

# Multimedia Super Corridor Malaysia: Public-private R&D collaboration

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Narrowing the gap in scientific and technological research is a challenge that Malaysia faces. The Multimedia Super Corridor (MSC) Malaysia project is but one component of the national initiative to close this gap. This article focuses specifically on R&D funding programmes within MSC Malaysia, one of the on-going efforts being made to bridge the gap in R&D talent. Opportunities exist today to integrate disparate R&D efforts in order to harness limited resources for maximum effect. The Multimedia Development Corporation, in its stewardship of MSC Malaysia, is aiming for more cohesive partnerships between industry and academia that would result in more successes in technology development and its commercialization.



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## Introduction

Malaysia's Multimedia Super Corridor (now known as MSC Malaysia), which was launched in August 1996 by the then Prime Minister Datuk Seri Dr. Mahathir Mohamad, was hailed as a bold initiative by an emerging country to move its economy into the Digital Age. MSC Malaysia featured a multi-faceted approach to shift the nation into higher value-added activities, primarily driven by the consumption and creation of information technology (IT) products and services.

Among the notable features of MSC Malaysia included a ten-point Bill of Guarantees that offered special privileges to investors such as freedom of ownership, freedom to

source capital globally and tax breaks. MSC Malaysia was also intended as a test-bed where new applications such as Telehealth, E-Government and MyKad were introduced by the government in order to pave the way for better government services to citizens. Malaysia was certainly one of the first, if not the first, countries to successfully rollout MyKad program to all citizens. Today, there are at least 50 applications available on MyKad.

A key emphasis by Dr. Mahathir was that MSC Malaysia should be a test-bed for new innovation and new technologies. Undoubtedly, he understood well that Malaysia's march towards developed nation status had to be anchored in an ability to innovate and conduct research and development (R&D) with tangible results. Over

the years, Malaysia had developed strong competencies in palm oil and rubber research. However, with the advent of MSC Malaysia, it was clear that the nation needed to build new strengths in the Digital Age, especially in information and communications technologies (ICT) and multimedia applications.

## Malaysia's challenge to move up the value chain

Some observers have noted that the MSC Malaysia initiative takes the best elements of the country's highly successful industrialization programme introduced in the early 1970s. This is reflected especially in the electronics manufacturing sector that has taken root in places like Penang, Kulim, Shah Alam and Bangi. Global giants such as Intel, Motorola, Siemens and Bosch have well-set operations that focus on the export market. Over the years, MSC Malaysia has also spawned clusters of supply chain companies with the capability to ably serve these multinationals over the full spectrum of upstream and downstream activities. Today, Intel and Motorola, among others, have highly competent design centres in Malaysia staffed by Malaysians, producing world-class products.

In support of the burgeoning electronics sector, the government had also invested heavily in wafer fabrication plants such as Silterra and 1<sup>st</sup> Silicon. Nevertheless, the challenge remains to ensure that existing capacity is fully utilized, especially by local fabless design houses. Inherently, creation of a critical mass of local fabless design houses is necessary to sustain the wafer fab investments. This is an example of one of MSC Malaysia's key challenges – to foster an environment that supports entrepreneurship in upstream activities, such as fabless design and software development.

Apart from leveraging on the electronics sector, MSC Malaysia is also pushing for growth in other areas. In the creative multimedia industry, emphasis and support are provided for games, education and entertainment contents. Programmes for capability

development are offered to assist software companies in achieving recognized certifications like Capability Maturity Model-Integration (CMMI), Project Management Institute (PMI) and software testing.

This article focuses on public-private R&D collaboration as realized through a specific R&D grant scheme offered by the Government of Malaysia to enable MSC Malaysia companies to build software and hardware.

## Establishment of MSC Malaysia R&D Grant Scheme

If MSC Malaysia is to achieve its long-term aim of climbing the value chain in ICT, it could not solely rely on investments from multinationals in the areas of data centres, contact centres and regional service hubs. Although these activities serve to provide large quantities of employment opportunities and other economic spin-offs, it is constantly under stiff competition from countries such as India, China, the Philippines and Viet Nam.

In 1998, the government allocated M\$200 million (US\$59 million)<sup>1</sup> to Multimedia Development Corporation (MDeC) to establish the Malaysia R&D Grant Scheme (MGS) with the aim of financing R&D projects from small and medium businesses in software and hardware development. This programme meant for majority-owned Malaysian companies offered grants of up to 70 per cent of project-related costs or M\$3.50 million (US\$ 1.03 million), whichever was lower. Aimed at creating research-infused products, the grant covered cost items like salaries, overheads and related R&D equipment for a maximum period of two years.

The Strategic Thrust Areas in Research (STAR) Grant, a variant of MGS, was created in 2003. It offered three-year funding of up to M\$10.0 million (US\$2.9 million) or 70 per cent of approved project cost, whichever was lower, to companies willing to set up a research hub in MSC Malaysia. There

<sup>1</sup> All currency conversions at current exchange rate (US\$1 = M\$3.39)

were no equity requirements but recipients were required to produce at least five patent filings and hire up to 90 per cent Malaysians as researchers. The main purpose of STAR Grant was to create centres of excellence in key technology areas such as wireless and mobility, advanced software and microelectronics.

Grant applicants were required to submit a comprehensive research proposal that had to contain commercialization plans also. Right from the start, there was an emphasis on "beginning with the end in mind"; that is, to find whether the product had a commercial potential and whether the research would give it a sustainable advantage in the marketplace?

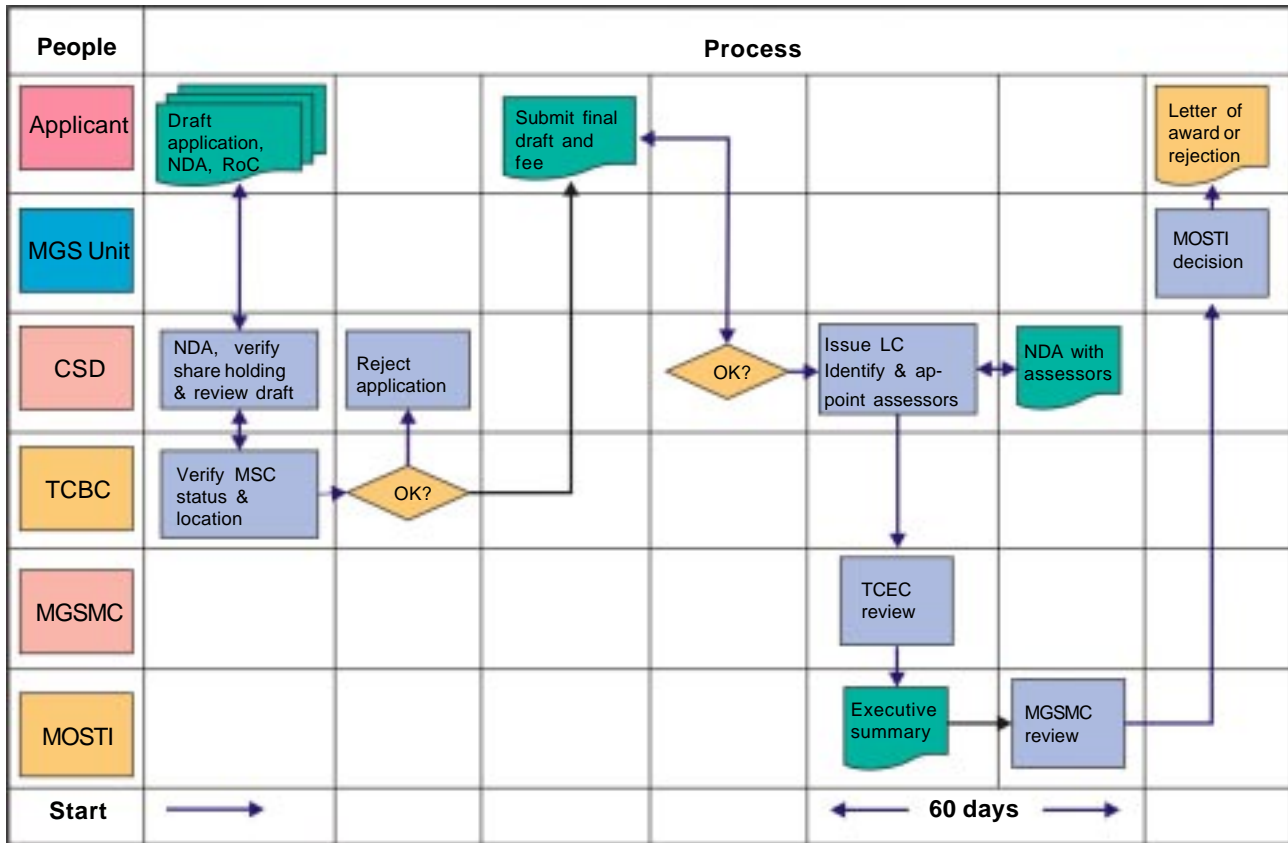
Proposal evaluation was carried out in two stages. The first stage involved appointing internal and external assessors to form a Technical and Commercial Evaluation Committee (TCEC). Their role was to analyse the proposal in detail and come up with funding recommendations. Some of the key assessment criteria include:

- The extent of applied research;
- Technical feasibility;
- Capability of core team members;
- Project management capabilities;
- Project milestones and deliverables;
- Creation of intellectual property;
- Market potential;
- Marketing plan;
- Projected cash flow; and
- Feasibility of project costing.

Applications that proposed the creation of patents with commercial value were highly regarded.

Upon completion of the first stage of evaluation, the findings of TCEC were tabled to the MGS Management Committee (MGSMC). This committee consisted of government stakeholders such as the Ministry of Finance, the Ministry of Science, Technology and Innovation (MSTI), and the Economic Planning Unit. Its role was to consider the TCEC recommendations with regard to project feasibility and funding, and to make a final recommendation to MSTI, which would take the final decision (Figure 1). The applications that were approved by MSTI received the grant in stages, based

Figure 1: Evaluation process flow of MGS applications



on actual expense incurred as well as milestone achievements.

**Case study: Jobstreet.com**

Jobstreet.com (www.jobstreet.com) is a public listed company on the Main Board of the Bursa Stock Exchange (formerly known as Kuala Lumpur Stock Exchange). It currently ranks as Southeast Asia’s largest online employment company, serving more than 45,000 employers and four million registered job seekers. From a humble beginning with five people, the company managed to secure Venture Capital and became the first online recruitment portal in Malaysia.

Relying on an alumni network from the Massachusetts Institute of Technology, the company developed all its required technologies in-house, using available tool-kits. Jobstreet applied to MGS to fund the development of an artificial intelligence engine that allows automatic search, short-listing and matching of candidate profile to employer requirements. The

justification for the project was clear: with an ever-expanding list of job-seekers’ CVs coupled with not only a growing list of new job requirements from employers but also more stringent employment criteria, employers had to have a better way to sift through large quantities of applicant information, saving time and making better hiring decisions.

Jobstreet teamed up with Multimedia University in Cyberjaya as part of the grant proposal, and the government approved M\$1.64 million (US\$484,000) grant to Jobstreet over a period of 20 months.

Today, Jobstreet continues to reap the benefit of industry-academia collaboration by sponsoring Master’s degree students to work on specific IT projects. The firm selects and supports students for two years where research, conceptual thinking, analysis and solution proposal are part of the learning curve. At the end of the sponsorship period, a prototype is implemented and results are bench-

marked. Students spend a week or two for orientation at Jobstreet’s office and provide monthly reports. In addition, they are also expected to spend a fair amount of time working with the Jobstreet team to ensure alignment to project goals. This arrangement has worked well for Jobstreet. Not only do they have a ready prototype, but it also nets them potential employees who are primed for the work.

Some of the key learnings from Jobstreet’s collaboration with Multimedia University are the following:

- It is crucial to find the right university partner to work with, one that understands deeply the business challenges;
- It is also important for the company to make an effort to obtain sufficient and clear understanding of research techniques that can be applied to solve the business problem;
- IP ownership should be made clear up-front; and
- Establish continuity in university

collaboration for reaping advances in technology for sustainable competitive advantage.

### MGS from 2006 to 2010

Under the 9<sup>th</sup> Malaysia Plan that runs from 2006 to 2010, MGS has continued with several variations. The main differences are:

- Project duration reduced to one year from two years;
- Grant ceiling reduced to M\$1.2 million (US\$354,000) from M\$3.5 million (US\$1.03 million);
- Disbursement model changed from reimbursement of actual expenses to fixed payout based on milestone achievements; and
- Under the STAR programme, projects were now funded for two years up to M\$7.5 million (US\$ 2.21 million) or 50 per cent of approved project cost, whichever was lower.

These changes were made upon reviewing the experiences gained during the grant's implementation over the years. Given the speed of change within the ICT industry, the funding period was reduced to enable more rapid speed to market. Secondly, the funding quantum was reduced to reflect the predominantly software-based businesses of MSC Malaysia status companies, where less funding was required for hardware design licenses and prototyping. Finally, the disbursement model was revised to speed up fund disbursement as well as ensure that projects produce the desired output as promised.

Another key change was in the application template and evaluation criteria. Before 2006, MGS had greater emphasis on research vis-à-vis development, but under the 9<sup>th</sup> Malaysia Plan, a more balanced focus on research vis-à-vis development or innovation was desired, and this had to be supported by clear commercial potential. The new application template now has the following criteria:

#### Category 1: technical merits

- Does the proposed project have R&D or systems development work of significance in the technology field and would the com-

pany acquire new knowledge and skills?

- Is the proposed product a unique innovation, or a modification of similar product in the market?
- Are the project activities, milestones, resource allocations and timelines realistic and achievable?
- Have the key project risks been adequately identified and is there a credible risk management plan?
- Does the project team have the required breadth and depth as well as the requisite experience and background/track record to deliver the project?
- Is there active involvement of Malaysian knowledge workers in the core project elements?
- Are the proposed equipment, facilities and other support relevant to the project?

#### Category 2: commercial merits

- Has the company defined its target market accurately and are there credible projections of future market growth?
- Does the company clearly understand the competitive landscape within their target markets and has it drawn up a credible positioning strategy for its product vis-à-vis competitors?
- Can the positioning strategy be supported by the proposed product pricing, features, performance and delivery?
- Have clear sales targets and market share goals been established in terms of geography and timelines? To what extent can the project outputs potentially increase exports and replace imports?
- Are there marketing, manufacturing and licensing arrangements?
- Have legal and trade barriers been addressed?
- Is there adequate marketing expertise available on the project team? Is future growth supported by marketing/sales expansion?

#### Category 3: financial merits

- Is there integrity in cost estimates?
- Is there reasonableness in the financial assumptions?
- Are financial management capabilities and resources evident?

- How healthy is the applicant's financial standing?

### Achievements

Under the 7<sup>th</sup> and 8<sup>th</sup> Malaysia Plans, between 1998 and 2005, MGS funded 67 companies for a total of M\$140.9 million (US\$41.56 million). Some of the notable successes emerging from this batch include Redtone International, Jobstreet.com, Green Packet, IRIS and I-Power. Twelve companies gained their listing on MESDAQ with a total capitalization of approximately M\$827 million (US\$244 million) as of April 2006. In addition, MGS projects trained over 1,000 knowledge workers in R&D, and 14 companies garnered 31 awards. Further recognition arrived when eight of these companies were listed in the Deloitte Technology Fast 500 Asia Pacific in the year 2004.

The first recipient of STAR was British Telecom's Asian Research Centre based in Cyberjaya. By the end of 2006, the Centre was employing more than 50 researchers, with Ph.D. holders forming approximately 10 per cent. It had filed five patents in the areas of mobile and wireless communications. Collaborations were forged with universities and today, some of the researchers have found their way into other companies and start-ups.

The second recipient was Mems Technology, a Malaysian company specializing in micro-electro-mechanical system (MEMS) devices such as accelerometers, silicon microphones and pressure sensors. Mems Technology is an upcoming player in the smart phone component supply market, and one of a few players with their own integrated manufacturing capability. The grant will be used by the company to establish a MEMS design centre in Penang. The company works closely with the Institute of Microengineering and Nanotechnology (IMEN) at the Universiti Kebangsaan Malaysia.

As of 27 July 2009, under the 9<sup>th</sup> Malaysian Plan, 46 companies have been awarded MGS for a total grant amount of M\$60.5 million (US\$17.85 million). Of these, 22 companies with total grant amount of M\$21.4 million (US\$6.31 million) have successfully

completed their projects and they are currently at various stages of commercialization.

Eight of the 46 funded projects had R&D collaboration with institutions of higher learning. This area can be further improved.

New STAR recipients under the 9<sup>th</sup> Plan include F-Secure and Panasonic R&D. F-Secure established its operations in Malaysia in 2005 and its Kuala Lumpur office operates as the Asia and Pacific headquarters for Singapore, Hong Kong, Japan, India and Australia. Its core activities in Malaysia are security response lab 24/7, 3rd level technical support 24/7, software development, technology research and marketing. Total staff strength stands at 180, with about 100 researchers having been involved in STAR research projects since 2007. Most of these are Malaysians.

So far, the following achievements from the completed projects have been recorded:

- Achieved export sales of M\$4.7 million (US\$1.39 million) and local sales of M\$ 16.5 million (US\$4.87 million);
- IP filings were made for 21 trademarks, 18 patents, 1 industrial design and 30 software copyrights; and
- Six international and two national awards were received.

### Challenges

Among the key challenges faced by MGS applicants is the effort required to put together a good grant proposal. MGS proposals need to be concise, cohesive and persuasive, but should avoid the use of jargons and buzzwords. To this end, the MGS Unit of MDeC offers help in reviewing the proposal and providing guidance on how best to position the application, given the company's business focus, strengths and weaknesses. For those applicants who have committed to writing it themselves, there are inherent rewards. For one, they are able to critically evaluate their own business assumptions, and ensure that they can put resources in place to achieve the goals set forth in the proposal. Part of this confidence will be borne

out during evaluation meetings, where evaluators look for commitment, integrity and competency.

The other challenge is to identify the innovation or research component that will offer sustainable advantage to the proposed solution. Companies without some background in research have tended to struggle with this.

### Case study: Zilun Systems Sdn. Bhd.

Zilun Systems ([www.zilun.com.my](http://www.zilun.com.my)) was founded in 2004 by two partners who had extensive working experience in CAD/CAM/CAE markets for the automotive industry. They observed that certain large contract manufacturers relied heavily on manual processes, assisted only by electronic spreadsheets, to retrieve engineering information and schedule production runs for customers. Given the distinctly different requirements of each customer with respect to a similar part, this meant a large amount of engineering information, right from the bill of materials up to the specific manufacturing processes, had to be used and managed efficiently. This led to the situation where heavy reliance is placed on just a few key personnel who had developed the know-how to manage these complex processes. A system was needed to reduce the risk of over-dependence and, at the same time, expand the factory's capacity effectively by maximizing machine utilization.

The early efforts of Zilun Systems had garnered them several awards, but a more complete system was required to handle complex environments. The partners sought the help of friends from Universiti Teknologi Malaysia (UTM), and a solution was found in the form of optimization algorithms. From the beginning, an under-

standing was reached in the area of intellectual property (IP) ownership between the two parties and soon after a team of six people from UTM was formed to work with Zilun.

The company applied for and received MGS grant of M\$1.2 million (US\$354,000), and the entire project was completed in March 2009. The solution is now undergoing live trials at the customers' sites. In addition to filing two patents, the project also produced one Ph.D. and two Master's degree holders.

Some of the key learnings in their collaboration with UTM are as follows:

- IP ownership issues should be resolved upfront prior to project commencement;
- University collaborators really need to grasp fully the customer/industrial problem to ensure successful development of a practical model; and
- The company needs to understand the constraints of each proposed model so as to aid in the development of the final model and minimize "patchwork" further on.

### The way forward

Looking ahead to the next five years, Malaysia will need to harness further its resources to drive innovation in the key sectors of the economy. Emphasis will be given to spur greater collaboration between MSC Malaysia status companies and Institutions of Higher Learning. Clusters with high IP productivity such as hardware/network/integrated circuit design, creative multimedia and artificial intelligence will be given priority. In addition, commercialization programmes will also be formulated to move products and services into the marketplace in a more visible as well as sustainable manner. □

#### India Innovation Initiative

The India Innovation Initiative (i3) project creates an innovation eco-system in the country by sensitizing and promoting Indian innovators aged 18 years and above and facilitating commercialization of the innovations. For more information, contact:

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