

Chapter 4

Information and Communications Technology

As Malaysia ventures forward in the 21st century, the surge towards building a strong and vibrant Information and Communications Technology (ICT) industry is at the forefront of the nation's vision to create a knowledge based society, which will be resilient in responding to the challenges in the new millennia. Even at present, Malaysia's ICT demographics have indeed been noteworthy with robust ICT consumption locally, a strong leaning towards e-commerce and the confidence conveyed by analysts on the future of this sector.

In line with a strong national vision towards this aim by the Government, industry and the citizens alike, Malaysia is definitely a major strategic location for investors to consider, especially with huge mega-projects being undertaken to achieve the aim – most notably the Multimedia Super Corridor (MSC) and the technological focus in educating the children of today. Coupled with a respectable legal cyberlaw framework, Malaysia is at the vanguard of purporting to undertake global responsibilities in line with international instituted governing conventions in electronic trading and operations, most notably the efforts to combat intellectual piracy and a set of regulatory guidelines for licensing. Also, most recently, Malaysia is positioning itself to be at the forefront of Biotechnology research and development under the auspicious National Biotechnology Directorate (NBD) reporting to the Ministry of Science Technology and the Environment (MOSTE)

Hence, for the wise and prudent investor, this chapter is divided into five sections to illustrate the competitiveness of Malaysia as the nation of choice for ICT ventures:

- Malaysia ICT Current Demographics
- Multimedia Super Corridor
- Biotechnology
- Malaysian Cyberlaws and Licensing Guidelines

4.1 Malaysia Current ICT Demographics – A Panoramic Insight

General ICT Statistics

Overall ICT expenditure of industrial sectors in Malaysia from 1996-2000 enjoyed an average annual growth rate of 9.2 per cent during these five years (Eighth Malaysia Plan).

The following are some quick current statistics regarding various growth levels in the ICT industry:

- a) Malaysia's IT expenditure is expected to increase by about 10% from around US\$2.2bil (RM8.36bil) in 2001 to US\$2.4bil (RM9.12bil) in 2002 (IDC)
- b) PC penetration in 2002: 14 to 15 per cent (New Straits Times – Computimes (Malaysia), IDC)

- c) Internet penetration growth in 2001: 27.5 per cent [(Malaysian Communications and Multi Media Commission) (CMC)]
- d) Projected categories of ICT growth for 2002 – IT Services 20%, Packaged Software and Data Communications equipment 10% and PCs and Servers 5% (New Straits Times – Investor Digest (Malaysia), IDC)
- e) E-commerce revenue: US\$426 million in 2000 and expected to reach US\$3 billion in 2004 (IDC). The government predicts this figure will increase to US\$9 billion by 2005 (Eight Malaysian Plan)
- f) E-commerce market growth forecast: compounded average growth rate of 47.3 per cent for the 2000 to 2005 period. (IDC)
- g) ICT segments forecast for 2006 (IDC):
 - PC Market valued at RM5.75billion
 - Enterprise Server Market valued at RM665billion
 - Software Segment valued at RM2.68billion
 - Services valued at RM3.73billion
 - Data Communications valued at RM1.67billion

By 2005, the Ministry of Energy, Communications and Multimedia is aiming for the nation to attain the target of 30 PC owners per 100 population and 25 Internet users per 100 population to pave the path towards a knowledge-based society.

ICT Public Sector Incentives and Listings

The Malaysian Government has generously allocated a substantial RM4.7 billion for the purposes of developing the science and technology field for the period 2001-2005. Although some of the programs are not necessarily exclusive for the ICT sector, they are pertinent considerations for the smart investor to grasp any available funding mechanisms that can boost profitability.

The incentives as tabled below are mainly geared towards research and development and the commercialization of technology findings.

Programs under the Eighth Malaysian Plan (2001-2005)	Government Allocation (RM mil*)
Intensification of Research in Priority Areas (IRPA)	1,000
Technology Development for Small Medium Industries	30
Technology Acquisition Fund (TAF)	250
Industrial Research and Development Grant Scheme (IGS)	200
MSC Research and Development Grant Scheme (MGS)	200
Demonstrator Applications Grant Scheme (DAGS)	100
Commercialization of Research and Development Fund (CRDF)	110
Science and Technology Infrastructure and Development	2,818.9
TOTAL	4708.9 (US\$1.2 billion)

Source: Eighth Malaysia Plan, 2001

Note: Exchange rate - US\$1:RM3.8

In due consideration of the immense potential of the ICT sector, The Malaysian Exchange of Securities Dealing and Automated Quotation (MESDAQ) was established as an alternative avenue for fund raising for technology and high-growth companies without a track-record or start-up companies. Since inception in April 1999, three technology-based companies have been listed on the exchange and it is reported that many companies are in the pipeline of being listed on the MESDAQ.

ICT Government Expenditure

The Malaysian Government, as part of its vision to develop the nation into a knowledge-based economy is setting the example in its investments into numerous ICT-related program and projects. A 5-year budget of approximately RM5.2 billion (US\$1.4 billion) for ICT related expenditure clearly reflects the Government's commitment as illustrated in the table below.

Program/Project	Allocation (RM million*)	Percentage
Flagship Applications	1,824.9	35.4
Computerization of government ministries and agencies	1,641.8	31.8
Research and Development	300	5.8
Bridging the Digital Divide	1,098.0	21.3
Local Content	10.0	0.2
Others	284.4	5.5
TOTAL	5,159.1 (US\$1.36 billion)	100.0

Source: Eighth Malaysia Plan, 2001

*Exchange rate - US\$1:RM3.8

National ICT Infrastructure

Fixed line population penetration rate in Malaysia was 20-23 per cent in 2000 and it is targeted for 35 per cent in 2005. Mobile phone population was estimated to be 23 per cent in 2000 and is targeted by the Ministry of Energy, Communications and Multimedia to reach 30 per cent in 2005. Currently, there are 6 licensed telcos that provides an array of telephony services. They are namely, Telekom Malaysia, Celcom, Maxis Communications, Time Telekom, Digi Telekom and Prismanet.

In terms of satellite technology, Malaysia has invested in the creation of satellite gateways in four major cities namely Kuantan, Labuan, Melaka and Sematan, which provides connections to countries around the Indian and Pacific Oceans.

The vision to be a developed nation by 2020 has made it crucial for Malaysia to develop her own communications satellite facilities. January 13, 1996 commemorated the nation's successful launching of the pioneer [Geo-stationary Malaysia East Asia Satellite](#) (MEASAT 1).

This in turn accelerated investments in the technological and commercial aspects of satellite communications. The second satellite, MEASAT 2 was successfully placed into orbit on November 14 of the same year, while Malaysia's first microsatellite, TiungSat, a Low Earth Orbit (LEO) satellite was launched in June 2000. With two Malaysian satellites operating in

their individual orbital slots and with many more planned, the satellite communications industry in Malaysia is destined for growth.

For the purposes of improving Internet penetration and propagating e-commerce, the nation has over 245,000 kilometers¹ of fibre optic network that traverses from North to South of Peninsular Malaysia and stretches via a submarine cable to the states of Sabah and Sarawak in East Malaysia. This enables the nation to benefit from high capacity broadband transmissions to channel electronic data, voice and video images across the states and major towns in Malaysia. A second submarine fibre optic cable connecting Peninsular Malaysia to Sabah and Sarawak is also in place. The transmission backbone in Malaysia will be fully upgraded nationwide to 10 Gbps within 5 years, according to the Eighth Malaysia Plan.

Asymmetric Digital Subscriber Line (ADSL) technology will also be introduced on a wider scale to residential and business areas to support multimedia applications and for speedier Internet access. The government has also promised to introduce broadband access on flat-rate bandwidth-based charges to increase uptake of Internet-based applications among the general population.

Migration to third generation (3G) mobile communications technology will also be expected and at present, some telecommunication companies are offering 2.5G technologies to service Malaysian mobile users. Currently, the major telecommunication players in Malaysia are in the process of applying for the exclusive licenses to implement 3G.

For e-commerce transactions, the Central Bank of Malaysia (*Bank Negara Malaysia*) has successfully completed and operates an online payment gateway known as the Malaysian Electronic Payment Systems (MEPS) to allow transactions between buyers and sellers over the Internet.

In addition, several B2B Internet hubs have developed, most of which are centered on specific industries. For example, Binaonline.com, a B2B construction portal, had signed on over 600 member companies by March 2001 and logged more than 20 closed tenders for construction services. Tradenex.com, the B2B electronic marketplace of the federation of Malaysian Manufacturers (FMM), undertook a RM15.5m expansion in March 2001 to enhance services, including supply-chain and trade financing processes, for its 2100 members².

ICT Workforce

Malaysia has placed a wide emphasis in creating an ICT literate workforce as there are over 170 private institutions and 28 public institutions offering ICT courses at the diploma, bachelor and post-graduate levels. More tertiary based ICT and related engineering courses will be introduced in the next few years. It is expected that a total of 122,910 students will enroll in these institutions for such courses by 2004, mainly at the diploma and bachelor degree levels. Malaysians have also sought overseas ICT related degree courses in reputable institutions in the UK, US and Australia³.

¹ Source: Telekom Malaysia, as at March 31, 2001

² Source: Economist Intelligence Unit

¹ Source: Economist Intelligence Unit

³ All figures quoted from Eighth Malaysia Plan, 2001.

A Human Resource Development Fund (HRDF) was created to emphasize the importance of continuous development of the workforce in the country and is funded by registered employers who register to pay the Human Resources Development Levy. Contributors to the Fund are then eligible to apply for reimbursements for equipping workers with skills and knowledge, particularly in the field of ICT. Apprenticeship schemes in ICT related areas will also be initiated and the Government will provide tax incentives to reduce the cost of training to firms under the Eighth Malaysian Plan.

4.2 Multimedia Super Corridor (MSC) – An Exciting Opportunity Awaits

Why the Multimedia Super Corridor (MSC) in Malaysia? What does it entail? Why has it received so much attention worldwide amidst the mixture of praise and criticism of its success?

The MSC represents the pioneering initiative of the Malaysian Government to spearhead Malaysia into a knowledge-based nation by 2020. The MSC is expected to be a major catalyst to achieve this far-sighted goal and hence, much painstaking effort had been undertaken to ensure its success. More exhilarating prospects, however, now awaits as the MSC has successfully achieved its predetermined major goals and is moving on towards Phase II of its development.

This section is therefore dedicated to present to investors an unequivocal introduction to the MSC and present a window of opportunity to Malaysia's premier ICT strategy in the forthcoming years.

Overview

The Multimedia Super Corridor (MSC) was launched on 1 August 1996 as a prime initiative by the Malaysian Government to accelerate Malaysia's entry into the Information Age, in line with actualizing Vision 2020 to develop a fully developed, matured and knowledge-rich society by year 2020. The Malaysian Development Corporation (MDC) was constituted on 5 June 1996 for the purpose of overseeing and implementing the MSC.

The MSC is located at a *green field* corridor spanning 15 kilometers wide and 50 kilometers long, stretching from the Kuala Lumpur City Center (KLCC) to the Kuala Lumpur International Airport (KLIA). The area also encompasses two of the world's first Smart Garden Cities, namely *Putrajaya*, the new administrative capital of Malaysia and *Cyberjaya*, an intelligent city housing multimedia industries, R&D centres, Malaysia's Multimedia University and the operational headquarters of choice for multinational multimedia technology based corporations.

A 20-year time frame is estimated by MDC for the completion and execution of the MSC, which will herald a new era of Malaysian leadership in the Information Age and to create an ideal ICT environment in Malaysia for the development of the sector. The three phases of activity targeted within the designated period are as follows:

Phase I (1996-2002):

Under this phase, the MDC will successfully create the Multimedia Super Corridor, attract a core group of world-class companies, launch seven Flagship Applications, put in place a world-leading framework of cyberlaws, and establish Cyberjaya and Putrajaya as the world-first intelligent cities.

Phase II (2003-2010):

The MDC envisages that during this period, it will link the MSC to other four to five cybercities in Malaysia and the world. It will create a web of interconnected corridors and establish a second cluster of world-class companies in other states in the country. At this stage MDC will also set global standards in flagship applications, champion cyberlaws within the global society, and establish a number of intelligent worldwide linked cities.

Phase III (2011-2020):

During this final phase, it is expected that Malaysia will be transformed into a knowledge-based society – being a truly global test bed for new multimedia and IT applications and a cradle for a record number of multimedia companies. It will have a cluster of 12 intelligent cities linked to the global information super highway and become the platform for the International Cybercourt of Justice.

Despite skepticism of its success, the MSC has continuously received the support from the top global ICT players that form the International Advisory Panel (IAP) – a highly regarded gathering which continuously draws in the foremost echelons in the ICT arena.

Furthermore, the MDC's targeted 400 MSC Status companies by the end of 2000 was fully met and this was proven as at 31 December 2000, the number of MSC Status companies was reported to be 429⁴. Currently, the figure is at 648 and growing. This represents a noteworthy success for the MSC since Malaysia's IT hub not only fulfilled the envisioned quota but managed to attract star-studded companies to create start-ups within the designated vicinity. The summary of the McKinsey report pertaining to an independent study of the MSC was also quoted that in spite of the shortcomings, the super corridor did '*make a significant progress*', an important consideration for investors⁵.

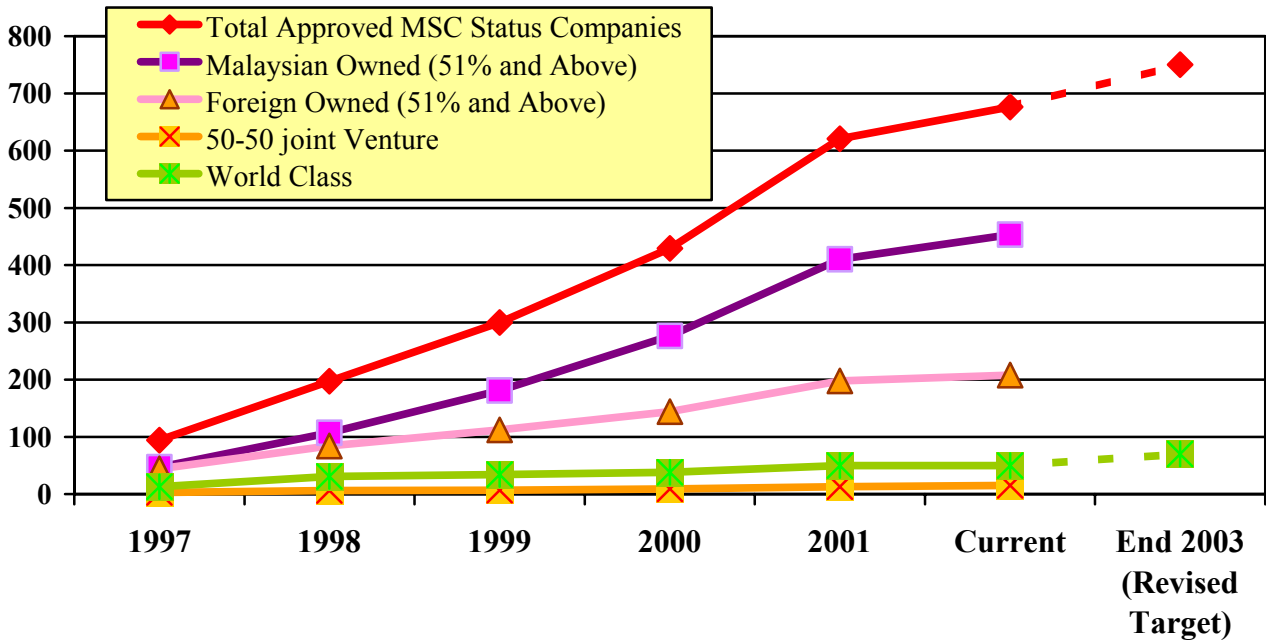
MSC Quick Market Stats

The following are some market statistics on the progress of the MSC in developing Malaysia's ICT industry:

⁴ NST, Local Independent Malaysian Press

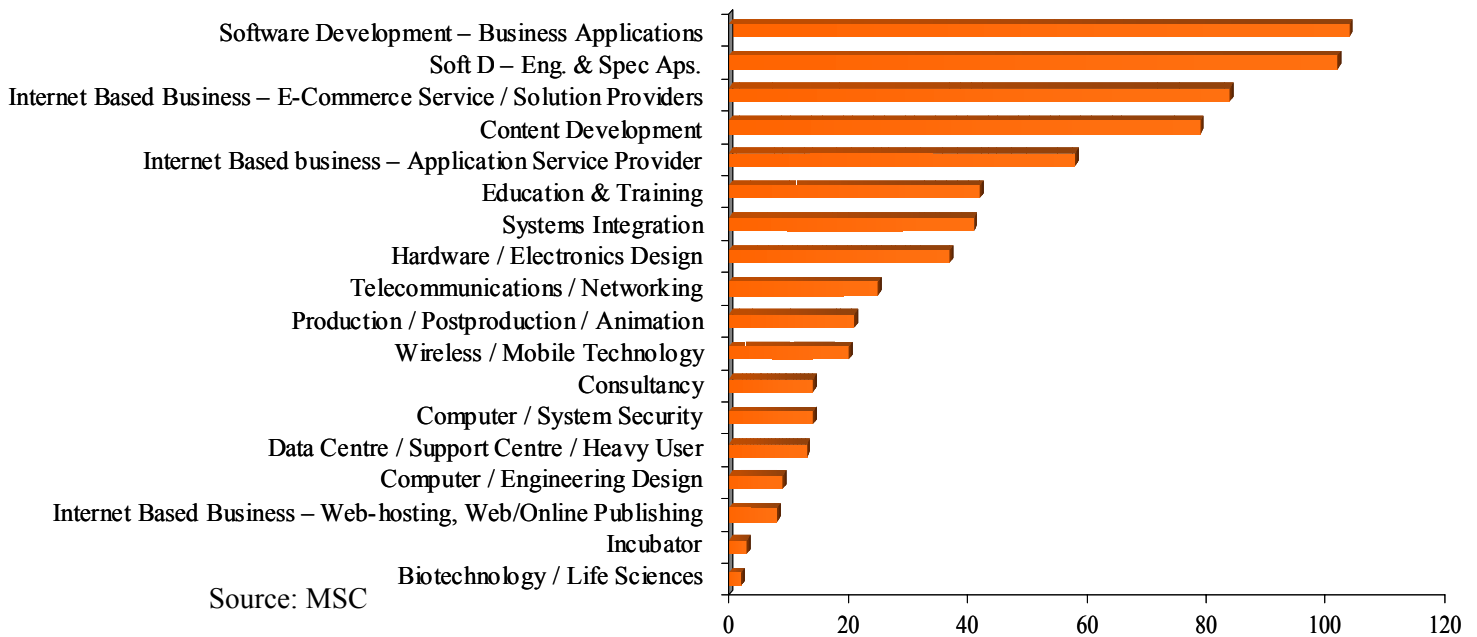
⁵ Quoted from: the Asian Wall Street Journal via Dow Jones (26 March 2001)

Growth of MSC Status Companies as of May 8, 2002



Source: MSC

Approved 650 MSC Companies by Sectors as of May 8, 2002



Source: MSC

MSC Status Benefits

To encourage the development of the MSC, the Government has introduced an incentive known as the MSC status for companies that adhere to certain stipulated requirements.

MSC Status companies benefit from the Government's pledge through the Bill of Guarantees, which encompasses the following:

1. Provide a world-class physical and information infrastructure.
2. Allow unrestricted employment of local and foreign knowledge workers.
3. Ensure freedom of ownership by exempting companies with MSC Status from local ownership requirements.
4. Give the freedom to source capital globally for MSC infrastructure, and the right to borrow funds globally.
5. Provide competitive financial incentives.
6. Become a regional leader in intellectual property protection and cyberlaws.
7. Ensure no Internet censorship.
8. Provide globally competitive telecommunication tariffs.
9. Tender key MSC infrastructure contracts to leading companies willing to use the MSC as their regional hub.
10. Provide a high-powered implementation agency to act as an effective one-stop super shop.

Other incentives to companies on being conferred MSC Status include:

1. Financial Incentives
 - Eligibility to the Multimedia Super Corridor Research and Development Grant Scheme (MGS) and venture capital opportunities from MSC Venture Capital Sdn. Bhd. (MSCVC) – a full subsidiary of MDC. The application and approval process for the MGS is relatively simple. The application will be filtered through a Technical and Commercial Evaluation Committee. After which, recommendations will be given to the MGS Management Committee and an approval should be released within 2 months of the applications.

As for Venture Capital opportunities, there are 4 steps involved in the application process: -

- i. Executive Summary – This involves preparing and submitting an executive summary of the overall plan and should contain the salient points of the proposal.
- ii. Executive Presentation – Potentials will be invited to present an executive presentation, which should incorporate an initial briefing of the entire business plan.
- iii. Business Plan and Due Diligence – If all criteria's are met thus far, MSCVC will request for a Business Plan and a detailed due diligence exercise of the applicants company will be conducted.
- iv. Making the Investment – After approval, MSCVC will discuss the terms and conditions of the investment with the applicant. Support and advice will also be given on a continuous basis

- Other financial incentives:
 - i. Investment tax allowance (ITA) is a 100% deduction on qualifying capital expenditure investments made within the first 5 years of a company's operation. "Qualifying capital expenditures" are; and are not limited to – Hardware and software, purchasing and/or renovation of building/office and expenditure of plant and machinery.
 - ii. Pioneer Status, which entitles companies to a 100% tax exemption for a period of five years for the first round. The tax exemption will later be extended for the next 5 years *provided* an application is forwarded to the MDC through its respective Account Manager and approval is granted via the Internal Approval Committee who in turn seeks the approval from the Ministry of Finance (MOF) and the Ministry of Trade and Industry (MITI). There are two ways of determining the effective date of pioneer status – The first being if the company does not have MSC status; the effective date begins on the day the MSC status is granted. The second being if the company is incorporated in Malaysia after MSC status is granted the effective date will commence on the day the company makes its first sale. Another benefit of having Pioneer Status is a tax exemption on income. This means, dividends paid to shareholders from tax exempt accounts will not be subject to income tax and where the recipient of exempt dividends is from another company, any dividends paid by that company to its shareholders would also be exempted from tax.
 - iii. Freedom to source capital and borrow funds globally. This means MSC Status company's are given general exemptions by the Controller of Foreign Exchange (Central Bank - Bank Negara) from exchange control requirements. These exemptions allows MSC Status company's to perform international monetary transactions and borrowings without having to obtain prior approval from Bank Negara Malaysia

2. Non-Financial Incentives

- The right to tender for key implementation contracts for Flagship Applications.
- Support from the MDC's one-stop client center that will expedite visas and other licenses and permits.
- Intellectual property protection and a world-first comprehensive framework of cyberlaws.
- Direct access to Malaysia's top leadership through membership of the MSC's International Advisory Panel, chaired by the Prime Minister, and the Founders Council, chaired by the Deputy Prime Minister. First movers to the MSC will be invited to sit on these high-level councils.
- Access to the high-capacity telecommunications and logistics MSC infrastructure that includes an Asynchronous Transfer Mode (ATM) based 2.5 – 10 gigabit optic fibre network with globally competitive telecommunication rates. The network includes a direct high-capacity links to Japan, US, Europe and countries in the Southeast Asia.
- Duty free importation of multi-media equipment

- Globally competitive Telecommunication tariffs and services reviewed and benchmarked against the best in the region every 6 months
- Excellent R&D facilities including access to the regions first Multi-Media University
- Green environment protected by strict zoning within the MSC area

MSC Status Application

MSC Status is not automatically awarded to companies upon locating their operations within the designated MSC area. To qualify for this status, investors are required to abide by a predetermined set of professional operational standards in line with the aim to support MSC companies to achieve pre-eminence in the global arena.

Applicants are hence required to contact the Multimedia Development Corporation (MDC) and are required to fulfill certain requirements as summarized as follows.

Every company that is awarded the MSC Status needs to comply with six *core* criteria as follows:

1. The company must be a provider or heavy user of multimedia products and services.
2. The company is required to employ a substantial number of knowledge workers.
3. The company should be able to outline the methodology in transferring technology and knowledge to Malaysia *or* contribute towards the development of the MSC and the Malaysian economy.
4. The company must establish a separate legal entity for MSC-qualifying multimedia business and activities
5. The company must be located in an MSC designated cybercity, which consist of:
 - Cyberjaya
 - Technology Park Malaysia (Phase 1 only)
 - UPM-MTDC
 - KLCC (Twin Towers only)
 - KL Tower (Communications Tower)
6. The company must comply with environmental guidelines

Options available to fulfill *other* MSC criteria include:

- Form a consortium to develop contractual Flagship Applications;
- Center their R&D activities within the MSC;
- Locate their manufacturing operations in the MSC;
- Use the MSC as a regional or global marketing base; and
- Provide value-added telecommunications services.

Applications must be accompanied by three copies of the MSC Status application form, a *three-year* business development plan, three years Audited Report of Substantial Stakeholders, three copies of the MSC Status Financial Account Template and a processing fee of RM2,000 payable to MDC.

To ensure that companies interested in entering the MSC have what they need to succeed, the MDC will function as a unique, performance-oriented, client-focused agency. It will provide the latest information and advice on the MSC, assist in expediting permit and license approvals, and introduce companies to potential local partners and financiers. In working

with companies setting up operations in the MSC, the MDC will further serve as promoter and facilitator to all MSC Status companies.

MDC guarantees a 30-day turnaround for applications, and will coach companies through the application process.

MSC Flagship Applications⁶ (Phase 1)

In addition to these tantalising profit opportunities of being concurred MSC status, the MSC presents a total of seven primary areas for multimedia applications to lead the development of the MSC. These flagship applications aim to ignite opportunities for the development of leading-edge multimedia applications as well as utilise the MSC as a global test bed for new developments. As a continuous aim for improvement, the number of flagships will be extended in the coming days to reflect Malaysia's efforts in expanding into various technological initiatives and fields to remain at the top of the ICT evolution curve.

The seven flagship applications of the MSC include:

Electronic Government

The vision of Electronic Government sees the civil service, businesses and citizens working together using multimedia technology for the benefit of all residents in Malaysia. The concept of an Electronic Government is expected to create fundamental changes in the fabric of society and be an important contributor in Malaysia's overall effort to become a fully developed nation. With this flagship application in place, Malaysia will be amongst the leading e-governments in the world today.

Five pilot applications have been identified to lead the development towards an Electronic Government and many are near completion:

- 1) Electronic Delivery of Driver & Vehicle Registration, Licensing and Summons Services, Utility Bill Payments and Ministry of Health Online Information;
- 2) Electronic Procurement (completed and launched in October 2000);
- 3) Prime Minister's Office – Generic Office Environment;
- 4) Human Resource Management Information Systems; and
- 5) Project Monitoring System.

Multi-Purpose Card

The MSC will be the test bed for the world's first, national multi-purpose card, which will be issued to all Malaysian citizens. Through this application, a single common technology platform will be developed that will enable government and private application providers to implement smart card solutions without duplication of effort and investment.

The "Smart-Card" will serve as a national ID, driving license, immigration and health card, electronic cash, debit, ATM and credit card. This RM270 million project outsourced by the Malaysian Government is in the process of undergoing a pilot-testing phase before a national rollout is scheduled in 2003.

⁶ Source: MSC

Smart Schools.

The Smart Schools Flagship Application is driven by the impending necessity to equip the workforce to complete Malaysia's transformation from a production (p) to a knowledge (k) – based economy. This would call for a technologically literate, thinking workforce, which is well able to perform in a global environment and use Information Age tools and technology to improve productivity.

Multimedia technologies ranging from computers and networks in schools to new teaching-learning software will be prime enablers in this flagship application. Approximately 90 schools across Malaysia are undergoing the pilot phase of Smart Schools and it is envisioned that by 2010, every school in Malaysia will enjoy a smart learning environment.

Telemedicine

The Telemedicine initiative aims to keep people continuously health conscious through seamless availability of information and virtual services to dramatically widen the horizon of healthcare services that are traditionally delivered and accessed physically through a computerized forefront where the Internet plays a predominant role in providing value-added services.

The pilot applications are Mass Customized /Personalized Health Information and Education (MCPHIE), Continuing Medical Education (CME), Teleconsultation systems, and Personalized Lifetime Health Plan (PLHP). Save for PLHP, which at the time of writing⁷ is nearing completion, all the other pilot applications are in operation, stemming the success of accomplishing the initial phase of this particular flagship application.

A further RM100 million investment is planned to complete the deployment of this initiative and more functionalities is expected in the forthcoming years for both the *rakyat* (the people) and opportunities for the corporate sector.

R & D Cluster

This will help to ensure that the MSC establishes itself as an attractive location for innovative companies developing cutting edge multimedia technologies.

Three core elements that will assist in achieving the flagship application are envisioned as follows:

- A corporate R & D cluster will be established and fostered through R&D funding, fiscal incentives, and dedicated facilities.
- A new Multimedia University will be created to provide links between corporate and academic R& D activities, as well as help build a strong base of local knowledge workers.
- Large-scale R&D pilot projects will be strongly encouraged and developed to provide companies with opportunities for collaboration around significant projects.

⁷ As at July 2002

The MSC's R&D Cluster will foster collaborative efforts among leading multimedia R&D firms, local universities and public research institutions and support the growth of numerous small companies engaged in multimedia R&D.

E-Business - Worldwide Manufacturing Web/ Borderless Marketing

This is an initiative to provide an environment for high value-added manufacturing activities and related service operations, this Flagship Application will create the ideal platform using multimedia and information technology.

The Worldwide Manufacturing Web will provide companies with the opportunity to locate manufacturing and manufacturing service hubs within the MSC, and encourage them to build links between their national and regional operational centers around a wide range of support services – including R&D, Design, Engineering Support, Manufacturing Control, Procurement, and distribution & Logistics Support.

This exciting opportunity allows companies to benefit from synergies of a close-proximity, world-class manufacturing community to achieve global competitiveness via cost-savings.

The Borderless Marketing Flagship Application is an initiative to create a world-best environment in the MSC for companies using multimedia technology to create and deliver marketing messages, customer services, and information products to their multi-cultural and multi-national customers.

By providing a platform for local and global companies to interact with their customers, Borderless Marketing will facilitate their existing businesses, and generate new business opportunities. It is designed to spearhead the growth of multimedia-based service industries in the MSC, with emphasis on Telemarketing, Online Information Services, Electronic Commerce and Digital Broadcasting.

Technopreneur Development

The Technopreneur Development program was conceived and launched on 6th November 2001. The aim of the flagship implemented by the Multi Media Development Program (MDC) is to nurture the growth of Small and Medium Enterprises (SMEs) to be inline with MDC's objective to spur economic development in the strategic area of Information and Communications Technology (ICT)/Multi Media (MM). The new high growth area of biotechnology will also be targeted by the flagship with respect to bioinformatics and the MSC's telehealth initiatives.

Key drivers that will fuel the Technopreneur Development flagship are:

- **Talent development** with skill-based training programs organized in collaboration with various Government bodies, institutions of higher learning and private corporations
- Promoting the growth of a **National Incubator Network (NIN)** as the **spawning ground** for entrepreneurs nationwide. These incubators will receive MSC- Status and will enjoy the incentives outlined in the Bill of Guarantees
- **Ensuring sufficiency and effective disbursement of funds** for seed capital, grants and venture capital to meet the needs of the industry

- Strengthening **market access** through partnership programs, trade missions and participation in international exhibitions to assist Malaysian ICT/MM SMEs to go global
- **Creating a network** of local and international SMEs, and providing a platform for the community to exchange resources and knowledge via a Technopreneur Portal

4.4 Biotechnology

Biotechnology is a fairly new industry in Malaysia with a vast growth potential. Malaysia is experiencing not only the maturing of dedicated biotechnology companies but also established industries in the resource sectors (eg. Kumpulan Guthries Berhad, Sime Darby Plantation) are beginning to examine the potential of biotechnology, particularly in the agricultural field.

The main driver in establishing a strong Biotechnology presence in Malaysia is the National Biotechnology Directorate established in 1996 (BIOTEK), which is a division in the Ministry of Science, Technology and the Environment (MOSTE). BIOTEK's mission is to commercialize the Biotechnology industry in Malaysia and establish Malaysia as a market leader in this field. Also, to foster the structured growth of Biotechnology in Malaysia is Bio Valley - located within the Multimedia Super Corridor, it will establish the nucleus of a biotechnology cluster in Malaysia. At the core of the BioValley will be three Institutes, each of which will have a mandate to pursue research in fields of technology that are critical to the biotechnology industry: Genomics and Molecular Biology; Nutraceuticals and Pharmaceuticals; and Agricultural Biotechnology. BioValley Malaysia is expected to create about 17,000 jobs, 250 new companies and attract investments of around USD 13 billion⁸.

Specifically, an important program of BIOTEK that will have a direct impact on potential investors is BIOTEK's corporate services. This program is designed to initiate and develop collaborative research with research organizations and industries and whose results will lead to successful commercialization of the industry. Key to this would be the setting-up of Biotechnology Cooperative Centers (BCC) to lead the research and development efforts of specific Biotechnology fields.

Another significant Brainchild of BIOTEK is the National Biotechnology and Bioinformatics Network (NBBnet). NBBnet is established as a distributed database and network composing of NBBnet Coordinating Center (NCC) located at MOSTE. The center will coordinate a multidisciplinary network of users that have common interest in Biotechnology and related fields. The philosophy underlying NBBnet is an operational mechanism to facilitate interaction between universities, research institutions, government policy makers and industry with the objectives of enhancing R&D activities, Human Resource Development and commercialization of biotechnology opportunities.

An immediate chapter of Biotechnology in Malaysia is the organization of Bio Malaysia 2002, a symposium, business partnering and exhibition event organized by BIOTEK. The event will run from 1-4 October 2002. Organizations and persons from related industries including investors, entrepreneurs, academics, venture capitalists and senior executives from

⁸ Source: National Biotechnology Directorate

diverse industries who are interested to participate in the development of BioValley Malaysia are strongly advised to participate in BioMalaysia 2002.

4.5 Malaysian Cyberlaws and Licensing Guidelines

No ICT investment or initiative is complete unless one understands the regulatory procedure of the nation in consideration, particularly in the area of cyberlaws (electronic transaction based regulations). In this aspect, Malaysia stands tall in the eyes of the world in having a set of cyberlaws that reflects the seriousness of our Government to ensure that a safe environment is in place for e-businesses to thrive in a competitive global arena.

Malaysian cyberlaws are constantly being reviewed by the Government and is intended to serve three main purposes:

- Uphold Intellectual Property (IP) rights
- Ensure a governed environment for the IT and multimedia industry
- Provide a system to validate and regulate online transactions

The following are selected cyberlaws enacted by the Government of Malaysia:

The Malaysian Communications and Multimedia Commission Act 1998

As at 1st November 1998, The Malaysian Communications and Multimedia Commission Act 1998 came into effect with the purpose of regulating the telecommunications and broadcasting industries as well as overseeing the IT industry and online services. The enactment of the Act provided a framework for the establishment of the Malaysian Communications and Multimedia Commission, which is authorized to be the sole regulatory authority to supervise and regulate communications and multimedia activities in Malaysia.

The Communications and Multimedia Act 1998

The Communications and Multimedia Act 1998 (CMA), which came into effect on 1st April 1999, seeks to provide a standard set of regulatory provisions to consolidate the telecommunications, broadcasting and computing industries but is however, **restricted to networked services and activities only**. Non-networked activities such as postal, print media and CDs are not within the scope of this legislation. The industry will ultimately be geared towards self-regulation, with government intervention to be minimal and as when deemed necessarily based on national interests.

Under the Act, the categories of licenses that are issued include:

Network Facilities Provider License (Individual and Class)

- *Network Facilities Providers* (NFP) are owners of communication and multimedia infrastructure that enables communication to be transmitted via electronic and air waves.

Network Service Provider License (Individual and Class)

- *Network Service Providers* (NSP) is defined as providers of basic connectivity and bandwidth to support a variety of application services. Network services enable connectivity or transport of data and information between different networks.

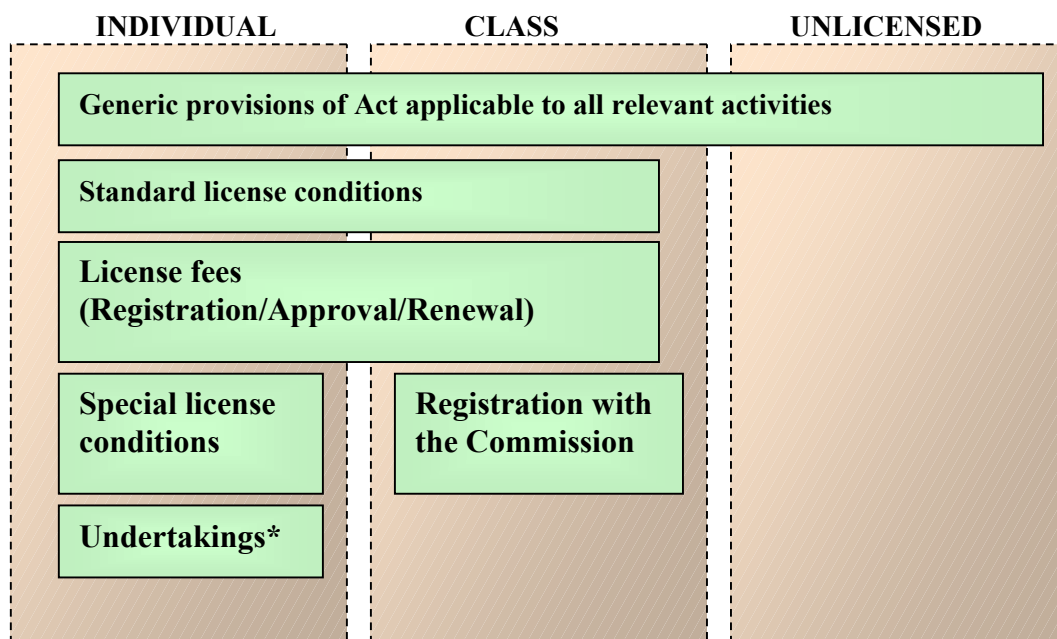
Application Service Provider License (Individual and Class)

- *Application Service Providers (ASP)* is defined as providers of functions essentially to end-users such as, but not exclusive to, voice services, data services, content-based services, electronic commerce and other transaction services.

Content Applications Service Provider License (Individual and Class)

- *Content Application Service Providers (CASP)* are a special subset of Application Service Providers including those providing traditional broadcast services, limited or closed *content services* and the newer *Internet content services*.

The licensing environment can be illustrated in the Diagram below:



*'Undertakings' is defined as an agreement by a person to meet particular conditions to perform particular actions or to provide services on particular terms and conditions without discrimination.

The Table below enlists activities requirements for licensing and exemptions⁹:

Licence	Type	Compulsory	Exempted
Network Facilities	Individual	Earth Stations	Broadcasting and production studios Incidental network facilities Internet cross connect equipment Private network facilities
		Fixed lines and cables	
		Public payphone facilities	
		Satellite hubs	
		Radiocommunications transmitters and links	
	Towers, poles, ducts and pits used in conjunction with other network facilities		
Class	Niche or limited purpose network facilities ¹⁰		
	Telex facility and service		
Network Services	Individual	Bandwidth services	Incidental network services LAN services Private network service Router Internetworking
		Broadcasting distribution services	
		Cellular mobile services	
		Customer access services	
		Mobile satellite services	
	Class	Niche customer access	
		Niche connection service	
Application services	Individual	PSTN telephony	Electronic transaction service Interactive transaction service Networked advertising board and Cineplex Web hosting or client server
		Public cellular telephony	
		Internet Protocol (IP) telephony	
		Public payphone service	
		Public switched data service	
	Class	Audiotext hosting provided on an opt-in basis	
		Directory service	
		Internet access service ¹¹	
		Messaging service	
		Private payphone service	
Telegram service			
Content Application Services ¹²	Individual	Satellite broadcasting	Internet content applications service
		Subscription broadcasting	
		Terrestrial free to air TV	
		Terrestrial radio broadcasting	

⁹ As at May 2000 (subject to changes by the Ministry)

¹⁰ Minister may issue guidelines on the meaning of niche or limited purpose network facilities

¹¹ A person who provides Internet Access Service under the class licence cannot provide PSTN telephony or IP telephony services

¹² Currently there is no content applications service under the class licence category

The Digital Signature Act 1997

This Digital Signature Act 1997 was enforced on 1 October 1998 and defines a **digital signature** as a transformation of a message using an **asymmetric cryptosystem** such that a person having the initial message and the signer's public key can be accurately determined. Digital signatures are intended to provide a means of secure online transactions and this Act accolades documents bearing such signatures as legally binding documents.

Only licensed **Certification Authorities** (CA) are allowed to issue Digital Certificates bearing digital signatures. CA are monitored by the Controller of Certification Authority (CCA), which was also appointed on 1 October 1998. The CCA is served by the Postal Department of the Ministry of Energy, Communications and Multimedia. At present, two CA have received operational licences to offer such services, that is, *Digicert Sdn. Bhd.* and *MSCTrustgate.com Sdn. Bhd.*

The Computer Crimes Act 1997

Enforced on 1st June 2000, the Computer Crimes Act 1997 relates to offences pertaining to the misuse of computers and enlists 5 major offences it aims to curtail. The related offences covered in the Act are as follows:

- Unauthorized access to any computer material.
- Unauthorized access to any computer material with intent of fraud, dishonesty or to cause injury.
- Unauthorized modifications of the contents of any computer.
- Wrongful communication of a number, code, password or other means of access to a computer.
- Abetments and attempts in the commission of the offences as in a), b), c) and d).

The Act also holds a statutory presumption that any person having custody or control of any program, data or other information when he is not authorized to have it will be deemed to have obtained unauthorized access, unless it is proven otherwise.

In terms of provisions, the Act considers any person, disregarding his nationality or citizenship and whether the offence was committed within or outside Malaysia, to be dealt with in respect of such offence as if it was committed at any place within Malaysia and therefore liable under this Act *provided* the offence in question, the computer, program or data was in Malaysia or capable of being connected to or sent to or used by or with a computer in Malaysia at the material time.

The Copyright (Amendment) Act 1997

This Act came into force in April 1999 to protect intellectual property rights in the transmission of content over the Internet. Under the Act, it is also illegal to circumvent any technological instruments that prevent access to works, that is, *hacking*. These provisions allow companies that invest in knowledge development in the IT and multimedia environment to be protected from intellectual piracy and misuse. The amendment to the Copyright Act 1987 is to assist in combating the infringement of intellectual property rights in line with developments in electronic and Internet based technologies.

The Act is unavailable to be viewed and/or downloaded at the time of writing from the ministry's website.