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Malaysia

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Total population	26.64 million (2nd Qtr 2006)
GDP per capita	USD 4,904 or MYR 18,145 (USD 1 = MYR 3.70)
Key economic sectors	Manufacturing, Services and Agriculture
Computers per 100 inhabitants	21.8 (October 2005)
Fixed-line telephones per 100 inhabitants	16.3 (2nd Qtr 2006)
Mobile phone subscribers per 100 inhabitants	80.8 (2nd Qtr 2006)
Internet users per 100 inhabitants	14.0 (dial-up), 2.5 (broadband) (2nd Qtr 2006)
Domain names registered under .my	83,709 (January 1995–December 2006)
Broadband subscribers per 100 inhabitants	2.5 (2nd Qtr 2006)
Internet domestic bandwidth	2 Mbps (October 2006)
Internet international bandwidth	2 Mbps (October 2006)

Introduction

Since achieving independence in 1957, the development programmes of Malaysia are conducted through Five-Year Development Plans. The year 2006 marks the beginning of the country's Ninth Development Plan. Besides the Five-Year Plan, Malaysia has Vision 2020, a plan to achieve developed country status for Malaysia by the year 2020 that was envisioned and launched by ex-Prime Minister Tun Mahathir Mohamad in 1991.

Vision 2020 contains nine central strategic challenges, the sixth of which is the challenge of establishing a scientific and progressive society, a society that is innovative and forward-looking, and one that is not only a consumer of technology but also a contributor to the scientific and technological civilization of the future (Government of Malaysia 2006). Key to meeting this challenge is the adoption and use of information and communication technology (ICT) by all sectors of government and society.

The deployment of ICT as an important component of development started in the Seventh Malaysian Plan 1996–2000. During this period the National Information Technology Council (NITC) was established as a think-tank and advisor to the government on IT development. The NITC initiated the formulation of a national IT plan and the identification of key programmes for the transformation of Malaysian society into a knowledge-based society (Malaysia 1996).

The government also launched the Multimedia Super Corridor (MSC) during this development period. Conceptualized in 1966, the MSC has since grown into a thriving and dynamic ICT hub, hosting multinationals, and foreign-owned and home-grown Malaysian companies involved in multimedia and

communication products, solutions, services, and research and development (Multimedia Development Corporation 2006). The MSC has seven flagship applications to enhance the socio-economic development of Malaysia: Electronic Government, Multipurpose Card, Smart School, Tele-health, Research and Development Clusters, E-Business and Technopreneur Development.

Another crucial component of ICT development in Malaysia is the National Information Technology Agenda (NITA) that was developed to spearhead and guide ICT development in the country. Its three main interrelated components are people, applications and infostructure. Hashim (2000) noted that NITA grants equal opportunity to every citizen to access the infostructure in order to transform Malaysia into the value-based knowledge society envisioned in Vision 2020.

This chapter presents the Malaysian scenario of ICT for development. For further information, readers are encouraged to refer to the websites listed at the end of the chapter.

Technology infrastructure

Since 1987, Malaysia has been actively involved in reforming and restructuring the telecommunications sector (Kementerian Tenaga, Air dan Komunikasi 2006). The participation of the private sector has ensured the development of the necessary information infrastructure. For instance, trunk fibre networks now crisscross peninsular Malaysia and extend across the South China Sea to connect Sabah and Sarawak in the eastern part of the country. With Malaysia's own satellite (MEASAT I, MEASAT II

and MEASAT III), completion of the Malaysian infrastructure superhighway is within reach.

Six licensed telecommunication companies provide telephony services: Telekom Malaysia (TM), Celcom, Maxis Communication, Time Telekom, DIGI Telekom and Prismanet. Two of these companies, TM and Maxis, are also Internet service providers (ISP). Another ISP currently operating in Malaysia is Jaring by MIMOS.

At the end of 2005, there were 2,839,000 fixed-line residential telephone subscribers (49.5 per 100 households) and 1,527,000 fixed-line business subscribers. The total of 4.366 million fixed-line subscribers represents a penetration rate of 16.6 per 100 inhabitants in Malaysia (Malaysian Communication and Multimedia Commission 2006).

The cellular phone penetration rate was higher at 74.1 per 100 inhabitants at the end of 2005. There are 19.545 million cellular phone users in the country, with a ratio of eight prepaid users to one postpaid user.

The penetration rate of dial-up Internet in the same period was 13.9 per 100 inhabitants. The penetration rate for broadband Internet was 1.9 per 100 inhabitants. The personal computer penetration rate in 2005 was recorded at 21.8 per 100 inhabitants (Malaysia 2006).

The Malaysian government is pursuing an overall technology infrastructure development strategy called the MyICMS 886 Strategy, which is short for Malaysian Information, Communication and Multimedia Services 886 Strategy. The numbers 886 refer to eight new services to catalyze and promote the development of eight essential infrastructure that are to generate growth in six areas that have been identified as key for the consumers and business in Malaysia (Ministry of Energy, Water and Communication n.d.). The eight new services are high-speed broadband, 3G and beyond, mobile TV, digital multimedia broadcasting, digital homes, short-range communication, VoIP/Internet telephony, and universal service provision (USP). The eight essential infrastructures are multi-service convergence networks, 3G cellular networks, satellite networks, next-generation Internet protocol (IPv6), home Internet adoption, information and network security, competence development, and product design and manufacturing. The six growth areas are content development, ICT education hub, digital multimedia receivers, communication devices, embedded components and devices, and foreign venture.

Specific to broadband service, in 2006 TMnet started providing Streamyx at 384 Kbps and above. Broadband services are available via fixed/cable (ADSL and fibre), satellite (VSAT and DTH) and wireless.

The growth of the communications industry in Malaysia is also underpinned by demand for new services arising from the

convergence of information technologies in the field of switching and transmission. For example, ATM, ISDN and SDH have created new services like VOD, video conferencing and many other multimedia applications on the Web, such as graphics, audio and animation, video and virtual reality, to mention a few. The key to this trend is liberalization, whereby government has allowed private participation in this sector. The thrust of the competition policy as envisaged in the Equal Access Policy is that it must lead to improvement in the quality of service as well as bring down prices as a result of improvements in operation efficiency. In keeping with this principle, 3G services have been awarded to four private companies.

Key institutions dealing with ICTs

All of Malaysia's 27 ministries and the Prime Minister's Department are urged to utilize ICT to the fullest in delivering services to their target sectors. The following government organizations are specifically tasked with ICT development in Malaysia:

- Ministry of Energy, Water and Communication—responsible for communication infrastructure, policy formulation and service regulation.
- Ministry of Science, Technology and Innovation (MOSTI)—tasked with creating an environment that is conducive to the advancement of science and technology and providing efficient technical and management support services to ICT projects and programmes.
- Ministry of Rural and Regional Development—in-charge of community access, telecentres, rural information programmes, bridging the digital divide and Infodesa projects for computer training skills and computer literacy.
- Ministry of Information—responsible for Smart Community projects, community access and bridging the digital divide.
- State government—tasked with providing community access through the State Information Technology Advancement Unit (KIT) for Electronic Government System, Education Net, Electronic Community and Electronic Commerce.
- Local Authorities or City Councils—must provide community access and computer training skills and computer literacy.
- Malaysian Communications and Multimedia Commission (MCMC)—issues licenses, implements regulations and facilitates universal service provision. This agency is under the Ministry of Energy, Water and Communication.

Private companies such as Maxis are expected to target ICT exposure, Internet access, basic computer training skills and computer literacy. Cybercafé entrepreneurs are expected

to provide access to the Internet and the digital experience to various communities.

R&D in microelectronics and IT is the responsibility of government-linked companies such as MIMOS Berhad. The Multimedia Development Corporation (MDeC) is responsible for the implementation of the MSC.

Education content is provided through the education portal Utusan Melayu.

ICT industries

The MSC was set up in 1996 to build a competitive cluster of local ICT companies and a sustainable ICT industry in a 750 sq km area south of Kuala Lumpur. Five cities and cyber centre ecosystems have been developed within the area: Cyberjaya, Kuala Lumpur City Centre (KLCC), KL Tower, Technology Park Malaysia and UPM-MTDC incubator centre. By the end of 2005, a total of 1,421 companies were awarded MSC status. More than half of these companies are engaged in software development for general enterprise solutions and data warehousing, as well as high-end specialized applications and e-commerce (Malaysia 2006). More than 500 companies were set up in 1996–2003, the first phase. Some 22,000 high-value jobs were created and some MYR 6 billion (USD 2.2 billion) in revenue was generated.

By August 2006, the number of MSC-status companies had increased to 1,556, of which 1,485 are MSC Malaysia technology companies, 52 are institutions of higher learning and 19 are incubator companies. Sixty-seven companies are international world-class companies, such as Nokia, Siemens, Motorola Multimedia Lotus, Lucent Oracle, Intel, Fujitsu and Unisys.

Under phase one there is only one corridor, the MSC. Under phase two, called Next Leap (2003–10), there will be a web of corridors with Penang-Kulim in the north, Johor in the south, the east coast, and Sabah and Sarawak. Under phase three, (2010–20), MSC benefits will be extended to the rest of the country, thereby transforming Malaysia into a value-based knowledge society and a one-nation Multimedia Super Corridor. To further speed up the development from August 2005, the states of Perak, Melaka, Pahang, Johor, Negeri Sembilan and Kuala Lumpur are to receive MSC benefits.

Enabling policies and programmes

When Malaysia chose ICT to drive its economic and social development in the early 1990s, it was in ready mode. By the late 1980s, Malaysia had privatized its telecommunication and broadcasting industries (Hasim 2000). Equally important, the

Microelectronic Systems of Malaysia (MIMOS) was established on 1 January 1985.

In 1994, Malaysia set up its National IT Council with then Prime Minister Mahathir Mohamad as chairperson. The Council was tasked with policy formulation, setting the strategic direction, policy coordination and evaluation and technology assessment and adoption, as well as industry promotion. The Council unveiled Malaysia’s IT Agenda (NITA) in 1996. Rooted in Vision 2020, NITA identified ICT as the means to help Malaysia leapfrog from being an industrial society to a post-industrial society. Entitled *Turning Ripples into Tidal Waves*, the document formed the basis for the informatization of Malaysian society—that is, the use of ICT in all walks of life to improve productivity and enhance quality of life. The focus was ICT for development (ICT4D) to address the issue of equitable development. Thus, the NITA document outlined a balanced and people-centred approach to ICT development.

The K-Malaysia migration strategy is part of the NITA document. Its vision is to evolve a values-based knowledge society in the Malaysian mould, where the society is rich in information, empowered by knowledge, infused with a distinctive value-system and is self-governing (John 2002). The strategy follows three stages of development: information society by 2005, knowledge society by 2010, and values-based knowledge society by 2020. The phases coincide with the three phases of physical development, where the first phase is development within the MSC; the second phase extends the corridor to the north, the east coast, the south, and Sabah and Sarawak; and the third phase will cover the whole country.

Under the Ninth Malaysia Plan, Malaysia will enhance its position as a global and multimedia hub, expanding the communication network to ensure more equitable access to information and services and bridging the digital divide. MSC phase II will be rolled out, expanding multimedia applications, identifying new sources of growth in ICT, developing a skilled ICT workforce, accelerating e-learning acculturation and enhancing information security.

Legal and regulatory environment

Malaysia’s approach to ICT development is two-pronged: providing the hard infrastructure in terms of physical development and laying out the soft infrastructure in terms of laws and regulations. At the start of Malaysia’s push for using ICT, six cyber laws were enacted, namely: Communications and Multimedia Act 1998, Malaysian Communication and Multimedia Commission 1998, Computer Crime Act 1997, Digital Signature Act 1997, Telemedicine Act 1997 and Copyright (Amendment) Act 1997 (Hasim 2002). Together with the Bill

of Guarantee, these laws became the soft infrastructure for the development of ICT. Each is discussed briefly below.

Communications and Multimedia Act 1998

This is the cornerstone of all cyber laws in Malaysia. It is the basic document for the MSC and Malaysia’s efforts for future digital development in Malaysia. One of the most important elements of the Act is absence of censorship of the Internet. The Act repealed the Telecommunications Act 1950 and Broadcasting Act 1988.

Malaysian Communication and Multimedia Commission 1998

This law enables the Malaysian Communication and Multimedia Commission to be set up as a new regulator for the communication and multimedia industry in Malaysia. The Act is based on the principles of transparency and clarity, more competition and less regulation, more emphasis on process rather than content, administrative and sector transparency and industry self-regulation. The Act covers only networked services and activities.

Computer Crime Act 1997

The law covers six crimes related to misuse of computers: unauthorized access, unauthorized access to commit fraud or dishonesty, modification of computer content, communication of a password to persons other than the person for whom the password is intended, abetting a computer offence, and custody or control of a computer program or data without authorization.

Digital Signature Act 1997

This Act, which legitimizes and provides for the use of digital signatures, aims to encourage electronic commerce. On 1 November 2001, the Malaysian Communications and Multimedia Commission was appointed as the Certifying Agency for digital signatures.

Telemedicine Act 1997

The Act provides for the use of multimedia in telemedicine. It provides a legal framework for the practice of telemedicine.

Copyright (Amendment) Act 1997

This is an amendment to the Copyright Act to include the Internet.

Security issues

The extent of security threats through the Internet in Malaysia can be gauged by the reported cases recorded by Niser, a

body set up by the Malaysian government to monitor such incidents. Niser classifies security threats as mail bomb, spam, harassment, forgery, hacking, virus, malicious code, denial of service, destruction and intrusion. MyCert, which was set up before Niser and is now part of it, began collecting data on these security threats in 1997. In 2005, a new category called malicious code (such as W32.Broutok worm and W32.Nyxem worm) was included.

During the past 10 years (August 1997–2006) Niser has recorded 30,803 cases of security threats: 23,330 cases of spam, 2,890 cases of virus, 1,775 cases of intrusion, 1,675 cases of hack threats, 339 cases of harassment, 198 cases of fraud, 137 cases of malicious code, 104 cases of mail bomb, 99 cases denial of service and 27 cases of destruction. It must be noted that these figures represent only incidents reported to Niser; the actual number of incidents could be much higher.

Police have taken action on many of the reported cases under Computer Crime Act 1997 and Communication and Multimedia Act 1998. Police action under the Communication and Multimedia Act 1998 resulted in 282 cases prosecuted, with damages totalling about MYR 1.17 million (USD 307,000). Most of the cases are related to licensing (Hasim 2005). Since 2000, when the Computer Crime Act was enforced, some 4,846 cases have been prosecuted with a total value loss of MYR 10.5 million (USD 2.76 million). Except for 2001 and 2002, the number of cases prosecuted under the Computer Crime Act appears to be dwindling. It is not clear whether the decline in number of cases is a result of fear of police action or inability of the police to take action. The police have recently taken in many IT graduates to beef up its computer crime section.

Education and capacity building

One of the flagship MSC projects is the Smart School project, which aims to: (a) prepare school leavers for the Information Age; (b) bring about a systematic change in education, from an exam-dominated culture to a thinking and creative knowledge culture; (c) re-emphasize science and technology education with a focus on creativity and innovation; (d) equip students with IT competence; and (e) inculcate Malaysian values among students and produce a generation of caring, peace-loving and environmentally concerned citizens (Curriculum Development Centre 1997). The Ministry of Education is implementing the SchoolNet Project in collaboration with the Ministry of Energy, Water and Communication towards achieving the Smart School initiative. The initial target was connecting 10,000 rural and urban schools and some educational institutions. However, in the Ninth Malaysian Plan the government decided on ‘Making All Schools Smart.’ The Ministry of Education is also developing

MySchoolNet, an educational portal for students, schoolteachers and school administrators (Kementerian Pendidikan Malaysia 2002).

The Malaysian Grid for Learning (MyGfL) is another national initiative for e-learning. It is being undertaken by MIMOS Berhad to: (a) provide e-learning systems and tools to enable and support e-learning activities and processes for life-long learning; (b) bring together all relevant players in the e-learning ecosystem (learners, enablers and providers) to participate in the overall e-learning value chain and be part of the national learning grid; (c) develop e-learning standards to ensure conformance and adoption of best practices in e-learning content and systems; and (d) encourage sharing and development of local/indigenous content, thus stimulating the content industry (MIMOS Berhad 2005). An example of projects under MyGfL is Cikgu.net, maintained by Jaring, a subsidiary of MIMOS Berhad.

The private sector also plays a role in providing educational resources to students and the public at large. For example, the Utusan Melayu Berhad has set up an educational portal called Smart Utusan Education Portal. This educational gateway attracts an average of six million visitors every month. It carries learning and teaching materials for all school levels, including pre-school and pre-university (Portal Pendidikan Utusan 2005). Within the portal, students can get access to the past year's national examination questions, and teachers can view teaching plans and mathematics and science teaching scripts which provide ideas or activities to make teaching and learning more interesting. There is also an interactive section for visitors to share their thoughts through an online forum and cyber chat, try the e-laboratory or play games. Under the 'Community' heading is *Sekolahku* (Myschool) where schools can publish their Web pages.

Online services

ICT has brought about changes in the way Malaysians conduct their work, social activities and leisure, especially since the Internet was made available in 1992 (Abu Hassan 2002). Many Malaysians now get their news, transact with banks, request services from or file complaints to the Local Authority, interact with the government officials, and communicate with friends and family online.

From the Malaysian government official portal, citizens and residents of Malaysia can get information and services related to education, employment, health, social welfare and community, property and investment, legal matters, public amenities and utilities, security and safety, taxation and collections, and travel and transport. There are also links to all government offices,

government tenders, job vacancies in government offices, and many more. Thus, it can be said that it is a comprehensive portal. In August 2006, the portal received an average of 42,000 visits monthly (MAMPU n.d.).

To ensure that the public has access to e-services provided by government, telecentres have been set up in rural and urban areas by the Ministry of Rural and Regional Development, the Ministry of Energy, Water and Communication, the Ministry of Information, the State Government and the Local Authority. The Ministry of Rural and Regional Development has the Infodesa Project (see 'Digital Content' section). The Ministry of Energy, Water and Communication is collaborating with Pos Malaysia, Telekom Malaysia, and the MSD group of companies (Kementerian Tenaga, Air dan Komunikasi) in setting up Rural Internet Centres (RIC). The RIC project aims to bridge the digital divide between rural and urban communities. In 2006, there were 42 RICs throughout the country, all located at the post office where people congregate to pay utility bills and conduct other business. Members of the RIC can use the computer and Internet facilities for free. Each RIC has a website containing information on topics that are of interest to the local communities, such as health, agriculture, fisheries, tourism, arts and culture, security, entrepreneurship, local and national news, and local history. The RICs also conduct regular workshops to train the local community in the use of computers and the Internet. One RIC has conducted a workshop on starting a blog.

The Maxis Bridging Community (MBC) project is an example of a private initiative to help bridge the digital divide in Malaysia. Maxis has trained 1,343 teachers and 2,722 school children from 719 schools in the Cyberkids Camp started in 2005. Using the 'Train the Trainer' concept, the camp includes classroom and outdoor activities designed to enable participating teachers and students to effectively use computers and the Internet and subsequently train others in their respective communities. The programme targets rural primary schools (Maxis Communication Berhad 2006).

Open source initiatives

The Malaysian Administrative Modernization and Management Planning Unit (MAMPU) is mandated by the government to take the lead in implementing the open source software (OSS) initiative for the public sector (Malaysian Public Sector 2006a). The four main components of the OSS Master Plan are: (a) framework and strategic thrusts, (b) technical implementation plan and roadmap, (c) open source competency centre and (d) OSS policies and guidelines.

Subsequently, the government formulated six objectives for the OSS implementation plan, namely: (a) reduce total cost of

ownership, (b) increase freedom of choice of software usage, (c) increase interoperability among systems, (d) stimulate the growth of the ICT industry, (e) promote the growth of the OSS user and developer community and (f) reduce the digital divide (Malaysian Public Sector 2006b). Since the launching of the OSS initiative, several workshops and seminars to create public awareness have been conducted regularly, mainly by the Open Source Competency Centre (OSCC) set up by the government.

The 2005 human resource targets of the OSS initiative were for all Chief Information Officers (CIOs) and Information Technology Personnel (ITP) to be OSS literate, 60 per cent of ITP to be trained in OSS and 10 per cent of ITP to be certified in the use of OSS. Other targets for 2005 were for 60 per cent of all new servers procured to run on open source operating systems, 60 per cent of Web servers (software) to use OSS, 30 per cent of office infrastructure (e-mail, DNS, Proxy) to use OSS and 30 per cent of desktop solutions to use OSS (Malaysian Public Sector 2006c).

Digital content initiatives

The NITA document identifies content development as one of the strategies to be pursued as part of the implementation of the seven MSC flagship applications. An important aim is to develop culture-appropriate content.

A key programme under content development is the Demonstrator Application Grant Scheme (DAGS). Its objectives include: (a) acculturating Malaysians to ICT, enabling them to maximize the benefits of ICT applications at work and at home, (b) building an integrated network of electronic communities using multimedia technology and (c) enhancing closer cooperation and collaboration between public agencies, private corporations and non-profit organizations through joint ventures and institutional linkages (NITC 2002). The DAGS funds Demonstrator Application programmes (DAs), which are small, focused and short-term projects that seek to create, develop and promote new ICT-based applications that create new content value for community development within specific contexts. To date, 75 projects have been started (some have been completed) under the DAGS strategic priority areas of Social Digital Inclusion, Economic Competitiveness and e-Public Services. Examples of DAGS projects are e-Bario, e-Homemakers, ICT in Masjid as a Neighbourhood Centre, MyBiz, Penang e-Doctor and Smart Taxipreneur (Demonstrator Application Grants Scheme 2003).

Another content development programme is Infodesa by the Ministry of Rural and Regional Development. This content exchange platform intended for rural communities has two

main components: *Medan Infodesa* or MID (Infodesa Centre) and *Titian Digital* (Digital Bridge). MID is a physical entity that is built or housed in the rural areas and equipped with ICT infrastructure and functions; it serves as the district training centre and as a catalyst for local entrepreneurs. Digital Bridge is a communication gateway for the local community to interact through ICT with service providers and those involved in rural development activities. At present, there are 30 MIDs throughout the country. Examples of MID are e-Bayangan in Sabah, e-Gulang in Selangor and e-Bujang in Kedah (Kementerian Kemajuan Luar Bandar dan Wilayah 2005).

Research and development

MIMOS Berhad has been designated to lead R&D activities related to ICT in Malaysia. Its approach to R&D has been collaboration and smart partnerships with universities, industry, research institutions and the government (MIMOS Berhad 2004). Four technology thrust areas are being emphasized by MIMOS: Pervasive Computing, Cyberspace Security, Microelectronics, and Grid Computing and Bioinformatics.

To support research activities, the Malaysian government has introduced several research grants. For instance, the Ministry of Science, Technology and Innovation (MOSTI) has the task of coordinating the ScienceFund, TechnoFund and InnoFund (Ministry of Science, Technology and Innovation 2004). There are few research grants from the private sector so far.

A number of studies regarding various aspects of ICT have been conducted by several universities in Malaysia. For example, academic staff and undergraduate and graduate students of the Department of Communication, Universiti Putra Malaysia have completed more than 50 ICT-related studies since the early 1990s. The research respondents include the general public, family members, youth, women, public and private sector staff, cybercafé users, members of urban and rural communities, as well as cyber communities. Among the aspects of ICT that have been studied are Internet addiction, techno stress, computer anxiety, telecommuting, IT in agriculture, the contents of community Web pages and societal readiness to accept IT.

At Universiti Kebangsaan Malaysia, an e-community research centre was set up in 2000. Among others, the centre monitors and assesses the impact of ICT on society, especially on changes in quality of life. It is hoped that systematic monitoring of e-community programmes would lead to better strategic planning, policy formulation, as well as theory-building. Membership in the e-community research centre is open to researchers from other academic and government institutions.

There is a need for information sharing among researchers from various universities and other research institutions

regarding what ICT studies are being undertaken. In this way, new areas of research can be identified, the findings of previous research can be utilized, duplication can be reduced and research resources can be optimized.

Challenges

Given Malaysia's ICT capability, it would be good to get as many Malaysians as possible online. Making citizens ICT users is one of the major challenges in the Malaysia ICT scene. Equally challenging is increasing Internet penetration throughout Malaysia. The way forward is to lower cost in terms of tariff and maintenance, so that more people can use the Internet. The government announced recently its intention to equip 1,500 schools with cybercafé facilities as part of the bridging the digital divide initiative. These facilities should also be made accessible to the public, especially in marginalized and rural areas.

Another challenge is keeping cyber laws up-to-date. It has been about a decade since the current laws were passed. A review of these laws would make them more relevant and attuned to changing technologies and online applications. For instance, the US government has come up with a law disallowing credit card companies from honouring payments for gambling through the Internet.

Above all, Malaysians should strive to ensure that Malaysia is ready to realize Vision 2020—that is, Malaysia as a developed nation and a value-based knowledge society.

References

- Abu Hassan, M. (2002). Internet in Malaysia. In Rao, S. and Klopfenstein, B. (eds), *Cyberpath to development: Issues and challenges* (pp. 137–57). Westport, CT.: Praeger.
- Curriculum Development Centre. (1997). *Concept*. Retrieved 28 September 2006 from <http://www.ppk.kpm.my/smartschool/concept.html>
- Demonstrator Application Grant Scheme. (2003). *Demonstrator application grant scheme (DAGS)*. Retrieved 29 August 2006 from <http://www.dags.net.my>
- Government of Malaysia. (2006). *Malaysia as a fully developed country—One definition*. Retrieved 9 September 2006 from <http://www.pmo.gov.my/website/webdb.nsf/>
- Hashim, R. (2000). Memasyarakatkan teknologi komunikasi maklumat (TKM) menerusi projek e-komuniti: Yakin boleh? [Socialization of information and communication technology (ICT): Have the confidence?] Paper presented at Seminar on Socialization of ICT, 10–11 May 2000. UPM Serdang.
- Hasim, M.S. (2000). South East Asian countries' response to the advent of the information era: With emphasis on Malaysia. *Jurnal komunikasi*, 16, 1–32.
- Hasim, M.S. (2002). *Introduction to media and cyber laws*. Kuala Lumpur: Utusan Publications and Distributors Sdn. Bhd.
- Hasim, M.S. (2005). Opportunities and challenges of the Internet: Coping with legislations in cyber space. Paper presented at IAMCR Conference, 27 July 2005. Taipei, Taiwan.
- John, K.J. (2002). Towards a K-Malaysia: A vision and strategy. Paper presented at the International Conference Partnership Networks as Tools to Enhance Information Society Development and Knowledge Economy, 9 December 2002, Moscow, Russia. Retrieved 4 February 2007 from <http://www.globalknowledge.ru>
- Kementerian Kemajuan Luar Bandar dan Wilayah. (2005). *Infodesa*. Retrieved 26 September 2006 from http://www.rurallink.gov.my/Pk_Default.php?
- Kementerian Pendidikan Malaysia. (2002). *MYSchoolNet*. Retrieved 28 September 2006 from <http://www.myschoolnet.ppk.kpm.my/main/perihal.htm>
- Kementerian Tenaga, Air dan Komunikasi. (2006). *The industry*. Retrieved 11 September 2006 from <http://www.ktkm.gov.my/template.asp>
- Kementerian Tenaga, Air dan Komunikasi. (n.d.). *Portal komuniti desa* [Rural community portal]. Retrieved 30 August 2006 from <http://idesa.net.my>
- Malaysia. (1996). *Seventh Malaysian Plan 1996–2000*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Malaysia. (2006). *Ninth Malaysian Plan 2006–2010*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Malaysian Communication and Multimedia Commission. (2006). *Facts and figures*. Retrieved 15 September 2006 from http://www.mcmc.gov.my/facts_figures/stats/index.asp
- Malaysian Public Sector. (2006a). *Government decision on OSS implementation*. Retrieved 18 September 2006 from <http://opensource.mampu.gov.my/index.php>
- Malaysian Public Sector. (2006b). *Objectives of OSS implementation*. Retrieved 18 September 2006 from <http://opensource.mampu.gov.my/index.php>
- Malaysian Public Sector. (2006c). *Master plan—Target to achieved*. Retrieved 18 September 2006 from <http://opensource.mampu.gov.my/index.php>
- MAMPU. (n.d.). *Citizen and resident of Malaysia*. Retrieved 26 September 2006 from <http://www.gov.my/MyGov/BI/Directory/Citizen/>
- Maxis Communication Berhad. (2006). *Giving back to society*. Retrieved 2 August 2006 from http://www.maxis.com.my/personal/about_us/profile/giving.asp
- MIMOS Berhad. (2004). *The organization*. Retrieved 16 August 2006 from <http://www.mimos.my/about2.html>

MIMOS Berhad. (2005). *About MyGfL*. Retrieved 28 September 2006 from http://www.mygfl.net.my/mygfl/index_php3?page=About&Lang=571&ms=main

Ministry of Energy, Water and Communication. (n.d.). *MyICMS886 strategy*. Putrajaya.

Ministry of Science, Technology and Innovation. (2004). *MOSTI grants*. Retrieved 18 September 2006 from <http://www.mosti.gov.my/MasterPortal/website/index.jsp>

Multimedia Development Corporation. (2006). *The multimedia super corridor*. Retrieved 9 August 2006 from <http://www.msc.com.my/msc/msc.asp>

NITC. (2002). *DAGS' pride: A collection of DAGS projects*. Kuala Lumpur: NITC Malaysia.

Portal Pendidikan Utusan. (2005). *Tentang kami* [About us]. Retrieved 28 September 2006 from <http://www.tutor.com.my/tutor/info.asp?pg=about.htm>