INTRODUCTION

At the threshold of the New Millennium, we face a critical challenge. And Malaysia is no exception. The challenge is to ensure that Malaysia remains competitive in the 21st Century; a challenge that is essential if we are to maintain the rapid economic growth, political stability and racial harmony we have long enjoyed. Compounding this challenge are two significant trends in the global economy: increasing globalization and its competitiveness; and a revolution that is driven by rapid changes in the information and communications technologies (ICTs). It is the convergence of these technologies that has transformed and is transforming our societies and communities. This transformation has long been anticipated, but there is clear evidence now to show that the process of change is exceptionally exhilarating. Based on this backdrop, Malaysia like many other countries is attempting to shift forward towards a knowledge-based economy or \textit{k}-economy – an economy which is directly based on the production, distribution and use of knowledge and information\footnote{For most countries, this would require significant micro- and macro-economic reforms, suggesting that there is a considerable gap between the reality of what can be achieved, compared to political rhetoric. But for Malaysia, it has taken an innovative step forward to create one of the most wired regions in this part of the world by setting up the Multi-media Super Corridor (in short MSC or a Smart region)\textsuperscript{2}.}.

On February 1, 2001 Putrajaya the newly created administrative capital city of Malaysia and a component of the Multimedia Super Corridor (MSC) was officially declared a Federal Territory\footnote{On February 1, 2001 Putrajaya the newly created administrative capital city of Malaysia and a component of the Multimedia Super Corridor (MSC) was officially declared a Federal Territory\textsuperscript{4} thus ushering Malaysia into the digital era and the new information economy. It is testimony of the Malaysian government’s commitment to the convergence of various information–based, telecommunications, broadcasting and mass media telecommunication technologies. In the words of Mahathir Mohamad, Malaysia’s fourth Prime Minister, the architect of modern Malaysia:} thus ushering Malaysia into the digital era and the new information economy. It is testimony of the Malaysian government’s commitment to the convergence of various information–based, telecommunications, broadcasting and mass media telecommunication technologies. In the words of Mahathir Mohamad, Malaysia’s fourth Prime Minister, the architect of modern Malaysia:
“Malaysia must develop into an information-rich society through coordinated development and effective use of information technology (IT). The Malaysians must go through a process of acculturation in order to participate meaningfully in an environment characterised by the centrality of knowledge in all spheres of activities. Opportunities for individuals and collective development will be generated through the provision of equitable access to information resources. The proper utilisation of knowledge will contribute to the creation of an intellectual and economic edge made possible by a supportive information infrastructure and an enlightened program of research and development” (The New Straits Times, 1995)

Thus this paper is an attempt at *raison d’etre* – the justification for the Malaysian government’s initiatives in formulating a cyber plan in which the first cyber cities – the Putrajaya and Cyberjaya in Malaysia are being built. It will highlight the concept and the components of the MSC plan. In the process, it will identify the challenges and issues that have to be addressed by the government and the private sector and how the two parties are being orchestrated for the common goal. It is the government’s commitment to position Malaysia through multimedia and information technologies into the 21st century’s digital age and to enhance its global competitiveness.

**THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)**

What will the future be with Information and Communications Technologies (ICTs)? Will the functions of future cities be the same as those of today’s? Or will ICTs alter the functions of cities? These are some pertinent questions lingering in our minds.

Many have argued that information economy is replacing the industrial economy in the new millennium. The global marketplace and its entire information infrastructure (info-structure) are in many ways shifting from the manufacture and distribution of physical goods to processing and exchange of value-added information. The ability to generate information and to add value to information create the opportunity for this information to be sold as a commodity and delivered through a combination of advanced digital networks that largely override geographical boundaries. We see this as a drive to decentralise cities into satellite towns and theme clusters and electronic communities. This challenges the traditional way of doing business in cities and between spatial organisation.

The ICTs will enrich our lives by increasing time for leisure. It will generate more opportunities and choices in leisure pursuits, kinship, social interactions, work and civic spheres of each person’s life. There will be less need to travel for business or government transactions. Almost all interactions with various government agencies will be possible through the national infrastructure. Shopping will be done at home, paid for electronically, and the items delivered at the doorstep. Such cash-less transactions, like tele-shopping and tele-banking, are made more efficient. As a consequence people have more
quality time and this will eventually lead to greater satisfaction of our levels of needs such as culture, spirituality, voluntarism and selflessness.

Many city-wide functions will be provided through the computers. The implications of this will be on the local government as the provider of public services. It is projected that its role will be greatly changed or diminished. Thus citizens’ perception of public places like city centres, neighbourhoods, schools, houses of worship as loci of social interaction will change. This will have an effect on the socio-political behaviour of the urban population and thus will further change the way people are governed. Many studies in the US, the Netherlands and Japan have supported this scenario. The question is what will draw communities together, to socialise to make those personal bonds? These are some of the possible scenarios of what would be the impact of ICTs on citizens’ behaviour and activities.

THE MALAYSIAN POLITICAL LEADERSHIP

Clearly a country which desires to be better prepared for the 21st Century will pay a price for this transition. It will need to re-skill its human resource, retool them, question old ways of doing things, challenge the vested interest or perhaps induce reinventing the government (Azman, 1995). But this assumes long term vision on the part of political leadership with a certain amount of political risks and the necessity of enjoying popular support from the citizenry. In Malaysia this vision is encapsulated in what is known as “Vision 2020” that is in the words of the Prime Minister, Mahathir;

“In the computer age that we are living in, the Malaysian society must be information-rich. It can be no accident that there is today no wealthy developed country that is information-poor and no information-rich country that is poor and undeveloped. The second leg of our economic objective should be to secure the establishment of a competitive economy … it must mean among other things an economy driven by brain power, skill and diligence in possession of wealth of information with the knowledge of what to do and how to do it.” (Mahathir, 1991).

The MSC is envisaged as an advanced technological milieu and contributing to the realisation of Vision 2020, the Prime Minister’s existing long-term goal of making Malaysia into a fully developed country by the year 2020. The MSC represents a continuation of prior aims and objectives of the national economic and industrial plan, though somewhat on a different technological platform. Two somewhat paradoxical strategies might be identified, namely integration and independence (Bunnel, 2001). The development of the most wired region in Asia is designed to be globally integrated with the world’s economy facilitated by the advanced ICTs infrastructure. The imperative strategy to be technologically independent has been the hallmark of the Malaysian policy thrusts since the 1970s. The acquisition of knowledge and new technology is thus believed as a means of preventing domination by the technologically and economically power-
ful nations. Thus ICTs are seen to be an imperative of technological and economic upgrading and thus circumventing foreign domination.

WHY THE CYBER APPROACH?

Why then does a newly industrialising country like Malaysia opt for a cyber plan? What are the compelling reasons to account for adoption of this untrodden path? Are there risks? These are some of the issues to be resolved by the government’s think tank. Since then, a task force was set up in the Prime Minister’s Department to prepare a plan for Malaysia for the 21st Century. Among the issues discussed were mechanisms to achieving the Vision 2020, taking into consideration Malaysia’s structural weaknesses and compelling strengths.

There are a number of options open to Malaysia. A pre-requisite, however is for Malaysia to sustain its economic Gross Domestic Product (GDP) of at least 7 percent throughout to year 2020, and its economic base to move from manufacturing to service and knowledge-based industries. It has been determined that based on the current industrial approach, Malaysia would have a potential of achieving USD 5,000 per capita by 2020. However to achieve the Vision 2020 agenda Malaysia needs to have a per capita income of say USD 10,000. On the basis of the findings, the only plausible approach to achieving the Vision 2020 is through the information technology approach, assuming other factors remaining the same that is the GDP growth of 7 percent, political stability and unforeseen natural disaster (Table 1). However the contagion of the

Table 1  Justification for Malaysia: The Vision 2020

Source: EPU, IMF; World Bank, McKinsey 1992
Asian Monetary Crisis starting from 1997, right through 1998 and 1999 had rendered Malaysia gravest concerns as there were doubts that the Vision 2020 and the developed nation status are achievable within the stipulated time frame. Fortunately, the adoption of the much-criticised capital control mechanism by Malaysia has proven to be very effective in containing the contagion, much to the chagrin of the critics.

The Malaysian economy was setbacked by the lackadaisical performance of the 1998 GDP (real) negative growth rate of –7.4 percent. The rebound of 1999 and 2000 of 5.8 percent and 8.5 percent (estimate) respectively, however, has provided an all round optimism that a new trajectory provided by the ICTs will determine that the Vision 2020 is achievable.

The National Information Technology Council (NITC) of the Federal Government is manned by members drawn from the government, the corporate sector, IT companies and academia. With the Prime Minister as chairman and the Malaysian Institute of Microelectronic System (MIMOS) as secretariat, they will determine the information technology agenda for the whole country. The national information technology agenda has two major components. First, the MSC with its seven flagship applications; and second, the demonstrator applications which focus on three key components of a developed nation or civil society; people development, info-structure development and application and the linkages between them.

Though the Task Force managed to identify perceived obstacles to Malaysia’s success, in such factors as availability and quality of telecommunications, shortage of skills, Bumiputra policies, restricted access to foreign expertise, intellectual property etc., Malaysia nonetheless enjoys compelling strengths. Factors such as multi-cultural links with the biggest Asian markets (China, India, Indonesia), English as a widely spoken language, cost advantages compared to the “tigers” of the region, no entrenched interests, laws which are easily changeable, stable political climate and highly committed top political elite have rendered ICTs a forgone conclusion. Having strategised all these, the government moved swiftly by setting up the National Information Technology Council (NITC) responsible for preparing the blueprint for the national IT plan or the National Information Technology Agenda (NITA). The delineation of a proposed intelligent region of the world, the Multimedia Super Corridor (MSC) and the setting up of the Multimedia Development Corporation (MDC) responsible for the development of the MSC with the corporate sector are the manifestations of the Government’s seriousness and commitment. The appointment of members of the International Advisory Panel (IAP) consisting of the ICTs’ giants such as chairpersons of Sun Micro-system, IBM, ACER, NTT etc. to advise on the MSC gives added credibility at the world stage. Areas outside the MSC are assigned to the respective states for implementation but their programs must fall in line with the NITA agenda and guidelines set by the Federal Government.
THE MULTIMEDIA SUPER CORRIDOR (THE “SMART” REGION)

The MSC, covering an area of 750 km², the size of New York City and even bigger than the island of Singapore is part of Malaysia’s strategy to shift to high-technology knowledge-intensive industries with a special focus on information and communications technologies industries. The MSC is a conscious creation of a conducive environment of a world class standard for multimedia firms and effort to catalyse local and foreign IT firms to become globally competitive. The MSC has three objectives namely;

- the MSC will help Malaysia achieve Vision 2020 goals by catalysing productivity led-growth;
- the MSC will help leapfrog Malaysia to leadership in the information age by promoting smart partnership between foreign and local firms, and
- the MSC will build global bridges between Malaysia and other intelligent cities for mutual enhancement. The MSC is to accelerate the development of information-age technologies that will fuel the growth needed to achieve Malaysia’s national goal of a developed, industrialised and information-rich nation status by 2020.

In August 1996, the Malaysian Prime Minister, Mahathir Mohamad announced that a region of 15 km by 50 km squares stretching southwards from Kuala Lumpur city in the north and the Kuala Lumpur International Airport (KLIA) in the south would be developed as the Multimedia Super Corridor (MSC). This “Smart Region” contains two new cyber cities which are under construction: Putrajaya, the new administrative hub of the Federal Government and Cyberjaya, an “intelligent” city (MDC, 1997) for foreign and local multimedia companies. In Malaysia, MSC is seen as a vehicle to laser-head into what is called as the – k-economy, informational economy and society. It is also an effort to provide a global connectivity as a means to national success in the new technological era (Bunnel, 2001). The MSC is not intended merely as an industrial park, but rather as what has been termed elsewhere as a “technopole” (Castells and Halls, 1994). The former is seen merely as a place of investment, while the latter is directly involved with research and development and the creation of new technology at Silicon Valley in the US.

The MSC combines the state-of-the-art urban planning and design with information and communications technologies (ICTs) in attracting the foreign multimedia companies to participate in the multimedia utopia (MDC, 1996) and thus incubates an ICTs culture and innovations that Malaysians will initially participate and eventually contribute. The MSC as a viable and attractive node in the high-tech economy (Graham and Marvin, 1999) and the ambience of the ICTs innovation will “catalyse” the development of a highly competitive cluster of Malaysian IT and would multimedia companies that eventually become world class (Zainuddin, 1997). Thus the MSC is envisaged to be a planned ICTs region for the long-term competitive enterprises of Malaysians which are globally connected where “an environment of collaboration, creativity and risk sharing are
fostered” (MDC, 1996). Besides, the MSC will be a global community living on the leading-edge of the information society supported by world-class facilities and sensitive to conserving and protecting the natural environment, predominantly low density area with nature-ways and green-ways of landscaped parks and conservation reserves.

The MSC is planned to world class standards, incorporating the notions of the aesthetics and functionality. To that end special teams were sent abroad to study some of the world’s best practices from Irvine and Florida in the US to Sophia Antipolis in France, Perth and Gold Coast in Australia, Japan and Europe. The highlights of the MSC’s physical environment include:

*The Kuala Lumpur City Centre (KLCC)*, the world’s tallest twin towers at the heart of the capital – Kuala Lumpur city with sophisticated and intelligent features. Sited at the northern gateway of the MSC, the KLCC offers unparalleled commercial, recreational, entertainment and retail facilities in planned parkland.

*The Kuala Lumpur International Airport (KLIA)* at Sepang to the south, a recently opened state-of-the-art airport complex and integrated logistics hub, commissioned in 1998 to 21st Century requirements. Designed to cater to an expected traffic of between 25–50 million passengers per year, the KLIA is equipped with 80 gates and two 400-metre long parallel runways, six check-in islands with a maximum provision for 216 counters, and excellent road and rail links to Kuala Lumpur city. In addition to serving as a regional logistic hub, KLIA will form the centre of Malaysia’s emerging aerospace industry.

*Putrajaya* the new seat of government and administration is a garden city catering for 250,000 people. Termed as Malaysia’s first intelligent Garden city, Putrajaya will become a vital development catalyst due to the role it will assume as a model city and marking a new chapter in the history of modern city planning in Malaysia and the world. It sits on a magnificent 4581 hectare spread. Its Master Plan is designed along an axial tangent which runs from the north-east to south-east taking full advantage of the natural surroundings. The design concept of Putrajaya is the harmony between man and his creator, man and man and man and nature. The “intelligence” part of Putrajaya is to create a comprehensive and integrated electronic community where products and services are accessible anytime, anywhere and by anyone. Its undulating terrain treats visitors and residents to commanding vistas of the environment. About 40 percent of Putrajaya is natural. Lush greenery, botanical gardens are spread across the landscape enhanced by large bodies of water and wetlands. It is designed as paperless government in a bold experiment at *e*-government. Putrajaya also houses the office of the Prime Minister of Malaysia. It will offer efficient, on-line services to citizens and businesses, streamline the government’s internal machinery, and increase productivity.

*Cyberjaya*, another garden city of 7000 hectares, the first MSC-designated cyber city to have a population of 240,000 people when fully completed. As the
nucleus of the MSC, Cyberjaya is envisaged to be a multimedia haven, a first choice site for innovative companies. Strategically located within the MSC, Cyberjaya will offer a full package of incentives and facilities – including high speed fibre optics 3–10 gigabytes, a balanced development of enterprise, residential, commercial and public precincts, world class homes, restaurants and shopping facilities and large parkland. Cyberjaya also aspires to be a near “zero-emission city” through strict zoning policies and environmental guidelines. Freedom of ownership guidelines will allow MSC-status companies to own 100 percent of the land and buildings in designated areas.

The highlights of Cyberjaya are:

- A world-class urban development, an attractive low density development revolving around green axis and reserves and excellent infrastructure.
- A human-friendly urban environment that comprises balanced development of enterprise, commercial and residential precincts with plentiful recreation areas and public facilities, including facilities for the physically handicapped and vulnerable group.
- An eco-friendly sustainable environment. Cyberjaya encourages solar and waste power generation and rain water utilisation. The city prohibits use of poisonous and hazardous materials and emphasise harmony with the existing topography and ecology through careful planning of roads and buildings.

**The Multimedia University**, a world first, started its operations in Cyberjaya in May 1999 with an initial intake of 3000 students. The University provides multimedia specific programs and caters to the skill requirements of companies located in MSC and Malaysia. It aims to be a world-class university in the promotion, acquisition, generation and application of knowledge in areas related to multimedia.

**Telecommunications and communications**, supporting the MSC is a high-capacity, digital telecommunications infrastructure designed to the highest international standards in capacity, reliability and pricing. This information network is part of an integrated logistics hub enabling rapid distribution of products along modern land, air and sea links. Key network features that will link MSC to regional and global centres include:

- A fibre-optic backbone with an unprecedented 2.5–10 gigabits per second capacity;
- Open standards, high speed switching and multiple protocols including ATM;
- Performance guarantees including installation of telephone services within 24 hours; ATM circuits within 5 days and a 99.9 percent service availability;
• High capacity links to international centres to ensure information, products and services free flow;
• Competitive pricing including flat-rate low pricing for basic network services compared with other regional centres and an open entry policy for value-added network services;

Amenities and Facilities, the state of the art eco-friendly commercial and enterprise estates, residential and housing suburbs, international schools and other academic and leisure and entertainment amenities.

Modern Transportation and Highway Systems incorporating rapid train links from the cyber cities to the Kuala Lumpur Metropolitan city. The systems include the KL-Seremban Highway, the North-South Central Expressway Link on the west of Cyberjaya, the South Klang Valley Expressway, the Damansara – Puchong Expressway and a highway providing direct link between Kuala Lumpur and the KLIA. Efficient public transport systems delivering efficient commuter rail and LRT services will also be available within the cyber cities.

MULTIMEDIA DEVELOPMENT AND ENVIRONMENT

To spearhead the development of the MSC and to give shape to its environment, seven primary areas of multimedia applications (flagship applications) have been identified. These applications contain a challenging opportunity unprecedented before for local and international multimedia companies to participate in the real world applications in the MSC. If successfully applied they can be replicated elsewhere in the world. The MSC flagship applications are divided into two separate categories: a) the Multimedia Development flagship applications offering concrete business opportunities to facilitate the MSC’s development; and b) the Multimedia Environment flagship applications providing optimal environment that supports multimedia companies entering the MSC.

The Multimedia Development applications projects have long term objectives that reach beyond MSC’s borders. These applications are e-government, multipurpose card, smart schools and tele-medicine. Each application will provide companies with excellent opportunities to collaborate with the Malaysian government in creating and implementing innovative multimedia solutions in a unique environment unprecedented elsewhere in terms of environmental location. Thus, these projects will use MSC as a global test bed for multimedia and IT development.

An Opportunity to Re-invent the Government (e-Government)

With e-Government, the government is to reinvent the way the government operates. e-Government will improve both how the government operates internally as well as how it delivers services to the citizens. It seeks to improve the convenience, accessibility and quality of interactions with citizens and businesses, simultaneously, it will improve information flows and processes within
government to improve speed and quality of policy development, co-ordination and enforcement and hence good governance. The vision of e-government focuses on effective and efficient delivery of services from the government to the citizens, enabling government to become more responsive to the needs of its citizens.

The objectives of the e-government are two pronged. One is to reinvent the government through connectivity and the other is to catalyse the MSC. The e-government is to redefine the relationships of government to citizens, to business and to itself.

**Tool for the Information Age (Multipurpose Card)**

This application seeks to develop a single and common platform for a multipurpose card that will enable the government and private application providers to implement smart card solutions without duplication of effort and investment. The MPC will be a plastic card embedded with a chip or micro-processor that has the capability to perform a wide range of functions, including data processing, storage, and file management. Eight applications have been selected for inclusion. They are the National ID, Driving Licence, Immigration, Health Card and Electronic Cash and Other Financial Transactions.

**Education for a Smart Society (Smart Schools)**

The MSC’s smart school initiative responds to the need of Malaysians to make the critical transition from an industrial economy to a k-economy. This requires for a technologically literate, thinking workforce which is able to perform in a global environment and use ICTs tools to improve productivity. An integrated set of strategies will be employed to focus on thinking ability, vertical integration of students’ progress, teachers as facilitators and learning to become self-directed.

**A New Paradigm in Health Provision (Tele-medicine)**

Tele-health is a process of providing individuals greater access and increased knowledge in healthcare. It empowers the individual to manage one’s own personal healthcare and integrates information to allow the smooth flow of services and products throughout the healthcare system. In other words, the tele-health initiative aims to keep people in the “wellness” paradigm. By taking advantage of the existing multimedia and information technology and also developing new technological solutions, this application will ensure Malaysians enjoy a high quality of health care. It would facilitate Malaysia’s becoming a global hub for tele-health services. There are already four pilot applications namely mass customised personal health information and education, continuing medical education, tele-consultation and lifetime health plan.

For each of these applications, teams from MDC – the lead agency and the private sector would develop Concept Request for Proposal that describe the
requirements of identified pilot applications and give consortia of private sector companies the flexibility required to innovate and deliver the best solutions.

The Multimedia Environment applications will provide both Malaysian and international companies with the opportunity to operate in an environment of close co-operation with leaders in the multimedia industry, research and academic institutions, and customers, in one of the world’s most attractive business regions. These applications will also allow companies to build centres of excellence for their R&D activities, create hubs to efficiently deliver value-added services to companies throughout the region, and innovate entire businesses by taking full advantage of the MSC’s unique environment and infrastructure. The Multimedia Environment applications projects are: R&D Cluster, World-wide Manufacturing Webs and Borderless Marketing.

Next Generation Multimedia Technologies (R&D Cluster)

Technological development and advances in multimedia and information technologies have been made possible through substantial investments in research and development. It flourishes in an environment where the necessary infrastructure is in place, where creative and risk-taking activities are promoted and shared, and where experts find living conditions most attractive (MDC, 1998). The MSC guarantees such an environment and Malaysia strives through this unique environment to promote the development of the next generation of multimedia technologies by forging collaborative R&D efforts among leading edge corporations, public research institutions and universities. Research-driven companies are encouraged to take advantage of the MSC’s strengths, including government commitment and support, the MSC comprehensive package, conducive research environment, and the growing business opportunities in Malaysia and the region. Other R&D advantages in MSC are Malaysia’s location and its cultural diversity which can easily relate to China, India –two of the world’s fastest growing economies and Indonesia, growing business opportunities and dedicated facilities. These include the Multimedia University, other universities within the region, the Technology Park Malaysia and the Malaysian Institute of Microelectronics Systems (MIMOS). MIMOS’ objective is to develop an indigenous capacity in multimedia technologies.

Building Best Practices in High-tech Operation (The World-wide Manufacturing Web)

This application aims to provide a conducive environment for high value-added manufacturing activities using multimedia technology. The WMW brings together Malaysia’s unique attributes as well as those of the MSC to enable companies to support their regional operations using multimedia technology. To foster companies to build links between operation centres around a wide range of support services such as R&D, design, engineering, manufacturing control, procurement, logistics and distribution support. The combination of reliable, state-of-the-art technology and infrastructure, combined with a central Asia-Pacific location, all contribute to making MSC an ideal place for regional research and
development. Foreign MSC-status companies will enjoy freedom from strict immigration laws and procedures, the 10-point Bill of Guarantees – a comprehensive and realistic framework of Cyber-laws and intellectual property laws, already committed by the government. The laws are: the Digital Signature Act 1997, the Copyright (Amendment) Act 1997, the Computer Crimes Act 1997, the Tele-medicine Act 1997 and the Communications and Multimedia Act 1998.

**New Frontiers in Commerce (Border-less Marketing)**

The borderless marketing is premised that multimedia technology can be used by businesses to move efficiently and effectively to serve customers across different time zones. The traditional barriers of time, space and form will be eliminated as a result. Tele marketing companies will find the MSC an opportunity to centralise their call centre operations and to tap the vast potential of the Asia-Pacific region robust economic growth.

**REALISING THE VISION**

No other Malaysian project but the MSC, has attracted so much world attention. Attention has been expressed in the form of scepticisms, criticisms, commiseration or plain foolhardy diatribe. And some expressed plain fascination that a third world country would dare to attempt such a technological feat. We are unsure whether the controversy relates to the nature and extent of the MSC project or the man behind the MSC or both. We ourselves are uncertain. But what we are certain is that the MSC project is very innovative, unprecedented, futuristic and of a scale quite grandiose. From the professionals to the politicians, the ICTs savvies to the transnationals, investors and Marxian economists have penned their opinions on MSC in journals, newspapers and books. Such is the nature of the MSC! Now, what are the concerns of all these critics and sceptics? Are these concerns valid? What are the strengths of the MSC or the line of defence that the optimists and the pro-activists employed? These are interesting issues that need to be addressed. We will, therefore, try to make an objective assessment of MSC in the context of its likely scenario to achieve what it is designed to achieve. At the same time we should be able to make critical observation of the government initiatives and strategies to transform MSC into an ICTs’ habitat for innovation and entrepreneurship (Miller, 1998) of the world.

William Miller, Herbert Professor at Stanford University, the leading researcher who made an objective analysis of the strengths and weaknesses of the various ‘‘silicon valleys’’ or smart regions of the world, made several observations. He uses 11 criteria to be applied across the globe and comes up with a competitiveness analysis. The eleven criteria are knowledge intensity, quality of workforce, mobile workforce, rewards risk taking, open business environment, community collaboration, developed venture capital, university interaction, quality of life, government involvement and indigenous companies (Miller, 1998). Based on these criteria and scaling applied, we find that topping the scale
is Silicon Valley of the US. The MSC is way below the list, in the same league as Gifu of Japan. Singapore One is better only in respect of university interaction score (Table 2: Regional Summary).

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H – high  L – low  M – Medium

The strengths of the MSC vis-à-vis the Silicon Valley as benchmark are in the areas of knowledge intensity and government involvement. To spearhead the development of ICTs and to give shape to its environment seven flagship applications of knowledge intensity, of which four constitute multimedia development applications and three are multimedia environment applications have been identified. A dedicated university namely the Multimedia University is specially built in Cyberjaya to produce ICTs’ professionals required for the MSC and Malaysia. This is over and above several universities located within the region.

The government’s involvement in MSC is viewed in a positive light. In terms of its role, its commitments in the physical planning and development, providing hard and “soft” infrastructures, introducing financial and fiscal incentives, creating conducive business environment with the necessary legal instruments such as cyber laws and intellectual property laws, besides the ten-point Bill of Guarantees. The Government’s initiative in inducting ICTs’ global players into the International Advisory Panel Committee is a smart strategy and has injected high level of credibility to the MSC. The visionary attributes of the current Malaysian Prime Minister Mahathir Mohamad cannot be underestimated.

The MSC can boast a high quality of life made available to the residents. Putrajaya and Cyberjaya are developed as a model intelligent city with a unique green-field environment within which one can work, live and play. There are sites for offices, enterprises, shopping facilities and recreational facilities. There is a wide choice of hillside mansions, lakefront houses and condominiums...
to suit varying family needs as well as commercial precinct comprising of shopping facilities, first-class resort hotels, convention centres, food outlets and service apartments to accommodate business professionals and activities. The whole development is supported by an advanced telecommunications infrastructure and world-class facilities including Multimedia University, a telemedicine hospital, an international school, a large public park and natural wetlands.

However what is interesting and perhaps a dominant attribute of MSC is the “newness” and the “dedicatedness” to ICTs compared to the rest. The rate of development and the quality of project execution are impressive when we consider the ground-breaking ceremony was done in August 1996. In five years time, the Prime Minister has already moved his office and official residence in Putrajaya. Being new MSC enjoys certain advantages such the flexibility of physical design, technology and learning from other people weaknesses.

Cities and city regions are commonly understood as the key players in the information economy (Castells, 1989, 1996). City regions have become motors of the global economy especially on the account that spatially concentrated human relationships which are essential for tacit learning, innovation and creativity (Storper, 1997, Crevoisier, 1999, Hall, 2000). Cities or city regions are thus understood as to be more flexible in adapting to the changing conditions of market technology, and culture in the so called information age (Castells and Hall, 1994). The fact that MSC lies within the Kuala Lumpur Metropolitan Region with Kuala Lumpur city as the hub has provided powerful synergy and critical mass to the mutual development of both entities.

The most telling factor is the creation of a habitat for the high-tech innovative community. The MSC has taken the right step in terms of knowledge intensity which are translated into various flagship applications. As what is happening in the Silicon Valley, knowledge intensity applications have generated new quality jobs. Knowledge quality applications require the presence of high quality work force in which the universities and other training institutions must provide the kind of skills required. In order to create the ambience of an open business environment, including international linkages, business climate should reward risks taking and does not punish failure. It must be a positive sum game (Miller 1998). Another important factor in spawning the habitat is the presence of the community dynamics of collaboration between business, government, independent sectors such as universities, foundations, councils etc. The other factor which MSC is trailing behind other smart regions is the venture capital industry that understand high-tech. Venture capital industry in MSC is still weak. The other locational factor of the MSC which can be taken advantage of is the presence and the accessibility of the Multimedia Universities and other universities within the Kuala Lumpur Metropolitan Region. The physical proximity of these universities must be translated into effective interaction with industry to generate co-evolution of ideas. It is these interlocking institutions which sustain the social relations which are the basis of continuous learning, innovation and therefore growth (Riain, 1997).
In implementing the MSC or cybercity initiatives we are faced with several intriguing and unprecedented challenges and issues. These include:

- **Systems Integration**

  In the top-down approach of MSC initiatives implementation the Federal Government takes centre stage and provides the impetus to the development of various components of the MSC, especially the flagships. The states’ initiatives are later rationalised through the National Information Technology Council (NITC) whose members comprise state representatives from the respective states. In a 2 or 3-tier government at local, state and federal levels, the highest level of coordination is necessary in terms of timing, project implementation etc., and they must be done collaboratively.

  The issue of standardisation of systems and protocols must be addressed to ensure effective implementation and application. This issue will be further exacerbated in addressing standardisation between countries.

- **Cultural Integrity**

  Quite often we tend to resort to engineering or IT solutions to solve IT problems. We tend to presume that people are receptive to new ideas and better ways of doing things and that the learning curve is always short. But in practice we find that people are not receptive to change or fear change. People do not want to be de-skilled and to lose their jobs. The older they are the less receptive they become. But we do find that people in the private sector are more receptive and adaptable and hence adoptive and the resistance is lower compared to the public sector, which is often less creative and innovative.

  As the world is intertwined and wired, we find that access to information and knowledge is made easier and faster. As a consequence there will be more interface and cultural assimilation or enculturation between and among cultures of the world. Undoubtedly there are the good and the bad elements. Cultural purity, in the future would be a thing of the past. Positive cultural borrowing and adaptation are not undesirable if they are done cautiously and creatively. The MSC with its Bill of Guarantees has brought to our attention some of the attendant problems.

- **Cyberlaws and Digital Crimes**

  MSC with its Bill of Guarantees and cyberlaws are meant to ascertain that the test-bed companies and other knowledge-based companies are given the right environment to compete. Their intellectual property rights are protected. The scope of cyberlaws on digital contract, digital signature and their admissibility as legal evidence in court are still being debated. Cyberpayment, multimedia intellectual property, cyber crimes are still unenforceable between countries. Other aspects of societal cyberlaws such as privacy
protection, consumer rights protection, equity and access, cyberfraud are still being discussed.

The Malaysian government commits that it would provide world class infrastructure, unrestricted employment of knowledge workers, freedom of ownership, competitive financial incentives, freedom of sourcing of capital globally etc. But one of the moot points is to ensure no censorship of the Internet. This has created some concerns in certain quarters.

- **Concept of Government and Governance**

  Governance is the way in which people are managed. In a democracy, governance is ideally by the people and for the people through a process of authority levels of administration, empowered through legislation to make things happen. In good governance, innovations and creativity make way for the best things to happen. Governance normally encompasses a large range of concerns, including effectiveness of institutional arrangements, decision-making process, policy formulation, implementation capacity, information flows and nature of relationship between the ruler and the ruled. IT makes good governance possible. It is participatory, transparent and accountable and encourages the creation of a civil society. This is something which is constructive and must be set in motion.

- **Technology**

  We need technology to enhance our lives. But technology is only a means to an end. The advancement of information and communication technologies has altered positively the way we do things – more effectively and efficiently. But where is the limit? There will be a time when technology becomes king and we are subservient to it. Information and communication technologies (ICTs) should not take away our fundamental rights to liberty, freedom and privacy. This is an ethical issue to be addressed by all.

  I am sure there are other pertinent issues and challenges that we ought to address and be prepared to face them. Since we are delving into a new territory a great deal of research has to be done especially the impact of ICTs on human behaviour and social interactions.

**CONCLUDING REMARKS**

The paper has put forward a critical review of the rationale and justification of Malaysia embarking on the ICTs path and strategising itself to achieve the Vision 2020 through the ICTs’ mode. It argues that with the government commitment, Malaysia’s impressive economic growth and its ability to rebound from the economic crisis of 1998–1999 and the tremendous effort on the human resource development, MSC will have every chance to succeed.

The optimism surrounding the MSC’s potential is boosted by the successes of Malaysia in attracting global investment and promoting international business and industry. The advantages of Malaysia as a regional hub are many.
Among other comparative advantages for Malaysia are its strategic location, stable economic growth, on the average of GDP 8 percent, political stability, quality of life, its multicultural and multiethnic environment, cost advantage and its development track record.

NOTES

1 k-economy is now the buzz word the Malaysian Government has officially adopted to instil the new economy which is based on knowledge.

2 the MSC or Smart Region of Malaysia has been used interchangeably to refer to the 15 km × 15 km area incorporating the Kuala Lumpur Twin Tower in the north and the Kuala Lumpur International Airport in the south.

3 Putrajaya becomes the third Federal Territory after Kuala Lumpur and Labuan. Under the Malaysian 3-tier system of government, the Federal Government acquired Putrajaya by paying certain compensation to the State Government of Selangor, the original land owner of MSC.

4 Vision 2020 is the Government of Malaysia development’s philosophy which was launched by the Prime Minister, Mahathir in 1991 charting the future course of Malaysia and the formula to go about attaining the objectives of developing Malaysia into an industrialised, developed, democratic country based on civil society.

5 McKinsey Consultants were employed by the Malaysian Government in mid 1990’s to advise on the development strategy for Malaysia.

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