

# INCUBATORS AS CATALYSTS IN DEVELOPING HIGH TECHNOLOGY BUSINESSES: MALAYSIA'S EXPERIENCE

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## Abstract

Malaysia has established various incubator centres as the main support system for the creation of homegrown technologies and entrepreneurship. The Malaysian government provided the necessary infrastructure for such incubators through technology parks and created funding systems that allow technology entrepreneurs to gain access to capital. Hence, the creation of venture capital funds and various grant schemes. This article explores how these programmes are being implemented in Malaysia, what are the problems faced by Malaysia in implementing the policies and what are the proposals for reform.

## Introduction

Malaysia has, for a long time, been employing investor and business-friendly policies, to attract foreign direct investment into the country. Malaysia has managed to transform its economy from being an exporter of raw materials to being an exporter of high technology products. This evolution is also associated with the expansion of knowledge-based industries (WTO, 2006). The shift in the emphasis is partly influenced by the competition from neighbouring countries, such as China, Vietnam and India, in attracting foreign direct investment. Malaysia can no longer offer cheap labour force required for the capital intensive industries. Instead, it focused on the generation highly educated workforce by investing heavily in human capital. The fact that Malaysia is recognised by the United Nations Development Programme (UNDP) as a potential leader in technology (UNDP, 2001) indicates that this strategy is paying off in making Malaysia more competitive.

The shift in emphasis in economic approach is documented in the Malaysia's Outline Perspective Plan (OPP 3, 2000 – 2010). This author was involved in advising various interest groups in the formulation of this important document that shapes Malaysia's development strategies. Based on the OPP3, Malaysia envisages a knowledge-based economy that will provide the platform to sustain a rapid rate of economic growth and enhance international competitiveness. The overall vision is to achieve the developed nation status by the year 2020 (OPP3). Emphasis on the knowledge-based economy will also strengthen Malaysia's ability to innovate, adapt and create indigenous technology. It also enables to design, develop and market new products, thereby providing the foundation for endogenous growth. The knowledge-based economy will complement and accelerate the

change from an input-driven to a productivity driven growth strategy. Thus, the emphasis is to nurture home-grown industries and home-grown technologies.

One of the ways to nurture home-grown industries and home-grown technologies is by creating technology entrepreneurs, or 'technopreneurs'. Recognizing the importance of nurturing technopreneurs, Malaysia embarks on several initiatives through various policy regimes. They include: various policy frameworks and guidelines for the generation of technopreneurship in Malaysia. These also include institutional frameworks for promoting research and development (R&D) and human development strategies for nurturing technopreneurs. The policies are being implemented by various ministries such as Ministry of Science, Technology and Innovation (MOSTI), Ministry of Entrepreneurs Development and Cooperative (MEDC) and Ministry of International Trade and Industry (MITI). These ministries also offer various grants. The initiatives also result in the establishment of incubators in various places under the National Incubator Network (NIN).

## 1 Incubators in Malaysia

Incubators are being used to nurture new technopreneurs as part of the effort to transform the Malaysian economy into a knowledge-based economy. Technopreneurs are classified as part of the small and medium enterprise sector (SME). The Malaysian Industrial Master Plan (1996-2005) recognizes the importance of a competitive small enterprise sector and provides assistance to this sector through several initiatives such as a strong technical infrastructure, supportive state policies, massive investments and tax incentives for research and human resource development, new structures for university-business linkages, a range of financing instruments for innovation, and continuing support to technology incubators.

Incubators have several special characteristics. Such characteristics include a managed work space providing shared facilities, advisory, training and financial services, and a nurturing environment for tenant companies. In addition, it provides a small management team with core competencies that carefully select promising start-up companies for entering the incubator. On average, 20 to 25 start-ups get selected and are to be graduated generally after 3 years (Scaramuzzi, 2002). Incubator models may vary according to their mandate (for-profit or not-for-profit), the type of sponsorship they have (publicly funded, privately funded or a mixture of both), and their focus or niche (ibid). In the case of Malaysia, most incuba-

tors are related to technology such as the information-, multimedia- and bio-technology.

In Malaysia, incubators are mainly set up by government-owned or government-related organisations. Many of the incubators are situated within technology parks, either within purpose built technology parks or within university campuses. There are two confusing figures about the number of incubators in Malaysia. One study states that there are 24 incubators in Malaysia as of February 2006 (Ghazi, 2006) whereas an official website listed only 19 incubators in the whole country (MSCa, 2006). The Government's target is to have 40 incubator centres by 2010 (Ghazi, 2006).

### 1.1 Technology Park Malaysia (TPM)

One of the technology parks that run incubator centres is Technology Park Malaysia (TPM). TPM is strategically located on 700 acres of land just outside Kuala Lumpur. It is located between Kuala Lumpur and Putrajaya, the Federal Administrative Centre. It has good train-, rapid transit-, and motorway- connections to the cities as well as the Kuala Lumpur International Airport and Cyberjaya, a city created for technology-related activities. This technology park is managed by the Technology Park Malaysia Sdn Bhd, a company owned by the Ministry of Finance Incorporated. It used to be a division of the former Ministry of Science, Technology and the Environment. The land is owned by the Federal Government through the Federal Lands Commissioner and leased out to TPM for 60 years. TPM is allowed to offer tenancies for its buildings and sub lease certain sites within the park.

The core system within TPM comprises:

- ⇒ an Innovation House to help initiate start-ups,
- ⇒ three Incubator Centers for early-stage ventures, and
- ⇒ Enterprise Houses for those graduating to good industrial space without services (Ibrahim, 2001).

TPM offers a space of around 204960.24 square feet in the Innovation House and Incubator centres (TPM, 2006). The rents are very competitive as compared to the ones in other parts of Kuala Lumpur. The congruence of support includes a Resource Center, Master Center (for rapid proto-typing, flexible manufacturing, and robotics), IT-Multimedia Center, and TPM Academy for advanced training together with wide band internet connectivity, R & D plots, and common facilities for recreation (Ibrahim, 2001).

### 1.2 MTDC, SIRIM and MCI: additional drivers of the knowledge-based economy

There are several other technology incubator centres, such as those run by the Standard and Industrial Research Institute of Malaysia (SIRIM); The Kulim Hi-Tech Park in the State of Kedah; and the Multimedia Super

Corridor Incubator Centre in Cyberjaya (MCI).

The Malaysian Technology Development Corporation (MTDC) has established Technology Development Centers to facilitate university-research-business collaboration in specific sectors: at Universiti Putra Malaysia (MTDC-UPM) (for multimedia work), Universiti Teknologi Malaysia (MTDC-UTM) (electronics and manufacturing), and Universiti Kebangsaan Malaysia (MTDC-UKM) (biotechnology and pharmaceuticals).

SIRIM's Industrial Incubator's areas are primarily focused on Advanced Manufacturing Technology (Industrial Automation/Mechatronic, Industrial & Engineering Design, CAD/CAM, Industrial Instrumentation & Electronic and Artificial Intelligence System, Process Technology and Advanced Materials). This incubator was first launched in 1986 offering integrated facilities for entrepreneurial and SME development. It is now located in Sepang, a town near the Kuala Lumpur International Airport and famous for its Formula One circuit. Among the added-value facilities and services offered by SIRIM are hands-on and technical training skills in technology and quality and advisory services on technology, quality, management, financial, marketing, Intellectual Property advice business plan assistance and access to funding and seed money.

Kulim Hi-Tech Park was inaugurated in 1993. It is a state-owned technology park that incorporates several functions: industrial, research and development facilities, as well as a new township concept with shopping centres, medical and educational institutions and recreational facilities.

MCI began operation in mid-1999. It offers 40 cubicles and 20 executive offices, 29,000 sq ft of general office space and 10,000 sq ft of laboratory office space, all designed to assist in R&D while providing market exposure to tenants. Because of its unique position, the MCI was expected to attract investors interested in new, innovative, commercially-viable products. One of the aims of the MCI is to accelerate the creation of the small and medium enterprises in the information technology sector (IT SME).

At the time of the launching of the MCI, the Government of Malaysia was concerned about the lack of IT SME in Malaysia. In 1998, only 247 IT SMEs were listed on the MDC database. This paled in comparison to that of established IT havens such as Silicon Valley which had 7000 IT SMEs and Cambridge which 1,200 IT SMEs (Mohamed, 1999). The Government of Malaysia's overall target was to create IT SME to about 1,000 in 2003. The MCI was one of the initiatives in this quest. The MCI target is to create 1,500 IT SMEs within its wing by 2003 (Schwankert, 2000).

The Government has managed to achieve the target to create 1000 IT SME in the whole of Malaysia by 2003. In 2003, there were about 2,000 IT SMEs in the whole country (Government of Malaysia, 2004). The latest figure in the Multi Media Super Corridor (MSC) database shows that there are about 3452 IT SMEs across the

country (MSCb, 2006), but not necessarily within the MSC area, let alone created by the MCI. This means that Malaysia has managed to create 3205 IT SMEs within a period of eight years between 1998 and 2006, an average of 400 IT SMEs across the country per annum. However, there is a need for a further study to ascertain the quality, the ownership and the profitability of these companies, to ascertain that they are profitable and involved in promoted areas of the IT sector.

However, the MCI has not managed to achieve its target. In the period between 2001– 2004, only 17 companies were supported by the MCI (Government of Malaysia, 2004). This could be due to several reasons. One is that the MCI is located in Cyberjaya, which requires relocation and not many SMEs can afford to relocate there. Secondly, the target itself is unrealistic, when one compares it with the Government's target of only 1000 IT SMEs by 2003 for the whole country. MCI probably did not conduct a proper study in creating the target. Thirdly, the management of the MSC has been criticised for many years for failing to implement Government policies within the MSC area and this lack of focus and implementation has caused the failure on achieving the target. If the MCI has achieved the target, MSC could have published separate IT SME figures instead of just the figure for the whole country (MSC, 2006b)

In general, government sponsored incubators in Malaysia offers several added-value programmes such as entrepreneurial training. Young technopreneurs in Malaysia are techno-savvy but they lack capital and basic business knowledge experience required to plan and build business operations around the technology concept they wish to develop. This is where entrepreneurial training comes handy. The trainings provided include preparation of business plan, basic company management and looking for financing.

## 2 Venture Capital Companies

To support the technopreneuers, especially with potentials and located within those incubator centres, Malaysia encouraged the setting of venture capital companies. There are several government-sponsored venture capital funds such as the Malaysian Venture Capital Limited (MAVCAP), Malaysian Super Corridor Venture Fund (MSCVF), Commercialisation of Research and Development Fund (CDRF), Technology Acquisition Fund (TAF), TPM Venture Capital Fund, MTDC Venture Capital Fund and MDC Venture Capital Fund.

In year 2004, RM 1.2b (US\$ 315.79m, USD1 = RM3.80) worth of venture capital funds were available in Malaysia with 17% going to life sciences and biotechnology. The bulk of 48% of the venture capital fund went to the information and communications technology (ICT) field. As for year 2005, the total venture capital available in Malaysia was estimated at RM 1.5b (USD 394m) for entrepreneurs and firms engaged in the ICT field alone (NST, 2005).

TAF provides partial grants ranging from 50-70 per cent

to companies with majority Malaysian-ownership. These companies undertake technology acquisition activities picked from the List of Promoted Activities and Products for High Technology Companies under the *Promotion of Investment Act 1986* and other strategic industries with support from the Government. The technology activities eligible for partial funding include purchase of high-tech equipment and machinery, technology licensing, acquisition of patent rights, development of prototypes and design, as well as expert-sourcing programmes

CRDF provides partial grants ranging from 50-70 per cent to majority Malaysia-owned companies incorporated under the *Companies Act 1965* to commercialize research results. The activities eligible under the partial funding include market survey and research, product or process design and development, standards and regulatory compliance, and intellectual property protection.

## 3 Grant Schemes to promote R&D and the application of ICT

There are several grant schemes available to encourage research and development in technology sectors. Such grant schemes include the Industrial Grant Scheme (IGS), Intensification of Research in Priority Areas Fund (IRPA), Industrial Technical Assistance Fund (ITAF), Multimedia Super Corridor Research and Development Grant Scheme (MGS) and the Demonstrator Application Grant Scheme (DAGS).

The IRPA Programme was established to provide funds to support R&D in the public sector for improvements in the socio-economic fields. It has now evolved to focus on R&D activities that are in line with the national R&D Priority Areas. Public research institutions and universities are eligible to apply for these funds.

The purpose of IGS is to increase the private sector R&D and promote closer cooperation between the private sector and public sector institutions and public sector universities through collaborative linkage. The aim is to encourage Malaysian companies to be more innovative in pursuing and adopting existing technologies and in creating new technologies, products and processes to benefit the national economy. The key technology areas that are given priority are the ones that support the Industrial Plan to foster clusters of small companies in complementary industries with good prospects for commercialization.

The purpose of the MGS is to help start-up and young local companies, including joint ventures, to develop multimedia technologies and applications that contribute to the overall development of the Multimedia Super Corridor.

The purpose of DAGS is to encourage Malaysians to adapt and customize current IT and multimedia technologies in applications compatible with local culture and to promote the development of local software and content industries for greater competitiveness in the global market.

#### 4 Weaknesses in Malaysia's Incubator Programme

One could not deny that Malaysia has good policies and infrastructures to develop technopreneurs. It helps explain the success story of Malaysia as a Newly Industrialized Country (NIC). Nevertheless, there are several problems which need to be addressed by the Government, in order to ensure the success of this programme.

One of the problems is that incubators established in Malaysia are not properly managed, with many start-ups going out of business. There are no proper statistics to back this assertion but experience tells that many technopreneurs suffer from birth defects. This could be due to the lack of experience on the part of the managers and lack of support towards the technopreneurs.

Secondly, technopreneurs suffer from lack of funding opportunities. We have seen from the above discussions that the government has set up various venture capital funds and grants. Some of the venture capital funds are managed through banks; either government-owned development banks or private banks. These banks approach technopreneurs and their technology business just like any other business. They either do not understand or do not care about the unique characteristics of technology-related business. Most commercial banks do not fund 'developmental work' and entrepreneurs seeking loans have to offer matching personal guarantees or collateral.

Development banks that have been specifically set up to assist entrepreneurs have not funded technopreneur companies to the level expected. The venture capital companies in Malaysia remain reluctant to provide seed capital financing due mainly to their risk-averse attitude towards investments, and the lack of groundbreaking technology in Malaysian technology firms (Ariff and Abubakar, 2001). For example, during the Eight Malaysia Plan 2001-2005, the Government allocated RM120 million (USD31.58m) to the Government owned MSCVF. MSCVF only disbursed RM75.4 million (USD 19.84m) or to only 17 companies by the end of August 2003 (Government of Malaysia, 2004). Although the amount disbursed represents about 62% of the allocated fund by the Government, the number of companies which received the grant is still small as compared to the whole IT SME companies in the country.

Technopreneurs may also find it frustrating in applying for grants as the process is long and tedious. An applicant may have to wait between three to four months to know whether their applications meet the criteria set up by the agencies, let alone being approved for funding.

Lack of funding causes a big problem among technopreneurs and some would just give up on the project. One could argue that this situation is not unique to Malaysia. For example, a study in Singapore shows that lack of funding is a main problems faced by the IT SME. However, the same study finds that the problem of funding in Singapore has improved. For example in 2004,

65% of those surveyed stated that insufficient cash flow was a hindrance to growth and this figure is now reduced to 35% (DP, 2005). The same survey states that 48% percent of SMEs in Singapore think it was easier to get funding as compared to 9% who do not think the same (ibid). There is no similar survey in Malaysia to provide empirical data to confirm this predicament.

Thirdly, the various funds set up by the Government are not properly disbursed. This could be due to difficult bureaucratic measures, or due to grants being issued to technology companies which employ 'know-who' rather than 'know how'. The former causes applications processes being conducted in intransparent manners. It causes some grants being issued to non-deserving individuals resulting in the depletion of the amount available to those with the 'know-how' but without the 'know-who'. This attitude and approach makes ordinary bidding technopreneurs that do not have contacts in high places become frustrated. This is despite them having the necessary knowledge and qualifications.

Fourthly, technopreneur development in Malaysia is undertaken by various ministries and agencies which may result in lack of coordination or wastage of resources. For example, the MEDC focuses on the indigenous people. This focus is often followed by lacking implementation procedures. They are sometimes managed by bureaucrats who do not have the basic knowledge in entrepreneurship. The MEDC has failed even to create a credible number of retail entrepreneurs, what more in the high technology areas. The problem lies in the implementation of the policies.

The tasks given to MEDC are duplicated in various other agencies within different ministries, such as the Multimedia Development Corporation (MDC) within MOSTI. MDC implements the Technopreneur Development Flagship. This programme has the same objectives like any similar programmes run by MEDC, that is to breed and nurture the growth of technology-based small and medium enterprises or SMEs and start-up companies involved in the ICT and multimedia industries.

Duplications and wastage also exist in the creation of technology parks. Several of these developments started as technology-based development but ended up being real estate-based development. In addition, these duplications are obvious as most of the technology parks are located in the same area. Most of the technology parks are located in the Klang Valley, near Kuala Lumpur. The Kulim Hi Tech Park and MTDC-UTM, are located in the The Kulim Hi Tech Park is located in the north-western State of Kedah, near the technology hub of Penang, and the MTDC-UTM is located in the State of Johor, close to Singapore.

This means that those who want to use or be part of the incubators and to enjoy the facilities in those technology parks must relocate either to the Klang Valley, Kulim, the Penang area or Johor. There are no comparable programmes created in other states, either in the Peninsular Malaysia or in the States of Sabah and Sara-

wak in the Island of Borneo. The State Governments of Pahang, Melaka and Perak in the Peninsular Malaysia and the State of Sarawak in the Island of Borneo have taken measures to create incubators. But these incubators may not have the same facilities as in the technology parks in the Klang Valley. Potential technopreneurs and technopreneurs who, for various reasons, do not want to or cannot move to the favourable regions will not be able to take advantage of the facilities offered by those incubators centres. This disparity causes regional disparities due to economic disadvantages.

## 5 Proposals for reform

To ensure that incubators continue to be the main catalysts in creating technopreneurs in Malaysia, the Government must implement several reforms:

1. There must be continuous government support, but with a more coordinated effort, more transparent and less bureaucratic procedures.

2. The Government must provide the appropriate degree of strategic, legal, financial and administrative support.

3. The Government could use the universities as the catalysts in creating new technopreneurs. There are universities in every part of Malaysia, meaning that incubators can be made available in various parts of the country. The universities have scientific expertise that must be tapped. Ideas and innovations by academics must be channelled to the private sector to allow for the optimum use of the R&D within the universities.

4. To overcome the issue of over concentration of incubators in technology parks in the Klang Valley, State Governments must have their own initiatives to create technopreneur centres within their own states. State Governments could form cooperation with universities and higher education institutions in their respective states. It is not an overstatement to say that many State Governments are slow in taking initiatives, as they are so used to political patronage and leadership from the Federal leaders. Failure on the part of the State Governments to assist the Federal initiatives will mean that the shift to a knowledge-based industry will not be widespread.

The government must encourage greater transparency in the management of incubators, venture capital funds and grant schemes. Technopreneurs and potential technopreneurs must know the exact requirements in every step of their applications. In addition, government-owned venture capitals must be more flexible and open in their approach. A very conservative approach towards seed funding will frustrate applications and thus dampen the creation of new innovations and development of local technologies.

It is not unusual that applications take about 7 or 8 months to be processed and some are rejected after having been revised based on the venture capitalist's

proposal. Rejection without reasons, even after the request for explanations from failed applications, is common. In addition, venture capital funds provided through technology parks are small and may not even cover the basic costs of the tenants. In this competition for small amounts of funding, 'know-who' plays a greater role in accessing the fund, rather than 'know-how'.

## Conclusions

Based on the above-mentioned constraints, it can be concluded that, despite having the physical infrastructure for incubators, and the existence of many different funds, Malaysia's effort to create technopreneurs is hampered by bureaucratic and implementation hurdles. Moreover, funds which are supposed to be used in providing capital to the businesses are being wasted through emphasis on real estate developments. If Malaysia were to compete with other countries in the region, Malaysia must be willing to provide easier access to grants and funding, focus more on the coaching of universities in their efforts to become entrepreneurial and reduce red tape. Malaysia must create an environment of opportunities that supports aspiring technopreneurs, tolerates failure, and rewards success handsomely and evenly across the different regions.

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