

WHEN PUSH COME TO SHOVE FOR TECHNOLOGY COMMERCIALISATION

By Husaini Dahalan

Technology commercialisation is an economic activity, which creates success stories, and failures. In a tough economic environment, success stories are soothing to read, and can become the role models for individuals and companies aspiring to make a break in an activity marked by high-risk and uncertainty. More importantly, success stories will attract young people to follow and take up the technology commercialisation challenge, and the new role model will then start to create new history.

As a technology commercialisation entity since 1993, Malaysian Technology Development Corporation (MTDC) has often been asked on the successful commercialisation rate of technology in the country. There is not any specific figure, but save to shout that success stories are aplenty.

Over the last 23 years, MTDC has been assisting Malaysian start-ups and Small and Medium Enterprises (SMEs) to commercialise innovative products for the mass market. More than 700 companies have benefited since 1997 up to end of the Tenth Malaysia Plan (10th MP). As an agency under the Ministry of Science, Technology and Innovation (Mosti), and a subsidiary of Khazanah Nasional Berhad, MTDC manages two matching grants namely Commercialisation of Research & Development Fund (CRDF) and Technology Acquisition Fund (TAF). Both grants offer up to RM4 million in financing.

By simple definition, technology commercialisation means commercialising Research and Development (R&D) outputs from Malaysian universities, research institutions (RIs), and companies to products and processes that have significant societal, cultural, and commercial value.

Simple as it may seem, technology commercialisation is not for the faint-hearted. Whether it is a product or services, technology commercialisation is risky, and the return on commercialisation investment may take years to realise. Some are doomed even before they are able to see the daylight! But often, the riskier the endeavour, the better the reward.

Seah Kian Hoe is but one of hundreds of brave entrepreneurs and recipients of the CRDF. Like many others with innovative ideas and lofty entrepreneurial spirit, Seah, who is managing director and founder of Heng Hiap Industries Sdn. Bhd based in Johor, jumped into the commercialisation bandwagon with high ambitions and hope to succeed in recycling business. With MTDC assistance in 2008, Seah conceived and developed breakthrough, recycling technologies that can transform plastic scrap into smart plastics, which can then be used in highly specialised niche applications. The plastics are considered smart as it offer improved properties like anti-bacterial performance, faster cycle times or better electrical conductivity. Today, his plastic recycling business has a turnover of RM85 million with export activities mostly to the European countries.

One other example is Lim Lee Wan, founder of Malaysian Phosphate Additives Sdn Bhd (MPA), who commercialises *DiCalcium phosphate* (DCP) and *MonoDicalcium phosphate* (MDCP). The two compounds are essential and cost effective sources of phosphorus and calcium for livestock's growth requirements.

MPA received the CRDF in 2007 for both the DCP and MDCP project. Slowly and steadily, MPA has since grown by leaps and bounds. Early February this year, it sealed a power purchase agreement (PPA) with Sarawak Energy Berhad for the latter to supply 150MW of power for the Malaysian Phosphate Additives (Sarawak) integrated phosphate complex, in Samalaju Industrial Park in Bintulu, Sarawak. By 2018, the complex will house nine different plants to produce food phosphate, fertiliser phosphate and Halal feed phosphate with a production capacity of 500,000 tonnes of phosphate additives, 100,000 tonnes of ammonia and 900,000 tonnes of coke per year. MPA's RM1.9 billion investment would generate, a gross national income contribution of RM11.8 billion to the Malaysian economy by 2017-2030.

If Seah's recycling technologies and Lim's DiCalcium Phosphates are any indication, there is a need to not just spurt, but to shove technology commercialisation as the catalyst for continued economic growth. Successful technology commercialisation can enhance Malaysia's economic competitiveness over the long-term through a systematic approach, with targeted interventions and support programmes.

The government-supported technology commercialisation activity, such as the CRDF and TAF, is not limited to assisting companies with financial assistance. It also helps to convert Malaysian companies into more enterprising entities vis-à-vis transforming R&D outputs into commercially

viable products and services. What is more important is that both the CRDF and TAF provide the catalyst for Malaysian researchers, entrepreneurs and financiers to team up and create high impact products for the world market!

Some products funded under the CRDF and TAF have made inroads overseas with key markets in the USA, United Kingdom, Egypt and Indonesia.

There is a need to replicate these success stories. More so for products and services that are derived from Malaysia's R&D laboratories. There is also a need to create the WOW! factor for Malaysia-owned brand that is able to create a great impact in the world marketplace. There is a pertinent need to create product that is low cost, high impact and rapid execution. In short we need a quantum leap to transform Malaysia from a technology-importing country to a technology-exporting one. Although, technology commercialisation is the road less travelled, it has shown results for Malaysia.

There is neither a brick and mortar rule nor one-size fit all ethos for successful technology commercialisation. Without the government's intervention through funding such as the CRDF and TAF, the local SMEs have less options. A quick read of the book - *The Entrepreneurial State: debunking public vs. private sector myths* (Anthem 2013) by Professor Mariana Mazzucato – reveals that even big companies such as Apple Inc. received funding from the State (USA). This means every technology that makes the iPhone so 'smart' was government funded: the Internet, GPS, its touch-screen display and the voice-activated Siri.

There are reasons for the government intervention. Firstly technology-commercialisation focuses on revenue generation, which is bringing the products to market. This kind of activity strongly focuses on numerical value such as number of patents filed, licensed agreements formed, spin-off companies created, royalties and cash from equity investments paid to the academic institutions and the numbers of products successfully introduced to the market.

Secondly, technology-commercialisation comprises technology transfer that can create value-added economic activity to the surrounding environment. This includes non-numerical value such as number of jobs created, companies' and universities/RIs' ability to sustain entrepreneurial activity, excellent reputation in the eyes of firms and industries, and providing skilled students for the industrial workforce.

Despite the government's intervention, there has been complaints on the lack of fund and access to funding for technology commercialisation. What have gone wrong? Is it due to lack of awareness on the funds available? Is it the lack of easy access to finance or is it because entrepreneurs/companies are not eligible for funding? While there may be more questions than answers, some key issues need to be kept in perspective.

Lack of Entrepreneur's Commitment

Grant managers typically look for entrepreneurs who are willing to commit fully to undertaking commercialisation activity. Typically, a newly researcher turned entrepreneur may not want to relinquish his/her research job at an institution lest his/her commercialisation project fails. It is cumbersome for the researcher to become the CEO of the new start-up company while at the same time fully committed to his/her research work full time at another institution.

Technology Novelty

Grant managers would seek to fund innovative products/services that are unique in terms of the new technique, new process, modification of existing product/process, additional application and patentable. Companies and entrepreneurs should conduct prior research on what is marketable and novelty technology for commercialization so that they may have greater chances of being funded.

The absence of a strong business case and execution strategy

Typically, proposal with a strong business case not only refers to the profit potential, product superiority and market outreach, but also reaches to strong management team with a blend of management, technical and commercial experience who can formulate and execute appropriate business strategy and drive the growth of company to a desired level within the period of investment.

While government funding is critical to the speed of commercialising products and services, market mechanisms must also be in place to bring forward private support. This is because, depending on the technology and its application, commercial scale demonstration and deployment is highly dependent on large scale finance and the success of a pilot scale demonstration.

The principle challenge is attracting funders via project finance and, at the same time, satisfying the return expectations to existing funders. This

obviously requires a combination of government funding to bridge a financing gap, a contract for the revenue or off-take, and favourable tax and other financial incentives for project funders. Where investors are looking for hurdle rate returns of certain percentages, the revenue stream becomes critical. In this environment, entrepreneurs need to show the right technology, at the right time, in the right market, with the right people. People are really important in this scenario and funders look for confidence regarding people in terms of track record, the board and management, and joint venture partners.

Companies and entrepreneurs have only themselves to blame if funding does not come in their way, partly because their characters are dubious, technology and market are not clear and without direction.

The Eleventh Malaysia Plan (11-MP) will see the engagement of both the CRDF and TAF as a continued catalyst for technology commercialisation and acquisition. As fund manager and technology promoter, MTDC will assume a rigorous pundit to shove more novel indigenous technology from universities/RIs and companies for commercialisation. At the same breadth and effort, companies already funded will continue to be nurtured for long-term growth and sustainability.

Since the introduction of the grant scheme in 1997 until end of 10th MP, some RM733.5 million had been allocated to help companies and entrepreneurs undertake commercialisation and technology transfer activities. During the 10th MP alone, a total of 109 companies (103 CRDF and 6 TAF) were approved grants totalling RM190.67 million (RM179.22 million for CRDF and RM11.45 million for TAF).

Companies are not offered just financial grants; they are assisted through the provision of value added services such as mentoring, fund raising, international collaboration and networking. They are also accorded incubation offices to start of their operation.

A plethora of assistance awaits companies as they rolled out their product, experiencing growth and expanding operation. Companies with potential for further expansion are offered hybrid funding and even accorded advisers who work as partners to pro-actively develop the business with start-up founders, providing visibility to new ventures and access to the right contacts through business networks. In a nutshell, companies operate in a complete and conducive ecosystem to succeed in their commercialisation and business endeavour.

While it is true companies/entrepreneurs find difficulty in commercialising and obtaining financial assistance for their products/services, their difficulty may stem from their own ignorance and folly. Often companies/entrepreneurs are not ready and also not aware of the financial opportunities from the various government agencies despite continuous publicity and aggressive promotion by the various funding agencies.

On the funders' perspective, there are guidelines which funders have to follow as funding commercialisation activities are highly risky. Funders are concerned about their return on investment and such risks have to be factored in. The government in general is making everything possible to assist companies/entrepreneurs through various financial and tax incentives. It is time companies/entrepreneurs do some research and find ways to overcome barriers to commercialisation.

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