As well, there are more than 1100 small and medium sized companies working as suppliers of original equipment (OEM), or producing replacement equipment (REM).

The automotive industry in Thailand is very concentrated with most of the factories located in the Samut Prakarn province (approximately 20 km south of Bangkok), followed by Rayong (approximately 130 km south-east of Bangkok).

The largest car producer is Toyota, and in 2003 it was the first manufacturer to establish a local R&D centre in Thailand. However, this type of initiative, a cooperative arrangement between MNCs and local universities, is so far not a widespread practice in Thailand. Therefore, there is a stringent need to understand the mechanisms allowing for knowledge transfer and sharing, if Thailand wants to position itself as a very competitive country, not only in the automotive industry but in other industrial sectors as well.

4. Methodology of study

Knowledge sharing is a context-embedded process, making its measurement difficult, and there is so far no standard method to measure the sharing process.

With the aim of understanding the knowledge flow/transfer and the learning processes between foreign companies and local Universities, we have undertaken a qualitative approach. Several focused and semi structured interviews have been conducted with different managers from automotive companies and from people working at universities. The aim was to identify the current situation in terms of University-Industry (UI) relationships and to investigate the indicators or mechanisms contributing to the increase of the willingness of automotive companies to share their knowledge with Thai Institutions.

The research study was conducted with 5 automotive industry companies situated in Rayong, approximately 30 Km South from Bangkok. The organizations are all led by Japanese senior managers.

In addition, a second set of data based on literature reviews and analysis of corporate documents has been undertaken.

Finally, we are in the process of finalising (the analysis is still an ongoing process) a third set of data collection, based on a questionnaire survey. We present some preliminary results from those data. The questionnaire included both closed and opened-ended questions, and the survey was conducted from March 1 to April 30, 2009. The questionnaire was distributed to 150 companies, with 110 responses being usable, and 5 considered as being incomplete.

The reliability and validity of questionnaire were tested by using Cronbach's alpha in which a value above 0.6 is adequate (Nunally, 1978).

From our interviews, we have identified several dimensions impacting the knowledge sharing intention (KSI) of companies with Thai institutions that are presented in figure 2. In addition, our questionnaires were designed to measure these various determinants of intention to share knowledge of MNCs.

We have formulated the following eight hypotheses that concerns both implicit and explicit knowledge.

Hypothesis 1: The level of Top Executive Decision-making has a positive effect on the intention to share knowledge of MNCs

Hypothesis 2: The flexibility of the MNCs's policy has a positive effect on the intention to share knowledge of MNCs

Hypothesis 3: The number of years spent in Thailand has a positive effect on the intention to share knowledge of MNCs

Hypothesis 4: The intensiveness of R&D strategy has a positive effect on the intention to share knowledge of MNCs

Hypothesis 5: The Level of Confidential Information has a positive effect on the intention to share knowledge of MNCs

Hypothesis 6: The level of technology intensiveness has a positive effect on the intention to share knowledge of MNCs

Hypothesis 7: The existence of a knowledge creation system has a positive effect on the intention to share knowledge of MNCs

Hypothesis 8: The level of benefits has a positive effect on the intention to share knowledge of MNCs

4. Findings

The hypotheses have been tested by performing a series of multiple regression analyses. All statistical tests were carried out at a 5 percent significance level. We tested the hypotheses for implicit and explicit knowledge.

Table 1 shows the results of hypothesis tests related to Explicit Knowledge sharing. The explanatory power (R^2 value) of 0.343 and adjusted R^2 value of 0.283 indicates that the overall model is acceptable based on Falk and Miller (2000). Falk and Miller suggested that an explanatory power greater than 0.1 is acceptable. The explanatory power for the multiple regression analysis under Implicit Knowledge types is 0.362 and the adjusted R^2 value is 0.303.

There are three variables that are supported. The number of years spent in Thailand, the level of confidential information, and the level of benefits all influence the intention of MNCs to share knowledge. The numbers of years that MNCs have been established in Thailand indicates a positive impact on the intention to share knowledge. It implies that the MNCs are more willing to establish

partnerships with Thai education and research institutions. However, according to the follow up interviews, collabouration is currently seen as more a social involvement, and belongs to the corporate social responsibilities programme of the companies. In general, this is reflected in the offering of study grants or internship within the enterprise.

Table 1: Results of hypothesis tests the Intention to share explicit knowledge

Independent Variable	Standardized Coefficient	Hypothesis Test
Top Executive Decision Power	0.106	H1 was not supported
Flexibility	- 0.231	H2 was not supported
Years	0.389*	H3 was supported
R&D Strategy	0.204	H4 was not supported
Confidential Information	- 0.265*	H5 was supported
Technology Intensive	0.102	H6 was not supported
Knowledge	0.080	H7 was not supported
Benefits Level	0.288*	H8 was supported

In addition, the results show that the level of confidential information has a negative impact on the intention to share knowledge. One main issue is related to the protection of knowledge seen as having a competitive advantage to the MNCs. The clear lack of an intellectual property strategy in Thailand makes the companies quite often reluctant to involve outside people in their business routines or within the premises of the enterprise. Trust is seen as a fundamental core value, and especially in South East Asia countries which would rather adopt the business style relationship rather than the deal focused relationship.

The perception of expected benefits greatly impacts the intention to share. Therefore, benefits should be clearly evaluated and highlighted in order to promote stronger collabouration. The benefits as stated in the interviews are related to cost reduction, enhancing the skills of employees, gaining a better position in the market place, and so forth.

The level of benefits shows a significant positive relationship to the level of knowledge sharing intention. The MNCs are more willing to share knowledge only when they see clear benefits to themselves from the collabouration. In this case, knowledge is often stored in repositories whenever codification is possible. The sharing process is more formalised though agreements or contracts.

Table 2: Results of hypothesis tests the intention to share implicit knowledge

Independent Variable	Standardized Coefficient	Hypothesis Test
Top Executive Decision Power	0.232*	H1 was supported
Flexibility	- 0.021	H2 was not supported
Years	0.024	H3 was supported
R&D Strategy	0.297*	H4 was supported
Confidential Information	- 0.508*	H5 was supported
Technology Intensive	0.046	H6 was not supported
Knowledge	- 0.092	H7 was not supported
Benefits Level	0.225*	H8 was supported

Table 2 shows that five variables are supported by our hypothesis: Top executive decision, the number of years in Thailand, the important level of R&D strategy, the level of confidential information, and the level of benefits shows significant impact to the intention to share knowledge.

Compared to the previous table, top executive decision-making and the importance of R&D adopted strategy, play a crucial role in the intention to share tacit knowledge that is considered a more rigorous activity. Sharing tacit knowledge implies the need to put actively in place some strategies such as personalisation. For example, networking is important and requires more time from both parties. Therefore, the strong involvement of leadership in the decision making is crucial for a successful collabouration with universities. In addition, companies that have a clear focus on engaging R&D efforts are more prone to share their tacit knowledge.

Model KSI Based on the interviews, literature review and the results of the conducted surveys, we have identified several dimensions that could impact the knowledge sharing intention (KSI) of multinational corporations with Thai universities or research institutions.

They are listed as follow:

- Business characteristics
- socio-technical, environmental and political facilitators or inhibitors
- Intended benefits
- Information use by the University or their absorptive capacity

The four dimensions rely strongly on the type of shared knowledge, the level of confidentiality and the Universities perspectives (absorptive capacity). These factors were strongly highlighted by the interviewed leaders.

The following figures summarize the key finding.



Figure 2: Dimensions of knowledge sharing intention

Indicators that play an important role in fostering knowledge sharing process are related to perceived benefits. It was mentioned several times during interviews that an increase in the product's quality, better positioning in the competitive market, or reducing costs, will positively influence the companies' relationship with the education and research institutions.

The role of top executives in successful collabourations should be considered. Leadership is central in the establishment of knowledge sharing or transfer.

The Cultural framework for implementation depends on the organizational structure and the flow of decision-making. The degree of involvement, transparency, shared vision and goals are essential prerequisites for successful knowledge sharing process.

Organizational structure impacts on the enabler organizational culture in terms of restricting collabouration, learning and trust. This is greatly reflected in the business characteristics and in the use of information by Universities.

Communication is also very crucial in the establishment of good relationships between companies and research or education institutions. Very often different segments of people might share conflicted interests in the process of knowledge transfer. Often enterprises are concerned with the intellectual property right, or lack of transparencies, in their interaction with Universities. language barriers (foreign language or academic and industrial languages) can also hamper clear and smooth communications.

Very often there are conflicting goals and expectations, theoretical interests of scholars versus the day-to-day concerns of managers, technological priorities of researchers versus the business

priorities of personnel managers and labour leaders. Conflicting interests of the stakeholders can be so acute that it will hamper the knowledge sharing intention.

As well, political stability and dedicated laws and regulation can increase the willingness of MNCs to cooperate more freely.

5. Conclusion

Knowledge Management is a new inter-disciplinary strategy in today's business world. It is well recognized that knowledge is an important asset for organizations. Making the most value from employees' knowledge is an important element of a resource-based strategy for firms. In addition, firms create and acquire new knowledge in many ways such as in-house or outsource R&D. Knowledge sharing between firms and Universities has been always considered as a challenging task. This statement is even more valid for emerging or developing countries such as Thailand.

In this paper, we have discussed the effects that Multinational corporations could have on technology diffusion and development of potential R&D within Thailand. Although the Thai government has implemented policy in order to foster and attract R&D based Foreign Direct Investment (FDI). Our study have highlighted that there are still barriers impeding the fluidity of knowledge sharing between multinational corporations and Thai universities.

We have conducted a cross-methodologies based on qualitative and quantitative approaches to collect data.

Based on the analysis of the data, we have delineated a model of intention to share both implicit and explicit knowledge of MNC'S with Thai Universities and research institutions. The knowledge sharing intention depends of 4 elements such business characteristics, the perceived benefits, capacity to absorb information or the usability of the knowledge and socio-technical environmental political factors.

Relation between factors such as industrial characteristics, firm characteristics and business models and how they could play substantial role in the knowledge sharing mechanisms has been closely investigated.

However, analysis and interpretation (Hermeneutics) of collected data are subject to the cognitive skill and the current thinking of the researcher/observer. Accordingly, the elabourated model does not definitely reflect all the aspects and dimensions of this highly complex area of Knowledge sharing and learning mechanisms. Furthermore the selected indicators might enlighten only some perspectives of those mechanisms. Therefore further research works should be conducted in order to confirm or refute the result of our study. This will be done by completing our study, with further analysis of the collected data. In addition, we intend to expand the study to other industries in Thailand.

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