

# Technology Parks, Knowledge Transfer and Innovation: the Case of Malaysia's Information and Communication Technology (ICT) Small and Medium Enterprises

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## ABSTRACT

This paper attempts to explore the views of key ICT stakeholders on the role of technology parks in promoting innovation via knowledge transfer. Many developed and developing countries use technology parks as an instrument to promote knowledge transfer and innovation. Policy makers incorporate this idea into public policy for science and technology. The study observes that Malaysia's technology parks have played a little role in promoting knowledge transfer and innovation because ICT enterprises located thereon operate on a different premise. The study suggests the government to review the policy on technology parks with the objective to intensify innovation in Malaysia's ICT industry.

**Keywords:** knowledge transfer, technology parks, information and communication technology, small and medium enterprises, innovation, Malaysia.

## 1. INTRODUCTION

In recent years, competitive and innovation pressures have 'forced' many developing countries to set up a technology park for knowledge transfer and innovation. In Malaysia, the prominent example is its Multimedia Super Corridor (MSC) of 15 km × 50 km size, occupied together with five clusters namely Cyberjaya, Technology Park Malaysia (TPM), Malaysian Technology Development Corporation – Universiti Putra Malaysia (MTDC-UPM), Kuala Lumpur City Centre (KLCC), and Kuala Lumpur International Airport (KLIA). This shows the seriousness of the Malaysian government to use a technology park to attract both foreign and local enterprises into its high technology ventures. In addition, these enterprises are also entitled to the MSC status if they are located in the MSC zone. In return, they will get enormous privileges and benefits under the 'Bill of Guarantee' scheme, such as tax cut, financial assistance, business networking, and easy access to government projects (Multimedia Development Corporation Malaysia, 2004).

Broadly speaking, the Malaysian Government decided to use the Multimedia Super Corridor (MSC) to in-

cubate local small and medium enterprises in the ICT industry dominated by multinational enterprises from all over the world (Multimedia Development Corporation, 2004). Accordingly, local enterprises can gain the benefit of knowledge transfer by locating next to these 'ICT giants' through the effect of 'knowledge spillovers.' Gradually, the local enterprises can produce home grown products and services. Apart from being innovative, profitable, and competitive, these local enterprises also can improve the growth of Malaysian economy. This is also in line with the government's objectives to provide sustainable employment and economic growth.

## 2. REVIEW OF KNOWLEDGE TRANSFER, TECHNOLOGY PARKS AND INNOVATION

The main objective of setting up a technology park is to generate innovation. Nevertheless, in reality these parks do not play a vital role in promoting innovation, instead it has been political instrument to promote economic development (Joseph, 1994, 1997). Accordingly, this section will review a few key terms related to the study.

## 2.1 Knowledge Transfer

Knowledge has been recognised as important substance in the economy. It is useful when it allows knowledge transfer among various participants in the economy. Knowledge transfer is important to enable a quick processing of knowledge to produce new products and services. The main outcome of knowledge transfer is innovation. It is part of the knowledge management where knowledge intensive organizations create, acquire, interpret, retain, and transfer knowledge to improve performance by purposefully modifying behaviour based on new knowledge (Garvin and Gray, 1997).

In general, knowledge has explicit and tacit dimensions. The former can be articulated in the form of text, tables and diagrams, but not the latter (Nonaka, 1995). The tacit dimension of knowledge is fairly difficult to be articulated as Polanyi (1967) argues "We know more than we can tell," but it is central to innovation, which contributes to wisdom of social practice (Baumard, 1999).

Nonaka and Takeuchi (1995) further explore the dual dimensions of knowledge (explicit and tacit knowledge) in an enterprise context. They found that knowledge transfer of tacit dimension is extremely difficult and require a greater attention among enterprises. However, Cohen and Levinthal (1990) caution enterprises to possess reasonable absorptive capacity to enable a workable knowledge transfer process.

Knowledge can be transferred if there are suitable mechanisms to do so. Prior to knowledge transfer, Szulanski (1996) suggests enterprises to identify tacit and explicit dimensions of knowledge within an enterprise and also among enterprises. If enterprises are unable to do the identification task, Hofstede (1991) points out that they will find knowledge transfer process can be extremely difficult.

This argument is reasonable because knowledge deals with the culture and social systems, especially the tacit knowledge that is deeply embodied in the individual conviction and organizational outlook (Polanyi, 1967; Hofstede, 1991). Strategically, Grant and Baden-Fuller (2000) suggest enterprise to consider inter enterprise collaboration to reduce knowledge transfer difficulties. Nevertheless, they caution these enterprises to be careful regarding potential risks and uncertainty in the process.

## 2.2 Technology Parks

Knowledge transfer process can be enhanced through inter enterprise collaboration, but this is inadequate. Accordingly, the idea to establish a technology park emerged (Joseph, 1997). The use of technology parks as catalyst for economic development has been evidenced in many countries, the developed and under developed. The policy makers were convinced to use this instrument to achieve both economic and social ends. Needless to say,

the policy outcome often includes political end (Cook and Joseph, 2001).

The incorporation of political agenda is inevitable especially in developing countries. Thierstein and Wilhelm (2001) say two popular technology park models often used by developing countries, namely (a) Anglo-Saxon Model and (b) Continental European Model.

Essentially, a technology park that is initiated and operated by an educational institution or a research organisation is classified as the Anglo Saxon Model. In contrast, a technology park that is championed by the politicians is categorised as the Continental European Model. Regardless of the modus operandi, both are addressing innovation. Luger (1992, 3) argues that politicians established a technology park 'to avoid the appearance of being inert or backward.'

Apparently, Malaysia's technology parks follow the Anglo Saxon Model despite the supportive role from the government. The government believes in its role to expedite knowledge transfer process through a technology park after considering the infancy stage of the ICT industry. Gradually, the government will leave the leading role in technology parks to these enterprises when they can operate independently. In fact, the government has been proactive when it established its own enterprises so that they can collaborate with as many ICT enterprises as possible to expedite the process.

Malaysia was convinced to use technology parks to spark innovation locally as well as regionally, hoping to develop the nation technologically through the ICT industry. This assumption is based on proximity learning and social modelling theories (Braithwaite, 1994). Historically, the practice of duplication has been noticeable in Malaysia, not only in technology, but also in social and economic aspects. The government seems to be interested in retaining two objectives: to maintain low unemployment rate and to achieve reasonable economic growth rate, in order to ensure public support for politicians' continued survival (Cook and Joseph, 2001).

## 2.3 Innovation

Innovation is crucial to produce competitive products and services. This subject is not only important in developed countries but also in developing countries, such as Malaysia. Nevertheless, the notion of innovation has been inadequately addressed. This is evident in the objective of setting up technology parks, and nonetheless addressing innovation issue. However, these parks become a popular instrument for high technology development in many countries (Joseph, 1997). Therefore, it is timely for the policy makers to revive the role of technology parks as an instrument to promote innovation globally (Joseph, 1994).

There are many factors that inhibit knowledge transfer effectiveness among small and medium enterprises in

the ICT sector in Malaysia, but the key reasons are (a) knowledge specificity, (b) knowledge networks, (c) economic attributes of knowledge, (d) inflexible knowledge and innovation policy, (e) narrow organizational policy, and (f) managerial attitude towards knowledge transfer and innovation.

### 2.3.1 Knowledge specificity

Knowledge transfer is not a new issue because of its vital role in promoting innovation that is crucial for economic growth. Moreover, knowledge is valued as prominent economic resource for organizations (Drucker, 1995).

Nonaka and Takeuchi (1995) further classify knowledge into two categories: tacit and explicit. In one hand, tacit knowledge is embedded in individual's experience, therefore difficult to codify for the usage of knowledge receiver, so does to share or transfer.

Before knowledge can be codified, those who have knowledge must be willing to share face-to-face with those who do not (Hansen, Nohria, and Tierney, 1999). On the other, explicit knowledge (Nonaka, 1995) that has been codified using computer can be easily transferred (Hansen *et al.*, 1999).

Since knowledge is valuable, knowledge creation and acquisition in any case is crucial to organizations (McEvily, Das, and McCabe, 2000). This can be source of organizational strength to face challenges (Teece, Pisano, and Shuen, 1997). Different mechanisms must be used for different types of knowledge, such as a document exchange mechanism for codified knowledge and personal contact for tacit knowledge (Gupta and Govindarajan, 2000).

Tacit knowledge may be transferred informally through socialization and internalisation mechanisms (Nonaka and Takeuchi, 1995). There are many ways for enterprises to enable tacit knowledge transfer process, but the feasible way is through mentoring and storytelling (Swap, Leonard, Shields, and Abrams, 2001).

The process of internalisation is related to learning by doing while socialization is related to sharing of experience (Nonaka and Takeuchi, 1995). Before sharing of experience becomes knowledge, the learner should be familiar with the context (Schacter, 1996).

### 2.3.2 Knowledge networks

The nature of knowledge networks is related to telecommunications, this leads to association of knowledge networks with information and communication technology (ICT). Subsequently, the intensity of usage of ICT equipment represents the well handling of knowledge.

Many countries often use ICT measurement to indicate a reasonable participation in knowledge transfer

process such as in United States, United Kingdom and Japan. However, Macdonald (1992a) argues that such conviction shows a serious lack of understanding about knowledge, technology and information. In addition, such concern also has motivated policy makers to emphasise greatly on 'technology' instead of knowledge and information. For instance, in any technology transfer, the essence is the transfer of 'know-how' from those who have it to those who do not; not the machinery (Macdonald, Lamberton, and Mandeville, 1983).

The notion of research and development (R&D) has been institutionalized as innovative centre to discover new information. Such conviction is commendable if it is used within the structure of an enterprise. Macdonald (1992b) contends many organisations (enterprises) tend to focus too much on R&D until they could not relate it to the entire objectives of organisations.

Knowledge is both crucial in the innovation process, and knowledge networks; however, knowledge received from external knowledge networks into organizations can hardly be accepted (Macdonald, 1992a). The reluctance to accept external knowledge for innovation is much related to organizational policy as 'not-invented-here' syndrome (Macdonald, 1998).

### 2.3.3 Economic attributes of knowledge

Knowledge can have economic attributes when it is regarded as economic good. As an economic good, it can have characteristics of public and private good (Macdonald and Williams, 1992). In addition, an economic good can be tangible and intangible. Nevertheless, knowledge is intangible. This attributes does not mean knowledge is a free goods. Although it is diffused freely, it is costly to those who produce the knowledge (Von Hippel, 1987).

When knowledge is characterised as private good, the owner can impose a fee through a patent. By having patent, ownership of knowledge can be determined but it creates problem for the knowledge to be used for innovation. If everyone inventor chooses to patent each single invention, then there will be no further advancement (Macdonald, 2004).

In term of knowledge exchange mechanism, knowledge is transferred rapidly through informal knowledge networks than formal networks because formal knowledge networks are constrained by the policy of organizations. Nevertheless, knowledge transfer or exchange through informal networks is not well addressed (Macdonald, 1992a). This is because the economic characteristics of knowledge also may create 'buy and sell' activity (Macdonald, 1996).

If knowledge is considered as 'economic good', then it can be purchased through knowledge networks (Macdonald and Williams, 1992). However, enterprises should 'jealously' protect their knowledge from be-

coming public good.

#### **2.3.4 Inflexible innovation policy**

Governments tend to set up technology parks by giving greater emphasis on good physical buildings and sophisticated knowledge technology equipment. However, they pay little attention to the role knowledge to assist innovation (Joseph, 1994). Accordingly, a high technology area may give location advantageous to the key employees to be part of the local knowledge networks but not the enterprises.

In fact, these key employees may use this opportunity to build their reputation instead of knowledge transfer that is crucial for innovation among the enterprises. Ultimately, they will regard their knowledge as their personal property rather than to use it for innovation (Macdonald, 1992a). Furthermore, knowledge transfer, particularly specialised knowledge, is faster through individual knowledge networks because such knowledge is embedded in the person (Von Hippel, 1987).

On the one hand, enterprises may be at severe disadvantageous when key employees quit together with their expertise because crucial technology competency is embedded in those personnel. On the other hand, when these people work for another enterprise, their knowledge will be beneficial to the new enterprise (Macdonald, 1992b).

#### **2.3.5 Narrow organisational policy**

In formulating organisational strategy all sorts of knowledge are required, whether acquired formally or informally because knowledge can be creatively modified to fit into the system of organizations. The 'not-invented-here' syndrome has deprived the senior management from using knowledge obtained from informal knowledge networks in formulating the strategy (Macdonald, 1996). Essentially enterprises are not so furious about informal knowledge as long as it does not threaten the management control (Macdonald, 1993).

In addition, many enterprises regarded knowledge obtained from informal networks as supplement only (Macdonald, 1996). This is because if senior management recognizes financial knowledge sought through formal knowledge system the same applies to technical knowledge (Macdonald, 1992a). Nevertheless, if external knowledge is significantly crucial, enterprises may resort to internalize them through formal collaboration arrangements (Dodgson, 1993).

In an organisational collaboration, all employees are exposed to direct interactions (Whipp, Rosenfeld, and Pettigrew, 1989) – formal or informal with electronic or face-to-face (Davenport and Prusak, 1998). Indeed, informal knowledge networks may be faster than formal knowledge networks (Macdonald, 1996).

In general many organisations tend to believe that

formal knowledge network is more reliable and less worrisome than informal knowledge network (Macdonald, 1992a). This is apparent particularly the tacit or non codified knowledge because individual capability is practical than organizational capacity (Daft, Sormunen, and Parks, 1988). In addition, the process of creating and sharing knowledge is natural to people.

Needless to say, it seems impossible for innovation just to rely solely on internal knowledge. This notion is true when organizations are not well equipped with sophisticated mechanism to stock all kind of knowledge. Furthermore, it is costly to do it alone. Therefore, it is more practical to use both internal and external knowledge for innovation (Cohen and Levinthal, 1990).

#### **2.3.6 Managerial perception**

Managers realize the importance of knowledge sharing between employees, but many do not give appropriate rewards (Lei, Slocum, and Pitts, 1999). Rewards include extrinsic and intrinsic. Employees may not want to contribute if no rewards in return. Such behaviour has to do with economic exchange theory that individuals will behave rational self-interest (Bock and Kim, 2002). Social exchange theory includes intrinsic rewards also to motivate employees to share their experience, knowledge and insights with others of within or without.

In a nutshell, knowledge transfer is difficult to be exchanged or transferred among enterprises but not impossible if knowledge specificity, organizational policy, employees' attitude, and the economic characteristics of knowledge are adequately addressed by both the policy maker and park tenants.

### **3. METHODOLOGY**

The objectives of the study are to explore the views on small and medium enterprises in the information and communication technology (ICT) sector pertaining to knowledge transfer and innovation in Malaysia's technology parks. The answers from the stakeholders give some insights into the context of technology parks, ICT enterprises, and the contribution of innovation in the ICT industry.

The study used a qualitative research method, namely personal interview. This method is adopted to enrich the understanding of the underlying context, which could not otherwise have been conveyed by the use of quantitative methods, such as survey (Wainwright, 1997; Patton, 1990). In addition, the personal interview also enables the research to continue probing and verifying information given by the same interviewees. The findings from interviews help generalizations and theories (Ezzy, 2002). By interviewing the stakeholders, the study is able to learn about various issues, especially in the relation to the social and cultural contexts (Myers, 2000).

The interviews were conducted from June through July 2005 mainly with small and medium enterprises whose primary activities are in the ICT sector in the Technology Park Malaysia (TPM).

The Technology Park Malaysia (TPM) is one of high tech clusters regulated by the Multimedia Super Corridor (MSC). Broadly speaking, the ICT small and medium enterprises are naturally motivated to locate in the MSC and the TPM because of the advantage of MSC status. There were 76 out of 100 tenant enterprises that have their business activities primarily in the ICT sector. The key informants of these enterprises were obtained from the TPM's website (Technology Park Malaysia, 2005). Out of the 76 letters sent out to chief executive officers, only 20 replied, but 8 of them withdrew close to the time of the actual interview. The total interviewees in this study are therefore 12 informants, who comprised two (2) chief executive officers, three (3) senior managers, and seven (7) business executives.

The personal interview used a note-taking approach and the interview sessions took place at various places (often outside the office) most convenient to the informants. After the interview, the notes were typed and the hardcopy sent to the informants for verification. The copy was considered final after the expiration of two weeks, as indicated in the transmittal letter to the informants.

#### 4. FINDINGS

The findings did not reveal the actual name of the informants and their respective organizations.

The basic objective of technology parks is to encourage innovation, but the reality does not fully support the objective. A business executive of Enterprise 1 points out:

Malaysians in general already had the capability to develop software even without the assistance of foreign information and communication technology (ICT) enterprises. I am not aware whether or not local ICT enterprises really share knowledge through collaboration or Memorandum of Understandings (MOUs) with foreign companies.

Perhaps, the Malaysian enterprises do not match their potential overseas partners in terms of financial strength, or left alone, would still not have a good financial base to pursue research and development (R&D) activities. The vision of ICT competitive edge remains unattainable for the Malaysian ICT enterprises due to their lack of financial resources. A chief executive officer of Enterprise 2 utters:

Our main problem is funding... not every ICT company need technology parks to start up their business. Nevertheless, we do appreciate the effort taken up

by the government. Those technology parks are suitable for those who do not have expertise in ICT but interested to be an ICT technopreneur. The government is serious about the ICT industry, but the funding issue [is still] outstanding.

The views from the business executive of Enterprise 1 are acknowledged by the chief executive officer of Enterprise 2, but both of them were still puzzled whether the technology park could lead them into global competitive environment. The industry suggests that it lacks core ICT product offerings; it appears to be engaging in trading rather than ICT development business. A business executive of Enterprise 3 argues:

In general Malaysia is a trading nation. Everyone knows about this matter; even the government also realizes this. You can find trading activity in every industry, including ICT industry and yet this industry is still new in Malaysia.

The business executive of Enterprise 3 further adds:

In ordinary industry, we call the traders as entrepreneurs despite the fact that they do not create any business or invent new products in the market. In the ICT industry, we called ICT traders as technopreneurs because they deal with ICT technology. Technopreneur is a combination of technology and entrepreneur. But we still call our ICT traders as technopreneurs although they are primarily foreign technology users and resellers of foreign technology.

The trade association for the ICT industry apparently has not played an active role. The chief executive of Enterprise 4 comments:

I thought Malaysia's Association for the Computer and Multimedia Industry (PIKOM) could be helpful in promoting innovation. The fact is it is just a traders' association. They sell computer hardware and software. They can survive on this because the government supports their selling campaign by allocating budget for government offices, schools, colleges and universities to purchase computers. ICT project in Malaysia is just another trick to boost the selling of computers.

The reality of Malaysia's ICT enterprises functioning as traders is not shocking. A business executive of Enterprise 5 explains:

These software companies are small in nature, lack of capital, lack of market experience, and lack of international exposure. Their main customer is the

government and its agencies. Even with this, they do not develop the technology themselves but purchased [it] from overseas and then do some customization or localization before reselling to their customers, who are primarily the government and its agencies to support their electronic government application like smart card, online procurement, online transaction, and so forth.

Often, cultural aspect strikes at the process of knowledge transfer. The 'easy' way out mentality may not fit in the process of knowledge transfer. Yet, the technology parks have also not been doing the job. Conceivably, a historical background provides some clarification. A senior manager of Enterprise 6 says:

We thank the government for initiating the Multimedia Super Corridor (MSC), which is the landmark for the development of the ICT industry in Malaysia. Prior to this, Malaysia is concentrating on manufacturing...

The industrial experience in Malaysia has been viewed as a contributor to the development of Malaysia's technology parks and the behaviour of ICT companies. The senior manager of Enterprise 7 shares the point mentioned by the senior manager of Enterprise 6. He argues:

The Multimedia Super Corridor [MSC] is just like the Free Trade Zone [FTZs], but the focus of the MSC is on the ICT and biotechnology, unlike the FTZ, more on the manufacturing. We are grateful to the government for creating the MSC that is dedicated to the ICT sector. Without the MSC, it could be difficult for the ICT sector to grow and what else the creation of ICT technopreneurs. However, we are still at infant stage... you cannot expect ICT technopreneurs to grow quickly.

It is not that the ICT enterprises could not grow quickly rather they have made a decision to be involved in the industry as traders. The business executive of Enterprise 8 points out:

In business, we always aim [for] profit... whatever we involve; it must bring profit to us. In the ICT industry, we sell both hardware and software. Our customers want cheap but high quality product. They just don't care about the intellectual property rights [as long as] they could get cheap computer hardware and software.

This idea is not acceptable in a highly technologically developed, knowledge society. A business executive of Enterprise 9 contends:

Whatever business, everyone must observe ethics... we may offer cheaper price, but if we 'steal' other people's property, that is not ethical. Malaysian ICT companies, particularly those that are selling hardware and software [without proper license] are not ethical.

There is still a hope for Malaysia's technology parks to bring back the spirit of knowledge transfer and the promotion of innovation. The business executive of Enterprise 5 suggests:

At one time we used to operate in Technology Park Malaysia as a platform to get to know people in the ICT industry. We are very grateful to the government for giving us this opportunity to establish business relationship with foreign partners in the ICT industry. We really concentrate on our R&D and utilize all the incentives given to us.

However, a business executive of ICT Enterprise 10 points out that in the previous industrialization experience the government has been involved in the process, but it could not afford to go beyond that. It is high time that the ICT enterprises realize that they need to do the job, not the government.

Some practitioners express their reservations toward Malaysia's technology parks and their role in innovation. The business executive of Enterprise 11 does not share the disappointment over the role of the government mentioned by the business executive officer of Enterprise 10. According to him:

The MSC and Technology Park Malaysia are a good idea since they try to duplicate Silicon Valley, but there is too much of top-down approach. People that led the MSC have not experienced the life of technopreneurs. They are mainly bureaucrats and thinkers, and they can't run MSC as Silicon Valley since they don't have the right experience.

At Malaysia's technology parks, ICT enterprises are not only granted with freedom to do business, but also tax exemptions and incentives. One of the MSC's clusters is Technology Park Malaysia. A business executive of Enterprise 12 says:

Technology Park Malaysia (TPM) is one of research clusters initiated by the government to encourage research and development (R&D) in the ICT and other technology. The operation of TPM was started with a few government-linked companies (GLCs) as anchor tenants and their subsidiary companies as the rest of tenant companies. Many private companies are not ready to operate here because they are still uncertain about the benefit if they [do]

operate here. So the government has to start the ball rolling.

The idea to enjoy tax cuts by ICT enterprises in technology parks has been shared by the senior manager of Enterprise 7:

The concept of Malaysian technology parks or the Multimedia Super Corridor (MSC) tends to follow Free Trade Zones (FTZs) model to increase export volume. If this is applied in MSC, then it encourages export volume for ICT products. But, the government insists that the MSC is a replica of Silicon Valley model to encourage ICT industry in Malaysia.

There were collaborations between ICT enterprises as mentioned by the business executive of Enterprise 8:

Our incubation center always collaborates with the government agencies to develop the market (entrepreneurs) because we feel that entrepreneurialism is still lacking, especially among the Malay (indigenous) entrepreneurs.

But, some respondents did not agree that Malaysian ICT enterprises participate in the ICT industry seriously in terms of research and development, knowledge sharing, knowledge transfer, and so forth. The main reason for this is that the innovation agenda is taking a long time to turn into profit. The business executive of Enterprise 12 points out:

I have no objection to describe Malaysian ICT companies are merely doing simple buying and selling activities. They are merely suppliers of ICT products and services to government offices, private companies, schools and universities. They don't produce their own. What for?

As a matter of fact, technology parks were established for economic reason despite the vocal language of innovation proclaimed by politicians. However, such rhetoric alone is not enough to encourage innovation through technology parks. A senior manager of Enterprise 6 argues:

Technology parks are not only incubation centers, but also innovation centers for ICT entrepreneurs. We are serious about innovation in the ICT industry. For that reason, we have a special programme known as technopreneurs development programme to train local ICT enthusiasts about ICT business and the innovation agenda.

The business executive of Enterprise 10 says:

Everyone in TPM is doing their individual project and to achieve their individual goals. There is hardly any tenant firms involved in knowledge sharing, except through any joint venture project. If an anchor tenant firm is awarded with a government project, this firm will invite other tenant firms with different specializations to be involved in the project.

Apparently, most of the tenant enterprises in Malaysia's technology parks are doing "business" in the ICT industry but lack participation in innovation. The business executive of Enterprise 8 says:

Our company is one of the subsidiaries to a government-linked company (GLC) and our aim is to get profit as much as possible from the e-government application project. The main source of profit is from the government projects, although we are trying to get ICT projects in overseas.

## 5. DISCUSSION

The section aims to relate the reviews of knowledge transfer, technology parks and innovation with the interview results. Indeed, the establishment of technology parks may be contemporary with the emergence of the knowledge-based economy, but there appears to be a mismatch between policy and implementation of the technology parks. Malaysia's technology parks possess enviable physical features, but are strongly wanting in operations.

### 5.1 Knowledge Transfer

Malaysia's technology parks appear to play a little role in promoting knowledge transfer. One plausible explanation is because the ICT enterprises are of small and medium size (Enterprise 6). Funding problem is inevitable (Enterprise 2), although there is a possibility to acquire knowledge through collaboration (Enterprise 1). This suggests that ICT enterprises have absorptive capacity (Cohen and Levinthal, 1990) to acquire knowledge externally.

There is sharing of wisdom of practice (Bourmard, 1999), through inter enterprise collaboration (Grant and Baden-Fuller, 2000), albeit it is difficult on the tacit dimension (Enterprises 3 and 4; Szulanski, 1996), and the possible influence of individual culture and conviction (Hofstede, 1991). Perhaps by using the SECI approach in knowledge transfer (Nonaka and Takeuchi, 1995), it is possible to have the desired inter enterprise knowledge transfer in technology parks (Enterprises 6, 7, and 10).

In short, there is a possibility to expect knowledge transfer via technology parks due to their spatial advan-

tage (close to industry, universities, and government offices).

## 5.2 Technology Parks

Basically, there are two models (Anglo-Saxon and Continental European) (Thiersten and Wilhelm, 2001) underlying the creation of technology parks. The Multimedia Super Corridor represents the Anglo-Saxon Model because it is based on US Silicon Valley (Enterprise 11). In reality, the government established the parks through government linked companies (GLCs). For instance, while the MSC is managed by MDC Corporation Sdn Bhd ([www.msc.com.my](http://www.msc.com.my)), the Technology Park Malaysia is under TPM Corporation Sdn Bhd ([www.tpm.com.my](http://www.tpm.com.my)). The establishment of the parks is said to be dominated by political objectives (Luger, 1992; Enterprises 3, 4 and 5).

Enterprises 9, 10, and 11 support the view that profit-making objective is combined with political objective because the two can work effectively. More importantly, all of the respondents are optimistic about the spatial benefit (Krugman, 1997) accrued from technology parks. In a way, Malaysia's technology parks are suitable for ICT SMEs and for short term.

## 5.3 Competitiveness

Ideally, knowledge intensive organizations like the ICT enterprises should focus on the knowledge activities. This is important to ensure that they introduce enough new products to cope with the short product life cycle. In the meantime, they must attempt to make huge profits. Enterprise 9 cautions ICT enterprises to make profits ethically especially with regard to intellectual property rights (IPRs).

But with pursuit of profit making (Enterprise 8) combined with the trading nation framework (Enterprises 3, 4), Enterprise 9 predicts some enterprises will disregard the IPRs in order to fulfill a demand. This can be done easily due to less stringent compliance to IPRs (Singh, 2001) in developing countries. If this continues, outsiders will have less confidence to collaborate with Malaysia's ICT enterprises.

The facility at technology parks is less costly apart from the tax cuts and grants provided by the sponsors of technology parks. Under this circumstance, ICT enterprises will enjoy high productivity, strong motivation to drive innovation, and stimulating economic growth (Porter, 1998). As such, there is a possibility to gain better competitiveness through technology parks.

## 6. FUTURE DIRECTION

The performance and capability of small and medium enterprises at Malaysia's technology parks can

be improved by aligning the former with 'giant', and more established ICT enterprises. Geographical proximity is a booster, but it is local enterprises that should accelerate their learning capability in order to capitalize on the opportunity. To achieve this objective the policy makers should attract established ICT enterprises to collaborate with small and medium local enterprises at available technology parks. It is only proper that the local ICT enterprises assume a higher level of responsibility to optimise the results of knowledge transfer and contribute toward the aspiration of the Malaysia's knowledge economy.

## 7. LIMITATIONS OF THE STUDY

The results of the study are based solely on the personal interviews with 12 informants, which may not give conclusive answers regarding the role of Malaysia's technology parks to promote knowledge transfer and innovation. There are a few options that this and future studies may undertake to improve the robustness of the results. The first option is to solicit the views of peers of the already interviewed informants. In this way, the study could verify the perceptual similarity or otherwise among the peers. Second option is to record the views of a cross section of informants. This approach will exhibit the views of a diversity of informants. Convergent results will strengthen, whereas divergent outcome weaken shared perceptions. Third option would be to interview policy makers and other interest groups in order to find out why knowledge transfer is difficult.

## 8. CONCLUSIONS

Knowledge transfer via technology parks has a significant role to enhance global competitiveness of the ICT industry. The technology parks provide spatial effects (close proximity to important stakeholders) in promoting knowledge sharing behaviour. At technology parks also, ICT enterprises gain the synergy (through collaboration) in terms of knowledge absorptive capacity. Since the market condition is favoring Malaysia's ICT, it is timely for the ICT enterprises to pursue innovation.

Both the government and the ICT enterprises should review the existing policy on Malaysia's technology parks to give the parks a more dynamic role for knowledge transfer and innovation. The infrastructure such the MSC or technology parks should be fully utilized to encourage knowledge transfer as a primer mover to innovation in Malaysia's ICT industry.

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