

Can Malaysia transit into the K-Economy?



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**Dynamic Challenges,
Tough Choices
and the Next Phase**

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To the next generation of Malaysians, for whom the k-economy is all about and on who's shoulders the sustenance of Malaysia's K-economy rest.

"It must be considered that there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the old order, and only lukewarm defenders in those who would profit by the new order ... this arises partly from the incredulity of mankind who do not truly believe in anything new until they have an actual experience of it."

— **Niccolo Machiavelli** (1469-1527)

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PREFACE

No student of Malaysia or Malaysian Studies can deny the tremendous achievements the country has attained since independence in 1957. To the doubting Thomas', a good place to start is to compare Malaysia's achievements to those of other countries it attained independence with in the same year. More than the skyscrapers that dot the skyline of its capital, Kuala Lumpur, is the ability of the country to move majority of its people out of poverty in a rather short period of time since its independence. Its transformation from the exporter of primary products to that of manufactured goods can be credited with its phenomenal economic growth and development over the years. Now comes the hard part.

As the country enters a challenging phase in its growth and development efforts, where the forces of globalisation, competition, liberalisation and the advancement in technology are relentless, it has to change strategies. Moving to a knowledge-based economy (K-economy) and the aspiration to become a developed nation in the year 2020 are some of the strategies developed by the leadership. The foundation and initial phases of these strategies are in place. Then comes the next phase. This book is about that phase. It is about the dynamic changes and challenges in the global system that the country will face and the tough choices it must make to move the country to a K-economy and to realising its Vision 2020 even in this era of impermanence. The book is divided into two phases. The first phase provides information about Malaysia's movement to the K-economy, it is more of a general information for those who are less familiar with the effort. The second phase deals with some of the tough challenges ahead and the tough choices the leadership in the country will have to make in the next phase as the country moves to the k-economy and a look into the post k-economy era.

Chapter one looks at Malaysia's vision of moving to the k-economy as well as becoming a developed nation by the year 2020; and deals with how such a vision will be attained. Chapter two deals with a general overview of some of the theories in economic development and tries to link them to Malaysia's k-economy effort. Chapter three looks at Malaysia's movement from a production economy to a k-economy and the challenges serving as an impetus to such a move. Chapter four deals with some of the efforts on the part of the government to move the country to the k-economy. In chapter five, private sector efforts to compliment government efforts to move to the k-economy are examined. Chapter six then looks at some of the challenges ahead.

Chapter seven which is in phase two of the book looks specifically at some of these challenges topically and in detail. It tackles the issues of knowledge workers. Chapter eight deals with the intangible challenges that Malaysia will have to face and suggests ways to tackle them. In Chapter nine, the issue of knowledge generation and its internalisation as well as dissemination is tackled. The generation of new knowledge will be one of the important challenges Malaysia would have to deal with in the next phase. Chapter ten deals with how Malaysia will manage its "endogenous knowledge." Chapter eleven looks at one of the cornerstones of the k-economy — lifelong learning. The Chapter also looks at why Malaysians should be bothered with lifelong learning. In Chapter twelve, the disturbing aspects of the digital and knowledge economy are dealt with. Issues of cybercrime, cybercriminals, cyberwarfare and cyberterrorism specifically, are dealt with. Chapter thirteen looks at the post k-economy era, what it has in store and why we should be preparing for it. A summary and conclusion follows, ending the book.

INTRODUCTION

On June 22, 2003, on the final day of the 56th Umno¹ general assembly, just before 6p.m. Dr. Mahathir to the shock of the delegates and the nation, announced his resignation from his political posts. His announcement was met with disbelief and shouts of protest and pleas for him to reconsider and stay on and continue to lead the party and the country. What could have made Dr. Mahathir, one who is resolute and known for his love for his country decide at this time to set down? He was in good health, nationally and within his own party he was unassailable. Furthermore, his stature internationally has grown tremendously over the years. For someone who has faced many national and international challenges and in most cases have come out a winner, his abrupt resignation was tough to accept and hard to comprehend (Samad, 2002). Even though he was persuaded to stay on, he later rescinded his decision of immediate resignation, but did not change his mind and will stay until October 2003 (*New Straits Times*, 2003, p.2) to facilitate the smooth passing of the baton to his deputy prime minister.

The die therefore is cast and Dr. Mahathir has crossed the Rubicon, so to speak, and will not rescind his decision. Some of the milestones of Dr. Mahathir's 21 years in office are evidenced by the transformation of Malaysia. For example, per capita incomes have increased about 320 percent, thus increasing quality of life and reducing poverty significantly. He announced the plans for a Malaysian national car in 1983 which came out of the assembly line in 1985, took a tough decision to save Malaysia from the Asian Financial Crisis in 1997 and succeeded, officially launched the Petronas Twin Towers in 1999 (the tallest buildings in the world at this writing). These and many more are some of his achievements. But the stepping down of Dr. Mahathir also ushers Malaysia into its

¹ Umno stands for the United Malays National Organisation.

next phase of development under new leadership. This comes at a challenging time, especially when the effort of the nation is to transit to a k-economy and as it aspires to be a developed nation by the year 2020. These were all goals set during the Mahathir era. With the stepping down of Dr. Mahathir, can Malaysia transit to the k-economy? Can it be able to attain its vision of becoming a developed nation by the year 2020? What are some of the dynamic challenges that it will face and how is it going to address them? Is the country ready to make the requisite tough choices needed to transit to the k-economy in the face of these dynamic challenges? What does the post k-economy era hold and is Malaysia preparing for it? These and many more of such questions are what this book has set out to try to answer. Granted, this effort is just scratching the surface. It is hoped that this book will generate enough interest for others to do further research into the next phase of Malaysia's transition to the k-economy. It is also hoped that policy makers would begin thinking about such a phase more seriously, and begin putting into place the necessary measures. For if they do, to paraphrase Nicholas Arthur Rimbaud, Malaysia shall enter the splendid cities at dawn.

D. Abdulai
Kuala Lumpur

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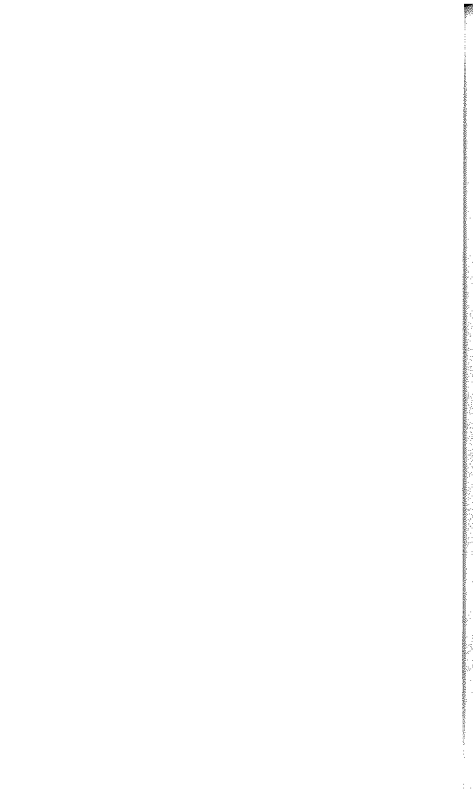
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ACRONYMS AND ABBREVIATIONS

ADTECs	Advance Technology Centres.
ATM	Automatic Teller Machines.
CLV	Cambodia, Laos, Vietnam.
EIU	Economic Intelligence Unit.
ENIAC	Electronic Numerical Integrator And Calculator
EP	Electronic Procurement.
FDI	Foreign Direct Investment.
GDP	Gross Domestic Product.
GNP	Gross National Product.
GOE	General Office Environment.
HRDC	Human Resource Development Council.
HRDF	Human Resources Development Fund.
HRMIS	Human Resources Information Systems.
ICT	Information and Communication Technology.
ILO	International Labour Organisation.
IPRs	Intellectual Property Rights.
ISH	Information Super Highway.
ITIs	Industrial Training Institutes.
KLIA	Kuala Lumpur International Airport.
KLSE	Kuala Lumpur Stock Exchange.
LDCs	Less Developed Countries.
MAMPU	Malaysian Administrative Modernisation and Management Planning Unit
MDC	Multimedia Development Corporation.
MESDAQ	Malaysian Exchange of Securities Dealing and Automated Quotation.
MIGHT	Malaysian Industry Government Group for High Technology.
MIMOS	Malaysian Institute of Microelectronic Systems.
MSC	Multimedia Super Corridor

MSCSB	Mimos Smart Computing Sdn. Bhd.
MyCERT	Malaysian Computer Emergency Response Team.
NASDAQ	National Association of Securities Dealers in Automated Quotations System.
NDP	New Development Policy.
NEAC	National Economic Action Council.
NEC	Nippon Electric Corporation.
NEP	New Economic Policy.
NITA	National Information Technology Agenda.
NITC	National Information Technology Council.
NVP	New Vision Policy.
PDA	Personal Digital Assistants.
PIN	Personal Identification Number
PMS	Project Monitoring Systems.
PPP	Public-Private sector Partnerships.
SME's	Small and Medium Scale Enterprises.
SMIDEC	Small and Medium Industries Development Corporation.
SMS	Short Messaging Services.
SSIS	Smart Schools Integrated Solutions.
TFP	Total Factor Productivity.
TRIPs	Trade Related Aspects of International Property Rights.
USM	University Sains Malaysia.
WWW	World Wide Web.

PHASE I



1. A VISION IS BORN

1.1 Introduction

During the era of the Cold War, when the former Soviet Union and the United States of America battled for political, economic and technological superiority, the Soviets put the first man, Yuri Alekseyevich Gagarin in space. The American president at that time, John F. Kennedy anteed the brinkmanship. He promised to put the first man on the moon. Asked by some why he thought of such an outlandish idea, to land a man on the moon and bring him back to earth safely? Why America should want to send a man to the moon at all? He answered, by quoting British explorer, George Mallory, "because it is there" (Harrison and Gilbert, 1993). Kennedy's vision, which he backed with the requisite resources and the power of his office, saw the first man landing on the moon in his lifetime and subsequently the exploration of outer space.

Today, almost forty years after the death of John F. Kennedy, the Cold War has ended, the Soviet Union is no longer in existence and most of the developing countries during his day are fast on the track of attaining develop nation status. But today is a

different day, each new day brings with it a set of opportunities and challenges. As Kennedy rightly put it, "today, we stand on the edge of a new frontier ... but the New Frontier of which I speak is not a set of promises — it is a set of challenges."¹ Today most of the developing countries that are on the fast track of attaining developed nation status are faced with different challenges, globalisation and the challenge of a knowledge-based era. In 1997-98 for example, most of these economies, particularly in Asia were severely impacted by the Asian Financial Crisis. To survive and prosper, in a rapidly changing world, these developing countries must develop and embrace new formulas that would enable them to attain sustainable growth in this challenging "New Economy," a knowledge-economy. How are these countries going to evolve these new formulas? There are those who call for a visionary with the requisite vision, and the Bards would call for a "Moses" to lead these countries to a development "nirvana." These hallow calls to stewardship and to deliver their people to a development "nirvana" by the Bards is heard by the visionary leadership of some developing countries. They, and their respective countries are rising up to the challenge.

Malaysia is one of those countries in the South East Asia region that has found a visionary leader(s) who has help transform their economy from just another backwater economy as it is the case with most developing countries, to one that has attained phenomenal growth and development in a rather short span of time by development standards. Malaysia under the leadership of Dr. Mahathir Mohamad has witnessed growth rates of up to seven percent except during the period of the Asian Financial Crisis. The country has moved from being a tin, rubber and palm oil producer and exporter to that of electronics and

¹ Speech by J.F. Kennedy whiles accepting the Democratic nomination for President in Los Angeles, 15th July 1960.

industrial goods. The latter strategy has served Malaysia well and has helped to move most of its population out of poverty in a rather short period of time (see Table 1.1)

Table 1.1: Incidence of Poverty

Incidence of Poverty Unit	1970	1980	1990	1995	1998	2000	2001
Overall % of households	49.3	29.2	16.5	8.7	8.5	5.5	4.5
Rural % of households	58.6	37.7	21.1	14.9	15.0	10.0	7.4
Urban % of households	24.6	12.6	7.1	3.6	3.5	1.9	1.7

Source: *The Malaysian Economy In Figures 2004*, Economic Planning Unit, Malaysia

Today, Malaysia stands at the edge of a new frontier, one with new dynamic economic challenges. It thus needs a new vision and strategy. The vision of Malaysia and Dr. Mahathir, its leadership, is to move Malaysia from a production economy to a knowledge-based one. In the foreword of the *Eighth Malaysian Plan 2001-2005*, Dr. Mahathir said, "during the Eighth Malaysia Plan period, we will be faced with even greater challenges from globalisation and liberalisation as well as the rapid development of information and communications technology. We will have to shift the growth strategy from being input-driven towards one that is knowledge-driven." (*Eighth Malaysian Plan, 2001-2005*). Indeed, the new realities of the global environment, the advancements in ICT as well as the emergence of the Knowledge-based economy have forced Malaysia to adopt a new strategy and vision. The new strategy is to move up the value chain in the production of innovative and high value added products. The vision is to become a developed nation by the year

2020. It is a tall order to fill, but like anything in life, nothing ventured, nothing gained.

1.2 The New Vision Policy

The adage that "necessity is the mother of invention," coupled with Malaysia's efforts to attain a developed nation status by 2020 has prompted it not to rest on its oars so to speak. Its economy has done well under the New Economic Policy (NEP) and the National Development Policy (NDP) prescriptions put in place over the years. But with the current challenges of globalisation, liberalisation and the emergence of the knowledge-based economy, the government has come up with the New Vision Policy (NVP). Basically, the New Vision Policy is the consolidation of the critical thrusts of the previous development policies of the NEP and NDP with an over-riding aim of national unity and the eradication of poverty and the projection of moving the production capabilities of the country up the value chain. The compositions of the NVP are listed below:

- Building a resilient nation by fostering unity, inculcating the spirit of patriotism, nurturing political maturity, cultivating a more tolerant and caring society with positive values, and raising the quality of life as well as increasing economic resilience;
- Promoting an equitable society by eradicating poverty and reducing imbalances among and within ethnic groups as well as macroeconomic management;
- Sustaining high economic growth by strengthening the sources of growth, the financial and corporate institutions as well as macroeconomic management;
- Enhancing competitiveness to meet the challenges of globalisation and liberalisation;

- Developing a knowledge-based economy as a strategic move to raise the value added of all economic sectors and optimising the brain power of the nation;
- Strengthening human resource development to produce a competent, productive and knowledgeable workforce;
- Pursuing environmentally sustainable development to reinforce long-term growth (Eighth Malaysian Plan 2001-2005).

In this chapter, our focus would be on two of the compositions of the NVP. These are, (I) developing a knowledge-based economy as a strategic move to raise the value added of all economic sectors and optimising the brainpower of the nation; (II) Strengthening human resource development to produce a competent, productive and knowledgeable workforce. Why the focus on these two? Because they are of significant importance in Malaysia's efforts to move to a knowledge-based economy, and to be a developed nation by the year 2020. It is the view of this author that the effective development of these two components of the NVP would be the defining aspects of the success of the NVP.

1.3 The Vision of Developing a Knowledge-based Economy as a Strategic Move

The policy makers of Malaysia will need to provide the country with the requisite platform that would enable it attain rapid and sustainable rates of economic growth that would contribute to the competitiveness of the Malaysian economy. If Malaysia is to attain its vision of becoming a developed nation by the year 2020, it must maintain growth rates of seven percent consistently from 1991 when Vision 2020 was launch to the year 2020. If such growth rates are to be attained over the years, Malaysia would have to double its national income every ten years and that would enable it to realise its vision by the year 2020 (*Managing the Malaysian Economy*, 2000). Yet, as a small open

economy, Malaysia can only plan ahead, but external factors and forces can affect its plans. The Asian Financial Crisis, the 2003 War on Iraq, and the Severe Acute Respiratory Syndrome (SARS) epidemic affecting South East Asia, are examples. In the case of the Asian Financial Crisis, Malaysia had to undertake selective capital controls to curb the decline of its capital markets and real economy. These external factors obviously disrupted the growth trajectory of Malaysia as apart of its strategy to attain a developed nation status by the year 2020. It is therefore clear that to make-up for such loses and to hedge against future global economic shocks and uncertainties, it must move to the knowledge-based economy.

Furthermore, declining marginal productivity of its capital prompts the vision of moving to a knowledge-based economy by Malaysia. In passing, one would like to mention that Malaysia's past growth was made possible by large capital investments in its economy. Briefly, if capital therefore is constantly flowing into the Malaysian economy for investment, overtime, the economy would keep growing but at a certain optimum, diminishing returns on capital invested would take place, according to the diminishing marginal productivity economic model. In the case of Malaysia, this was reflected in its increasing incremental capital output ratios. Moving to the knowledge-based economy is the best way to increase productivity, particularly, Total Factor Productivity (TFP). TFP is the additional output that would result from improvements in methods of production, with the inputs of labour and capital unchanged. This includes, improvement of technology, know-how, innovation, superior management techniques, gains from specialisation, and increased efficiency to mention a few. TFP would contribute to enhancing the competitiveness and value of goods and services from the productive sectors of the economy as well as an increased innovative capacity to enable the economy produce new and

innovative products. It is one of the key variables in growth accounting. Using regression analysis as a way to isolate and quantify TFP as one of the key variables that contributes to economic growth, a simple equation to illustrate TFP can be written thus:

$$\text{Economic Growth} = \text{Increases in Labour} + \text{Increases in Capital} + \text{Total Factor Productivity}$$

But why is TFP of importance to Malaysia? Because it can be regarded as the intangible gains in productivity, usually not accounted for through the increase in investment and labour. Indeed, it can be regarded as the measure of a country's overall efficiency. Economist, Paul Krugman, as it pertains to Asian economies first raised the issue of TFP. In an article titled "The Myth of Asia's Miracle" in *Foreign Affairs* in 1994, Krugman questioned the fast growth that economies in the region attained at that time. He contended in his article that fast growing economies in Asia had little or no TFP growth at that time. He argued that the growth of the economies in Asia at the time he wrote his piece was due to countries in the region putting more people to work and investing heavily (Lehner, 1995).

One country that came in for criticism in Krugman's article is Singapore. According to Krugman, Singapore had no TFP growth between 1966 and 1990. He held the view that the city-state's economy only grew because it put more people to work, up from 27 percent in 1966 to 51 percent in 1990 and it also boosted investment. Thus Singapore's growth was through investments and labour, not through efficiency. This growth by boosting investment according to Krugman was not sustainable (Lehner, 1995). He added that similarly, societies that invest heavily in capital equipment can increase their output rapidly at first, but would face the laws of diminishing returns. Naturally,

Singapore was outraged but quietly formed a task force to examine ways to improve its TFP growth because it saw it as a major source of the country's competitiveness (McDermott, 1996). In the final analysis, Krugman was vindicated. In an interview in 1996, he added that, "economic efficiency is something more subtle; it's the ability to get more out of an economic input" (Williams, 1996). The essence of stressing on TFP is that if Malaysia has to move to the k-economy and to increase productivity growth and efficiency, it must educate and train the requisite knowledge workers. The issue of knowledge workers is tackled at length in this book.

1. Strengthening human resource capabilities to produce a competent, productive and knowledgeable workforce

The vision to move Malaysia from a production based economy to a knowledge-based one would require a substantial amount of a knowledgeable workforce to fuel Malaysia's sustainable growth and foster its competitiveness as it prepares itself to become a developed nation by the year 2020. The strategic plan to strengthen the human resource capabilities is therefore in order. The policy thrust to attaining such an end include:

- Expanding the supply of highly skilled and knowledge manpower to support the development of a knowledge-based economy;
- Increase the accessibility to quality education and training to enhance income generation capabilities and quality of life;
- Improving the quality of education and training delivery system to ensure that manpower supply is in line with technological change and market demand;

- Promoting lifelong learning to enhance employability and productivity of the labour force;
- Optimising the utilisation of local labour;
- Increasing the supply of S&T manpower;
- Accelerating the implementation of the productivity-linked wage system;
- Strengthening labour market information system to increase labour mobility;
- Intensifying efforts to develop and promote Malaysia as a regional centre of educational excellence;
- Reinforcing positive values (Eight Malaysian Plan 2001-2005)

From all of the above policy thrust, a couple would be extracted and given further explication. The first is the expansion of the supply of highly skilled and knowledge manpower to support the development of a knowledge-based economy. Malaysia knows that knowledge workers are important in its efforts to move to the knowledge-based economy. Consequently, it must put in place the requisite plans, programmes and policies that would increase the supply of knowledge workers. Chapter 7 of this book have addressed in detail the issue of k-workers. It must expand opportunities in education and training. The country must also put into place the mechanism that would foster and encourage continuous learning. But it must be stressed that the proposed expansion of the education and training programmes should concentrate on how the future and current knowledge workers of Malaysia acquire, synthesise, create and deploy knowledge. They must also be imbued with entrepreneurial skills. Hence, just getting an education alone today is not enough and certainly, chasing paper qualifications by some Malaysians without the requisite

academic rigour and experience is also not going to help. This is evidenced from the numerous unemployed university graduates, who are unable to meet the tough requirements of the private sector (*New Straits Times*, 2002, p.7). Thus, a new type of education that places emphasis on skills, acquisition of knowledge and effectively applying them to the sustainable growth and development efforts of Malaysia in the k-era cannot be emphasised enough.

If Malaysia is to prosper and survive in the knowledge-based economy era, access to quality education must be made available to all of its races. Each and every Malaysian, no matter their race and religion has an important role to play in helping the country attain its vision of a developed nation status in the year 2020. Certainly, the role to be played by each group in Malaysia to move the country to the k-economy is equally important. Thus Malaysians of all racial persuasions and beliefs should stay alert to any group be it a political, religious, racial or economic concern that tries to drive a wedge between the people. Extremism has no place in a multiracial society. The world is full of examples of the devastating effects of extremist. Dr. Mahathir Mohamad, speaking at the "One Nation, We Care," gathering at the National Stadium in Bukit Jalil, Kuala Lumpur in July 2002, expressed the same concern of how extremism on the part of some Malaysians could lead to instability. He said, "confrontations will take place, escalating to riots, as in 1969. ... if we ignore history, we will be repeating the same mistakes." He continued, "Extremism breeds extremism. When one race has people who are extreme and do not respect the feelings of other races, then the other races too will indulge in extremism" (*New Straits Times*, 2002, p.1&2). If such extremism were to lead to instability, it would detract from Malaysia's efforts to move to the k-economy and to

attain a developed nation status, using its unique human resources of diverse races and religions.

Finally, having access to education and training opportunities alone are not enough to develop the requisite knowledge manpower to fuel the Malaysian economy in its move to a knowledge-based economy. Attention must also be paid to increasing the effectiveness and efficiency of the education and training delivery systems. Skills imparted must help the student to be able to develop the abilities to attain competency in solving problems as well as the ability to be innovative and to be able to generate new ideas. Students should not be tested on just passing examinations. Emphasis should be placed on whether they understand the problem and have them show how to find solutions to such problems. Hence, new and dynamic subjects should be introduced which should be germane to the changing times. Education and training should also touch on areas that instil in students skills such as effective communications, management and supervisory skills. Courses that teach the acquisition of skills in the areas of new technologies should also be encouraged.

1.4 Planning and Implementing the Vision

The vision of moving Malaysia to the k-economy and for the country attaining developed nation status was an idea developed through research, consultative efforts and a deliberate policy plan to increase and sustain growth and development of the country. It could also be added that external conditions, such as globalisation and advancements in ICT have all contributed to the development of such a vision. But what is important is that, any nation that wants to develop and continue to grow must constantly devise ways to face dynamic changes in the global environment. According to Dr. Mahathir, "a nation that does not constantly reform itself and is not willing to try new ideas and

strategies; an economy that is unable to quickly reinvent itself and then to quickly reinvent itself again, will soon be left behind in today's fast-moving world, a world buffeted by new ideas and concepts such as globalisation, borderless economies, disregard for sovereignty of nations and unlimited as well as confusing information" (Mohamad, 2000).

The planning process of the vision entailed inputs from diverse sectors of the economy, academic institutions, think tanks and the general public. Debates and discussions were held at policy levels in the country and concerns as well as divergent views were taken into consideration. All these views were taken into perspective in designing and planning the vision. Now that the vision has been planned, implementing it took centre stage. Here the government had to codify it as a national policy and a goal in its overall development strategy in the form of the NVP as already explained in this chapter. Directions were given to the appropriate divisions within the Federal and State governments to effect its implementation. Resources were made available to these bodies from approvals of the national budgets to support the implementation exercises. These resources are not confined to financial only but also include the requisite human resources in the form of advisors and specialists. The private sector in the country has also been engaged to contribute to the implementation of the vision. There is also a role for educational institutions and Think Tanks in this effort.

1.5 Walking the Talk of the Vision

The process of attaining Malaysia's vision goes beyond the provision of the requisite resources. There must be an un-ending political will that should continue to fuel the embers of the vision until it is realised. A vigorous and continuous marketing of the vision to the populace and to Malaysia's neighbours as well as friends and well-wishers around the globe must be in place. If

such is not done, the populace could soon lose enthusiasm for the idea, which could have an impact on achieving the vision. The continuous marketing of the idea to outsiders would ensure that they buy into the vision through direct investments in the country and their investments would help to compliment government fiscal efforts to realise the vision. Furthermore, to attain the vision, the government must be obstinate in its decisions and support of projects and programmes that pertain to the vision. If it says one thing and does another, it would lose the credibility needed for the success of the vision. Its fortitude and support of the vision should be unwavering.

It is also important that those in policy positions be open to good and innovative ideas that would contribute to the attainment of the vision. Ignoring innovative ideas because they did not originate from certain quarters or that they might require the making of tough decisions would be relegating the attainment of the vision to the back burner. Finally, those at the helm of steering the nation towards attaining the vision must accept responsibility when they make mistakes in the process for to err is human and to forgive is divine. Requisite steps must also be taken to address those problems quickly before they derail the vision. They must also be willing to accept constructive criticisms if such are founded and would contribute to the greater good of the nation and help it achieve its vision. At the same time, they should be flexible and nimble to implement changes, proactively with resolve and tact. But it is not only the policy makers that are charged with helping Malaysia attain its vision. All Malaysians are charged with helping the policy makers by contributing their share in diverse ways to help the nation achieve its vision. The claim by some in the populace that *ini adalah tanggungjawab kerajaan* (this is solely the job of the government) is misplaced. The country would attain its vision if all hands are on deck. The call is out, all aboard the vision train.

1.6 Realising the Vision

For Malaysia and Malaysians to realise their vision, they should see no limitations and must hence let no one set limitations for them. They must be realistic to understand that there are going to be hard times on the way like the Asian Financial Crisis. The country may face temporary setbacks in such times but it must keep its focus, by keeping all eyes on the vision. There must be the realisation amongst the people that a vision is the future, the tomorrow that becomes today, the present. Indeed it is the unreachable that becomes reality. To this end, and with this realisation, they would be able to "conquer the Alps in the Winter." As an elucidation to this quote, a pedagogue in history is appropriate. History has it that a Roman military tactician during the war of Trebia in 218 B.C. advised that, "the Alps in the Winter form an impenetrable barrier." Hence the Romans assumed that they were safe and protected from attacks. They shrugged-off Hannibal's plan to attack. The Romans were surprised when Hannibal swept down the Alps with his elephants to defeat them at the battle of Trebia in 218 B.C. Similarly, those who claim that it is impossible for Malaysia to achieve its vision could be surprised. But the onus is on Malaysia to pull it off. The nation must mobilise behind this effort, working with a united sense of purpose to realise the vision. Any "self-destructive attitude" of "I got mine, to hell with them" complexes would be defeating and can derail the attainment of the vision.

The government must continue to have the economic fundamentals in place, its macroeconomic fundamentals must be continuously enhanced to weather the changing tides of globalisation. The role of the government as an important facilitator to help the private sector in growing the economy must not change. Furthermore, the government should not be afraid to take decisive action against adverse internal or external forces that may affect the growth of the economy. The "Winning

Formula" that have helped Malaysia move from a tin, rubber and palm oil exporter to that of electronics and manufactured goods should be maintained. Finally, for Malaysia and Malaysians to realise their vision, peace and stability must pertain. It must be the watchword. Without peace and stability, socio-economic and political growth and development would be elusive, hence the move to a knowledge-based economy and a developed nation status by the year 2020 would not be possible.

1.7 Conclusion

A vision is yesterday defined today. Malaysia's Vision 2020 is where Malaysia wants to be tomorrow defined today. But in its efforts to attain this vision in a dynamic and uncertain global environment, there are going to be peaks and valleys, day and nights but at the end of the day, if the country and its leadership are armed with a burning patience, as Nicholas Arthur Rimbaud (1854-91) once said, they will enter the splendid cities. The efforts so far and the dedication on the part of the leadership point to such possibilities. Thus this journey of a thousand miles as Lao Tzu (570-490 B.C.) once advised has already begun. The first steps have already been taken, the subsequent steps must follow in the same rhythm and tempo as the first. Going forward on this journey, the challenge would be, being nimble and flexible and having the ability to respond swiftly and adequately to hurdles and unforeseen occurrences in the domestic and global environment. With such fortitude and perseverance, the vision would be attained.



2. THEORETICAL CONTEXT OF MALAYSIA'S K-ECONOMY IN ECONOMIC DEVELOPMENT

2.1 Introduction

The 1991 *World Development Report* explaining what development entails asserted that: "the challenge of development ... is to improve the quality of life. Especially in the world's poor countries, a better quality of life generally calls for higher incomes — but it involves much more. It encompasses as ends in themselves better education, higher standards of health and nutrition, less poverty, a cleaner environment, more equality of opportunity, greater individual freedom, and a richer cultural life" (*World Development Report*, 1991). Against this backdrop, all those who have followed the development trajectory of Malaysia from the early days of independence when it was a rubber, tin and oil palm producer to today where most of its exports are manufactured goods and electronics would not be surprised at how it has been able to raise its income levels and subsequently be able to improve the quality of life of its people.

As Malaysia moves to a knowledge-based economy, it would be prudent to explore under what developmental theoretical base such development plan/policy trajectory is built on. To do that,

this chapter would offer a general overview of most of the competing development theories¹. With such an overview, it is hoped that this would offer valuable insights and perspectives into the different development theories used for different economic circumstances and stages of growth. Brief criticism of each policy would be given after each theory and at the end of the overview of these theories, an effort would be made to reconcile the differences and linking such to Malaysia's move to K-economy. It should be noted here that the effort in this chapter is not to offer an exhaustive elucidation of the theories rather it is to be able to show some links, more of a guide, with such an overview of these theories to the K-economy and why Malaysia's move to a k-economy draw from some of these theories. With such, it is hoped to offer the reader the opportunity to ponder on some of the salient features of the k-economy and its importance in development theory.

The major conventional economic development theories over the last five decades have five major different leading theories. These theories are as follows:

- (1) Linear stages of economic growth theories
- (2) Neoclassical structural change models
- (3) International dependency paradigms.
- (4) Neoclassical Counterrevolution model
- (5) The New Growth Theories.

¹ Most of the development theories in this chapter were drawn from the work of Michael Todaro, especially his book *Economic Development in the Third World*.

2.2 The Linear Stages of Growth Theory

Rostow's Stages of Growth Model

- (1) The first of these theories is the linear stages economic growth model by the late W.W. Rostow, an American economic historian who, around the 1950s and 1960s, first advocated it. According to this theory, the process of development was viewed as that of successive stages through which all countries who wish to develop must pass through.

According to Rostow industrialised countries have passed through this stage, hence developing countries have to follow a certain set of rules of development to attain their development goals. These stages are: (a) the traditional society stage (b) the preconditions for take-off stage (c) the take-off stage (d) the drive to maturity stage and (e) the age of high mass consumption stage (Rostow, 1962). According to this theory, for developing countries to move from the "pre-conditions" stage to "take-off" stage, the mobilisation of domestic and foreign savings for investment, which, would lead to economic development of their various economies, is necessary.

The Harrod-Dormar Growth Model

Such a view is also captured by Harrod-Domar in their economic development and growth model. The Harrod-Domar Growth Model postulates that every economy must save a certain proportion of its national income to attend to recurrent cost associated with capital goods in its economy. But for such an economy to grow, the economy must create additional capital stock for new investments. This model assumes that there is a direct economic relationship between the size of total capital stock (K) and total GNP (Y). Such a simple model of economic

growth by the Harrod-Domar model can be represented by the following equations (Todaro 2000):

$$S = s \cdot Y \quad (1)$$

Savings (S) is some proportion, s , of national income (Y)

$$I = K \Delta Y \quad (2)$$

Investment (I) is defined as a change in the capital stock (K)

$$\frac{K}{\Delta Y} = K \text{ or } \Delta K = K \Delta Y \quad (3)$$

According to this model, since total capital stock (K) has a direct relationship to total national income or output (Y). Such a capital/output ratio is expressed thus in equation 3.

$$S = I \quad (4)$$

Total Savings (S) is equal to investment (I)

$$S = s \cdot Y = K \Delta Y = \Delta K = I \text{ or } s \cdot Y = K \Delta Y \quad (5)$$

A combination of equations (1) (2) and (3) can be written as in (4); savings is equal to investment.

$$\frac{\Delta Y}{YK} = S \quad (6)$$

Equation (6) is the simplified version of the Harrod-Dormar economic model. This equation states that GNP ($\Delta Y/Y$) is

determined jointly by national savings ratio (S) and the national capital/output ratio (k) (Todaro, 2000).

So what is the economic logic of the Harrod-Dornar theory as expressed in the above equation (6)? Simply put, the theory states that in order to grow, economies must save a certain proportion of GNP, which must be invested productively. Hence the more these economies can save, the faster they can invest and the faster they will grow. The theory also holds that the rate of their growth at any level of their savings and investment will determine how productive these investments may be.

Criticisms of the Linear Stages Theory

Rostow and Harrod-Dornar models are often criticised as been very simplified. Critics hold that these models are too simplistic, because they easily assume that economic growth and development is easily addressed by simply increasing national savings and investment. These critics argue that if capital and investment were the sole constraints, then attracting Foreign Direct Investment (FDI) or foreign aid could easily solve such constraints by developing nations. Hence the notion that those nations have to rely on savings to create capital for investment for growth and development is too simplistic a theory.

Another critique of these models is on the way they prescribe development and growth as occurring. This did not always happen. This is because savings and investment alone are not a sufficient condition for development and growth. Besides, the arguments that because these models worked elsewhere, say in the West, the implicit assumption by some Western development economist that it will work in most developing countries is a leap of faith. Finally, the models have been criticised as not taking into consideration the fact that developing countries are highly integrated into a complex international system which is capable of nullifying the best development strategies these countries may

adopt, due to forces beyond their control. Those who belong to the international dependency paradigm school often argue such criticism. Their criticism if clearly analysed seems to argue that, merely "removing obstacles" and providing "missing components" such as capital, foreign exchange, skills and management do not easily attain development.

The failures associated with the Rostow-Harrod-Domar theories of economic growth and development, especially its inflexibility has brought about the emergence of a theory that combines both economic and institutional factors into a social systems model of international development and underdevelopment. This theory is captured by the international dependency models (Amin, 1971; Frank, 1968).

2.3 The International-Dependency Models

The Neoclassical-Dependence Model

The international dependency models view developing countries as beset by institutional, political and economic rigidities internationally and domestically. These countries they contend are also caught up in a dependency relationship with rich developed countries. One of the arms of the theory subscribing to this view argue that developing countries' underdevelopment dilemma has its historical roots in the evolution of a highly unequal capitalist system.

This arm, an outgrowth of Marxist thinking (Marx, 1969), asserts that rich countries in this unequal relationship consist of the core and the poor countries the periphery. The core thus extracts surplus from the periphery. This arm of the international dependency school further assert that inside the periphery, there are certain groups such as elites (comprador groups) who perpetuate the international capitalist system of inequality, thus their actions inhibit any genuine efforts of reform that might

benefit the masses to free themselves from the economic control of developed countries.

Criticisms of the International Dependency Model

There are many criticisms of the International Dependency Model, but one of the most important to be highlighted here is that dependency retards growth. Briefly, the theory holds that growth is limited by decapitalisation of the dependent country. Decapitalisation takes place through trade (unequal exchange) and direct transfers of capital in the form of profits, royalties and debt payments. Yet, these terms of trade and direct capital transfer argument, lack any solid theoretical foundation. As it pertains to the terms of trade, the fact that the terms of trade argument is based only on the predominance of primary product exports from Less Developed Countries (LDCs), it is off the mark. This is because a new international division of labour is emerging in which many LDCs like those in Asia are increasingly exporting manufactured goods and services. The criticism is that of dealing with capital outflow and inflows. Since capital outflow is greater than capital inflow, there is this deduction that there is a net capital transfer from the periphery to the centre. But the mere difference between capital outflow and inflow does not in itself represent capital loss (Caporaso and Zare, 1981).

False Paradigm Model

A second arm of the international dependency model of development is often referred to as "the false paradigm model". It attributes the underdevelopment of developing countries to faulty and inappropriate advice provided by well meaning but often uninformed international "experts" advisers from multinational or donor agencies who are mostly ensconced in glass offices in developed countries. The advices these so-called "experts" offer are often elegant and sophisticated, with complex

econometric models but they often lead to inappropriate or simply incorrect policies with devastating consequences for developing countries.

Furthermore, "the false paradigm model" points to the fact that most leading university intellectuals, high-level government economists to mention just a few, most of whom got their training in developed countries, where they unwittingly acquire "alien" concepts and theories which are inapplicable to developing country situations to whom they may eventually return. They therefore unknowingly become apologist for the respective Western countries in which they have studied in, thus contributing unwittingly to the underdevelopment of their various countries.

Criticism of the False Paradigm Model

Again this model is based on assumptions. The fact that some of the intellectuals and high-level officials in developing countries got their training from developed countries does not mean that they all acquired "alien" concepts and that they became apologist to the respective Western countries in which they have studied. In fact, most of the leaders and thinkers of developing countries studied in Western countries but when they returned they fought against colonialism and Western domination and led their respective countries to independence. They applied what they learned in the West to the cultural and environmental conditions of their various countries and were able to develop despite the impact of colonialism and neo-colonialism. Today, what is actually happening is that most of the people from developing countries educated in developed countries do not return. Hence the arguments put forward by this theory are porous.

2.4 Structural Change Models

The Lewis Theory

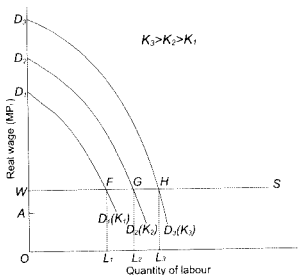
Two other prominent mainstream Western theories of development in this book that this author will briefly touch on are the Lewis Theory of Development and the Structural Change and Patterns of Development models. These two theories are often referred to as the Neoclassical Structural Change models. These theories focus on the mechanism by which underdeveloped economies should transform their domestic economic structures from a heavy emphasis on subsistence agriculture to a more modern, more urbanised, and more industrially diverse manufacturing and service economy. The theory of Structural Change employs neoclassical tools such as price and resource allocation, as well as econometrics to show how this transformation process can take place.

The late W. Arthur Lewis (1954), a Nobel Laureate in economics formulated one of the best-known theoretical models of development. His theory focused on the structural transformation of a primarily subsistence economy. His model of an underdeveloped economy consists of two sectors. The first is a traditional overpopulated rural subsistence sector. This sector according to Lewis is characterised by zero marginal labour productivity and he classified the labour in this sector as "surplus" that can be withdrawn from the agricultural sector without a loss of output. Lewis' model also consists of a highly productive modern urban industrial sector into which the surplus labour from the subsistence sector can be gradually transferred.

The emphasis of Lewis' model is on the process of labour transfer and on output and employment growth in the modern sector. The growth of this sector is built on the assumption that "capitalist" reinvest all their profits. Also, there is the assumption by Lewis that levels of wages in the urban sector are assured to be

constant. These levels of wages are determined as a given premium over a fixed average of subsistence level of wages in the traditional agricultural sector. Lewis further assumed that urban wages would have to be at least 30 percent higher than the average rural income to induce workers to migrate to urban areas. Thus at such a constant wage, the supply curve of rural labour will be considered as perfectly elastic.

Figure 2.1: Two Sector Economy and Growth in the Modern Sector



Source: M. P. Todaro, *Economic Development in The Third World* (New York and London: Longman, 2000)

The graph is a simple illustration of Lewis' model showing a two-sector economy and growth in the modern sector. Real wages (MPL) are represented on the vertical axis. The quantity of labour is on the horizontal axis. OA on the vertical axis represents the average level of real subsistence income in the traditional or

subsistence sector. OW on the vertical axis represents the real wage in the modern capitalist sector. At this wage according to Lewis, the supply of rural labour is assumed to be "unlimited." The supply curve WS at this wage level can be described as perfectly elastic. This means the modern sector can hire as many surplus rural workers at an urban wage OW , a wage rate above OA , which is rural wage, without a fear of rising wages.

The graph show that at the initial stage in the modern sector growth, with a fixed supply of capital, K_1 , the demand curve for labour will be determined by labours declining marginal product, shown by the curve $D_1(k_1)$. F on the supply curve is the profit-maximisation point where employers from the modern sector assume the labour they have hired from the rural sector is equal to the real wage (Marginal Physical Product is equal to real wage at F). At F , total modern sector employment will be equal to OL_1 . Points OD_1FL would represent total modern output. $OWFL$ will represent total output paid to workers in the form of wages. Area WD_1F is the balance of the output, which represents total profits that will accrue to capitalists.

But according to Lewis, it is assumed that capitalist reinvest the profits that accrue to them. Such a reinvestment will cause the total capital stock in the modern sector to rise from k_1 to k_2 and will cause the total product curve in the modern sector to rise. It then includes the marginal product demand curve for labour to rise. Such an outward shift in the labour demand curve is shown by line $D_2(k_2)$. The new equilibrium point for the modern sector is G with the employment of OL_2 workers. Total output in this case will rise to OD_2GL_2 and total wages and profits will increase to $OWGL_2$ and WD_2G respectively. Reinvestment of profits will repeat the process.

Lewis' model assumes that the process of modern sector growth and employment expansion will continue until all surplus rural labour is absorbed into the new industrial sector. When

such a goal is attained, any additional workers withdrawn from the agricultural sector will be at a higher cost of lost food production. This is because, declining land/land ratio means that the marginal product of rural land is no longer zero. The land supply curve will slope positively as modern sector wages and employment continue to grow. At this juncture, the Lewis model assumes that the structural transformation for economic development have taken place. Economic activity would have shifted from traditional rural agriculture to the modern sector.

Criticism of the Lewis Model

The Lewis model is often criticised as not applicable to contemporary conditions and realities of developing countries. The model according to critics, implicitly assumes that the rate of land transfer and employment creation in the modern sector is proportional to the rate of modern sector accumulation. The question then asked is, if alternatively capitalist reinvest their profits in more sophisticated labour-saving capital equipment rather than the duplication of their existing capital as the model assumes, what would be the repercussions? The result would be that all extra income and output realised from growth would go to the few owners of capital. GNP would rise but income as well as unemployment levels would remain unchanged. There would therefore be no change in the aggregate social welfare.

Another critique of the model is its assumption that surplus savings exists in rural areas and in urban areas; hence full employment is realised. Such an assumption does not hold true in most countries in the developing world. Contrary, most urban areas or cities in developing countries are usually overpopulated with most of the population being unemployed (Stryker, 1979). Even though there may be some seasonal or geographic exceptions to this rule, we assume that urban surplus savings is more the norm than Lewis assumes about rural surplus savings.

Other critiques of the Lewis' model centre on its assumption that the competitive modern sector will guarantee the continued existence of constant real urban wages. This according to Lewis will continue up to the point where the supply of rural surplus savings is exhausted. Lewis' assumption does not apply in contemporary developing countries. Contrary, in developing countries of today, wages tend to rise over time relative to rural incomes. Besides, institutional factors i.e. civil service wage scales, multinational corporations hiring practices, union wage negotiations all tend to go against the existing forces of competition in savings markets in developing countries. Thus while the Lewis model is a valuable contribution to the literature of development economics, particularly offering a better understanding of the importance of the process of sectoral interaction and structural change, it needs to be greatly modified to fit current conditions or situations of many developing countries.

Structural Change and Patterns of Development Model

The other Neoclassical Structural Change model is called the "Patterns of Development" model. Hollis B. Chenery, a Harvard economist is renown for his work in this area (Chenery 1979, Chenery and Syrquin, 1975). Hollis and Chenery, who were both Harvard economists, based the structuralist model of development largely on their work pertaining to developing countries. They examined patterns of development for numerous developing countries between 1950-73. Empirically, all those who subscribe to this school of thought emphasise that both domestic and international constraints impede the development of developing countries. Domestic constraints include resource endowment, population size and government policies and objectives. International constraints on the development of

developing countries include access to external capital, technology and international trade.

The focus of this model is on the sequential process through which the economic, industrial and institutional structures of an underdeveloped economy can be transformed overtime. Such a transformation according to the model would replace traditional agriculture as the engine of economic growth. In this model, increase savings and investments are perceived as necessary but in themselves are insufficient conditions for economic growth. Other factors according to this model are necessary for such to occur. These are described as "interrelated". These "interrelated" factors are those that can help change the structures of developing countries from traditional to modern. These structural changes involve the transformation of production, changes in the composition of consumer demand, international trade, resource use, as well as changes in urbanisation and the growth and distribution of a country's population. Thus in a nut-shell, it should be noted in passing that the structural change and patterns of development model recognises that developing countries are part of this highly integrated international system, popularly known today as globalisation. This globalisation can both hinder as well as enhance their economies as elucidated on in this book (see Chapter 3 page 55 on Malaysia and Globalisation).

Criticism of the Theory

The main thrust of this model is that development can be regarded as an identifiable process of growth and involves change. The main features of such a process are thus regarded as been similar in all countries. It is within such a thrust that the model has its weakness. First, the assumption of the model is that of "one size fits all." To contend that the process of growth and change are similar in all countries is further from the truth. Different countries have different resource endowments,

circumstances, capacities, environment and various other factors that may affect its pace, pattern or quality of development. Second the model also holds the view that, despite the different circumstances in different countries that may affect their development, one can still identify certain patterns that do occur in almost all countries during the development process. These patterns thus affect the choice of development policies that developing countries pursue. Hence, they argue, the "correct mix" of development policies by developing countries would bring about sustainable growth and development.

Such an assumption is highly optimistic and does not take into consideration that external factors in the international environment can have devastating effects on the economies of most developing countries even if the "correct mix" of development policies were pursued; they could still be at the mercy of external factors. The Asian Financial Crisis of 1997-98 is a good example. In fact, the International Dependency School are also less sanguine about these assumptions. They argue that, the diverse range of statistical averages of diverse developed and developing nations calculated by Structural-change economist is of limited practical value in identifying the critical factors in a particular nation's development process (Amin, 1971).

2.5 Neoclassical Counterrevolution Models

Challenging the Statist Model

The ascendancy in the 1980s in Britain, the United States and in the former West Germany of conservative governments (Ronald Reagan in the U.S., Margaret Thatcher in Britain and Helmut Kohl in Germany) could be attributed to the rise of the neoclassical counterrevolution model in economic theory and policy. This theory was heavily biased towards supply-side macroeconomic policies, rational expectations theories and the

advocacy for the privatisation of state owned enterprises. The neoclassical counter-revolution models also called for free markets, the dismantling of statist planning, public ownership and government regulation of economic activities in developing countries. At this time, the neo-classicists controlled most of the powerful positions on the board of international financial agencies. The leading writers of the counterrevolution model, Lord Peter Bauer, Deepak Lal, Ian Little, Bela Balassa, Anne Krueger and Jadish Bhagwati to mention a few, argued that it is state intervention in economic activities especially of developing countries that slows economic growth. Thus underdevelopment as these neoclassical counterrevolutionaries see it, results from poor resource allocation due to incorrect pricing policies and too much state intervention by governments especially in the developing world.

For developing countries to develop, they contend that their governments must allow free competitive markets to flourish. They must promote and expand free trade as well as privatise state owned enterprises. They further argue that, governments in developing countries must rid their economies of a plethora of government regulations, price distortions in their factor, product and financial markets. An extreme of this neoliberal argument falls under the banner of public-choice theory or what have common been referred to in certain quarters as the New Political Economy Approach. They hold the view that *governments can do little right*. According to those who subscribe to Public Choice Theory, they assume that politicians, bureaucrats and citizens act solely from self-interest, hence they use their power for their selfish ends. Citizens are not innocent either, they use their political influences to exact "rents" (benefits) from government and government policies. Politicians are guilty of using government resources to consolidate and maintain their positions in power, whiles bureaucrats are known to use their positions to

exact "rent" from citizens who are themselves "rent-seeking." The net result is the reduction in individual freedoms, hence those who subscribe to this theory call for "minimal government."

Criticism of the Theory

First, most of the arguments of the neoclassical counterrevolutionaries might not have taken into consideration the social-cultural, institutional and structural circumstances of most of the developing countries. Most of the markets in these countries are weak and do not have the requisite structures to support free market systems. Thus the unquestioning exaltation of free markets and open economies is open to debate. Also, the disparaging of the public sector in developing countries as to their role in promoting equity, growth and development is unfounded. Contrary, a case can be made if it is argued that to have successful development, developing countries must adopt a skilful and proper balance between market promotion, where they would exist and operate in an efficient manner and equity oriented government, intelligent enough to intervene in areas where the consequences of the forces of an unfettered market could lead to undesirable socio-economic and political consequences.

Traditional Neoclassical Growth Theory

The traditional neoclassical models are a direct outgrowth of the Harrod-Domar and Solow models. Robert Solow's neoclassical growth model is one of the seminal contributions to the neoclassical growth theory by expanding on the Harrod-Domar model.² The Traditional Neoclassical Growth model stresses the importance of savings. According to the Traditional Neoclassical Growth models, the liberalisation of national markets would draw domestic and foreign investment would contribute to the increase

² Solow was awarded the Nobel Prize in Economics in 1987 for this model.

in the accumulation of capital, enhancing the capital labour ratios and per capita incomes in developing countries. This theory also holds that output growth results from one or more of three factors, increase in the quantity and quality of labour, increase in capital and improvements in technology. Increases in the quantity and quality of labour can be achieved through population growth and education, while increase in capital can be attained through savings and investments. The theory further holds that closed economies therefore would grow slowly (other things being equal) in the short run because of their low savings rates. Open economies, through trade and foreign investments would experience a higher income convergence due to the flows of capital from rich countries to poor countries. This is because capital labour ratios in these countries are lower and thus returns on investments are higher. Thus governments of developing countries who impede inflows of FDI are going to retard the growth and development of their economies.

Criticism of the Theory

One of the criticisms of this theory is that, there is the assumption that all developing countries are the same. What these Neoclassical Growth theorist forget is that, the economies of these developing countries as well as their organisational structure are different. Other cultural and environmental differences amongst them do not call for the blanket application of this theory to all developing countries.

One of the weaknesses of the neoclassical growth theories is that it has failed to show the source of long-term economic growth. The literature instead concentrates on the dynamic process through which capital-labour ratios approach long-run equilibrium. Neoclassical growth theories have also failed to explain the remarkable consistent pace of historical growth in economies around the world. This disenchantment with the

traditional neoclassical models of economic growth intensified during the era of the Third World Debt crises (see, Payer, 1974, Delamaide, 1985, George, 1992). These traditional theories were at a loss to explain the cause of these crises and particularly, the dramatic nature of the disparities in economic performance across countries. These shortcomings include the inability to explain the outflow of capital from poor to rich countries. Furthermore, most developing countries, particularly in Africa that are open and have the right macro economic policies in place still find it difficult to draw in FDI due to the perceived negative image that the region has in the eyes of external investors. Thus being open alone is not enough.

2.6 The New Growth Theory

One of the weaknesses of the neoclassical growth theories as already pointed out is that they have failed to show the source of long-term economic growth. The literature instead concentrates on the dynamic process through which capital-labour ratios approach long-run equilibrium. Neoclassical growth theories have also failed to explain the remarkable consistent pace of historical growth in economies around the world. This disenchantment with the traditional neoclassical models of economic growth intensified during the era of the Third World Debt crises. These traditional theories were at a loss to explain the cause of these crises and particularly, the dramatic nature of the disparities in economic performance across countries. These shortcomings including the inability to explain the outflow of capital from poor to rich countries, which were some of the basis that gave rise to the newest approach to the economic growth theory — the New Growth Theory or often referred to in some quarters as Endogenous Growth Theory.

This theory holds that GNP growth is a natural consequence of long-run equilibrium. Even though this theory bears

resemblance to the neoclassical growth theory in some ways, in others it does not. Its underlying assumptions and conclusions are different from the neoclassical growth theory. For example, the endogenous growth model discards of the neoclassical assumption of diminishing marginal returns to capital. Rather, it holds that there is an increasing return to scale in aggregate production. It also believes that externalities have a role in determining the rate of return on capital investments (Stern, 1991; Helpman, 1992). The theory also seeks to explain why there exist a divergent long-term growth pattern among countries and the reason for increasing return to scale. Furthermore, it agrees just like the neoclassicals that technology is an important contributor to growth and development but holds the view that such is not a necessary condition to explain long-run growth. But one most important aspect of this model is that, it has helped to explain the anomalous flows of capital that have exacerbated wealth disparities between developed and developing countries. The theory contends that, the potentially high rates of return on investment offered by developing economies with their low capital-labour ratios are greatly eroded by lower levels of complementary investments in human capital (education), infrastructure, as well as research and development (Romer, 1986; Lucas, 1988; Barro, 1990).

Finally, unlike the neoclassical counterrevolutionaries, endogenous growth theorists hold the view that government must play an active role (not a passive role) through its policies to promote economic development. This can be achieved if governments invest directly or indirectly in the formation of human capital (education), encouragement of FDI inflows and their investment in knowledge-intensive industries as well as technology and ICT.

Criticism of the Theory

One of the criticisms of the theory is that some aspects of it still remain rooted in the neoclassical tradition. Most of these elements of its neoclassical roots are not appropriate and not applicable in most developing countries. A few examples here would suffice. First, the theory's assumption that there is a single sector of production as well as that all sectors are symmetrical then does not permit the crucial growth-generating reallocation of labour and capital among the sectors which have undergone changes during a transformation (Todaro, 2000). But the theory has also overlooked the numerous inefficiencies in developing countries that have impeded their growth and development such as, lack of adequate infrastructure, weak institutional frameworks, and corruption, instability and poor capital markets. More importantly, these inefficiencies vary from one developing country to another. The inability of endogenous theory to realise such important factors makes its applicability to the study of issues of development in developing countries rather limited. **Albeit**, the theory's recognition of the important role governments in developing countries should play in the development process, points to its realisation of the weakness of the free market system. It thus differentiates it from the free market advocates.

2.7 Reconciling the Differences and Linkage to Malaysia's K-economy

The different theories of economic development reviewed in this chapter point to three important facts. The first is that each subscribes to a certain ideological bent, second, they differ in their empirical approach and third, are propounded on different theoretical foundations. Yet, it is refreshing to say that each has provided development economist and practitioners as well as policy makers, a way to look at and understand the diverse and complex development problems that developing countries are

facing. For example, the linear-stages model posits that for long-run development to prevail, savings and investment play an important role. W. Arthur Lewis' two-sector model tries to show the important linkages that exist between the agricultural sector in developing countries and their industrial sectors. Hollis Chenery and others have in their theory tried to show how economies undergo structural change while identifying some of the numeric values of key economic parameters involved in such a process. The Dependency theorist have cautioned us about the structural inequalities that are part of the global economic system and that decisions made in developed countries using the limited knowledge of sub-rosa issues in developing economies, can have devastating effects on developing countries.

It is also true that most of the views propounded by the neoclassical economic theorist need to be modified to meet the challenging socio-economic, cultural and structural circumstances of developing countries. Views by the neoclassical counterrevolutionaries as it pertains to inefficiencies of state enterprises, and the harmful effects of government induced price distortions offer an insight and a learning curve for developing countries in formulating better policies in this arena. In contrast, "the unquestioning exaltation of free markets and open economies along with the universal disparagement of public-sector leadership in promoting growth with equity in the Third World is open to serious challenge" (Todaro, 2000). It is the view of this author and many others that for successful development to pertain in developing countries, not only should the socio-cultural and environmental factors be taken into consideration, but according to Todaro, the role of a skilful, intelligent and equity oriented government intervention in areas where unfettered market forces would lead to undesirable economic and social outcomes. Thus the role of governments in the development process in developing countries is indispensable.

Then the importance of the new growth theory building on the latter view is that, aspects of it uphold the significant role government policy can play in promoting long-run growth and development. It then brings us to where the issue of Malaysia's k-economy fit in these theoretical summaries.

From these summaries, and how they can be applied to Malaysia; first, it can be observed that Malaysia is a small open economy and relies on trade for its growth and development. Hence, it believes in free trade but not the kind of unfettered free markets as advocated by the neoclassical counterrevolutionaries. It can be argued that, Malaysia is engaged in what I would term "managed free markets." It is a country that believes in the participatory role of government in the economy. In Malaysia, the government has formed a partnership with the private sector under the rubric of a policy called "Malaysia-Inc." It is a policy where the role of the government in the economy as a facilitator but also as an important player cannot be emphasised enough. In this sense, this action of the government is in line with what has being propounded by the New Growth Theorist. Which is abhorred by the Neoclassical Counterrevolutionaries. But one of the most important areas that Malaysia can be said to have similarities with some of the propositions of the New Growth Theory is in its efforts to move to a K-economy. The New Growth Theory in a way points to the importance of knowledge and technology as driving forces for growth and development. Hence human capital, its formation and deployment in knowledge intensive industries are important

2.8 Conclusion

A summary of the theories of development in this chapter has helped to throw some light on how we can look at the theoretical base for development policies of developing countries. As it pertains to Malaysia's developmental trajectory so far, some of

these theories or parts of them were adopted. In its efforts to move to the K-economy, the New Growth Theory offers the best theoretical grounding to understand such a development policy. Its emphasis on knowledge, development of knowledge intensive industries, formation of human capital and an active role of government in the development process are the core similarities with Malaysia's k-economy effort. Moving to the K-economy would surely help Malaysia increase its TFP.

3. FROM A PRODUCTION ECONOMY TO A K-ECONOMY¹

3.1 Introduction

On the 31st of August 1957 at Stadium *Pahlawan* in Melaka, Tunku Abdul Rahman Putra al-Haj reminded his fellow Malaysians that, "Independence is only the threshold to high endeavour. At this solemn moment I call on you to dedicate yourselves to the service of the new Malaya" (Sheppard, 1995). Such a poignant remark by the first Prime Minister of Malaysia was a call to service but it also pointed to the enormous work that needed to be done to build an independent Malaya (Malaysia). Since Tunku's clarion call, a lot have been achieved in the effort to transform Malaysia from a rubber, tin and palm oil exporter to electronics and other manufactured goods (Production-economy). Today, the torch has been passed to a new generation of Malaysian leaders. The call may be for the same purpose but the focus and direction and challenges are different. The focus

¹ An earlier version of this chapter was presented as a paper at the Sixth National Civil Service Conference, National Institute of Public Administration (INTAN), Kuala Lumpur, June 28-20, 2001.

and direction is to move Malaysia to a knowledge-based economy — an economy where the intensive application of knowledge to the productive sectors of an economy can bring about quantum leaps in growth and development.

This chapter would look at the efforts by Malaysia to move to a knowledge-based economy as a new strategy to transform its economy for sustainable growth and development in an increasingly competitive global economy. The first part of this chapter will offer an overview of the different growth phases of the Malaysian Economy, with an analysis of how such phases have contributed to the growth and development of the country. The arrival of the knowledge-based economy is seen as an opportunity for Malaysia to transform its economy from the production of electronics and manufactured goods to knowledge-intensive goods as propounded by the New Growth theorist, elaborated on in chapter two. Such a transition will entail some challenges to the Malaysian economy. These challenges would be looked at and suggested responses offered. The chapter will also explore other reasons why Malaysia must move to a knowledge-based economy.

3.2 The Phases of Growth of the Malaysian Economy

The Federation of Malaya gained its independence from Britain in 1957 with Tunku Abdul Rahman being its first Prime Minister. In 1961, Tunku proposed a Malaysian federation and all but Brunei joined the federation in 1963. Singapore later broke away from the federation in 1965 due to economic, political and racial differences with the Tunku administration.

At independence, the economy of Malaysia relied principally on exports of tin, natural rubber, palm oil and timber. Between 1966-70, the Tunku administration drew up the First Malaysia Plan. This plan embraced import-substitution as its industrialisation policy. What were the reasons behind such a

move? First, the population of the country was growing at 3.3 percent yearly at that time and it was clear that the agricultural sector would be unable to absorb the excess labour force. For example, the unemployment rate at independence in 1957 was two percent. By 1967 it has risen to seven percent and to eight percent by 1970. The second reason was that a reliance on tin and primary products as exports whose prices fluctuated on the world market made it difficult for effective economic planning to achieve the growth plans of the country. Hence there was the need to diversify the economy to minimise its dependence on primary products (Cho, 1990).

The import-substitution strategy under the First Malaysian Plan had limited success. First, only a few industries such as resource based industries benefited from the strategy. Products such as tobacco, furniture, rubber products, wood and cork are a few examples. They accounted for 80 percent of the market at that time. There were two major shortcomings of this strategy. First, because of the inefficiency factor that is synonymous with import-substitution industries. For example, import-substitution industries usually do not face competition from outside due to tariff barriers established to protect them, thus they become inefficient. According to Fong (1989) during that time, the Malaysian Tariff Advisory Board introduced 396 tariffs, which eliminated all Commonwealth preferential rates. In addition, the effective rate of protection during this time also rose from 25 percent in 1962 to 65 percent in 1972 and government subsidy was 4 percent of GDP in 1965, roughly about 14 percent of total government expenditure around that time (Jomo and Edwards, 1993). A final reason was the size of the domestic market. Because Malaysia is a small open economy, in the short-run, the market could sustain requirements of an import-substitution strategy but not in the long run.

From 1971 to 1990 the government introduced the New Economic Policy (NEP). The NEP was aimed at the eradication of poverty and the promotion of growth with equity. The overarching aim of the NEP was to foster national unity. Malaysia then shifted from an import-substitution strategy to an export-promotion strategy. The economic logic of such a strategy was that it would give Malaysia the opportunity to expand its markets and enable the country to achieve economies of scale. But it can be argued that export-promotion strategies in general involve the offering of incentives across the board to all industries as oppose to the imposition of controls, which are synonymous with import-substitution strategies. Hence based on such logic, industries in all sectors of the economy stand to benefit and would thus contribute to the growth and development of the country. Finally, it was also easier for policy-making bodies to detect whether export-promotion strategies were effective at specific periods and to develop the necessary policies to address lapses. With the adoption of this strategy saw the introduction of the Second Malaysian Plan; this was to run from 1971-75. Under the Second Malaysian Plan, government strategy was geared at increasing productivity and income, promotion of export oriented industrial development, increase opportunities for inter-sectoral linkages, modernise the rural sector, restructure the socio-economic balance and increase the role of the government in aiding the private sector. The Second Malaysian Plan also saw some successes. The plan saw some strides made to improve the lives of Malaysians, particularly the *Bumiputeras* (sons of the soil). With inter-sectoral linkages as an impetus to the export orientation focus of the government now in place, it then decided to build on such a success.

In 1976, the Malaysian government introduced the Third Malaysian Plan. This plan was to run from 1976-80 and had as its major goals: to enhance the role of agriculture and industrial

sectors, optimise the benefits of industrial growth, promote human resource development and the increase in the ownership of business by the *Bumiputeras*. The success of this plan was minimal. First, the plan period was rather short in relation to the government's ability to enhance the industrial sectors. Besides, much more resources were required to educate and train the requisite human resources which could not be done in such a short time frame. Secondly, for most *Bumiputeras* who never owned businesses, the push for them to own businesses was new and needed an apprenticeship period. Successes of such an effort could not be measured in a short-run. Overall, the plan could be lauded because it set the stage for the country's efforts to attain growth and development and to offer a better life for its people.

Between 1981-85, the government introduced the Fourth Malaysian Plan. This plan had as its objective the expansion and diversification of its industrial base, modernisation of the country's financial services, the promotion of heavy industries and the increase of export — oriented industries among others. The Fifth Malaysian Plan was introduced in 1986. This plan was to last through 1990. Its major goals were to increase the competitiveness of the economy, encourage foreign direct investment, and increase the role of the private sector in national development and to put more emphasis on research and development among others. The Second through the Fifth Malaysian Plans under the New Economic Policy were all part of a broad policy strategy called the Outline Perspective Plan (OPP1) which was to run from 1971-1990. As part of another broad policy strategy, the government of Malaysia introduced a second OPP2, which is to run from 1991-2000. Under this strategy, the government drew up more ambitious plans under the banner of a National Development Policy (NDP). This was to bring about a structural transformation of the Malaysian

economy, aimed at helping the country attain a fully developed nation status by the year 2020, hence the slogan Vision 2020.

The government then introduced the Sixth Malaysian Plan, which run from 1990-95. Under this strategy, the government's aim was to sustain the growth momentum of the economy, to ensure macro-economic stability, and to continue to create a conducive investment climate, increase efficiency and competitiveness of its industries, enhancing the upstream and down stream linkages among others. The Seventh Malaysian Plan followed this. It was introduced in 1996 and was to run through the year 2000. The Plan was aimed at accelerating large-scale production; the promotion of manufactured capital and intermediate goods, intensifying the acquisition of technology and commercialisation of new technologies and the expansion into new growth industries among others. The Seventh Malaysian Plan, it was hoped will lead Malaysia by 2020 into a fully developed nation status. This plan could be regarded as a success because this plan period was marked with rapid economic growth except in 1998 when the Asian Financial Crisis adversely affected the economy. Through the implementation of effective monetary and fiscal policies and strategies by the Malaysian government, the economy was turned around (Mahathir, 2000). In 2000, the Malaysian economy reverted to its pre-crisis level.

The government on April 23, 2001, introduced the Eighth Malaysian Plan. This plan is to cover the period of 2001-2005. The plan would serve as the first phase in the implementation of the Third Outline Perspective Plan (OPP3), which will run from 2001 to 2010. The OPP3 embodies Malaysia's National Vision Policy (NVP), a policy that is drawn to chart the development trajectory of the country in the first decade of the 21st century. It is therefore the Eighth Malaysian Plan that embodies the strategies, programmes and projects designed to achieve the NVP objectives such as, attaining sustainable growth, strengthening of

the Malaysian economy and the creation of an equitable society (Eighth Malaysian Plan 2001-2005, 2001).

The Eighth Malaysian Plan has as its primary aim, to sustain economic growth and competitiveness in the face of growing globalisation and liberalisation. For this planned period, the government has targeted GDP to grow at 7.5 percent a year against 4.7 percent during the Seventh Plan (1996-2000). To be able to achieve such growth rates, the government have to undertake prudent macroeconomic management of the economy to ensure that resources are efficiently used. The experience of the Asian Financial Crises would also require the government to undertake the strengthening of the financial and monetary system to make them resilient against global financial shocks. Other areas of focus of the plan are to shift growth from input-driven to a knowledge-driven economy; to accelerate structural transformation within the manufacturing and service sectors and to revitalise the agriculture sector. The plan also aims at strengthening the socio-economic stability of the country through equitable distribution of income and wealth (*New Straits Times*, April 24, 2001).

Now that we have looked at the various development plans the country has undertaken so far, let us now look at the export-promotion strategies of Malaysia and their impact. It can be said that from the early to the medium-term, the strategy has been successful. It has helped the country achieve a consistent average growth rate of six percent from the 1960s to the 1990s. Export revenues as reported by the Economic Planning Unit of Malaysia rose from RM5,163 million in 1970 to RM208,879 million in 1997. Four reasons can be ascribed to this. First, most of the industries during the early stages of this strategy were in the light-manufacturing sector. Hence, massive capital investments were not required. Second, these industries were mainly labour intensive making use of Malaysia's cheap and abundant labour supply. Third,

most of the industries were in either processing or assembly and did not require high technical skills. Finally, these industries were highly encouraged to use the abundant natural resources of Malaysia in their production of goods. This allowed for forward-backward linkages within the economy and helped to produce value-added goods for export. This overview shows that Malaysia has prospered by undertaking an export-led method of growth and the country has done well in this regard. The country witnessed a growth record of an average of 6 percent in the 1960s, 7.5 percent in the 1970s, and 5.9 percent in the 1980s (Okposin et al., 1999). In the 1990s, average growth rates were around 6.7 percent until the Asian Financial Crisis eroded such a growth rate almost throwing the growth of the country into a halt.

Before the Asian Financial crisis, the Malaysian economy showed favourable features. The GDP growth rate averaged 8.7 percent per annum. Inflation rate in 1996 was around 3.8 percent and unemployment was around 2.5 percent. External debt was put at a manageable US\$45.2 billion, which was 42 percent of GDP as at June 1997. At the end of 1996, the debt service ratio was 6.1 percent of exports. Non-performing loans were put at 3.6 percent of total loans at the end of June 1997, and savings rate was at 38.5 percent in 1996 (NEAC, 1998). Despite such favourable features the country still suffered from the crisis. In the book, *The Malaysian Currency Crisis: How and Why it Happened*, Dr. Mahathir argues that it was because of the speculative attacks on the Malaysian ringgit, despite the strong fundamentals of its economy, which led to the sharp depreciation of the ringgit against the U.S. dollar. The domino effect aggravated the economic turmoil the nation found itself in due to the rapid fall in its market capitalisation (Mahathir, 2000).

The country has rebounded from the crisis after the authorities undertook selective capital controls to stem short-term capital outflows. There are many voices for and against such

selective capital controls. Unfortunately, such a debate is not the preoccupation of this chapter. The country has also been able to diversify its exports from a reliance on rubber which accounted for 33.4 percent of its exports in the 1970s, tin 19.6 percent, forestry 16.3 percent, oil and gas 3.9, manufactures 11.9, palm oil 5.1, others 9.8 percent which yielded the country RM5,163 million to a whopping RM208,879 million by 1997. By 1997, manufactures accounted for 80.9 percent of its exports, palm oil 5.1, rubber 1.3, tin 0.2, forestry 2.4, oil and gas 6.6 (The Malaysian Economy in Figures, Various Issues). But if the country is to achieve a developed nation status by the year 2020, it would have to move away from the export led strategy of the assembly and production of valued added electronic goods and other manufactures using cheap labour to industries where knowledge intensity and their application to the productive sectors of the economy would bring about the productivity of high quality value goods and services to contribute to quantum leaps in growth.

3.3 Economic Planning and Growth of the Malaysian Economy

One of the important secrets behind the growth and development of the Malaysian economy is because it has been managed well. Its growth and development processes have been planned and well coordinated. The requisite structures as well as checks and balances are all in place to support its growth. At points on the road when the economy is faced with unfavourable external environmental factors, the government is quick and nimble on its feet to find workable, flexible solutions. Just how does this planning process work? The following steps are just a brief summary to familiarise the reader as to such a process. This process could be more complicated than it is explained in this chapter. First issues are discussed within the macro-framework as

¹ See appendix for more statistics on the Malaysian economy.

it pertains to proposals at the state government and federal agencies level. They then set the requisite targets, develop the requisite strategies and policies in conjunction or in consultation with the Inter-Agency Planning Group before the development budget is set. Then it is sent to the Economic Planning Unit who works with the Inter-Agency Planning Group to develop a draft Input where necessary is sort from the private sector during this draft stage. The draft is then sent to the National Development Planning Committee who also continues to work with the Economic Planning Unit to refine the draft and where necessary input is sought from the Malaysian Business Council. The finished draft then moves on to the Prime Minister's Special Committee who would further discuss the draft and make any amendments or additions where necessary. It is then sent to the Cabinet for discussion and finally to the Parliament for debate and ratification.

One should mention in passing that the success of some of the economic planning and policy decisions made by the Malaysian government are subject to external forces in the global environment that are beyond the control of a small open economy. Yet, it cannot be emphasised enough that some of the good policy measures do help to mitigate against the devastative forces that prevail on the Malaysian economy and indeed on the economies of developing countries as a whole. Effective economic planning as pointed out in the case of Malaysia, contributes to this effort.

3.4 Arrival of the Knowledge-based Economy and Globalisation

Advances in information and communication technologies (ICT) have brought with it the ability of countries to be able to achieve quantum leaps in growth without the advantages of the endowment of natural resources (Kelly, 1998). Resource poor countries like Taiwan, Singapore and Hong Kong are cases in

point. This ICT era or knowledge-based economy era serves both as an advantage and a challenge to Malaysia. It is an advantage because it can enable Malaysia realise its dream of becoming a developed nation by the year 2020, and a challenge because it involves a total structural change of the country's industrialisation policies and focus that have served it well over the years. Also it needs the construction of the requisite infrastructure, infostructure and the development of the requisite human resources, which are not an easy feat to attain. A good ICT infrastructure requires massive capital investments, and it is not easy to produce the requisite human resources to run such an economy in the short-run. Yet, if Malaysia is to develop and prosper, it has no choice but to move to a knowledge-based economy. Speaking on this issue before the *Dewan Rakyat* (Malaysian Parliament), Dr. Mahathir Mohammed said, "The development of a knowledge-based economy is extremely crucial for the country to sustain rapid economic growth and enhance international competitiveness. We will need to strengthen our capability to innovate and create indigenous technology as well as develop and market new products. By increasing the knowledge input, we will be able to change from an input-driven strategy to a productivity-driven growth strategy" (Mahathir, 2001). Dr. Mahathir's speech at the *Dewan Rakyat* attest to the fact that even those at the high echelons of power in Malaysia realise that the country must move to a knowledge-based economy to be competitive. To justify why Malaysia must move towards such an economy and how it is going to do that, let us first look at some general characteristics of this k-economy.

3.5 General Characteristics of the K-economy

One of the most important characteristics of this knowledge-based economy is that while things such as land, machinery and capital are scarce, ideas and knowledge are abundant; they build

on each other and can be reproduced cheaply or at minimal cost. This means that ideas or knowledge do not obey the laws of diminishing returns (Wysocki, 1997). Another important characteristic of this economy is that it can be located anywhere. Operations of companies in this kind of economy can be located anywhere on the globe. With the aid of computers and telephones, satellites and other advance methods of communications, goods and services can be exchanged around the clock without the physical presence of parties or structures in what is commonly referred to as "Virtual Offices." Payments can be made electronically (encryption technologies have greatly enhanced such transactions) and at a much faster speed. Because ICT are the pillars of this k-economy, a highly educated labour force, which is also technology savvy are important for the functioning of such an economy. The skills and knowledge of this highly educated labour force then would serve as the key assets for any country, which wishes to move to a knowledge-based economy. It has thus seen the scramble amongst countries to attract such talents to its shores (*Time*, 2000, p.22).

Furthermore, the advancement in ICT has made the world to become smaller spatially with each node or knowledge-centre being connected to the other making exchange of information, ideas, methods and trade faster and easier. It thus makes it possible even for resource poor countries to attain high levels of growth by moving to a knowledge-based economy. It might require an initial high investment capital. For example, the initial capital outlay required by Microsoft to develop its Windows software is expensive, but the additional cost to make copies of this software for the marketplace is negligible. Subsequent investments in the production of goods or services in such an economy are minimal and thus its attractiveness as a new method for countries to attain growth.

Besides, the key drivers of growth in a knowledge-based economy are not labour and capital, even though such factors are important to help in a country's growth efforts, innovation and knowledge are now the key driving factors. Land, labour and capital all obey the laws of diminishing marginal utility — they deliver less and less output with additional inputs after the optimum. The opposite is the case in a knowledge-based economy. Thus even capital, land and labour poor countries can now attain higher growth rates with knowledge and the production of innovative products. Singapore, Taiwan and Hong Kong serve as good examples to this effect as it pertains to land area. Finally, in a knowledge-based economy, markets are global not national. Hence for small open economies like Malaysia, having the whole globe as its market is advantageous. It can afford to export as many knowledge-based economy goods and services without saturating its market. These few characteristics are offered to set the stage to justify why Malaysia should move to a knowledge-based economy. The next section will look at challenges by posed globalisation on the Malaysian economy.

3.6 Challenges Posed by Globalisation and the K-economy to the Malaysian Economy

Writing in his book, *Globalisation and its Discontents*, Joseph Stiglitz, winner of the 2001 Nobel Prize in Economics wrote,

"globalisation itself is neither good nor bad. It has the power to do enormous good, and for the countries of East Asia, who have embraced globalisation under their own terms, at their own pace, it has been an enormous benefit, in spite of the setback of the 1977 crisis" (Stiglitz, 2002). Drawing from Stiglitz's quote, one can say that there are some obvious good things about globalisation that Malaysia and other South East Asian countries can benefit from.

The first of these is that globalisation affords for the free flow of goods and services, ideas, information and capital. This fosters trade and education between nations of both developed and developing. Malaysia and most countries in the South East Asian region bare testimony to this fact. For example, most of the growth and development in this region prior to the 1997-98 crisis can be attributed to the massive inflows of foreign direct investment to the region, which, started around the 1980s. At the same time, an open international trade regime allowed for the exports of manufactured goods from the region, which led to growth rates averaging seven to eight percent in most of the countries in the region. It brought prosperity to some of the countries in the region and enabled them to move majority of their people out of poverty in rather short spans of time.

Another good aspect of globalisation is that the advancement in information and communications technologies (ICT) has rendered our world today to be more spatial and smaller. Today, developments in one corner of the world are instant news in another, communication is much easier using e-mail, and information can easily be obtained from the Internet about most issues. It thus spreads the boundaries of knowledge through the exchange of information and ideas and has led to what some term the "knowledge-era." It has also led to the development of a new kind of economy, called the "knowledge-based economy," where the effective application of knowledge to productive resources of a nation can bring about quantum leaps in growth and development. In the knowledge-base economy, countries that are innovative, creative, efficient and competitive would benefit in this era of globalisation.

Furthermore, some political scientist and indeed politicians hold the view that globalisation has contributed to our world through the spread of ideas, information and values. In so doing, it has facilitated the democratisation process around the world.

Some also make the argument that with the advancement in ICT, it is much harder now for authoritarian regimes worldwide to be able to control the dissemination of information. One example that have been offered is how the late Ayatollah Khomeini used the fax machine, one of the technologies of the globalisation era to rally his followers within Iran from his base in France to overthrow the Shah of Iran. Some may beg to differ on this point. Debating this issue is not the pre-occupation of this chapter.

There are many examples given about the benefits of the good aspects of globalisation. For the purpose of this chapter, these few would suffice. Thus, drawing from some of these good aspects of globalisation, it is thus argued that Malaysia and other South East Asian nations can benefit from globalisation, but they must according to Stiglitz, embraced globalisation on their own terms, at their own pace.

But globalisation also has some bad aspects that could be detrimental to Malaysia, its growth trajectory, security and general well being. The 1997-98 Asian Financial Crisis is a good example. It exposed the volatile nature of global capital markets, especially short-term portfolio investments and hedge funds. Not only was Malaysia affected, Thailand, and Indonesia were equally affected. It almost led to the collapse of some of these economies, literally, overnight. According to Dr. Mahathir, "The Asian Financial Crisis has brought to the fore-front the risks and challenges that globalisation poses to developing countries, particularly small open economies such as Malaysia" (Mahathir, 2002).

Furthermore, the bad aspects of globalisation are manifested in the widening gap that is created between the poor and the rich by advances in ICT and the Internet. Majority of the people in developing countries are poor and do not have the means to connect to the Internet. Most of these people are also illiterate with no formal education, more so most of the content on the Internet (about 80 percent) is in English, a language majority of

these people in these developing countries do not speak. Thus these people are cut-off from the promises of the Internet. Malaysia is fortunate in this aspect but the country still has a long way to go, as most of the populace do not have access to the Internet. Such a negative aspect of globalisation could have an impact on the growth and development of the country.

There is also the concern in developing countries but in developed countries as well, that the core aspect of globalisation which weaves together the economies, politics and the social fabrics of different countries poses a threat to the power of the nation state. This is evident as some of the rules and regulations of global, regional and sub-regional institutions supersede those of nation states or exert undue pressure on these countries to reduce their powers in some arena's to conform with international agreements and norms. It is also the case where economic choices are being determined by regional economies across borders (Ohmae, 1996).

Others have argued that globalisation has made diverse cultures in our environment accessible through the global media, entertainment, travel and trade. But it has also succeeded in breeding cultural insecurity among non-Western societies by inundating them with the dirtiest and least valuable, and uplifting aspects of Western culture. These could lead to the breakdown and in some cases the supplanting of the indigenous culture. A backlash to this aspect of cultural imperialism is the breeding of narrow-minded reactionary groups in non-Western societies, promoting extremist views and even exploiting religion to gain political mileage (Abdullah, 2000).

It is thus obvious, from the aforementioned points that, Malaysia has some tough challenges ahead of it in this era of globalisation and the knowledge-based economy. For Malaysia to grow and prosper in this era, it must embraced globalisation under its own terms, at its own pace, choosing and enhancing the

good aspects of globalisation to the benefit of its people but at the same time it must try to contain the negative aspects of it. For example, instead of rapid liberalisation of its economy, Malaysia can develop a selective approach as it did with selective capital controls against disruptive capital outflows. Indeed, it must strike a balance between opening up its domestic market and protecting it to ensure that small producers are not driven out of business by global conglomerates (Khor, 2000). Another option for Malaysia is to enter into Smart partnerships with other developing countries. According to Dr. Mahathir, "Smart partnerships can help unify concerns and to formulate a common stand and embark on cooperative actions in order to counter any perceived negative forces of globalisation affecting the emerging economies" (Mohamad, 2002).

3.7 Why Malaysia must move to the K-economy

First, if Malaysia is to realise its dream of becoming a developed nation by the year 2020, it must move from a production-based economy to a knowledge-based one. This will enable it to produce high-end goods and services, which have a much higher return on investment but also offering the country a distinctive competitive advantage against other countries in the global market place. It would thus help the government in realising the requisite resources to undertake in the development of the country. Second, moving to a knowledge-based economy would enable the country realise its ultimate efforts to eradicate amongst all Malaysians irrespective of their race and religion hardcore poverty; as well as the eradication of poverty between the different racial groups and within such groups in the country. Such poverty reduction programmes require a dispensation of government expenditure on social programmes; hence it would require an increase in government revenues, which can be attained through increase in the growth rate of the country.

Table 1.1 offers an example to show that the overall poverty rate in Malaysia, which was at 49.3 percent in 1970, has fallen to a project percentage of 4.5 in 2001. Poverty rates in rural households have also been reduced significantly from 58.6 percent in 1970 to about 7.4 percent in 2001 (Malaysian Economy in Figures, 2003). Despite such efforts, the government still has a long way to go to eradicate poverty in Malaysia.

Third, moving to a knowledge-base economy would enable Malaysia produce highly competitive goods and services for the global market place. Competitive goods and services would enable Malaysia penetrate markets previously unavailable to it while at the same time consolidating its market share in its traditional markets. This will enable the country realise increase revenues for its growth and development efforts. The flip side is that the refusal of Malaysia to move to such an economy could result in the production of uncompetitive goods and services, which could result in the country losing its market share in exports to other countries with relatively cheap labour cost. The consequence for a small open economy like Malaysia with a multiracial, multiethnic and multi-religious population cannot be emphasised enough. A rule of thumb that one can point to is that socio-economic and political stability of multiracial nations is usually maintained when all the races in the said country feel and believe that they have a stake in the sharing of the national cake. Thus governments of such societies must constantly be on the look out for ways to expand the national cake. In the case of Malaysia, moving to a knowledge-based economy is one of the ways of expanding the national cake. The shrinking of the cake and a feeling amongst stakeholders i.e. the different races that they do not have access to the cake could spell trouble. Instability could result and efforts at economic growth and development halted. The experience of Indonesia post-Suharto is

a good example in the South East Asian region that can be drawn on to support this point.

Fourth, the aim of Malaysia to become a developed nation by the year 2020 if attained would mean that its current edge in producing goods and services for the global market place, which hinges on low wages, would be eroded. If Malaysia becomes a developed country by the year 2020, its cost levels as it pertains to the production of goods and services would approach those of developed countries. Hence, for Malaysia to be competitive, it must produce goods and services to compete at comparable levels as those in developed countries. Moving to a knowledge-based economy would offer Malaysia that ability to compete at the global level. It would also enable Malaysia identify niche areas to specialise to afford it that competitive advantage it would need as a developed country by the year 2020.

Fifth, there are certain constraints that can impede Malaysia's efforts of becoming a developed nation by the year 2020. One of such constraints is the ability to fund and produce cutting-edge research. Such kind of research is no ordinary research. Certainly, not the nickel and dime variety. It requires a large pool of highly skilled personnel, which should be accompanied by a certain economies of scale to be successful. Malaysia does not have either at this point in its development history. Besides, to train such specialised labour requires a lot of resources and adequate time, both are scarce at this point in time as it pertains to Malaysia. Moving to a knowledge-based economy would enable Malaysia to employ the requisite talent from all parts of the world for specific periods without having to incur the cost, resources and time to train these talents. The savings in the construction of the requisite infrastructure, purchase of equipment and the cost to the nation in educating the talents or knowledge-workers it has gained from employing expatriates (knowledge-gain) cannot be emphasised enough. Similarly,

Malaysia would be able to collaborate with high technology institutions and businesses in developed countries, thereby benefiting from their know-how, processes and products. Thus moving to a knowledge-based economy offers more benefits to Malaysia than costs.

Finally, one of the most important reasons why Malaysia must move to a knowledge-based economy in the view of this author is the growing economic power of China. While there are those that would argue that China's growing power would benefit the South East Asian region, I am cautiously optimistic. First, according to reports by the Economic Intelligence Unit (EIU), a sister publication of the *Economist*, China now gets four-fifths of all foreign direct investments that come into the South East Asian region. This trend according to EIU is expected to last to at least 2005. Secondly, export goods of Malaysia and other South East Asian countries in their domestic and international markets would face stiff competition from cheaper and equal quality goods from China, especially labour intensive textiles (*The Economist*, 2001, pp.73-74). Malaysian exhibitors at the consumer goods show in Frankfurt were visited with most of these observations raised here in 2002. They found to their consternation that countries like Vietnam, China, Taiwan, India and Thailand all overshadowed Malaysia (*New Straits Times*, 2002, p.B4). Furthermore, Malaysia has been losing its competitiveness to other cheap labour cost countries. Its labour cost has spiralled upwards and according to the National Productivity Centre of Malaysia, the electrical and electronics sectors saw its unit labour cost rising between 6 to 20 percent from November to December 1999. This gap is projected to rise in the coming years (Sakran, 2000). The importance of this point is shown by the concern raised by the Deputy Prime Minister of Malaysia, Abdullah Badawi in his address to the Fourth National Smart Partnership Dialogue. He said, "globalisation is also opening up economies

deliver cost-effective and efficient production possibilities to global corporations. As a result, Malaysia is increasingly losing its wage-based competitiveness to economies with a cheap and efficient labour force ... our human capital is not cheap enough to attract investments for lower-skilled production and our labour force is not sufficiently trained or educated to attract investments into value-added, high-skilled production" (Sakran, 2000). To avert such a stiff challenge as a result of the lack of the cheap labour advantage on the part of Malaysia, it must move into the area that deals with the production of high-end sophisticated goods and services of which it can attain a competitive advantage. Moving to the knowledge-based economy would provide Malaysia with such a competitive advantage.

Suggested Ways for Malaysia to Move to a K-economy

Having examined the reasons why Malaysia should move to a knowledge-based economy, let us now look at suggested ways, which Malaysia should take to move to the knowledge-based economy. For Malaysia to benefit from the knowledge-based economy, it must first develop the requisite physical infrastructure, which is necessary and needed to support knowledge-based industries as well as activities related to such an economy. It must also develop the requisite infostructure, which comprises of networks, appliances and the legal system as well as an enabling environment for the smooth flow of information for growth and development of the nation in a knowledge-based era. It is the production of goods and services in this area that would enable Malaysia move out of the production of lower end products to higher end ones, which are needed for its growth and development in the future as a small open economy.

Malaysia would also need the requisite manpower in its move to a knowledge-based economy. But in the short-run, it would be difficult for Malaysia to be able to produce such manpower to fuel

its move to a knowledge-based economy. Thus in the short-run, would need to develop progressive immigration policies to attract the knowledge-workers it needs. The common definition of a knowledge-worker is that of a person dealing in data and ideas (Cortada, 1998). Such a move would be nothing novel, even developed countries like the United States, Canada, Germany, and United Kingdom have all developed or revamped their immigration policies to attract knowledge workers due to a world wide shortage of such workers. For example the United States increased its H1-B visas from 15,000 in 1990 to 200,000 in 2000. The United Kingdom has eased its work permits rules to meet the shortage of 200,000 workers. Germany has launched a new Green Card scheme to attract knowledge workers (*Time*, 2000, p.22). Thus, if Malaysia does not undertake similar moves, it would risk retarding its move to a knowledge-based economy. In the long-run, it might be able to develop the requisite knowledge-workers it need with the right government policies which should include retraining of workers and the revamping of the education system to make it develop and train workers who are going to be needed in this area.

If Malaysia is to move to a knowledge-based economy, it would have to intensify its efforts in enhancing its science and technology as well as its research and development capabilities. Such efforts would bring about the production of innovative products for the global market place. Increase research and development would also make Malaysian products competitive in the global market place. Malaysia must also develop workable solutions to re-invent its public sector as well as the preparation of the private sector to make them ready to face the knowledge-based economy. The public sector must be transformed to serve more as an effective facilitative mechanism to provide the appropriate environment for the private sector in a knowledge-based economy. The private sector will have to swiftly redefine

their processes by applying appropriate and cost-efficient technologies. They must also take a global view as markets have become virtual and borderless. Traditional modes of sourcing inputs and marketing products will have to be complemented by the greater use of e-trading and e-business tools (*Third Outline Perspective Plan 2001-2010*, 2001). The authorities must also make an effort to bridge the digital-divide between the various populations in the country. The effort of the country to move to a knowledge-based economy would exacerbate the digital gap between high and low income groups and thus cut the latter off from areas regarded as growth poles in the country. Without a concerted effort on the part of the government, such a gap would create socio-political and economic problems for a multiracial population like Malaysia. Table 3.1 gives details of statistics about Internet and Telephone subscribers in Malaysia. The importance of such a table is to offer and insight into the efforts that need to be made to close the digital divide.

Table 3.1 shows the number of telephone and Internet subscribers in Malaysia from 1990 to the year 2003. As it pertains to the Internet, the figures show that the numbers are increasing. Such numbers though laudable when compared to Malaysia's total population of about 23 million, it is not encouraging. It could be surmised that the difference between the three million Internet subscribes from the number in the total population point to the existence of a divide. Much work needs to be done to bridge such a divide in order not to create a nation of "digital haves" and "have-nots." Similarly, Table 3.3 also shows key penetration performance indicators of the important components that drive the knowledge-based economy and thus could exacerbate the digital divide. Looking at the figures, especially in Table 3.1, the use of mobile telephony is growing in Malaysia from 78,000 in 1990 to 4,839,900 in 2001. It is one of the areas

Table 3.1: Telephone and Internet Subscribers for Malaysia (1990-2001)

Indicators	1990	1996	1997	1998	1999	2000	2001	2002(p)	2003(f)
Telephone subscribers	1,585,744	3,777,314	4,223,042	4,369,871	4,429,729	4,474,026	4,790,752	4,512,000	4,680,000
Mobile phones	78,000	1,362,000	1,957,000	2,123,350	2,698,400	3,723,000	4,839,900	8,952,000 ⁽¹⁾	9,768,000 ⁽²⁾
Internet subscribers	N/A	90,000	200,000	400,000	700,000	1,659,000	2,115,000	2,600,000	3,000,000

Note: (p) Preliminary. (1) Based on 18.8% and 19.5% penetration rate of the population for 2002 and 2003 respectively.

(f) Forecast. (2) Based on 37.3% and 40.7% penetration rate of the total population for 2002 and 2003 respectively.

Source: *The Malaysian Economy in Figures*, 2001, 2002, 2003. EPU.

Table 3.2: Malaysia's Dial-up Internet Penetration Rate

Year	Penetration Rate (%)
1998	1.8
1999	2.9
2000	7.1
2001	8.8
2002	10.5

Source: *Malaysian Communications and Multimedia Commission*

the government should target with programmes in an effort to reduce the digital divide

Table 3.3: Key Penetration Performance Indicators, 1998

Indicator	Status
Landline density (main lines per 100 population)	21.6 Level 3
Cellular Mobile Penetration (cellular subscribers per 100 population)	10 Level 3
Internet Penetration Per Household	11.9 Level 3
Internet Penetration Per 100 Population	6 Level 3
PC/IN Penetration Per 100 Population	0.04 Level 3
Internet Host Per 100 Population	1.9 Level 3
Computers Per 100 Population	8 Level 3
Computer Power Per 100 Population (MIPS)	1,211 Level 3
Pay TV Penetration Per Household (%)	2.1 Level 3
Average Performance	Level 3

Level 1 (World Class) - comprises the United States, United Kingdom, Finland and Japan

Level 2 (Advanced) - comprises Germany, South Korea, Taiwan and Singapore

Level 3 (Emerging) - comprises Argentina, Chile, Thailand and China

Level 4 (Rudimentary) - comprises India, Indonesia, Honduras and Nigeria

Source: *Third Outline Perspective Plan 2001-2010*, Economic Planning Unit, Malaysia

Furthermore, bridging of the digital divide alone is not enough. For Malaysia to move to a knowledge-based economy, it must begin to promote an information technology (IT) culture amongst its populace. Specific policies and programmes must be set up by the government to introduce new software and hardware and bring the Malaysian people up to date with technology and developments in the IT industry. Initiatives should be put in place at the primary, secondary and tertiary levels of its educational system to promote IT culture. Efforts should also be made to train the working population to become IT literate. Finally, public libraries and community centres should

be equipped with computers and IT facilities for public use and training.

But the government alone cannot do it all. It requires the participation of the private sector. It would first entail a shift in the mindset of the private sector, a mindset of "this is the governments domain hence it should handle it." The private sector must thus invest in research and development as well as in IT to produce competitive goods and services for the global market place in this knowledge-era. For example, in the United States, investments by the private sector in research and development and IT have helped catapult the economy of the country to a long period of sustained growth since 1990 (Stiglitz, 2000)¹. The government must help the private sector in Malaysia to contribute its quota to help the country transit to a knowledge-based economy. This can be done through a private-public partnership where the government provides the required stimulus as well as the legal infrastructure; the private sector would provide the requisite capital for such a take-off. The private sector in Malaysia must bear in mind that such a symbiotic relationship between it and the government in more ways than not would be to its advantage. The ability of the country to produce many knowledge workers to solve the manpower needs for the sector in this knowledge-base era should be the watchword.

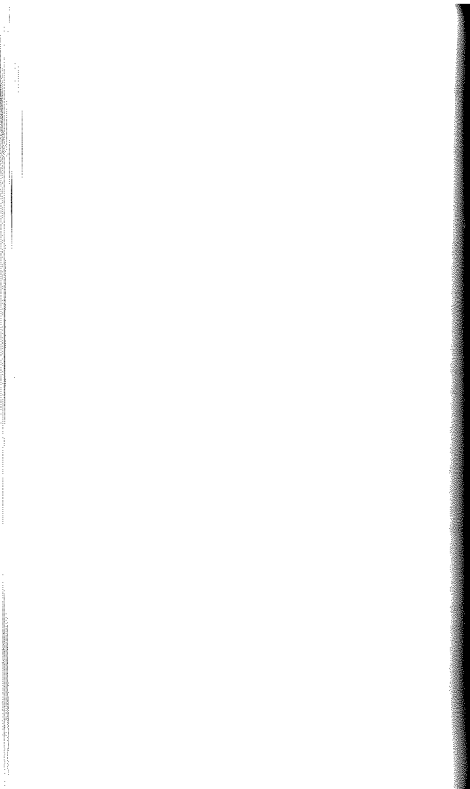
Finally, Malaysia should collaborate with countries in the South East Asian region to help it in its efforts to move to a knowledge-based economy. Because countries in the region share similar or same development histories, races, religions to mention just a few, pulling together to help each other to move to a knowledge-based economy would bring about each attaining

¹ The current slowdown in the U.S. economy since 2001 notwithstanding

sustainable development. The example of the consortium of European countries that pulled together to make advances in the aeroplane and aviation industry by developing the Airbus industry can be an example for countries of South East Asia. By collaborating, European countries have been able to make Airbus to be a formidable competitor to Boeing of the United States. Thus collaboration by South East Asian countries in a knowledge-based era would enhance their prosperity. This can be likened to the "prosper thy neighbour" policy as advanced by Dr. Mahathir Mohamad. By each country helping the other to transit to a knowledge-based economy, the benefits that would accrue to the region in general cannot be emphasised enough.

3.9 Conclusion

Malaysia has come a long way from its days as a tin, rubber and oil palm producer to that of electronics and manufactured goods. Today, an increasingly competitive global environment, the advent of the New Economy and Malaysia's own plans to be a developed nation by the year 2020 has created a need to move to the New Economy, a knowledge economy to enable the country to adequately compete, thrive and prosper in this competitive global environment. It must thus develop the requisite knowledge industries and train the knowledge workers needed to run these industries. It must enhance its IT infrastructure and infostructure, as well as vigorously engage its public and private sectors in this effort. There must also be a concerted effort to engage its neighbours in the South East Asia region, in the marshalling of resources, comparing of notes and exchange of ideas to help each other and their various countries move to the k-economy. Finally, Malaysia should build global coalitions to share and exchange knowledge in the country's efforts to move to the k-economy.



4. GOVERNMENT EFFORTS TO MOVE MALAYSIA TO A K-ECONOMY

Introduction

A bird's eye view of the economy of Malaysia shows that from the humble beginnings of a tin, rubber and palm oil producer, Malaysia has grown to be one of the fastest growing developing nations. For example, 34 percent out of its 85 percent commodity exports come from manufacturing. What is also interesting is that 60 percent of this 85 percent of the commodity exports also come from services. In the year 2002, exports in goods and services alone brought in RM236,571 million, an increase from 2001's figure of RM228,141 million (Malaysian Economy in Figures, Various Issues). Some developing countries would have been happy with the success attained by Malaysia so far as it pertains to its economy. But there is a general realisation in the policy echelons in Malaysia, that such success can be ephemeral (New Straits Times, 2003, p.10). For in a constantly changing world, there is no time to gloat or rest on one's laurels. Consequently, the policy echelon of the country realises that, if a small open economy like Malaysia's is to sustain its economic growth and development and if the country is to be able to face

the challenges that are going to be posed by the k-economy and globalisation, it must move from a production to a knowledge-based economy. So what is behind such a realisation? It is the knowledge that the current tide of globalisation can wipe out all the significant gains of the country overnight. Most of the countries in this region came to that realisation during the Asian Financial Crisis.

The government has therefore put into place the requisite measures and have set up institutions and introduced programmes to help Malaysia move to the knowledge-based economy. This chapter is going to look at some of these measures. It will specifically look at some of the institutions, infrastructure and infostructure put in place to move the country to the k-economy. Some of these include, the National Information Technology Council (NITC), the Malaysian Institute of Microelectronic Systems (MIMOS), the Multimedia Super Corridor (MSC) project, the new Multimedia and Cyber laws, and the Human Resource Development Council funding for training. Even though there are other efforts, the few chosen are some of the most prominent and the rationale for their choice is to point to the government's commitment to moving the country to the k-economy.

4.2 National Information Technology Council (NITC)

The recognition by the policy echelon of the Malaysian government that a solid information and communications infrastructure would serve as a sound foundation that would propel the nation into a k-economy brought about the setting-up of the NITC. It was founded in 1994 to serve as the primary advisor to the government of Malaysia on matters that involve the utilisation of information and communications technologies to spur national development.

The core members of NITC comprises of the Prime Minister of Malaysia, who serves as the chair of the council, his deputy,

the CEO of MIMOS, who was also the secretary of NITC. NITC has as its core objectives the below:

- The promotion of the sustainable growth of information technology, its development and application via research and development planning and the development of the requisite technology acquisition strategies.
- The council was also to ensure that new technologies were well integrated into the socio-economic development of the country.
- The council was equally charged with the role of determining the likely impact information technology would have on the Malaysian society as well as its economy.
- Finally, it was given the responsibility to find out and explain the potential information technology has in the transformation of the society at all levels.

To be able to achieve these objectives, the NITC launched the National Information Technology Agenda (NITA) in December 1996. NITA's aim was to come-up with a framework on how information and communications technologies are going to be used to transform Malaysia into a k-economy and to help it achieve its vision of a developed nation status by the year 2020.

NITA's greater aim was first, to transform Malaysia into an information society, a knowledge society and subsequently a value-based knowledge society respectively. To attain this transformation, emphasis would be placed on the development of the Malaysian people, the country's infostructure, applications and ensuring equity to enable all Malaysians to benefit from such a transformation. Furthermore, a strategic agenda has been put in place by NITC as an added mechanism to achieve the NITA vision. This agenda revolves around a strategy of helping Malaysia migrate to the electronic world in this millennium.

NITC realises that for such a strategy to be successful, there must be a partnership between the private, public sectors and the society at large. An added issue of importance is the stress on a participatory approach from the society if Malaysia is to move to a knowledge society. A societal participatory approach denotes an ownership of the transformation process by the populace. Such an approach would ensure sustainability of Malaysia's movement to the knowledge society. Undergirding this strategy is a framework that combines the elements of people, infostructure, and applications.

So far, it can be said that the NITC has made efforts and chalked up some successes in the promotion of the NITA. The consciousness state of the populace about the k-economy has been raised. To what extent some within the populace truly understand what the k-economy stands for is another different challenge for NITA (*New Straits Times*, 2001, p.2). In the early stages of the awareness exercise, lots of programmes were rolled out and it did help to raise consciousness. At the time of this writing, this euphoria has died down and it should be a challenge to the NITC and NITA to rejuvenate this momentum.

The assessment by NITC on the impact of IT on the economy of Malaysia has been undertaken. The framework that the NITA came up with on how information and communications technologies are going to be used to transform Malaysia into a k-economy to help it achieve its vision 2020 must be revisited and constantly be reviewed to keep up with the constant changes in the global ICT environment. In his book, *The Road Ahead*, Bill Gates (1995) talks about a dialogue between policy makers, ICT specialist and the populace about the opportunities and issues of the ICT era. Such a dialogue must be continuous. It is the observation of this author that such is lacking in the NITA. Perhaps in the rejuvenation of the momentum of Malaysia's k-economy efforts amongst the

different sectors of the population, this dialogue should constitute an important part of this process.

4.3 Malaysian Institute of Microelectronic Systems (MIMOS)

MIMOS¹ was established in 1985 as a technology research and development (R&D) organisation to advise the government of Malaysia in its efforts to move to the knowledge-based economy. In its formative years, it was a small unit in the Prime Minister's Office. It evolved into an organisation five years later in 1990 under the Ministry of Science, Technology and the Environment. Under corporate restructuring in 1996, it became MIMOS Berhad. It still performs its original role as advisor to the government but has added a special focus on technology development, deployment, technology policy and business.

MIMOS has three core sections, technology, and policy and business sections.

Technology: Under the technology section are subsections of research, product development, development programmes and knowledge management groups. The research group undertakes systematic and intensive research in the fields of science and technology where results are directed into the production and improvement of materials, devices, products and processes. The product development group develops and produces ICT products in line with MIMOS' strategic initiatives. The knowledge management group at MIMOS is charged with the responsibility of bringing into existence a holistic system for knowledge creation and sharing.

Policy: The policy arm of MIMOS comprises of two divisions. The first is the Information Technology Policy Development

¹ At this writing, MIMOS is undergoing restructuring.

(ITPD) division. This arm is that which represents MIMOS as the secretariat for the NITC. ITPD supports and assists the activities of the NITC by providing the platform for the cross-sectorial planning and cooperation between the public, private and community sectors. Its agenda involves micro-level research initiated to gauge macro-level implications. Results obtained are used to make policy recommendations to the NITC.
(http://www.mimos.my/mimos/html/core_itpd.htm).

Another policy arm of MIMOS is the National IT Security and Emergency Response Centre (NISER). Starting out in 1997 under the name Malaysian Computer Emergency Response Team (MyCERT), its main goal was to assist Malaysians during times when incidences like intrusion, hacking, and malicious attacks, to mention a few occur. Its goal then was to address wider security issues with the advancement in ICT and the dynamism of this environment.

Business: The business division of MIMOS has a wholly owned subsidiary called MIMOS Smart Computing Sdn. Bhd. (MSCSB), a joint venture company called Digicert Sdn. Bhd. and Business Ventures office. MSCSB is a wholly owned subsidiary set-up in 1998 to develop the local computer industry. In collaboration with several industrial partners, it is now one of the largest local computer manufacturers. Apart from the assembly and sales of computers, MSCSB is also in the business of computer peripherals, advisory and consulting services as well as project management.

Digicert Sdn. Bhd. is a joint venture between MIMOS and POS Malaysia Bhd. The company offers digital certificates, which offers assurances for secure online transactions. The company uses a Public Key Infrastructure technology, which ensures the authenticity and integrity of information transmitted during an electronic transaction. It also ensures non-repudiation during

transactions. Digicert's PKI complies with the requirements of the Malaysian Digital Signature Act of 1997. Finally, MIMOS' Business Ventures Office was established to assist ICT entrepreneurs. It welcomes joint-venture projects from such entrepreneurs and help fund small short-term ICT projects that would develop ICT applications for the benefit of the country.

So far, the success of MIMOS can be described as mixed. It has succeeded in playing its role as adviser to the government in its efforts to move to the K-economy. It has also succeeded in creating some moneymaking units in the MIMOS family such as its Joint Advanced Research in Inter-networking (Jaring) unit. But MIMOS faces numerous challenges moving forward. One of these is putting in place a good market savvy team to compliment its excellent technical team. The other is the difficulty of how to juggle its function as an R&D organisation and a business entity, which must make profit. At the time of writing, the consultancy group McKinsey have recommended in its report that the company's money making units be spun off and that it should go back to its function of remaining solely an R&D organisation (Jacobs, 2002). Just before press time for this book it is reported by the Minister of Science, Technology and the Environment of Malaysia, Law Hieng Deng, that MIMOS' operations will be placed under three ministries. Under MIMOS' restructuring, R&D will be placed under the Ministry of Science, Technology and Environment, the policy division under the Ministry of Energy, Communications and Multimedia and the business divisions under the Ministry of Finance (*New Straits Times*, 2003, p.36). Whichever decision the board of MIMOS decides on, what is sure is it needs a clear and concise focus moving forward, to be able to and to continue to contribute its quota to Malaysia's efforts to move to the k-economy.

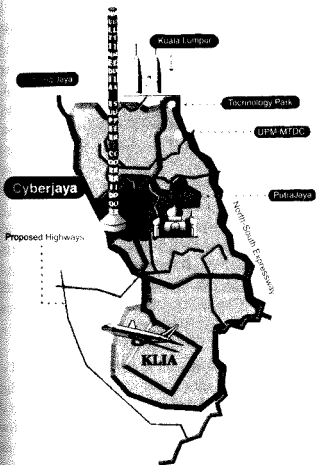
4.4 The Multimedia Super Corridor Project

The realisation of the role ICT can play in the socio-economic development of nations, especially in the k-era is one of the guiding principles that is behind the decision of the government of Malaysia to conceive and put into place the MSC projects. Guided by similar projects like that of Silicon Valley in California, USA, the Route 28 Corridor in Massachusetts and the North Carolina Research Triangle all in the USA, the MSC would have a learning curve and cases of proven success. From the time the MSC was launched in 1996, it was then looked to as the vehicle that would lead Malaysia into the information age and the knowledge-based economy.

The vision of the government of Malaysia in creating the MSC was to create a world-class environment for ICT and multimedia, and this environment would attract global companies of international calibre to locate in the MSC, as it is the case of Silicon Valley or the Route 28 Corridor. The vision, which was long-term in nature, was to complement Malaysia's efforts to become a developed and knowledge society by the year 2020. Thus, the government divided the MSC into three phases starting from its inception in 1996 through the year 2020. The first phase of the MSC was to cover an area, 15 kilometres wide by 50 kilometres long. This area was to stretch from the Petronas Twin Towers in central Kuala Lumpur to the Kuala Lumpur International Airport (KLIA).

Located within the 15 by 50 kilometre space would be the Technology Park of Malaysia, Putrajaya, the new Federal Government administrative centre, Cyberjaya, the intelligent city amongst others. The infostructure of the MSC has a present digital fibre optic network of 2.5 gigabits, which is expandable to 10 gigabits, which is connected to the rest of the nationwide fibre optic network. Other "soft" infrastructure, include Cyberlaws, requisite policies to make the MSC a success as well

as incentives. MSC's Physical infrastructure includes a network of highways, quality homes, shopping malls, business centres and recreational areas and facilities. The second phase of the MSC, which started in 2003, will deal with the opening up of similar corridors in Malaysia through the year 2010. The vision for the third phase of the MSC is to see the whole of Malaysia evolving as a Multimedia Super Corridor, and a national as well as international test bed for new technologies.



Map of MSC

The task to move Malaysia to a knowledge-based society and economy is a laudable one and needs enormous work and effort. Flagship applications were developed in the MSC to help chart this course. These applications include the Electronic Government Flagship, Government Multipurpose Card, Smart Schools, Telehealth, E-Business, R&D Clusters, and Technopreneur Development Flagship (<http://www.msc.com.my/mdc/flagships>).

- Electronic Government Flagship:** Would herald Malaysia's efforts to reinvent its government using ICT. It would compliment government's efforts to increase productivity in its operation and delivery of services to the people of Malaysia. The electronic government initiative of the Malaysian government would also increase the interaction between the citizens and the government as it strives to realise its vision 2020. Putrajaya, the new Federal seat of government would be the seat of the E-government initiative of the government. Currently, under the Electronic Government Flagship, five pilot projects have been identified which is hope to lead Malaysia's e-government efforts. They include: Project Monitoring Systems (PMS), Human Resources Management Information Systems (HRMIS), Generic Office Environment (GOE), Electronic Procurement (EP), and Electronic Delivery Services (E-Services).
- National Multi-Purpose Card Flagship:** As part of Malaysian government efforts to move to a knowledge and developed society by the year 2020, it has instituted the National Multipurpose Card. It is a collaborative effort between government and the private sector to provide a common smart card solutions platform as well as enhance services to customers, convenience and security to existing

applications and new applications that are to be delivered on the card. The National Multipurpose Card which would be rolled out in two stages would have a 32k microprocessor chip embedded in it. It is developed to be multifunctional across different systems in the country. The first phase would be a pilot rollout of two million to be used within the MSC/KL vicinity. The second phase would introduce the card nationwide.

• **Smart School Flagship:** For Malaysia to move to a knowledge-based society and to be able to compete effectively in an increasingly competitive global environment, it would need a cadre of workers and a population that is innovative and technologically savvy. They must be able to use ICT to increase productivity and to help develop and produce innovative products. For that to be done, there is the need to develop new learning and teaching methods that are germane to the ICT revolution. The Smart School Flagship is one of the answers developed by the Malaysian government to prepare Malaysian kids for the challenges of a knowledge era. The Smart School Flagship has as its objectives the below:

- To produce a thinking and technology literate workforce
- To develop students physically, mentally, emotionally and spiritually
- To provide opportunities to improve individual strengths and abilities
- To increase stakeholders involvement
- To democratise education

The Ministry of Education of Malaysia and Telekom Smart Schools Sdn. Bhd. Are in the process of developing the

necessary software and other solutions to power this initiative. What they are developing is called the Smart Schools Integrated Solutions (SSIS). This would encompass multimedia teaching and learning aids and best school management practices to help the growth and sustainability of this initiative. Currently, the technology infrastructure of this initiative has been completed, so is the teaching and learning materials, school management systems among others. When all the necessary SISS which are currently tested in 90 rural and urban schools, it would be implemented nationwide.

It would then pave the way to start the preparation of next generation of Malaysians to lead the country in an information-based society.

- **Telehealth Flagship:** The Telehealth Flagship revolves around the dictum that "a healthy mind equals a healthy body." Knowledge-workers and skill workers needed to power Malaysia's move to the knowledge-based economy and society would need to be healthy. Hence access to healthcare and the knowledge about healthcare-services and their availability is important. It is therefore a process that would enable Malaysians to access and manage their personal health issues and how to access and increase flow of information and services in the Malaysian healthcare system. Perhaps the listing of the objectives of the flagship would throw more light into its purpose. These include (<http://www.msc.com.my/mdc/flagships/th.asp>):

- Enhance the quality of medical services
- Improve outreach in urban and in particular in rural areas
- Reduce delivery time
- Save costs

- **Become a Regional Centre of Excellence in Telehealth Development**
- **Deliver leading edge health care products and services worldwide**

The Telehealth flagship also consists of four applications. These include:

- **Teleconsultation:** This would enhance the optimisation of the usage/utilisation of experts and would help reduce patient transfers because it would afford linkages between primary healthcare centres and specialist.
- **Mass customised/Personalised Health Information and Education:** Each Malaysian would have the opportunity to have access to education and advice as it pertains to their personal health information. Effort would be made to customise such information.
- **Lifetime Health Plan:** This component of the flagship proposes to offer a prospective lifetime health plan to the people that would be personalised and proactive to keep the individual in highest possible state of health.
- **Continuing Medical Education:** It would provide and up-to-date knowledge and skills to healthcare providers.

Progress under this flagship so far has been encouraging. More information can be found on (<http://www.telehealth.com.my>).

R&D Clusters Flagship: The importance of R&D to the economic growth and development of any society cannot be emphasised enough. This importance is more pronounced in the knowledge era. Malaysia realises that if it is to become a knowledge society and a knowledge-based economy, it must beef-up its R&D efforts. This flagship aims for the MSC to be

the preferred destination for R&D activities in Asia, and to an attractive destination for the development of next generation technologies and innovations by world class companies. But this flagship would also encourage the development of endogenous technologies. To help spur endogenous technologies under this flagship, two grant schemes are put in place:

- *MGS Grant*: Launched in 1997, the MGS grant is an R&D grant to support R&D initiatives of MSC status companies.
- *MSC Student Attachment Program*: This grant scheme is to allow Malaysian students attain the relevant industrial experience with ICT companies with MSC status. Collaboration between the Ministry of Science, Technology and the Environment and the MDC are in place to oversee this programme.
- *E-Business Flagship*: The revolution of business with the advancements in ICT has made it clear that to win in the new age of business, one must be conversant with applications that enhances relationships and affords for business to be undertaken 24/7/52/366. Connectivity to the Internet, access to timely information about the customers, the market and products as well as process mention just a few is thus necessary. This flagship would help contribute to enable Malaysian businesses become responsive to this new way of doing business. It would also provide the necessary education and services that would enable Malaysian businesses accept e-business as part of their day-to-day activities.
- **Technopreneur Development Flagship**: If Malaysia has to grow and sustain its ICT and multimedia industry, which

would in turn be an impetus to its growth efforts; it must develop its own entrepreneurs or technopreneurs as they are often called to see this effort into reality. The Technopreneurship Development Flagship is the government's answer to this need. It was launched in November 2001 with the below four key objectives (<http://www.msc.com.my/mdc/flagship/td.asp>):

- To spawn a critical mass of SMEs and start-up companies involved in the ICT/MM industries
- To facilitate the growth of potential Malaysian world-class companies
- To create the nuclei for the physical rollout of the MSC nationwide through the National Incubator Network
- To spur the growth of the venture capital industry

The government hopes to achieve these objectives by collaborating with private and public sector entities as well as institutions of higher learning in the country to offer training that would be aimed at imparting the requisite skills to develop Malaysian technopreneurs. Furthermore, efforts would be made to expand the National Incubator Network to nurture and grow more technopreneurs to fuel Malaysia's efforts to move to the knowledge-based economy. Other efforts would include the provision of seed capital and grants to these technopreneurs as well as the provision of market access by helping them to go global and linking them with both domestic and international technopreneurs.

Multimedia Development Corporation (MDC):

Established in 1996, the MDC is charged with the development and management of the MSC. In short its main aim is to see the MSC become a success. Thus, a 20-year time frame is given to

the MDC for the implementation and execution of the MSC. The MDC would thus serve as a "one-stop centre" for application worldwide who want to relocate to the MSC. It is also charged with the marketing of the MSC globally. The MDC has thus proposed three stages in which it would develop the MSC and use it to lead Malaysia into the knowledge-based society.

The first phase of this effort would see the development of the MSC, attracting world-class companies, development of flagship applications, establishment of the Cyberjaya and Putrajaya and establishing the framework for Cyberlaws. The second phase would see the establishment of Cybercities around Malaysia and linking them to the MSC and subsequently to other Cybercities around the world. The final phase would be when Malaysia would have a cluster of intelligent cities linked to others in the world, and the country would have been transformed into a knowledge-based society.

Impediments, Criticisms and the Progress Trajectory of the MSC so far

The MSC has achieved some notable successes since its inception. For example, as of September 2002, the MSC had about 745 MSC-status companies, of which 53 of these companies are classified as world class. The MSC has also created over 18,000 jobs since its inception and as of May 2002, 407 of these companies had total sales of RM5.65 billion. Of this amount, RM4.27 billion was reported as local sales and RM1.38 billion were from sales derived from exports (*The Star*, 2002, p. 1). Development is still ongoing in the Corridor and efforts continue unabated to attract more world-class companies to the MSC.

Despite such achievements, the MSC has not been spared criticisms. Some of the critics of the MSC claim that it is an attempt to replicate California's Silicon Valley, and so far it has not worked (Alexandra, 2003). Such an assertion is unfounded.

Even within the United States, the I-28 Corridor where Massachusetts Institute of Technology is located, or the North Carolina Research Triangle, which are both within the same "environment" — the U.S., none of them can be a clone of Silicon Valley or each other. Each has its unique role, different resources and dynamics. The MSC is in a different "environment" and was established under different circumstances, to tackle different challenges and dynamics, different from that of Silicon Valley. That the MSC project is young and can learn from the experiences of Silicon Valley, the I-28 Corridor, the North Carolina Research Triangle and other successful technology hubs is true. But any claim that it is a clone of Silicon Valley is far from the truth.

Another critique of the MSC project is the assertion by some, especially in the international media, that the project is stalling. Most of the journalist who hold such view claimed to have arrived at it by comparing the MSC project to the Cyberport project in Hong Kong, the Singapore One project and other technology projects in the region. The former Chairman of MDC, Dr. Mahman Yeop Abdullah disagrees. According to him, based upon his visits to these other technology hubs in the region, he saw first hand how their pace of growth and development are nowhere near that of the MSC (Asia Pacific Information & Communication Technology, 2001). Some of these critics also paint the MSC as a massive real estate project. Obviously, it is impossible to undertake any project of this size without massive construction of infrastructure, offices, research laboratories to mention just a few. This therefore does not make it a real estate project. Anyone who has visited Silicon Valley would find out that most of the companies have huge campuses, comprising of different divisions, sprawling over large hectares of land.

Albeit, these criticisms should be seen in a positive light and efforts should be concentrated on moving the MSC ahead to help

the country achieve its Vision 2020. The continuous challenge that the MSC would face as Malaysia moves to the next phase of the k-economy is the recruitment and retention of knowledge workers. Because knowledge workers are a fickle lot, and because Malaysia has to compete with other developing as well as developed countries for these knowledge workers, it is tough holding on to even those that have been recruited. I will contend that, that would be the tough challenge moving forward for the MSC as evidenced by the unwillingness of even highly skilled Malaysians to return home, due to the fact that salaries and perquisites offered in the country were not attractive (*New Straits Times*, 2000 p.7). Non-Malaysian knowledge workers may feel the same.

4.5 New Multimedia and Cyberlaws

(<http://www.cca.gov.my/legislat.htm>)

Advancements in ICT has brought with it benefits for growth but has also brought with it challenges as it pertains to existing law. If Malaysia has to move to a knowledge-based economy and society, it must develop new set of laws to address this new challenge. The government of Malaysia has thus passed four Cyberlaws through the act of parliament to address this issue. These are: the Digital Signature Act, the Amendment to the Copyright Act of 1987, the Computer Crimes Act, the Telemedicine Act and the Communications and Multimedia Act.

- **Digital Signature Act (1997):** The Digital Signature Act was envisaged and drafted to allow for the removal of doubt about the possibility of fraud as transactions over the Internet and digitally increases. The Act would therefore allow for the licensing and regulating of authorised Certification Authorities. The Act would allow the appointment of specialised authorities in the country that would be the only ones allowed to issue Digital signatures and would thus be charged

with their certification and identity and that of the signor. They would make the Digital Signature legally valid in Malaysia and would have the same enforceability like a regular physical signature. It went into force in October 1998.

• **Copyright Amendment Act (1997):** Copyrights are one way of encouraging innovation. It is a legal way of granting temporal rights to the creator or producer of an intellectual work or artistic product to encourage others to come up with equal innovative work that would benefit mankind.

Advancements in ICT has put such protection in jeopardy because it is now much easier to copy and disseminate this information with the new digital technologies. Malaysia's new Copyright Amendment Act of 1997 amends the Copyright act of 1987, extending coverage to the new ICT products. This act took effect on April 1999.

• **Computer Crime Act (1997):** From the development of ENIAC, the first digital computer to today's Pentium chip processor computers, the role of computers in the daily lives of individuals cannot be emphasised enough. The criminal elements of society are not oblivious to this fact. Hence they have developed ways to use computers in their criminal enterprises. Others have targeted their activities to computers of companies and government agencies. New words have been created to cater for these crimes, such as, hacking, computer viruses, Spam or junk mail to mention just a few. Malaysia's computer crimes act is to deter such abuse and misuse of computers by criminals. The Act makes it an offence to attempt or enter computer systems without authorisation, damage or alter information contained in computers or computers systems or aid others to undertake such an act. The act also makes it a crime to give passwords to people who are not authorised to receive them. The Act

was effective June of 2000 (Chapter 12 of this book deals in detail about computer crimes/cybercrime).

- Telemedicine Act (1997):** Telemedicine is a new way of administering medical advice using ICT to transmit information, pictures, data and voice over long distances. It has tremendous advantages for rural dwellers by bringing expert medical advice to their doorsteps. In cases where it is between a developed and developing countries, world-class medical specialist can dispense advice to rural and developed areas without actually being there in person. Despite such advantages, it is true that it could be abused with tremendous disadvantages. The purpose of the Telemedicine act by the Malaysian government is to protect this new way of dispensing healthcare from abuse. It provides that only registered doctors may practice telemedicine in Malaysia. Others such as healthcare providers, which include nurses, midwives and medical assistants, are to obtain a licence before they can do so.
- Communications and Multimedia Act (1998):** Since the development and growth of the first digital computer and subsequent development of the world wide web, hypertext and advancements in satellite and communications technologies, a convergence process have taken place called ICT. Legislation in Malaysia i.e. telecommunications and broadcasting therefore needed to be created as separate entities. The 1950 Telecommunications Act and the 1988 Broadcasting Act are cases in point. With the advancement of ICT, new challenges are presented and the old legal framework would be unable to cope with these new challenges. The Communications and Multimedia Act of 1998 is to address such shortcomings. The Act would create and define a new role for those in the country that are in the communications and multimedia industry, outline their roles

and responsibilities and the crafting of a new licensing system to enhance the role of the industry in Malaysia's efforts to move to the knowledge-based economy.

Personal Data Protection Act: At the time of this writing, work is still going on, on the development of an act to protect the privacy of individuals, to ensure that data collected on them and about them are not misused or abused.

Electronic Government Act: Work is also ongoing on the development of an act that would facilitate the delivery of government services to the Malaysian public as part of the e-government efforts of the country spearheaded by MAMPU. For more on this effort, see the book, *E-Government in Malaysia: Improving Responsiveness and Capacity to Serve* (Abdul Karim & Mohd Khalid, 2003).

The development of Cyberlaws by Malaysia is laudable. In fact, it is one of a handful of countries that have Cyberlaws. For these Cyberlaws to continue to be effective in this decade and beyond, they must constantly be updated to enhance their relevance. An important but not intractable challenge is for the government of Malaysia to look for ways to harmonise its Cyberlaws with others worldwide. First, it would serve as a basis for any collaborative effort to fight Cybercrime across borders. Secondly, harmonisation affords the comparing of notes by law enforcement bodies around the globe in the fight against Cybercrime, to come up with best practices and to work towards specific internal and international standards for Cybercrime. Chapter 12 of this book dealt in detail about Cybercrime.

Human Resource Development Council (HRDC) Funding for Training

Alfred Marshall, the renowned British economist once said that, "the most valuable of all capital is that invested in human beings."

If Marshall is right, then the important role that human capital play in the economic development of countries cannot be emphasised enough. The importance of human capital is illustrated by the impressive growth rates that countries like Japan, Taiwan and other countries in Asia attained about a couple of decades ago. Most of these countries especially Japan and Taiwan do not have natural resources and had to rely on their well trained and educated human capital. Gary S. Becker, a professor of economics and sociology at the University of Chicago is one of the known authorities in the area of human capital. For his efforts, he was awarded the Nobel Memorial Prize in Economics in 1992. Becker built on the work of pioneers like Ted Schultz, Jacob Mincer, Milton Friedman, and Sherwin Rosen, to mention just a few. According to Becker,

"schooling, a computer training course, expenditures on medical care, and lectures on virtues of punctuality and honesty are capital too in the sense that they improve health, raise earnings, or add to a person's appreciation of literature over much of his or her lifetime. Consequently, it is fully in keeping with the capital concept as traditionally defined to say that expenditures on education, training, medical care, etc., are investments in capital. However, these produce human, not physical or financial, capital because you cannot separate a person from his or her knowledge, skills, health, or values the way it is possible to move financial and physical assets while the owner stays put (Becker, 1993).

Deducing from Becker's quote, it goes without saying that education and training are indispensable investments in the human capital of any country. It is thus clear deducing from countries who have managed persistent growth in income have also had large increases in the education and training of their labour forces. Education and training also contribute as a coping

mechanism to changing technologies and advancing productivity in the manufacturing and service sectors. Thus for Malaysia to attain its vision of a developed nation status by the year 2020 and if it is to move to a knowledge-based economy, the development of its human capital must be one of the most important priorities.

The policy makers in Malaysia are not oblivious to this fact and have charged the *Kementerian Sumber Manusia*, (the Human Resource Ministry) with this task. Speaking on this issue, the Malaysian Minister for Human Resources said, "the need for SMEs to upgrade themselves becomes even more critical in our transition to a knowledge economy. SME entrepreneurs must re-orientate the business organisations to knowledge-based enterprises and the core competency for survival is knowledge management ... It must be further emphasised that in the context of the k-economy, knowledge and the ability to apply it is as important as capital and labour as a means of production of wealth. Knowledge is considered the human capital or intangible assets. Knowledge generation, innovation, networking capabilities and ability to invent new products are the intangible factors that will increasingly determine economic success. In this context, the emphasis on continuous retraining and skills upgrading is inevitable for Malaysian industries and individuals" (<http://www.jaring.my/ksm/spm245.htm>).

This section is not about the Human Resource Ministry but about the HRDC funding for training of Malaysia's human capital. Policy makers in the country are aware that globalisation and advances in ICT are new challenges to the survival of the country. Human resource development would be one of the actions that would contribute to enhancing Malaysia's TFP and making it competitive to face the challenges of globalisation. To this end, the government of Malaysia set up the Human Resources Development Fund (HRDF), administered by the HRDC and earmarked for the training, retraining and skills

upgrading of workers. This HRDF is funded by levy contributions from companies and businesses in the country. The government matches these contributions. As of April 30, 2002, a total of 3.20 million training places were approved for the training and upgrading of the skills of workers in the country to the tune of RM1.13 billion, funded from the HRDF (<http://www.jaring.my/ksm/spm245.htm>).

The government's strategy in the use of the HRDF is to ensure that unskilled Malaysians, those with minimal or low skills, receive training to equip them with the requisite skills for the k-economy. Those who have lost their jobs or are retrenched are also to be retrained to be able to find jobs in the new sectors of the k-economy. Furthermore, to prevent structural unemployment, workers who are faced with job insecurity are advised to take the opportunity under the HRDF to unlearn and relearn new knowledge and skills to better prepare them for the k-economy and the information age. Despite such efforts by the government to train and retrain Malaysian workers and prepare them for the K-economy, the response according to the Human Resource Minister could be better. But what is the reason for a lukewarm response? According to the minister, "one of the factors for the low training culture is the negative mindsets among SME employers on the importance of training. Reasons given for this are tight production schedules, fear of losing trained workers, matured technology and placing training at the bottom of the priority lists" (<http://www.jaring.my/ksm/spm245.htm>).

Despite such a low training culture amongst some SMEs and indeed as is the case with some individuals, the government will continue its efforts and work with those who are acquiring the training culture, it must also continue to educate those with a low training culture to change their mindset about the importance of training and the effort of the country to move to the k-economy to attain its Vision 2020 as well as face the challenges of

globalisation. It must encourage companies to use the HRDF as it is partially funded by their contributions. When all is said and done, the government can only lead these SMEs to the water, but it cannot force them to drink, so to speak. Those who do not drink cannot be saved by the government from the tidal waves of globalisation and the dynamic changes in our global environment at the 11th hour. Sadly they would go the same way like the dinosaurs — extinction.

Effects of Government Efforts so far

The efforts of the government so far to move the country to the k-economy and to become a developed nation by the year 2020 are laudable. First, there has been an unwavering commitment on the part of the government to see this effort a success. This commitment has been demonstrated with the backing of the construction of the infrastructure and infostructure with the required resources. In fact, Bill Gates on one of his visits to Malaysia commented on how he was impressed with the commitment on the part of the government to this effort. The government has also put in place the necessary Cyberlaws, one of a handful of countries to do so. It has also increased spending through the Human Resource Development Fund to train the requisite knowledge workers to fuel its k-economy efforts. Efforts are also under the way to bridge the digital divide and increase the penetration of ICT beyond Klang Valley (the capital city and environs) to the rural areas.

Where the effort is lacking is in R&D and the generation of indigenous knowledge. R&D expenditure of the country is put at 0.5 percent of GDP, which is rather low compared to some countries in the region like South Korea, Japan and Singapore which is about 2.7, 2.9, and 1.8 respectively (*World Competitiveness Year Book*, 2000). The generation of new knowledge, local content and innovative products is rather inadequate (see more about this

issues in chapter 12). For now, the efforts so far on the part of the government are in the building of the foundation to move to a k-economy. The next phase would be to build on the latter and address the areas it is lagging behind.

4.8 Conclusion

The effort of the Malaysian government to move the country from a production economy to a k-economy should be applauded. Not only has it spent the requisite resources to put into place the necessary infrastructure; it has also put into place the infostructure like Cyberlaws. The sensitisation process of the masses has also begun. Other structures like the MSC, NITC, NITA, the HDRF to mention just a few have been put in place to support the country's efforts to move to a k-economy. All of the government's efforts so far can be classified under the first phase in this book. The next phase, which will be dealing more with intangibles and dynamic challenges in our global environment, will require, still a more concerted effort on the part of the government. This will entail the making of tough decisions and the support of the right alternatives. But this effort cannot be left to the government alone, the private sector and non-governmental organizations must play an equally important role. Indeed, all Malaysians must play their part if the move to the k-economy is to be successful.

PRIVATE SECTOR EFFORTS TO MOVE MALAYSIA TO A K-ECONOMY

Introduction

The important role that the private sector play in the economic growth of developing countries cannot be emphasised enough.

The private sector provides employment, produces goods and services for export, and is a source of revenue to the government as well as the payment of corporate taxes, another source of government revenue. In most countries in the developing world, the private sector is regarded as the engine of growth, hence the efforts by numerous governments in developing countries to nourish and enhance its growth. But what is economic growth? In this chapter, we would regard economic growth as the increase in the gross domestic product (real GDP) and income of a country over time. This can be simply depicted as:

$$g = \frac{\Delta Y}{Y_t} > 0$$

Where g = growth

$\Delta Y = Y_t - Y_{t-1}$

Y_t = GDP at time t

In the case of Malaysia, the private sector has played a significant role in the country's growth. For the last two and a half decades, the private sector in the country, particularly the manufacturing sector, has contributed over 27 percent of the GDP of the country. The private sector was also able to pull in FDI from US\$695 million in 1985 to about US\$2,333 million in 1990. By 1992 before the Asian Financial Crisis it dropped significantly, FDI was put at US\$5,183 million. The economy grew at an average of eight percent over the period 1988-1997 prior to the East Asian Financial crisis. In 1998, the country experienced an economic contraction of 7.4 percent due to the impact of the crisis. Its economy has since recovered and registered a growth rate of 6.1 percent in 1999 and 8.3 percent in 2000. The global economic downturn of 2001 affected Malaysia's economic growth and it registered a growth rate of 0.4 percent. With the upturn in the global economy in 2002, the country has forecasted a growth rate of 3.5 percent but actually, the economy grew by 4.2 percent, surpassing the forecast (http://www.neac.gov.my/about/020419mahathir_dinner_business_community.htm).¹ Because of the important role the private sector plays as the engine of growth of the Malaysian economy, its role equally in Malaysia's effort to move to a knowledge-based economy and to become a developed nation by the year 2020 cannot be emphasised enough. This chapter would look at such an effort.

5.2 Role of the Private Sector in Malaysia's Development

The private sector in Malaysia is regarded as the engine of growth. According to statistics culled from various Malaysian

¹ Extracted from a speech by Dr. Mahathir Mohamad at the dinner with the Libyan business community, Tripoli, Libya, April 19, 2002.
² Ibid.

Economic Reports, reports from Bank Negara (the Central Bank) and the Statistics Department of Malaysia, the country moved from 4.6 percent of its output from construction, 10.1 percent in mining, 19.6 percent in manufacturing, 22.9 percent in agriculture, 40.1 percent in services, with 2.7 percent accounting for others in 1980 to 6.5 percent in mining and quarrying, 8.1 percent in agriculture, 29.7 percent in manufacturing, 52.2 percent in services and 3.2 percent in construction in 2001 (*New Straits Times*, 2002, p.13), with much credit from the private sector particularly the Small and Medium scale Enterprises (SMEs).

According to Mangsor Saad, Executive Director of Malaysia's Small and Medium Industries Development Corporation (SMIDEC), as of June 2002, there were 53,553 companies in the manufacturing sector and 90 percent of these were SMEs and they employed about 33.3 percent of the total workforce in the country. In 2001, the SMEs contributed about 15 percent of the total manufacturing output. In terms of value-added, SMEs contribution rose from 9.4 percent, which is about RM12 billion in the year 2000 to RM13.1 billion in 2001. The value added percentage has risen to 18 percent in 2002 (*New Straits Times*, 2002, p.E4). The contribution from the SME sector alone proves the important role the private sector has played and continued to play in Malaysia's economic growth. Apart from the provision of jobs to Malaysians by the private sector, it is a source of revenue to the government. The private sector pays corporate taxes on income earned and the government uses such taxes from the sector for public projects. Also, the workers in this sector pay taxes on their incomes and the taxes also go to add to government revenues to undertake social as well as public sector programmes to enhance the lives of all Malaysians. The role therefore, that the private sector in Malaysia would have to play in the country's efforts to move to the K-economy is of great importance.

5.3 Public-Private Sector Partnership for Malaysia's Development

Public-private sector partnership (PPP) is the interface between the public and private sector in an economy. It can simply be described as the combination of resources of the private sector such as, access to finance, business experience, market orientation, technical expertise, human resource development and entrepreneurship to the resources of the public sector, such as, an enabling environment, legal framework, regulations, public accountability, social responsibility and investment in social infrastructure for growth and development. It is important to stress here that the cornerstones of any PPP is that it should blend the productive and social cohesion aspects of sustainable development, that is the governments role of providing an "enabling" environment and the private sectors role as "active partners" in the provision of economic services (Lintjer, 2000; Magariños, 2001). The key elements of such a partnership are:

- For a successful PPP to pertain, the governments in developing countries must maintain and strengthen their macroeconomic environment as well as put into place the appropriate structures and policies.
- Governments must also have the requisite legal infrastructure in place, and mechanism that foster competition. There must be an effort to promote and work towards the provision of social goods and enabling the poor to have an access to these goods.
- Finally, the public sector must take an active and indeed a leadership role in the provision of the requisite infrastructure that would support the private sectors efforts.

Public-private sector partnerships would contribute to economic growth and development when they both use their

resources effectively. The public sector would bring to the partnership its ability to mitigate political risk and be able to withstand long paybacks on its investments. The private sector would bring to the partnership its entrepreneurial skills and its ability to meet the demands of a changing market place. These would all contribute to the growth and development of the country.

In the case of Malaysia, PPP in most instances is referred to as "Malaysia-Inc." where the public sector works closely in partnership with the private sector to bring about the growth and development of the country. The government realises that if the private sector prospers, it would pay corporate taxes and its employees would also pay income taxes, all these are forms of income to the government which enables it to undertake its development programmes and pay salaries of public sector employees. Furthermore, the public sector can only absorb a tiny proportion of the labour force. The rest is absorbed by the private sector. Hence the public sector has an interest in the development of the private sector. The private sector realises that it needs the support and collaboration of the public sector to provide adequate laws, policies and enabling environment for them to survive and thrive. So it has an interest in an effective and efficient public sector. There must therefore be the need for a strong commitment from the public sector to work for the development of the private sector and vice-versa. It is also important that there is mutual understanding and trust between them and each must be responsible and accountable for their actions. All this will go a long way to contribute to the already healthy relationship between the private and public sector in the country.

5.4 The Private Sector and the Challenge of Change and the Effort to Move Malaysia to a K-economy

Apart from the partnership of the private with the public sector in Malaysia, if it is to contribute to move to the K-economy, it has to redefine its production techniques and processes. First, ICT has made it possible that one can conduct business 24/7/52/366 globally. We are thus now in the borderless world. The private sector in Malaysia must therefore develop a global view and approach to business. Efforts should be invested to move away from old ways of sourcing inputs as well as the marketing of their products and services. Cost-efficient methods with the employment of ICT and other technologies are the way to go. The general observation of most private sector businesses in Malaysia is the view that the employment of ICT and other technologies to give them a competitive edge by improving the productivity is a waste of time. Such a mindset is unfortunate and can only be described as shortsighted. In the end, it is Malaysian businesses that cannot compete in an increasingly competitive region and world. Furthermore, the Malaysian private sector must invest more in research and development and be able to produce innovative products to be competitive in the global market place or they would be left behind. They can survive and prosper in this challenging global environment if they build competencies and benchmark themselves with the best companies in the world. Finally, the Malaysian private sector would have to adopt best practices, benchmark itself to be at the top levels than the best in their respective industries to be able to succeed and stay ahead (Third Outline Perspective Plan 2001-2010, 2001).

5.5 Re-engineering Malaysia's Public Sector to move to the K-economy

As already discussed in the preceding chapters, the role of the public sector in Malaysia in partnership with the private sector

move the country to the k-economy is extremely important. But for the public sector to be able to play its role effectively as an enabler and providing the requisite environment, infrastructure and to be an effective facilitator, it must re-engineer itself. It must keep with the rhythm of enhancing the capabilities of public sector employees to be able to employ ICT effectively in the day-to-day conduct of their activities and in their dealings with the public and the private sectors. The Malaysian public sector must also benchmark itself against best practices, and adapting its mindset to conform to the demands of the k-economy. To do this, the skills of those in the public sector have to be continuously upgraded. There must be the effort to recruit the best and brightest from local universities, instil in them resourcefulness and innovative capabilities and above all, the ability to deliver superior services to the public and the private sector (Third Outline Perspective Plan 2001-2010, 2001).

Furthermore, the work ethic of the public sector in Malaysia must change. Public sector jobs in these competitive times can no longer be regarded as just a JOB, a place to *cari makan* (make a living); Hence, most workers in this important sector of the economy can no longer approach their jobs with a lackadaisical attitude. Complaints by the populace about the services rendered by the public leave much to be desired (Saminathan, 2001). Indeed, the public perception of the civil service in Malaysia, according to the editor-in-chief of the *New Straits Times*, a Malaysian daily, is that it is now less efficient, less transparent (than before) and even corrupt (*New Straits Times*, 2003, p.4). It must be made clear that there are many in this sector who work very hard and are cognisant of the important role that the public sector play in the economic growth of the country. But there are those few bad apples that are believed to take frequent breaks for *teh tarik* (tea breaks), and at the end of the day accomplish little of the task at their disposal. The complaints by customers of *Tutup*

(closed) signs during peak hours, with only one or a few windows to serve them also gives a bad impression of the civil service (Arifin, 2003). These are just a few examples that give all in the public sector a black eye. This would definitely hamper Malaysia's efforts to move to the K-economy. Civil servants must therefore raise their benchmark to a higher level if they are not to retard the country's progress in a more globalised and competitive world, observed, Abdullah Ahmad, the Group Editor of the *New Straits Times* (*New Straits Times*, 2003, p.9).

On balance, several initiatives have been embarked upon to enhance the quality of the public sector in Malaysia. Some of these include the implementation of Total Quality Management (TQM), client charter, quality control circles, improved counter services, new systems and work procedures, and positive work values (Abdul Karim, 1999). And in fact, the public service is listening. An initiative is already underway to retrain civil servants manning counters to ensure efficient service to the public. According to Samsudin Osman, Chief Secretary to the government, it is important that those manning counters were helpful and have a pleasant demeanour as they formed the frontline of the civil service. He added, "This is important as the public will immediately form a bad impression of the civil service if they come across a rude and unhelpful counter staff" (Singh, 2003). All these efforts are steps in the right direction. However, to be effective and to contribute to the re-engineering efforts of the public sector, these initiatives implemented thus far need to be constantly monitored, re-evaluated and streamlined to meet the dynamic challenges of global competition. Where necessary, new and innovative methods needed to contribute to the re-engineering efforts of the public sector, must be applied. All these efforts will go a long way to help the public sector in Malaysia contribute its quota to enabling the private sector and the country transit effortlessly to the k-economy.

Private Sector Efforts to Move Malaysia to a K-economy

As already mentioned, the important role that the private sector in Malaysia play in the growth and development efforts of the country cannot be emphasised enough. Similarly, as Malaysia undertakes efforts to move to the K-economy and to become a developed nation by the year 2020, the role of the private sector in this effort is of enormous importance. Increasingly, as knowledge becomes the input that determines a country's competitiveness, Malaysia's comparative advantage in producing manufacturing products using cheaper factor inputs is being challenged by lower input cost countries like China. Other developing countries are enhancing their ICT and technological capabilities to move up the value chain and to remain competitive. The private sector in Malaysia cannot be oblivious to these changes and challenges from other countries. If it is to remain competitive, it must intensify its efforts to increase its productivity by embracing ICT and other new technologies as well as processes.

In this wise, the private sector in Malaysia must forge global alliances and use benefits from these alliances to enhance their local production capabilities. Some of these alliances could be of collaborative nature or could be strategic ones to enhance their capabilities in areas of high technology all helping them to enter foreign markets or diversify their production and products. Added to this must be a strive to be efficient. An efficient private sector would be nimble to be able to take advantage of opportunities in the global market place and to be able to respond to rapid changes in the global market, which can be described as volatile at times. Indeed, it will contribute to the competitiveness that Malaysia needs to be a player in the global market place as it moves to the k-economy and strives to be a developed nation by the year 2020.

Furthermore, for the private sector in Malaysia to contribute to the development of the country and its move to the k-economy, it must invest a significant percent of its operating capital in research and development (R&D). Currently, the investment of the private sector of Malaysia in R&D is rather low (*New Straits Times*, 2003, p.B3). Of the current 0.4 percent of Malaysia's GDP spent on R&D, the private sectors' contribution has been put at 45 percent in 1992 and 48 percent in 1994 respectively (<http://www.moste.gov.my/kstas/s&t/igsfaqs.html>). This is partly due to the limited importance some SMEs and other businesses in the private sector put on research and development. Other factors that are ascribed to this is the scarce financial resources to invest in R&D as more resources are needed to meet recurrent expenditure as well as regional and domestic competition. Such concerns are sound, however, if Malaysia is to move to the k-economy and to remain competitive, the private sector must find ways to invest in R&D. Not only would R&D enhance the products of these companies, but it would also enhance their competitive position in the global market place. If new and cutting-edge technologies are developed in the process, these companies have the right to benefit from the patents and copyrights for a considerable period of time. The private sector in Malaysia must therefore intensify their efforts in the R&D arena. They must therefore spend a reasonable amount of their Gross Domestic Expenditure on R&D to be able to create new knowledge and move the country to the k-economy.

In an era where the only constant is change and rapid change, the private sector in Malaysia must be prepared for these changes. They must identify and abandon outdated rules and other fundamental assumptions that underlie current business operations — thus they must engage in *discontinuous thinking* (Hammer and Champy, 1993). Their assumptions about technology, people and organisational goals must radically

change. Their goals must be loftier, aimed at developing high quality products and services, at competitive prices. Indeed for the private sector to be able to contribute to the Malaysia's efforts to move to the k-economy, it must respond to the challenges and changes in our global environment by re-engineering itself. Hierarchies need to be flatter, cost reduction need to be undertaken and moving up the value chain is a must (K-Economy Master Plan, 2002).

Finally, Malaysia's efforts to move to the k-economy can be enhanced with the ability of the private sector to help produce the necessary knowledge workers. This can be done through the constant training and retraining of its workforce to be able to use and adapt to new ways of production. It should also be willing to take in fresh graduates from local universities, most of who have no skills and offer them on the job training. Most science and technology writers have described this on the job training as "learning by doing." By undertaking task assigned to them these graduates as well as old hands in the private sector industries would learn by performing these tasks. With repetitive performance of such tasks, they will become "experts" and can then be directed to train others in the different locations of the business (Segal, 1987). The process of learning by doing would be one of the ways Malaysia can develop its much needed knowledge workers to fuel its move to the k-economy and the private sector can help in this effort.

Conclusion

As Malaysia moves to the k-economy, an increased symbiotic relationship between the public and private sectors will be the saving grace. Thus the laissez-faire approach advocated by the neoclassical counterrevolution growth theorist, a neoliberalism view, alone would not work for the case of multiracial Malaysia. A command control economy also would not do it. A balance is

the best option, more of a "partnership" between the public and private sector. The middle-road, an option the policy makers of Malaysia have opted for, has helped and continue to help the country in its movement to a k-economy. The road ahead is for the public sector to re-engineer itself to compliment the private sectors effort as an engine of growth. The private sector must also re-invent itself to be lean, mean and nimble to be able to compete in a dynamic, competitive global environment. In a nutshell, the public and private sectors in Malaysia need each other. There might be differences in this relationship but the goal is the same — a developed, knowledge-based economy, Malaysia.

6. CHALLENGES AND SOLUTIONS

Introduction

Malaysia's efforts to move to a knowledge-based economy would pose some challenges and the road ahead would not be rosy. First, the major challenge for Malaysia is to be able to convince the different sectors in its economy and constituencies in the country about the importance of moving to the New Economy. There is also the need to be able to change the mindset of the people from thinking about production for the old economy to that of producing for the new. Furthermore, the need to motivate those sitting on the fence to join the bandwagon is another challenge. Speaking on the same issues at the Second Global Knowledge Conference held in Kuala Lumpur in 2000 Dr. Mahathir Mohammad said, "We must remember to forget old ways. We must force ourselves into new habits. We must build new processes, institutions and organisations that are necessary for the Information Age" (Sakaran, 2000). This will require an innovative and creative way of thinking. This kind of thinking would lead to the production of innovative products for the global market place in the knowledge-based economy. Second, a lot of Malaysians are

still in the dark about what the knowledge-based economy is all about. From the experience of this author, conducting a series of seminars nationwide in Malaysia on the K-economy, most people ascribe the k-economy to ICT. The government would have to educate these masses, especially those at the grassroots as to what the k-economy really entails and its importance to the growth and development efforts of Malaysia.

6.2 Highly Skilled Labour Force

To develop a competitive edge in a knowledge-based economy, Malaysia would need a highly skilled labour force. A highly skilled labour force is the fuel to the engine of growth in the knowledge-based economy. They provide the "know-how" that goes into the production of innovative products to enable a company or a country be competitive in the global market place. As mentioned earlier in this chapter, the short-term prospects of that happening are not bright. The recent report in Malaysia's *Knowledge-based Economy Master Plan* acknowledges this problem. It states that, "Less than 30 percent of Malaysians of the relevant age cohort received tertiary education, compared to over 50 percent for industrialised nations. In addition, out-migration drains the limited talent pool. At least 50,000 professional and technical personnel have migrated to Singapore, Australia, New Zealand, US, Canada and Europe over the last 15 years. Currently, between 500 and 1,000 Malaysians work for high-tech US firms in the Silicon Valley alone. An estimated 51 percent of foreign ICT workers in Singapore are Malaysian nationals. The over 100,000 Malaysian students overseas are another source of potential out-migration" (Knowledge-based Economy Master Plan, 2002).

The only other alternative is to bring in the requisite skilled labour from outside and conditions in the country should be liberalised for their recruitment. At the time of this writing the authorities are debating the appropriate provisions in its

immigration policies that would accommodate such a need without upsetting the balance of the multi-racial and multi-religious mix of Malaysia. The government is also studying methods of how it would compensate such skilled labour to be able to compete with other countries that are also courting the same skilled labour without creating discontent amongst its people. Another short-term strategy to meet the shortage of knowledge workers is the provision of incentives in the 2000 budget to lure skilled Malaysians back home (Zainuddin, 2000). This strategy is termed by the authorities as a "knowledge-gain" effort. Though this effort should be lauded, it is not going to be an easy task. First, the wages and salaries paid to Malaysian skilled workers abroad are way high compared to what these same workers would receive if they come to Malaysia. If the government is to match such salaries, it could pose a strain on its expenditure. The government should continue to review this initiative and where it finds some intangible benefits that could accrue to the country by recruiting such skilled Malaysians, it should make all efforts to make them return. There should also be other compelling reasons more than money for most of these skilled Malaysians to return. This is because Malaysia may not be able to compete in matching the remuneration currently enjoyed by most of these skilled workers abroad and could affect the success of such an initiative. The long-term strategy of training the populace, as part of such cadre of knowledge-workers to power the knowledge-economy cannot be emphasised enough. But such efforts would require massive investments and a committed effort on the part of the government to make it happen. Mentioned should be made that the government of Malaysia is expanding the physical capacity of the public sector training institutions to contribute in the training of the requisite skill labour. For example, the Industrial Training Institutes (ITIs) and Advance Technology Centres (ADTECs) alone, under the

Ministry of Human Resources realised about 17,000 full-time trainees in 2001. This expansion is set to continue under the Eighth Malaysian Plan (Yeoh, 2002).

The government as well as the private sector institutions should start a process of industrial attachment for some of the current skilled labour force in other domestic or international businesses or institutions in similar or identical industries. This kind of industrial attachment or "skills retooling" will help these Malaysians learn new processes, techniques and "know how" that will enhance their knowledge and skills sets. Upon their return to their original posts, they can blend such new knowledge and experiences to their work to bring about innovation and increased productivity. This proposed "skills retooling" scheme would enhance the existing skilled labour in the country, which will in turn pass it on to other Malaysian workers on the job.

6.3 Enhancing Innovation and Producing Innovative Products

Another important challenge that Malaysia would face in its efforts to move to a knowledge-based economy would be its ability to build an innovative capacity in the country to be able to develop innovative goods and services for the knowledge-based economy. With increased liberalisation of economies and the removal of tariff barriers, goods and services produced by Malaysian companies and workers will have to compete with multinationals and those of other developing countries, especially those in the South East Asia region. In the ensuing competitive market place, innovative, quality and competitive priced goods and services will win the day. Malaysia must thus build an innovative capacity in the country to offer it the advantage in an increasingly liberalised globalised environment. Such an innovative capacity will not happen without a firm commitment on the part of the government, the private sector and institutions of higher learning. A commitment of incentives and recognition

is a good place to start. Furthermore, researchers and institutions of higher learning must venture into new and cutting-edge fields. In the words of Raja Permaisuri Agong Tuanku Zariah Tengku Abdul Rashid, the current queen of Malaysia and Chancellor of University Sains Malaysia (USM), "take 'big leaps' in exploring new fields." To USM researchers, she said it was vital that they came up with "innovative and creative ideas to be emulated by others" (*New Straits Times*, 2003, p.8). The queen's message is not only to USM researchers but applies equally to all researchers in universities and institutions of higher learning throughout the country. Indeed, scientist and researchers in the country must strive to undertake original research into areas in which breakthroughs are made for innovative products to evolve (*New Straits Times*, 2003, p.9). It would also require a proactive approach where the requisite resources should be provided for research to develop products and processes to help the country to compete in the knowledge-based economy.

Table 6.1: R&D Expenditure for Selected Countries

Country	R&D Expenditure (% of GDP, 1998)
Australia	1.7
Canada	1.6
China	0.7
India	0.7
Ireland	1.5
Japan	2.9
South Korea	2.7
Malaysia	0.4
New Zealand	1.0
Singapore	1.8
United Kingdom	1.9
United States	2.5

Source: *World Competitiveness Year Book*, 2000; *World Development Report*, 1999/2000.

The current amount of resources allocated to R&D in the country as a percentage of the GDP is at a low 0.4 percent compared to other countries (see Table 6.1). Furthermore, to bring about innovation, the government must foster an environment where creative and innovative thinking are rewarded. Incentives should therefore be given to those who come up with cutting-edge ideas and recognition should accompany such discoveries in the form of "the Malaysian Nobel Prize," like the recognition bestowed by the Albert Nobel Foundation of Sweden on Nobel Laureates world-wide. But in Malaysia's case it should be for contribution to the innovative capacity of the country. One must say in passing that, recognition of contributions to the country is nothing new in Malaysia. The recognition bestowed by the King, Sultans and government on individual Malaysians, comprising of titles such as, *Tun, Tan Sri, Dato and Datins* for their contribution in diverse ways is laudable. The difference between the proposed "Malaysian Nobel Laureate" and the aforementioned is that the "Malaysian Nobel Laureate" should have reasonable prize money to accompany it to make it coveted. It should also be strictly for the contribution of an innovative product and process or processes that would enhance Malaysia's innovative capacity and competitive standing in the global marketplace. In addition, eminent international panel of judges should staff the selecting process, with the selecting process design to be akin to the Swedish Nobel nomination and selection. This would make sure the process is not cheapened and those Malaysians who earn such a Nobel see it as an epitome of achievement. At the end of the day, the sole aim of such recognition is to serve as an impetus to spur an increase in R&D and in academic and non-academic research to come up with innovative processes and products for Malaysia and the global market place.

Use of Capital

Furthermore, the challenge of the government should be in the directing of its energies to garner funds and make sure such funds are made available to local entrepreneurs to enable them produce competitive goods and services for the knowledge-based economy. So far, the government has made available RM130 million to the Multimedia Super Corridor ventures, RM300 million has also been made available to Mayban and Commerce ventures. Such efforts on the part of the government are laudable in comparison to Australia and Singapore pale. Australia has allocated RM5 billion and Singapore RM3.8 billion respectively as venture capital (Sivapalan, 2001). The reason why such a point cannot be stressed enough is that in the era of knowledge-based economy, all the aforementioned countries would produce goods and services that would compete with those of Malaysia in the global market place. Malaysia cannot afford to be left behind. The venture capital industry in Malaysia thus needs to be developed as an alternative source of financing to contribute to R&D and the generation and commercialisation of innovative ideas (see Table 6.2 below).

Table 6.2: Venture Capital Funds/Companies

Venture Capital Funds/Companies	At end 2000	At end 2001(p)
VC funds/companies (nos)	31	36
Investee companies (nos)	159	180
Assets RM (Million)		
Shareholder's funds	972.6	983.2
Liabilities	543.4	993.8
Net assets (RM million)		
Investments in investee companies	718.2	652.9
Other assets	797.8	1,324
Total	1,516	1,976.9

Source: Bank Negara Malaysia (p) Preliminary

Mention should be made in passing that in the 2001 budget presented by the Malaysian government, RM500 million has been allocated to fund the start-up stage of companies in the country who venture into areas related to the knowledge-based economy. During the period of the OPP3, the government has allocated RM1.1 billion to develop the industry. All these efforts are steps in the right direction. But it must also be kept in mind by most aspiring "knowledgepreneurs" that they can outsource private venture capital to grow their companies. But they should be aware of some of the dubious venture capitalist. A word of caution here to these "knowledgepreneurs" is that there are a lot of dubious private venture capital funds out there and they would do anything to help you part with your limited resources. These scam venture capital funds/companies have duped a lot of Malaysian and foreign entrepreneurs and "knowledgepreneurs". Others were lucky to slip through the net of these dubious venture capital funds (*The Star*, 2002, p.30). Aspiring Malaysian "knowledgepreneurs" and "technopreneurs" must undertake the requisite thorough due diligence when dealing with venture capital firms. They should not let their hunger for capital cloud their visions. One rule of thumb to go by is that, when it is too good to be true, it is indeed too good to be true. Having said this, the government should wade in and put in place a formal regulatory mechanism for venture capital firms in Malaysia and a registry where their authenticity can be checked out.

Still on the issue of funding, efforts should be made to revitalise the Malaysian Exchange of Securities Dealing and Automated Quotation (MESDAQ), Malaysia's version of National Association of Securities Dealers and Automated Quotations Systems (NASDAQ), the U.S. technology exchange where entrepreneurs can raise funds to undertake ventures related to the knowledge-economy. The importance of such a proposal is because the government alone cannot provide all the funds

needed to fund "knowledgepreneurs" and "technopreneurs" who want to venture into business pertaining to the knowledge-economy. In the U.S. and most developed countries, most of the requisite capital raised by the new economy entrepreneurs is from various venture capitalists and from their technology exchanges. MESDAQ must be revitalised to do the same for Malaysia and Malaysian "knowledgepreneurs" what NASDAQ has done for U.S. "knowledgepreneurs." But efforts should also be made to encourage participation of "technopreneurs" and "knowledgepreneurs" in the Kuala Lumpur Stock Exchange (KLSE). Measures should be put in place to enhance the competitiveness of the KLSE, accessibility and transaction cost must also be reduced to ensure maximum participation for Malaysian entrepreneurs to lead the country into the k-economy. At this juncture, credit needs to be given to the government and the management of the KLSE and the Securities Commission for drafting and releasing Malaysia's Capital Market Master Plan (CMP) in February 2001. The CMP would enable the creation of efficient capital market structure to help in the mobilisation and the allocation of capital. Efforts to bring MESDAQ into the KLSE fold as well as the setting up of the Labuan International Financial Exchange (LFX) are all commendable. The role of capital in enabling Malaysian "knowledgepreneurs" and "technopreneurs" to produce innovative products is of extreme importance in the nation's efforts to move to the k-economy. Hence KLSE must continue to play its important role as the source where "knowledgepreneurs" and entrepreneurs can raise money on the capital market. It must also continue to upgrade its technological infrastructure and human resources to make it efficient and competitive vis-à-vis other international bourses to ensure an access to capital by Malaysian entrepreneurs to lead the country into the k-economy and to realise its vision 2020 (Yeoh, 2002).

6.5 Challenge of a turbulent and chaotic global environment

The futurist, Alvin Toffler, wrote in his best selling book, *The Wave* that, "a powerful tide is surging across much of the world today, creating a new, often bizarre, environment in which to work, play, marry, raise children, or retire. In this bewildering context, businessmen swim against highly erratic economic currents; politicians see their ratings bob wildly up and down; universities, hospitals and other institutions battle desperately against inflation. Value systems splinter and crash, while life ... are hurled madly about." Toffler adds in the book that, "in a time when terrorists play death-games with hostages, as currencies careen amid rumours of a third World War, as embassies flame and storm troopers lace up their boots in many lands, we stare in horror at the headlines" (Toffler, 1980). One may ask, why dredge up such gloom? First, I must point out that I am not a Cassandra neither am I about to announce a doom prophesy. These quotations are just to drive home the point that we live in a chaotic global environment, as such, the uncertainty and chaos of our world today should be factored in, in all our plans and policies. But it is also to point out that it is within this chaos and uncertainty that the winners of tomorrow are made. This is because one man's chaos is another man's opportunity. According to Tom Peters, the winners of tomorrow "will deal proactively with chaos, they will look at the chaos per se as a source of market advantage, not as a problem to be got around." Chaos and uncertainty are market opportunities for the wise. Those capitalising on fleeting market anomalies will be the successful. The business's greatest accomplishment" (Peters, 1988). In short, victory in this chaotic world will go to those who can and are willing to master instability through a concerted and consistent effort of constantly working on their responsiveness-enhancing capabilities.

It therefore goes without saying that one of the challenges that Malaysia would face in its efforts to move to a k-economy would be the challenge of a turbulent, uncertain and chaotic global environment. These turbulent and chaotic challenges would be of an economic, political and social nature. For example, who knew that the Asian Financial Crisis was going to happen? Who could foretell the recent September 11th bombings of the Twin Towers in New York City and the subsequent socio-political and economic impact it had globally? These and many more are what I call the X factor. In other therefore for Malaysia to deal with the X factor as it prepares to attain a developed nation status by the year 2020 and to be a knowledge-based economy, the X factor must be factored in, in all aspects of the economy process, programmes and policies. This is to forestall irrationality in decision making, reacting to such chaotic challenges, instead of having in place the shock absorbers and requisite landing gear to cater for a soft-landing in such tough times, so to speak.

Role of Intellectual Property Rights (IPRs) and Wrongs

The definitive currency of a knowledge-based economy is intellectual property rights (IPRs). Such IPRs include copyrights, patents, trademarks, service marks and goods of geographical indication. Increasingly, as our world is characterised by the change of creative products, technologies and techniques as well as information, global wealth would be determined by an individual country's ability to produce and control knowledge-based knowledge products; and since IPRs are used to protect such knowledge, countries will zealously protect such rights. In fact, studies have shown that IPRs are positive correlated with real GDP per capital (Maskus and Penubarti, 1995). IPRs in a way are monopolies awarded to original owners of copyrights and patents to enable them benefit from their discoveries. Such it is

hoped, would serve as an impetus to foster innovation and the discovery of new products, processes and other artistic creations to better the lives of mankind. They are also a way of ensuring the effective distribution of those inventions into an economy (Maskus, 2000). Individuals, companies and countries that infringe on the rights of others would be visited with legal actions where punitive damages and lost revenues due to such infringement would be sought by the IPR owner.

Sadly, respect for IPRs of others is very low in Asia and indeed in Malaysia. Pirated CDs, VCDs, DVDs and software as well as designer goods, and the making of photocopies of entire books without the written permission from the owners of such copyrights are commonplace. Efforts by the appropriate authorities in Asia to stop such violations are underway but can be described as "bandage measures." There are laws on the books in most Asian countries to punish copyright and patent violations but their enforcement are sparse and fines are minimal and do not serve as a deterrent to violators. The consequence to Asia and Malaysia in particular as it moves to a knowledge-based economy can be disastrous. First, others in similar developing countries can violate the copyrights or patents of Malaysian companies with impunity or point to Malaysia as a learning curve for their activities. Second, developed countries can blacklist Malaysia, seek and impose trade sanctions on its exports unless such practices were stopped. Some companies can either argue for the stopping of shipment of their goods and technologies to a specific country fearing that their copyrights would be violated. Many are the measures that could be taken as retaliatory by other countries that could harm Malaysia's knowledge generation and export efforts. Hence, the appropriate authorities must develop workable ways to arrest copyright and patent violations in the country.

Yet, it cannot be emphasised enough, the difficulties that some IPR regimes have exacted on developing countries. Some even hold views that regard these difficulties as IPR "wrongs." They argue that this could be the reason why some of these IPRs are violated with impunity in some developing countries (Maskus, 2000). One of such wrongs given is the rigid and inflexible nature in the pricing of products and services by IPR holders mostly in the North. Since the income per capita of those in developing countries are not the same as the developed ones, IPRs holders should take that into consideration in the pricing of their products and services in developing countries. Unfortunately, no consideration is given to customers in developing countries in the pricing of much needed products such as medicines. The experience of South Africa as it pertains to AIDS antiretroviral drugs is a case in point.

Another "wrong" is the concern raised by some that a strong patent and copyright regime as put forward by the Trade Related Aspects of Intellectual Property Rights (TRIPs) agreement, would have adverse effects on the terms of trade of most developing countries who are importers of technology. This is because a strong patent and copyright regime would also expand the market powers of these technology providers to the detriment of developing countries that would see a higher mark-up in prices. It would also affect the key inputs needed for their industries, thus having a devastating impact on their growth and development efforts (Smith 1999; Maskus, 2000). Furthermore, It is also true that foreigners own most of the IPRs registered in developing countries. Because of their deep pockets and external affiliations, some are also Trans-national Corporations and such a pattern would not change anytime soon. Hence, a strong TRIPs regime would shift the terms of trade in their favour and would result in the reduction of the short run welfare of developing countries (Maskus, 2000).

In addition, massive rents would accumulate to most of the holders of patents and copyrights, and undeniable, these are developed countries. Developing countries see a sizeable outflow or gross outward transfers in the form of payment of rents because they own less patents and copyrights, the opposite would be the case for developed countries. Thus, it would exacerbate the growing economic divide between developed and developing countries. Finally, the issue of patents for biotechnological inventions which consist of genetic research tools, pharmaceutical products, transgenic strains of plants and animals as well as biological industrial processes have drawn the ire of most developing countries. Tensions have risen when some of the scientist and pharmaceutical companies in the North have tried to patent blood types, DNA and living organisms. Some of the reasons for such concerns are either ethical, the possibility of unknown health risks but most importantly, the "exploitation" of the genetic resources of developing countries (Maskus, 2000; Correa, 2000). IPRs therefore can be said to have inbuilt benefits as well as costs as elaborated on so far. Hence, developing countries including Malaysia must watch the issues of IPRs closely, especially as it pertains to debates at international forums. This will make sure that IPRs are not used by developed countries to strangle their development and growth efforts, rather it should be harnessed to produce a win-win situation for developed and developing countries as a whole.

Also, the Malaysian government despite the understanding of some of the inherent "wrongs" of IPRs, it acknowledges their rights and benefits and has started clamping down on violators of IPRs in the country. For example, the government has ordered the Domestic Trade and Consumer Affairs Ministry to wage an all-out-war against copyright piracy, a menace it regards as seriously affecting innovation. The extract of a full-page advertisement to warn culprits speak to this seriousness.

NOTICE STOP USING UNLICENSED SOFTWARE

The Ministry of Domestic Trade and Consumer Affairs views software piracy seriously.

Software piracy is a crime and the Ministry will continue its sustained and concerted crackdown on software piracy of all forms. Consequences to offenders are very serious. Retailers, Distributors and End-user Corporations who are engaged in any illegal activities face severe penalties under the Copyright Act 1987 and the Trade Descriptions Act 1972. If found guilty under the Copyright Act 1987, offenders risk criminal penalties of fines up to RM10,000 for each unlicensed software, a jail sentence of up to 5 years or both. Senior management of corporations including directors, company secretaries or managers could be deemed guilty of the offences committed by their corporations and be personally liable to similar penalties. Similar corporate offenders risk hefty penalties under the Trade Description Act 1972 of up to RM250,000 in fines. Senior management may be personally liable to fines of up to RM100,000 or 3 year jail term or both. From 24th September onwards, the Ministry will intensify its nationwide crackdown campaign against software piracy. Failure to comply with the provisions of the Copyright Act 1987 will result in serious consequences to the corporation and senior management.

Source: *New Straits Times*, September 1, 2001, p. 1 (Full page advertisement).

Some of the measures to be applied are: the revoking of licenses of manufacturers found violating the Copyright Act, seeking judgement in court against those caught manufacturing and distributing, selling pirated audio, video compact discs. Recruiting of more law enforcement officers and their deployment nationwide is in process. Also, sending seized optical discs to the Science and Technology and Environment Ministry for forensic tests, registering IPRs and seeking international help

because the ministry believes that copyrights violation, especially in Malaysia is a syndicate activity, involving gangsters and underworld elements with international linkages. All these efforts are steps in the right direction in the effort to combat copyright piracy in the country (Freeda Cruz, 2002).

6.7 The Challenge of Arrival

One of the challenges Malaysia would face as it makes the effort to move to the K-economy is the challenge of convincing the masses that it is not going to be attained overnight. There is a tendency amongst many in developing countries, who are all clamouring or are interested to benefit from the good that growth and development bestows but are rather impatient and in most cases are not willing to sacrifice or pay the requisite price for such development. Yet, it is common knowledge that nothing that is worth having comes easy, and sometimes it arrives rather later than its expected. In fact, some philosophers hold the view that one must sweat before they sweet. But many are those who usually become frustrated and cannot sacrifice, or afford to wait a little longer for the arrival of the benefits. For these kinds of people, I would only say that they are enslaved by the "now mentality." Malaysia would be faced with the challenge of the impatience of many in the populace who wish the k-economy would shower its benefits on them "now" even overnight. These people cannot wait for the day of the arrival, so to speak. Already, some of these people are spelling the death knell of Malaysia's k-economy efforts, as they see no immediate benefits accruing to them. Fingers and unsavoury remarks will be directed at the government for an insistence of patience and sacrifice to benefit from the k-economy. Probably what they might not understand is that moving to the k-economy is a journey not a sprint. Programmes should therefore be put in place to educate and rally the people, especially those with the "now mentality."

such a move to the k-economy as not a developmental trajectory that can be attained overnight or in a sprint. It should be made clear to them that there would be twist and turns on Malaysia's road to the k-economy. Indeed, the ride could be bumpy. They must thus be made to understand that the effort to move the country to the k-economy is equally the responsibility of the government as it is of the populace. One would like to stress that "government" used here is to refer to the policy makers the people have elected to represent them. Often in developing countries including Malaysia, when most people talk about the government, they forget that they are referring to themselves. Hence they are responsible for electing people to represent them in the government. Hence, this assertion that Malaysia's movement to the k-economy is not just the responsibility of the government." Thus as Malaysia enters the next phase of the country's efforts to move to the k-economy, it would be faced with the challenge of arrival — those eagerly wishing the arrival was yesterday without a clue of what to do when it arrives.

Conclusion

An unknown philosopher once remarked, that one had to cross the desert to get to the Oasis. The desert represents the challenges one will face before they get to the Oasis. Similarly, Malaysia would have to cross its desert before it gets to its k-economy Oasis. These challenges would be trying and they range for need for knowledge workers, the enhancing of its innovative capabilities, to the issues of capital, intellectual property rights and the challenge posed by a turbulent and chaotic global environment.

There are mistakes and missteps that the country would be faced with in this effort. But it will be Malaysia's own mistakes and the ability to quickly learn from these mistakes and move on will serve it well as it moves to the k-economy. Indeed according

to Theodore Roosevelt, the 26th president of the U.S. and a Nobel laureate, "far better to dare mighty things, to win glorious triumphs, even though chequered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much because they live in the grey twilight that knows not victory, nor defeat." As Malaysia moves to the k-economy, particularly in the next phase, it should be cognisant of such challenges.

PHASE II

7. KNOWLEDGE WORKERS AND MALAYSIA'S K-ECONOMY

Introduction

Jon Sommer the former CEO of Deutsche Telecom once remarked that, "those who don't invest in the future won't have one." Sommer's observation applies to both individuals and nations. Investing in the future today is investing in knowledge, because knowledge is the greatest source of economic value and labour markets are rewarding people who work with their brains and slap around those who do not (Stewart, 1997). Such an observation is more pronounced in the era of the k-economy, an era where the production process has been transformed dramatically by constant changes in ICT. Hence for countries, particularly developing ones to survive and prosper, they need to develop the capacity to acquire knowledge and apply it to their development process. To be able to undertake this, these countries need knowledge workers who would be able to process knowledge and apply it for the development of the nation. In Malaysia's efforts to move to a k-economy, it would thus need

knowledge workers to help it attain this goal. But why would Malaysia not use its "regular" workers? Why knowledge workers?

This is because the 21st Century according to Lester Thurow, a professor at MIT, entails the play of a new economic game, with brand new rules, which require different strategies to win. Using its "regular" workers wouldn't cut it. Hence, no matter how successful you have been in the past, it does not translate into future success and if you have to be successful in the future you would have to do things differently ... because of the forces that will shape the future — and it is always better to play with the forces than against them (Thurow, 1999). In this sense, Malaysia is smart, it is playing with forces that would shape the future by moving to the k-economy and knowledge workers. "regular" workers are indispensable in this aspect. Besides in the economies of today and the future, knowledge is the driver of growth and the creator of wealth, hence those who have it (knowledge workers) are the keys to creating this wealth and hence indispensable in the k-economy (Horibe, 1999).

7.2 Who is a Knowledge Worker?

The question, who is a knowledge worker in a way, is a misnomer. Does it mean that there are some workers who do use their mental faculties? Definitely not. The use of the word knowledge workers is to connote a high intensity of the use of knowledge involved in the production process. Hence, a definition of what a knowledge worker is, is necessary. There are so many definitions of who a knowledge worker is, and it would be thus appropriate to look at a few. Some hold the view that a knowledge worker is someone who uses his or her head more than their hands (brains more than their brawn) to produce value. This value is added through ideas, their analyses of those ideas, their judgement, syntheses and designs (Horibe, 1999). Others define the knowledge worker as a person dealing in data and

ideas (Cortada, 1998). Peter Drucker writing in his book, *The New Realities*, describes the knowledge worker as a new majority, which does not fit any interest group definition. He regards knowledge workers as a "uniclass" (Drucker, 1989). Whatever the definition of what a knowledge worker is, one thing that is evident is that all knowledge workers use their brains more rather than their brawn and that they combine both the tacit and the codified aspects of knowledge to unlock value for their organisations. Because knowledge workers can determine the competitive advantage of an organisation or a country and indeed today form the most important input in the growth and development efforts of nations, they are in great demand. The remuneration for these knowledge workers therefore is rising. The market place therefore rewards those with knowledge and punishes those without it.

The Emergence of Knowledge Workers

To talk about the emergence of knowledge workers, it would be appropriate to draw an example using the Freemasons. Specifically during the era of the 11th Century Europe. The Freemasons were members of a guild of skilled workers in Europe around the middle ages. The Freemasons could be regarded as the equivalent of our today's knowledge workers. These Freemasons guarded secretly the knowledge and skills needed to plan and build tall stonewall buildings. The secrets of their architecture, stonemasonry and building were fiercely guarded through the use of secret passwords, handshakes, rings and other symbols by these Freemasons as signs to identify each other (Housel and Bell, 2001).

The example of the Freemasons of 11th Century Europe, point to the fact that knowledge workers has been around for long. From historical times other knowledge workers we can point to are scholars, professors, teachers, priests, ministers,

clerics, lawyers, accountants, doctors, writers, politicians to mention just a few (Cortada, 1998). Thus, the true emergence of knowledge workers started ever since when the aforementioned workers started exchanging their services for remuneration. However, it is only most recently, starting around the 1980s with the proliferation of computers and microprocessors that the name knowledge workers gained popularity. Also, knowledge workers have gained popularity with the movement from a production to a knowledge-based economy.

7.4 Characteristics of Knowledge Workers

Because ICT is dynamic and changes are taking place in every sector of the global economy, one cannot assume that the characteristics of knowledge workers are static. Robert Reich, the former labour secretary in the Clinton administration, currently professor at Harvard University in his book *The Work of Nations*, regards these knowledge workers as problem solvers, problem identifiers, strategic brokers and I would add thinkers. Thus, it goes without saying that since problem identification and solution are continuous challenges in human existence, knowledge work and knowledge workers would always be in demand. I would then contend in this book that the characteristics of knowledge workers are more of a moving target in this era of dynamic changes in ICT. Albeit, a few characteristics can be given to serve as a core to elucidate on what characterises today's knowledge workers. Some of these include:

- **People who mostly use their heads and hands more than their brawn to produce or add value:**

The knowledge workers of today are busy creating, mining data, manipulating it and either disseminating it or using it to aid in the finding of solutions to a problem. One can

therefore safely say that one of the most important characteristics of knowledge workers is the aforementioned.

Highly educated, experienced and specialised

One of the important characteristics of knowledge workers is that they are well educated. At least, most knowledge workers have a college degree and must have moved beyond this level to either the graduate level or have acquired more knowledge through the process of continuous learning and training.

Highly mobile people

Knowledge workers are highly mobile within their jobs and between jobs of their specialisation. It is said of knowledge workers that they think as nothing moving from one job to another, say from one university to the other, one company to another, one country to another, as long as they stay within the same field of knowledge (*Economist*, 2001, p. 10).

Non-hierarchical

Knowledge workers do not see themselves as hierarchical. For example, the case could be made that an open-heart surgeon may make more money than a speech therapist. It could also be that the open-heart surgeon may enjoy a much higher social status than the speech therapist. Yet both of them are knowledge workers and in the case where the patient of the open-heart surgeon, a stroke victim, may require speech therapy, the knowledge needed from the speech therapist to rehabilitate this patient suddenly becomes more important than that of the open heart surgeon (*Economist*, 2001, p. 10). Hence, each of these two knowledge workers are equally important, it only depends on the given situation when their skills are need. Knowledge workers

therefore see themselves in comparison to their colleagues as equals.

- **Enjoy lifelong learning**

Knowledge workers are lifelong learners. They continue to learn throughout their lifetime and continuously upgrade their knowledge and skills to continue to be competitive. Knowledge workers know that in an increasingly changing global environment spurred on by information and communication technologies, the knowledge they gained yesterday can easily be obsolete the next day; hence they have to continuously learn, unlearn and re-learn.

- **Take pride in their professional performance and achievements**

Knowledge workers take pride in their professional achievements and their performance on their job. Money may play an important role in the schema of things for knowledge workers but they do not regard money as the ultimate yardstick and is usually not regarded as a substitute over their professional achievements.

7.5 Categorisation and Qualities of Knowledge Workers

To categorise knowledge workers is taking a giant leap of faith but I will try. First, knowledge workers do not see themselves as subordinates to those who have hired them for their services. They tend to see themselves as equals with owners of the organisation. They also believe that even though they might be employed in an organisation, the organisation need them most. According to Peter Drucker, these knowledge workers tend to see themselves as "professionals" rather than as "employees." Taking this into consideration, we would divide knowledge workers into two main broad categories — "senior professionals"

and "junior professionals." A knowledge worker who is a senior professional would be one who has more tacit experience in a specific speciality. It could be that he started out by gaining experience and education, codified knowledge in that area and having practised in this field for a considerable length of time can be regarded as such. A junior professional would be a knowledge worker freshly out of school, where they have gained codified knowledge in a specific area of speciality. If they join a firm, they are equally knowledge workers and professionals just like their senior colleagues. They can work on same projects together with these colleagues and because they do not have vast experience gained beyond their formal education like their senior colleagues, they would therefore be categorised by this author as junior professionals.

These knowledge workers would all have numerous qualities that set them apart from regular workers. First, they would all be team players; they usually work together to advance the interest of the organisation. Second, they are all savvy in ICT usage. ICT enhances productivity and the ability to effectively use these technologies to enable the knowledge worker to be very productive. They also possess good communication skills of both written and spoken abilities. They have a positive mindset and are very resourceful. Thus the ability to have an open mindset, as well as being flexible in the adaptation to changes, the ability to seek information, synthesise and apply such information are some of the unique qualities of knowledge workers (*New Straits Times*, 2002, p.10).

The Arrival of the K-economy and the Need for Knowledge Workers

The convergence of ICT has brought about the knowledge economy. Prior to this in the agrarian and industrial economies, land and labour, capital and labour were the requisite inputs

respectively in the aforementioned industries. Today in the knowledge-based economy, knowledge and information are the necessary inputs. In addition, knowledge workers are the fastest growing group in developed and some developing countries today. Their jobs require them to have formal and advanced education. For example in the US today, about a third to half of the American workforce comprises of knowledge workers. It is reported that knowledge-intensive companies in the US, those who have over 40 percent or more knowledge workers, account for over 28 percent of the total US employment. And in the last decade, these knowledge-intensive companies have accounted for over 43 percent of new employment growth (Stewart, 1997). To explore more about knowledge workers and why they are needed most today, it would be appropriate to find out how the terms "knowledge workers," "knowledge industries," and "knowledge work" came about. Most of these words were coined around 1960. The name "knowledge work and knowledge workers" was coined by Peter Drucker in 1960 and the term "knowledge industries," by Prof. Fritz Machlup in the same year. These terms were coined to show how the emerging knowledge economy of society had radically different requirements as it pertains to the work force or to the type of industries, which were different from those of the 20th century.

The knowledge based economy needs knowledge workers because they are the key resource to fuel these economies. The nature of work needed to fuel the knowledge-based economies are specialised and thus require a specialised workforce. These specialised workforce or knowledge workers come together to direct their special skills towards the production of knowledge products. Hence they could be regarded as a resource in the production process (Fitz-enz, 2000). As a resource they are therefore scarce that is why the remuneration for knowledge workers are high in comparison to non-knowledge workers.

Recruiting, Managing and Retaining Knowledge Workers

Because knowledge workers are scarce in relation to their demand for work in knowledge industries, recruiting, managing and retaining them have become a very important issue for companies in developed and developing countries alike. Another reason why recruiting, managing and retaining knowledge workers are important is that characteristically, they are a highly mobile people. They like to move between jobs, and from country to country in jobs of their specialisation. According to Peter Drucker, "they keep their resumes in their bottom drawer" (Drucker, 1999). Thus, recruiting, managing and retaining them for a job in order for them to contribute to the growth and development of the organisation require a new approach. Companies like McKinsey have built a unique relationship with top universities in the world and tend to recruit top talent from these universities when the students graduate. Others recruit knowledge workers by either luring them away from their competitors with generous employment packages and perks. Others might offer equity in the company to lure knowledge workers away from competing companies. Whatever the strategy may be, it is clear that recruiting knowledge workers is a competitive affair because in the k-economy, they are the lifelines of the organisation.

Recruiting knowledge workers is just the first challenge. The next challenge is managing them. This is because knowledge work as we have mentioned is different from traditional work. In knowledge work, the knowledge worker owns the means of production not the employer. Consequently, they must be managed as volunteers not employees. Peter Drucker (1999) has listed a number of ways to do that. They include:

- make demands on knowledge workers and hold them accountable;

- give them responsibility;
- put in stretch goals they can be proud of achieving;
- make sure they have training and education;
- place people so that they are productive;
- give them freedom so that they develop their own standards;
- ensure that they have rewards and recognition.

In addition, once these knowledge workers are hired, another important feature is the ability to keep them, to make sure that they do not move to another competitor. Even though money is not so important to knowledge workers, there is the need to keep them satisfied with their remuneration and work conditions. If they are dissatisfied with their remuneration and work conditions, it could serve as a disincentive to make them leave. Peter Drucker advises that to manage knowledge workers, an assumption should be made that the corporation needs them, not the other way around. Thus, "they have to be treated and managed as volunteers, in the same way as volunteers who work for non-profit organisations" (*Economist*, 2001, p.16).

A second most important factor that contributes to the retention of knowledge workers is the environment. Organisations must develop a nurturing environment that would help knowledge workers continue to grow and to realise their personal achievements. Any organisation that wants to survive and prosper in this knowledge-based era must realise that they cannot treat their knowledge workers as traditional workers and have them stick around. Any organisation that witnesses a substantial amount of its knowledge workers leave the company or organisation is the hand writing on the wall and indeed an urgent call to reform or it could result in its collapse. Furthermore, to retain knowledge workers, managers of organisations must build trust between them and their knowledge workers. The management must trust these knowledge workers

enough to allow them to make decisions in their areas of expertise and they should be respected for it. Indeed, if there is one thing that gets under the skin of knowledge workers, it is to have their intelligence abused, their work discredited and the accolades that is due them appropriated with impunity by those who never spent a day on the project. In most developing countries and to some extent in developed countries, cases where bosses have hijacked work of their subordinates as their own, or cases where lecturers in higher institutions of learning simply append their names to works by their subordinates or students can have a severe impact on the creation, recruiting and retention of knowledge workers in organisations where such unethical practices are common.

In addition, they must also be motivated and encourage into undertaking lifelong learning to enhance their knowledge and to contribute such knowledge to the growth and development of the organisation. For example, an automobile engineer who left school in the 1960s without continuous learning and training cannot work on cars of the year 2000 and beyond. This is because most of the cars today have electronic parts. Chapter ten of this book would deal extensively with the issue of lifelong learning.

Finally, to retain knowledge workers, they must be given "meaning" — a feeling that they belong to something, that their efforts and talents are appreciated. Most managers of knowledge workers understand all too well that it is all about sense not scent (Edvinsson, 2002). Managing and retaining knowledge workers in the final analysis include the setting-up of "stretched goals;" i.e. providing incentives; cultivating a sense of empowerment; allowing every unit to experiment in a "sandbox;" so to speak and developing an internal market for the exchange of ideas (Gupta and Govindarajan, 2000). An example of a company that has followed these methods and benefited is Nucor Steel. Nucor used financial inventiveness to boost employee expertise and also

"share the pain" programmes to share work loss equally in recession, thus stimulating loyalty. It has also associate task with sharing and mobilising knowledge ... sharing best practices through routine measurement and distribution of performance data; paying incentives to work groups rather than individuals; reward sharing; keeping individual plants small to encourage face-to-face transfer of unstructured knowledge; and transferring people between different plants (Edvinsson, 2002).

7.8 The Tug of War for Knowledge Workers in Asia

Over thirty years ago, Asia and indeed South East Asia was a no place. It was underdeveloped, unstable and was marked as "incapable of development." At that time, it was no secret that much of the world's misery was in Asia. If one can take trip back history of the region, one will find out that, India and Pakistan fought three wars at that time, and the two nations still have nuclear weapons pointed at each other and still squabbling. Also that time, the Korean War of 1950 was on, so were many wars in Indochina. During this same historical era in the region, Vietnam and Indonesia saw violent upheavals and internal instability. Thailand, Malaysia, Burma (Myanmar) and the Philippines saw lot of guerrilla insurrections. China which is today touted as the emerging dragon in the region, under the leadership of Chairman Mao Zedong witnessed the brutality of its Red Guards in the 1960s, and in Cambodia, the Khmer Rouge of which the name "Killing Fields" is synonymous wiped out over 20 percent of the population of the country (*Economist*, 1993, p.6).

Economically, in the 1950s and 1960s Asia, there was nothing compelling about the economies in this region to talk about. In fact Asian economies looked rather bleak and were generally regarded as having no promise. Interestingly, the economies in the region were written-off as incapable of development. For example, a Swedish author, Haken Hedberg, writing about Korea

and its prospects for development at that time said it has "no future, fullstop" (Woronoff, 1983). Hedberg's observation was circumscribed by his view of the economy of Korea and others in the region at that time. Around 1969, Japan had a GDP per head of \$110, South Korea in 1962 had a GDP per head of \$110, Taiwan had a GDP per head of \$160 and China in 1962 had a GDP per head of \$60 (*Economist*, 1993, p.6). South East Asian countries and indeed most of the Asian countries confounded the nay Sayers and grew their economies through the export of electronics and manufactured products. In the process, many of the countries in the region were referred to as "Tigers." One of the important contributions to such a phenomenal growth was the region's cheap but fairly educated labour that could undertake the assembly of these and other electronic products for exports. The Asian Financial Crisis of 1997-98 brought most of these economies to their knees. It started with the collapse of the Thai baht and the contagion spread throughout the region. Most countries like Thailand, Indonesia and Korea had to resort to the International Monetary Fund (IMF) to survive.

Today, most of the countries in the region are recovering from the Asian Financial Crisis and some are even witnessing a modicum of growth. But they are now faced with another challenge. With the emergence of the knowledge-based economy, where knowledge now has become the most important source for creating wealth and the knowledge workers now the important cogs to such a wheel, the demand for their skills have moved centre stage. Previously when we talked about the country's wealth, we talk about how much land, oil and other natural resources they own. Today, a company or a nation's wealth and their value are tied to the experience and knowledge of their workers or population. Because these knowledge workers are in high demand, developed and developing countries are all scrambling to attract them (*Financial*

Times, 2000, p.6). South East Asian countries are no exception to this. They are scrambling and competing with developed countries to attract these knowledge workers and at the same time between themselves to hold on to the few knowledge workers they have. Sometimes, to no avail (Tulcan, 2002).

To be able to attract these knowledge workers to their shores, developed countries like the United States, Germany and the United Kingdom have revamped their immigration policies locking out unskilled workers and welcoming skilled or knowledge workers. The United States increased its H1-B visas from 15,000 in 1990 to 200,000 in 2000. The United Kingdom has also eased its work permit rules to meet the shortages of skilled workers especially in information technology. Germany which has been restricting emigration, has now launched a new Green Card scheme to attract knowledge workers (*Time*, 2000). According to the German Federation of Industry, the country would need close to 1.5 million IT workers and foreign knowledge workers in other sections of their industries (Ait-Abdelmalek, 2001). In passing, an observation can be made that the September 11th Twin-Towers bombing by terrorist in New York, the recent Dotcom bust and the subsequent downturn in the global economy could have affected the increase in the number of knowledge workers the West was going to absorb. Albeit, once things pick-up again, they would be aggressively scouting for knowledge workers. In the competition to attract knowledge workers, if Asia's governments are to stand a fighting chance in growing their economies in this knowledge based era they need to take radical steps to recruit as well as retain knowledge workers to fuel their economies. An example that would be used in the rest of this section is IT professionals.

The projected demand for IT professionals in Asia is going to exceed 2.2 million by 2008. It is projected that Malaysia needs over 15,000 IT workers alone in 2001 and this number is

projected to grow in the coming years. Korea's need for IT workers is put at over 50,000 in 2002, Hong Kong would need over 17,000 by 2005 and Thailand would need over 800,000 in the next 15 years (*Far Eastern Economic Review*, 2000). This projection essentially captures the crux of the matter. In fact the shortage of skills is now being felt across the region, despite the dotcom bust in the U.S. Governments in the region cannot be complacent about this threat. They must find workable solutions to this issue. Granted that it is a region that retains deep-seated notions about their different cultures, identities and religions, adding the issue of immigration to this mix can be tricky but a necessary evil in this knowledge-based era. It would be naïve to say that it does not carry some socio-political and economic costs but the alternative to strike some kind of a balance is to do nothing, which would end up in having the economies in the region stagnate.

Furthermore, the tug of war for knowledge workers in Asia goes beyond liberal emigration policies. One area to look at is the ability to go beyond the important emphasis of the culture on hierarchy and conformity in the region. Divergence views on specific issues, which do not conform, with that of the hierarchical structure's view can be detrimental for underlings. Hence decisions are made by a small group of leaders and pressure is mounted on the underlings to conform. This definitely would stifle the development and growth of knowledge workers (Koh, 2000). This also would stifle individual initiative as seen in the West because in most of Asia, the hierarchy has to decide on what should be done next. Underlings or subordinates accept such decisions or directions without questioning. The sage would question whether today's battles require the use of yesterday's weapons? Thus, if subordinates are not afraid to question some of the decisions or instructions of their superiors, offering alternative views, one can then argue that the socio-cultural and

political milieu in the region suppress rather than foster creativity and innovative thinking, a substance for which knowledge workers are made off.

There are no quick fixes to this problem; just like in economics you cannot vary fix factors in the short-run. The answer is to bring in foreign talent or skilled labour in the short term. In some cases, they might be needed for a long-term. As mentioned earlier, this might not go down well with most of the populations of the region. In Hong Kong for example, it would take about four months just to get a work visa. Singapore which is the only country in the region that is much more forthcoming in recruiting knowledge workers or talent from abroad, had to face the grumbling of its citizens who are complaining of the change of the racial balance in the country and what they call Singapore's "fallen talents". Singapore's Senior Minister, Lee Kuan Yew had to step in and told his fellow Singaporeans that, "unless we change our mindsets, we will be out of this race." He was referring to the ability of the City-State to compete in the knowledge era. As the cries get louder with the economy in a slump, Lee waged in again, "the policy cannot change. If we change the policy, we undercut our capability to grow and expand". Using the declining birth rates of the country as an example, he added, "Without immigration, we'll be in very serious trouble. If we depend on only Singapore talent, I'd say today's Singapore cannot be sustained. It's simple as that" (*New Straits Times*, 2003). The country had set-up the Infocomm Development Authority (IDA) to work with the Manpower Ministry to address the shortage of tech-skill workers in Singapore by enabling knowledge workers migrate to the nation-state from abroad (*Eastern Economic Review*, 2000).

The tug of war would continue for Asia's knowledge workers until the region finds lasting solutions to this issue. In this New Economy, any country that wants to be in the money must be

know. According to Goh Chok Tong, Singapore's Prime Minister, "if we sit back and do nothing, the West will forge ahead in the Internet economy." He adds, "We have to make Asia attractive to talents as the U.S. is. We have to create a Silicon Valley of the Mind ..." (*Asiaweek* 2000, p.18). Perhaps, the best place to start is for the region to begin to take steps to create the 21st century workforce and also to engineer a reverse migration of Asian talent from abroad. As it pertains to creating a 21st century workforce, serious attention should be paid to the adequacy of most of the institutions of higher learning in the region as it pertains to producing "thinkers" rather than "rote learners." These "rote learners" are more interested in passing examinations and getting certificates than becoming "thinkers." The new knowledge worker in Asia must be a person that would acquire broad general knowledge, which in no way diminishes his or her specialisation or expertise. For example, if a person is a software engineer, they must have broad knowledge of finance, marketing and even design and packaging. This is important because they can make the best software but if they are unable to market it, no one will buy it. One renowned example to state here is the fate that befell the Betamax video format. It was recognised to be the best format than its competitor VHS. But VHS format was better marketed than Betamax, it thus became the global accepted format and caused the slow death of Betamax. Incidentally, the Betamax was an Asian format (Japanese).

Malaysia and the Need for Knowledge Workers

Malaysia's efforts to move to a knowledge-based economy would not be possible without the requisite knowledge workers. In an increasingly competitive global environment, Malaysia's competitive advantage would not lie in its ownership of natural resources. Its competitive advantage would lie in whether it can

generate and apply knowledge to produce innovative and cutting-edge products for the global market place. Knowledge workers are an indispensable feature in this equation. Malaysia cannot therefore afford to be complacent in this effort, for, developed countries that are even more advanced are not resting on their laurels in their quest for knowledge workers (*Time*, 2000, p.22). More importantly, dynamic developing countries in the same league as Malaysia are competing to move up the value chain. For example, China has launched an ambitious project aimed at establishing 100 universities, selected for their expertise in key areas. This project is called Project 21 and its aim is to develop its universities into world-class institutions and to train the requisite knowledge workers that China needs for its increased growth (*Far Eastern Economic Review*, 2000). If Malaysia is to attain its goal of becoming a developed nation by the year 2020 and if it is to be able to withstand global competition, it needs knowledge workers. The role of knowledge workers in Malaysia's long-term growth strategy and the effort to achieve Vision 2020 is inextricably linked to the ability of the country to draw, develop, manage and maintain knowledge workers.

Compared to other developing countries, Malaysia has done quite well in the development of its local knowledge workers and opening its doors to knowledge workers from abroad. Such efforts although commendable, are not enough to enable the country attain its Vision 2020 goal. But it is not an easy task. As elaborated in the section on the "Tug of War for Asian Knowledge workers," many countries of both developed and developing are competing with Malaysia for knowledge workers. In most of the developed countries, salaries offered are higher than those offered in Malaysia for the same job specifications. This therefore serves as a pull for knowledge workers from developed countries including Malaysia to those countries. Because Malaysia cannot match such salaries, it puts it at a disadvantage. Even

Countries in the South East Asian region are also competing with each other for the same pool of knowledge workers. Those countries with deep pockets are able to attract knowledge workers from others in the region. For example, it is reported that about 51 percent of foreign IT workers in Singapore, Malaysia's next door neighbour, are from Malaysia (*Far Eastern Economic Review*, 2000). One would contend that the pull factor for these Malaysian workers going to Singapore is higher wages and of course the strong value of the Singaporean dollar to the Malaysian ringgit. Comparatively, the pull factor is higher income they gain in the former. But the often-neglected reason could be that the Malaysian talents are not nurtured or less effort made to cultivate and groom them to attain star status (Koh & Amodaran, 2002, p.14).

Another important issue is the socio-political and economic costs that liberal immigration policies put in place to attract more knowledge workers could bring. First, to get and attain such top talent from abroad, Malaysian companies would have to pay wages closer to similar levels in the global market place. This might not go down well with some of the locals but if the country does not solve its shortage of knowledge workers, it could be left behind. Since Malaysia needs knowledge workers, an observation made by Robert Bishop a member of the International Advisory Panel of the MSC points to this fact. According to Bishop, "Malaysia does not yet have enough knowledge workers but it has good training programmes," and that the country must stay in the lead in the provision of cutting-edge technology to attract knowledge workers to Malaysia as they were attracted to working with cutting-edge technologies (Long & Hor, 2000).

The second issue is fear in all of Asia including Malaysia in the change in the racial balance of the various countries. An example can be drawn from the displeasure of Singaporeans with

their government's policy of aggressively attracting knowledge workers from around the world. Many in the City-State are grumbling about Singapore's own "fallen talents" and the possible change in the country's racial make-up (*Far Eastern Economic Review* 2000). Such sentiments and concerns are not only limited to South East Asia. Indeed, around the world, those locals in the country that would lose out due to change are usually vociferous. Hence, the policy makers in Malaysia would have to strike a fair balance, indeed a delicate dance between the need for knowledge workers and the addressing of the concerns of its citizenry and the maintenance of national security.

Despite such concerns, the lack of sufficient knowledge workers in the system would have adverse effects on the country's economy and its efforts to move to a k-economy. One of the obvious impacts could be the relocation or the decision not to locate specific industries in Malaysia due to the shortage of knowledge workers. It has been reported by the Human Resources Ministry, that since the beginning of 2002 to this time of writing, 14 companies have relocated to other countries resulting in the loss of 506 jobs, and the year also saw the closure of 113 companies, and a sale of 41 resulting in the loss of 7,072 jobs (*New Straits Times*, 2003, p.7)¹. Steps must be taken to make sure that more industries do not relocate because of the lack of specific knowledge workers and the requisite efforts must be marshalled to address Malaysia's need for knowledge workers. It is in this view that events like the March 9, 2003 police operation against IT professionals from India at the Palm Court apartment in Brickfields in Kuala Lumpur should not happen again. Some over zealous police officers who took the law into their own hands and violated police procedures could have damaged the

Not all these relocations or closures are due to lack of knowledge workers.

government's efforts to recruit foreign talent. (*New Straits Times*, 2003, p.12). The government acted swiftly to punish the officers involved and to solve the situation. Such efforts came too late for some of the IT professionals, who left for home (*New Straits Times*, 2003, p.13).

The effort to meet Malaysia's need for knowledge workers should entail a multiple prong approach. Recruitment of knowledge workers is one aspect, encouraging Malaysian knowledge workers to return home is another. However, the most important effort should be the focus on developing Malaysia's own knowledge workers. This can be done through a focused strategy on the educating and training of Malaysians (Rahman, 2000). But if Malaysia stands any chance of enlarging the pool of its knowledge workers, the Malaysian education system needs to be revamped and restructured. Existing curriculum must be made more innovative to imbue in young Malaysians the aptitude for critical, analytical and creative thinking. It is from this base that highly skilled and competent but motivated knowledge workforce would evolve (Johan, 2001, p.11). What is of most importance in the latter approach is that the academic content to train these knowledge workers must be rigorous, stressing on the maintenance of standards to meet the demanding needs of the knowledge economy. Some of the private schools in the country have given education in the country a black-eye and the Ministry of Education of Malaysia have started cracking down on such schools and some of them are being closed down. Others have their accreditation withdrawn until certain quality issues and standards are addressed. All these are steps in the right direction in the effort to produce the requisite knowledge workers for the country. The government of Malaysia is also moving on with plans in the setting-up of 18 more industrial training institutes (ITIs) under the Eighth Malaysian Plan to meet the rising demand in

knowledge workers. The country already has 10 of these ITIs in existence, with an enrolment of about 7,000. The new 18 ITIs scheduled to be ready by the year 2005 and emphasis in these would be to train Malaysians in the field of IT. It is estimated that these new ITIs would enrol about 35,000 to 45,000 more students (De Silva, 2000).

Finally, the efforts by the Malaysian government requesting highly skilled and qualified Malaysians to return home under a "knowledge gain" programme needs to move beyond slogans and an attitude of "we are waiting for them to come" to a more vigorous and proactive move to recruit and entice them to come home. Because of the lack of a proactive element of this strategy, the response so far has been lukewarm. It is estimated that there are about 250,000 skilled Malaysians working abroad. Since January 2001, only 104 highly skilled Malaysians have returned home (*New Straits Times*, 2003, p.7). The known reasons given for such a lukewarm response is the unattractive salaries and perks offered to them in Malaysia; others include lack of suitable positions in the public and private sectors. But what are the other reasons beyond salaries, perks and lack of suitable positions that are hindering their return? Only a proactive approach would uncover that and all efforts must be made to remove those obstacles to facilitate their return. In this exercise of encouraging highly skilled Malaysians to return home, perhaps Malaysia can learn from the examples of South Korea and China who have been able to successfully encourage the return of large amounts of their highly skilled nationals, which have contributed, immensely, to their growth and development success.

7.10 From Knowledge Workers to "Knowledgepreneurs"

It is a truism that knowledge workers are the cogs behind the wheels of knowledge-based economies. Knowledge workers would determine the competitiveness of economies around the

world in this globalisation era. The successful development of Malaysia's k-economy would largely depend on its ability to educate, train and produce knowledge workers. The need for knowledge workers to drive Malaysia's move to the k-economy cannot therefore be emphasised enough. Luckily, the government is doing something about it. Apart from increasing the number of higher educational institutions in the country, efforts are being made to ensure that the education these institutions offer the future knowledge workers of the country is of high quality. Some of these efforts include the reviving of the education system of the country from pre-school to tertiary level and beyond should be reviewed periodically to prepare students to meet the skills required for the k-economy. The curricula should also be revised to be likewise and the methods of pedagogy should be enhanced to impart the necessary skills needed to spark creativity and innovation in the knowledge workers. This effort of the government is bearing fruit and in not too distant a future, Malaysia would produce the requisite knowledge workers it needs for its move to the k-economy.

But what the government should understand is that knowledge workers would like to work with advance technology and machinery, hence as Malaysia moves to the k-economy, more capital investment would be needed to increase the productivity of its knowledge workers and this capital investment would increasingly fuel the need for more knowledge work (Drucker, 1980). This latter point has both costs and benefits. On the one hand, it would require increase government expenditure not only on capital machinery and technology, but also in training and the continuous learning of the knowledge workers. If such investment leads to an increase in the productivity and knowledge of the knowledge workers, then the investment is worth it. The benefits would not only be realised in the increase in productivity, a heightened knowledge of the workers, but it could also lead to an

enhanced innovative capabilities of the knowledge workers, the point where some of these workers can develop their own processes or technologies to further increase productivity or products of such innovation can be sold to other countries.

When Malaysian knowledge workers become highly knowledgeable and have the ability to develop innovative processes and technologies, they have reached the stage of becoming what I call "knowledgepreneurs." "Knowledgepreneurs" are knowledge workers who are in the business of the exchange of their knowledge, an intangible product or the processes or products of their knowledge for cash or kind. This

"knowledgepreneurs" would have to decide the quantity, time and conditions under which such knowledge would be exchanged. When Malaysian knowledge workers reach a high advance stage of the development of world-class knowledge products and processes, this knowledge and processes or technologies can be exported to other developing countries or to some developed countries to earn more income for the country. A new industry would therefore evolve where the commodity now sold or exported would be the skills or knowledge of the knowledge workers or the processes and technologies that have been developed by these knowledge workers. A case in point is the Indian IT market. Today, India exports, its IT workers and products to developed and developing countries as well. It is reported that revenues from this sector bring in over US\$40 billion annually for India.

"Knowledgepreneurs" are going to be the next category of knowledge workers in demand. These are not just ordinary knowledge workers, but those with leadership and entrepreneurial skills to match. Some of the attributes of the "knowledgepreneurs" are, that they are risk takers, innovative, not fear to fail, can think on their feet and are team players.

view of this author that in the post k-economy era, "knowledgepreneurs" will lead the day.

Conclusion

Drucker (2002) writing in his book, *Managing in the Next Century*, said, "increasingly, the success, indeed the survival, of any business will depend on the performance of its knowledge force ... It would be difficult to overstate the importance of relying on knowledge workers' productivity. For the critical feature of a knowledge workforce is that knowledge workers are not labour; they are capital." If knowledge workers can be regarded as capital, their contribution to wealth creation in an organisation or country is of extreme importance. Malaysia should do well to heed to such advice vis-à-vis its knowledge workers as it moves to the k-economy.

8. THE NEXT PHASE

Introduction

Emerson, once said that, "all successful men have agreed in being causationist, they believe that things were not by luck, but law — that there was not a weak or cracked link in the chain that joins the first and the last of things — the cause and effect." These observations by Emerson are equally true for individuals as it is for a nation states. Dr. Noordin Sopiee, the Chairman and CEO of the Institute of International Studies (ISIS), Malaysia, compliment this observation, but his take pertains to Malaysia. According to Sopiee, "the fundamental fact is that today's performance is always the result of the right things we did in the past, not the right things we are doing today. If we do not lay the foundations for the next quantum leap to becoming the economically advanced country of the future, we will hit a brick wall. We will be like the many who did extremely well for a time but who could not get on to the next plane of development. We have no choice but to change, to now lay the foundation for the next leap forward. If we fail to do so, we will have to say goodbye to Vision 2020. Our dreams of becoming an advanced country

would have to be consigned to the dustbin of history" (Sopie 2002). In this era of rapid technological advances and the need for lifelong education, the competitive advantage that a country's business of individual has would determine whether they survive and prosper in this new knowledge era. As Malaysia transits to the next phase of its efforts to move to a k-economy and to attain a developed nation status, the foregoing observations should be watchwords.

Furthermore, if history were anything to go by, then the demise of Smith Corona, the typewriter company of the same name would be instructive. Smith Corona was a famous brand known for making typewriters. The company started its operation in 1886, introducing the first typewriter that could print both upper and lower-case letters. In 1906, it introduced the first portable typewriter and later the first electric powered typewriter that had a carriage-return feature. Smith Corona disregarded the warning to innovate. With the proliferation of computers and the subsequent reduction of their cost, it sounded the death knell for Smith Corona. The lessons that can be gleaned from the demise of Smith Corona for all developing countries including Malaysia that wants to develop in this era of neck breaking change, where no condition is permanent is to invent the future or be passed over by it.

Malaysia is one of the most fortunate developing countries as being blessed with visionary leaders from Tunku Abdul Rahman to Dr. Mahathir Mohamad (the baton is about to be passed to the next generation of leaders at this writing). This leadership had a vision and invested in Malaysia's future, the results of which Malaysians are seeing today. Mahathir's vision of moving Malaysia to the knowledge-based economy and the

¹ These observations were made when Malaysia was about to launch its K-economy Masterplan in 2003.

efforts for it to attain a developed nation status by the year 2020 is laudable. Numerous investments have been made to secure Malaysia's future in an increasingly competitive and dynamic world. The government has invested heavily in education, the Multimedia Super Corridor, in the country's infrastructure and infrastructure and in many other areas to secure Malaysia's future. But all these investments would amount to little, if Malaysians do not cease the day (*Carpe Diem*), so to speak and move the country to higher heights, building on the current developments and gains of the country. Malaysians cannot afford to be complacent, for if they do, they would have no one else to blame but themselves. Al Neuhart, former CEO of USA Today and his observation about complacency is worth quoting here. According to Al Neuhart, "one of the ruthless realities of life is that nobody gets to the top by standing quietly or patiently in line, unless you were born there." Similarly, Malaysia and Malaysians cannot get to the top by standing quietly or patiently in line. This chapter is about the intangible and dynamic challenges that Malaysia would have to confront in the next phase of its developmental trajectory as it aims to become a k-economy and a developed nation by the year 2020. The chapter will focus more on the internal and external intangible challenges and suggestion on how the country can overcome them.

A New Day

Malaysia has come a long way. It has moved from a tin, rubber and palm oil exporter at the time of its independence to the exporter of electronics and industrial goods and services. Today is a new day, a day where a nation's wealth is no longer determined by their natural resources or what economists call comparative advantage. Today, the sustainable growth and development of a nation hinges on its ability to generate and apply knowledge. The same applies to humans. In today's

knowledge era, it can confidently be said that what a human being has does not determine how wealthy he is, but rather what he knows. Why such an assertion? The answer is no far-fetched. Whatever tangible properties one has can be lost in a disaster, through obsolescence, government decree, acts of war or theft, but what he or she knows, they can never lose unless in death. Physical assets therefore do not determine how wealthy a person is (even though the general consensus thinks so), in this new day knowledge is wealth (Kimbrow, 1997). In this new day, that which would determine whether Malaysia could continue to grow and be prosperous would be its ability to move to the knowledge universe, be able to develop knowledge products and services in the knowledge-based economy. It must continue to advance in this new day if it refuses to advance it will fall behind other countries. Henri Amiel, the late Swiss philosopher's observation would help to drive this point home. According to Amiel, "he who does not advance falls back. He who stops is overwhelmed, outdistanced, and crushed. He who ceases to grow becomes smaller. He, who leaves off, gives up. The condition of standing still is the beginning of the end" (Kimbrow, 1997).

Each new day arrives with its challenges and nuances. This new day Malaysia is facing is no different. It would present its obstacles and Malaysia would have no choice but to surmount them if it has to climb the top. But Malaysia must also be cognisant of the cost of its dreams and be willing to pay the price to attain those dreams. A good example to draw on was Malaysia's decision to go it alone during the Asian Financial Crisis to impose selective capital controls when its currency was under attack (Mahathir, 2000a). At that time, global common consensus was that the country would fail in this effort. In fact, it was echoed in the hallowed halls of Europe, the Americas and by the Washington Consensus that Malaysia was delinking itself from the global capitalist system (*Asiaweek*, 1998). Malaysia

accepted the price it was going to pay for such a decision in order to save its people from peonage. Today, Malaysia's decision has been regarded globally, albeit grudgingly as right. Today, one of the solutions accepted by the international community as part of the efforts to reform the international financial system, particularly curbing the destructive effects of hedge funds, is the use of "temporary" capital controls. In this new day of the knowledge-based economy, Malaysia needs to trust its guts and forge ahead with its plans to move the country to a knowledge-based economy. The strategies put in place by the government and the building of the requisite infrastructure and infostructure are laudable. Now it must move to the next phase to make such a goal attainable. The next phase, which is the tough part, has to do with the changing of attitudes, mindsets, old ways of doing things, and the development of an innovative culture to mention just a few.

The Need for "New Thinking", "Change of Mindset" and "Attitudes"

It has already been made clear in this chapter that Malaysia has put in place the necessary infrastructure and infostructure to enable it move to the knowledge-based economy. The Eighth Malaysian Plan and the country's OPP3 have made clear the government's intentions and will to move the country to the knowledge-based economy. Now comes the hard part. In the next phase of Malaysia's move to the knowledge-based economy, the populace must truly understand what the knowledge-based economy is all about. They must understand that the country is now about to move to an economy where "brain power" would supersede "brawn power." Not only should this distinction be made crystal clear but also the attendant demands that come with acquiring "brain power" should be spelt out and the means of

acquiring and utilising knowledge to help Malaysia move to the knowledge-based economy should be driven home.

It should be made clear to all Malaysians in no uncertain terms, that the need for such effort go even beyond the attainment of a developed nation status but that the future and survival of the nation depends on it. As Malaysia's economy matures and is faced with the challenges of globalisation, competition from China and other developing countries, a comparative decrease in foreign direct investment as well as a comparative high cost of labour vis-à-vis Indonesia, Thailand, Philippines, Cambodia, Laos, Vietnam (CLV) and China to mention a few, steps such as moving to a knowledge-based economy are a must or Malaysia would lose out (Jasin, 2002). Malaysians should also be made to understand that the knowledge-based economy is for them and is for their welfare and survival as a nation. A concerted effort must be made by those in policy to develop a method where the populace should participate in the building of Malaysia's k-economy. Popular participation would serve as the glue for the sustainability of Malaysia's move to the k-economy. If the populace perceive the k-economy as "something coming from top," they may have a lackadaisical approach towards it and it might be difficult to attain the vision in the prescribed time.

One of the challenges of the next phase is making Malaysians develop a new thinking that the k-economy is for all and sundry, including the man on the street and that it does not belong to the domain of "geeks" and bureaucrats, indeed something beyond them and their grasp. This new thinking must go beyond popular participation in making the k-economy a reality; it should also entail changing of the mindset (see *New Straits Times*, 2003, p.2). It will be problematic for Malaysia to attain a developed nation status while the mindset and attitude of its populace is stuck in the Third World mode. Malaysia cannot move to a k-economy if the mindset and attitude of the

populace remain one of *tidak apa* (don't care). To continue to pretend that such an attitude does not exist would be akin to the proverbial Ostrich sticking its head in the sand and it will hurt the efforts to find solutions to it. A letter by a Malaysian to the opinion section of one of its dailies puts this concern best, "It benefits no one, not even our good leaders, if we continue to pretend that the attitudes and mindsets are okay when there are enough signs around to attest otherwise," (Lovrenciear, 2002). The Prime Minister of Malaysia says it best when he said, "it is only a matter of culture and mindset, we could be better if we embrace Research and Development as a culture and continuously find ways to improve" (Abdullah, 2002a).

The attitude to strive for quality requires a mindset that thinks about quality in whatever endeavour a person finds themselves. In the k-economy where economies are becoming borderless due to advances in ICT, Malaysians must develop a global mindset and outlook to be able to compete. The Yang DiPertuan Agong Tuanku Syed Sirajuddin Syed Putra Jamalullail (the current King of Malaysia) emphasised such a move and urged Malaysians to be prepared for the borderless world in his 59th birthday speech. He added, "without preparation, our country may find it difficult to face the borderless world, to tackle the digital divide in society and economic competitiveness based on information and knowledge" (Abdullah, 2002b). Dr. Mahathir has also urged Malaysians to change their value systems, one of being laid-back and prone to taking the easy way out to one of a "can-do" and willing to seek knowledge and take risk to be able to survive and prosper in this knowledge-era. According to Dr. Mahathir, progress is not the monopoly of a race or ethnic group, neither has it anything to do with a persons domicile (*New Straits Times*, 2002b). He adds, "this has nothing to do with creed or colour, it is just the culture and mindset" (Abdullah, 2002a). Thus Malaysians of all races can help

Malaysia move to the k-economy and attain its vision of a developed nation status if they develop a positive mindset, an excellent attitude that allows them to be receptive to new and innovative ideas and thinking. Similarly, the Deputy Prime Minister, Abdullah Ahmad Badawi echoed the same sentiment in his speech before the Oxford and Cambridge Society of Malaysia². In his speech he said, "If we are going to realise Vision 2020, we must compete for it and work hard to achieve it. It will require changes in the way we manage our country." He added, "the way I see it, the malaise affecting Malaysia that may well jeopardise our way forward is a case of having First-World infrastructure and Third-World mentality. From poor execution and inept management to shoddy maintenance and appalling customer service, Malaysia is in a danger of possessing the "hardware", but little software" (*New Strait Times*, 2003, pp.10-12). Malaysia's best opportunity for its success in moving to the k-economy would always lie within Malaysia and Malaysians, because no body likes Malaysians more than they like themselves. The closing chapter of the Deputy Prime Minister's speech at the Oxford and Cambridge Society of Malaysia sums up best, "without changing our mindset, attitude and mentality, we will not usher in the future that we envision. Building a better Malaysia means being better Malaysians. If we cannot step up to this challenge, we will almost certainly be poor Malaysians — left behind" (*New Strait Times*, 2003, pp.12).

Finally, Malaysian schools, educational institutions, teachers and lecturers must also change their mindset and develop new thinking. Teachers and lecturers who teach the next generation of Malaysians must develop a mindset receptive to changes and realigning their attitudes to help the country attain its national

² See appendix for the whole of the Abdullah's speech before the Oxford and Cambridge Society of Malaysia.

goals of becoming a develop nation by the year 2020 (*New Strait Times*, 2002). Furthermore, the students must be made to understand that, the ability to think comes from asking the right questions and evaluating outcomes. The observation by the Royal Professor Ungku Aziz puts it best, "the system doesn't encourage students to ask questions and maintains that teachers know best, or somebody knows best" (*New Straits Times*, 2002, p.4). Such a mindset must be a thing of the past as Malaysia moves to the next phase of the k-economy. In the next phase of Malaysia's efforts to move to the k-economy, educational institutions in the country should improve standards and benchmark themselves amongst the best in the world. This is the only way they can produce world class graduates with the ability to think for themselves, to innovate and to push the frontiers of R&D (Ong, 2003).

Lecturers in Malaysian universities are also challenged to move away from a quest for titles, the trappings that come with such titles and concentrate their efforts on research and teaching the future leaders of the country. Malaysian universities must move away from becoming bureaucratic machines that impede the progress of learning and become centres of knowledge (Khattab, 2001). As Malaysia moves to the k-economy, nothing can stand in its way. The only thing that can stand in Malaysia's way of its movement to a k-economy and attaining a developed nation status by the year 2020 is Malaysians. Henry David Thoreau, the English philosopher once said that, "as long as a man stands in his own way, everything seems to be in his way," in similar vein, Ralph Waldo Emerson, the American essayist and poet also said that, "most of the shadows of this life are caused by standing in our own sunshine." Thus if Malaysians do not want to stand in their own way or in their own sunshine, then they must

seriously change their mindset and develop new thinking, different from that of a Third World to that of a developed nation as they move towards attaining a developed nation status. This change of mindset and new thinking would help Malaysia attain its vision and when it does, the people would fit with the environment and values that are part of a developed nation as a hand to a glove. That day a true *Bangsa* Malaysia, one that is confident, innovative, productive and efficient will emerge.

8.4 A Paradigm Shift and a New Value System

The late Winston Churchill, British Prime Minister (1940-45, 1951-55) once said that, "all the great empires of the future will be the empires of the mind." Churchill's observation is right, because whatever we can conceive with our minds we can achieve it if we really want it. Malaysia has as its goal to become a developed nation by the year 2020. Plans are in place for the country to move to a knowledge-based economy. The shift of the country from a production economy to a knowledge-based one would not be possible unless Malaysians of all persuasions want to and work together to make it be. There is therefore a need for a paradigm shift, a shift from the mindset of a production economy to a knowledge-based one. This would need the development of a new value system, one that moves away from the *tidak apa* (never mind) mentality to a proactive one. The new knowledge-based economy would not wait for anyone to take their "jolly" time to get there on their own leisure and pace. Malaysia's competitors are using ICT as an enabler to work faster and smarter 24/7/52/365 to gain the competitive edge. Furthermore, Malaysian's should also realise that other developing countries are busy trying to catch-up to the

⁶ CNBC Asia, "Legacy and Succession," Television interviews and presentations of Dr. Mahathir et al by Teymour Nabili, February 8, 2003

current development level of Malaysia and if the people become complacent, they could easily be surpassed in this era of galloping globalisation (Abraham, 2000). As the world becomes increasingly globalised, Malaysians would have no choice but to compete, even for those who do not want to. Fact, the country will have to compete for markets and investments as it is manifested by the significant draw by China of FDI from the region.

The nagging complacency of postponing things that can be done today for tomorrow will put Malaysia at a disadvantage in this competitive era. The example of the incident of errant motorist who stood in long queues to pay their finds after the amnesty period expired would suffice here. When the Deputy Prime Minister and the Police announced a further extension of the deadline as a further reprieve, the queues suddenly disappeared with many of the errant motorist postponing the payment until the last minute. The frustrated Inspector-General of Police (IGP), Norian Mai, was at a loss for words at such behaviour since most of the motorist blamed the police payment counters for such long queues. The IGP later said, "to me, the problem is not the payment counters but the attitude of Malaysians who seems to prefer doing things at the very last minute. What we are seeing today is proof of this" (Razali, 2002).

The significance of such a story is to point to the fact that Malaysians cannot wait until the last minute to contribute their share to the country's move to a knowledge-based economy. There are many who could not be bothered about what the knowledge-based economy is all about and these are not just the ordinary men and women on the street, but those well meaning Malaysians who know better but refuse to do anything. To them, the words of Dr. Mahathir from his book, *The Challenge*, are worth mentioning here. At the end of the book, he looks at all the tribulations Malaysia has gone through and yet have stayed intact and prospered whiles other countries it started independence

with have fallen behind or broken up. He then asks, "will the realisation of all this cause Malaysians and their leaders to work side by side to preserve the integrity and sovereignty of Malaysia and the characteristics which have so far managed to make Malaysia a multiracial nation that is successful and progressive in the true sense. *Quo Vadis Malaysia?*" (Mahathir, 1997). The answer is not far-fetched. To continue in this trajectory, and to continue to benefit from its current developmental status, vis-à-vis other developing countries, a new value system must be developed in tandem with a paradigm shift to support the nation's effort to move to a k-economy and to help it attain a developed nation status by the year 2020.

There must also be a paradigm shift and the creation of a new value system as it pertains to "the culture of saving face" (Mian). In most of Asia including Malaysia, in order to "save face" and preserve harmony, Asian's may prefer not to question, reprimand or convey negative messages and feedback. The preference is to speak nicely to you in person, but behind you, the worst is said. Such an act is duplicitous and unfruitful since the timely change of sort is not achieved. Instead of stopping a blister before it becomes a sore, nothing is done for a long time. By the time something is done, the blister is almost a cancerous ulcer with worse consequences than if intervention had taken place when the ulcer was just a blister. This concept of saving face is a great idea and does have its plus points as well as minus ones. The idea here is not to abandon it totally, but some aspects of it must be enhanced or changed if Asian countries are to be able to face globalisation, the borderless, fast changing digital and knowledge economy. Malaysia is no exception as it moves to a k-economy. For example, if an employee is working on an expensive high-technology project and mistakes are made in the process, and in order to save face, the supervisor finds it difficult to tell the employee that they are making mistakes and show them how to

correct it, it would not only cost the company money to correct the problem later, but the credibility of the company and the country would be tarnished when the product is exported or delivered to the customer. If the customer is an international customer, and say the mistake causes them to lose money and the root of the problem is traced to the manufacturer, a legal case could be brought against the company and compensation and punitive damages sort. There are many examples of these types of cases in the West to mention here. What is been pointed out here is for the realisation to be there that such an issue could pose some challenges to Malaysia as it moves to the k-economy

Commitment and Effective Implementation of Plans

The impending globalisation with its devastating impacts and its imperfections for developing countries, the unpredictable global financial system, regional as well as global security concerns can all have an impact on the development plans and projects in the country. The next phase of Malaysia's effort to move to a knowledge-based economy could fall victim to such unpredictable external circumstances. The Asian Financial Crisis is a case in point. It affected Malaysia's economic growth, which fell from a high of seven percent at pre-crisis level to a negligible level during the crisis. The currency of the country was under attack and many businesses collapsed. Yet the government stuck with its commitment to continue with priority projects that would have a significant impact on the country's economy. The commitment was not only in monitoring spending prudently in a trying economic climate, it also took the form of overseeing the effective implementation of such plans and programmes. That such hard times can present themselves again cannot be ruled out. Hence, the current and future leadership of the country must maintain the commitment to moving the country to a

knowledge-based economy and to a developed nation status as it did during the era of the financial crisis.

Having the requisite commitment alone is not enough; plans must be effectively implemented. The next phase of Malaysia's move to the knowledge-based economy would require the effective implementation of all projects and programmes that would enhance and support the success of such an effort. Partially implemented programmes and partially completed projects, ensuring the whole project cycle is seen through, would hamper and impede the movement of the country to the k-economy in the next phase. Reports have it that Dr. Mahathir Mohamad, the father of a developed Malaysia, pays personal and subsequent visits to most of the important projects he has initiated to develop the country and its people. Most of the people who have worked on some of the projects he has visited report that he can be tough if schedules are not met and goods are not delivered. All such efforts are for the societal good. Malaysians of all persuasions and professions should borrow a leaf from Dr. Mahathir.

Effective implementation of programmes and projects would be one of the challenges that the country would be faced with in the next phase of the country's move to the k-economy. Effective implementation means that there is a thorough follow-through method in place, which should be flexible enough to address unforeseen problems and circumstances when they crop-up in the project circle. Furthermore, an uncompromising attitude, one that pertains to quality and the meeting of deadlines should be the watchword as the country moves to the next phase of the k-economy. Some may ask, what do you mean by an "uncompromising attitude to quality"?

A good or service of high quality is one with a long-shelf life, durable, and one that gives the customer the value for their money. It is more of making the "best mouse strap" so to speak, and in a competitive global market place, the customers would

beat the path to your door. Moving up the value chain in the k-economy would require of Malaysia to produce technologically sophisticated and superb quality goods and services to be competitive. The only way to be able to do this is never to compromise on quality. Finally, the quality of service, pre or after delivery by the public and private sectors in Malaysia to the domestic and international customers needs much to be desired. The experience of this author and many others interviewed on this issues point to a feeling on the part of most customers that the merchant or vendor thinks they are doing you a favour by selling to you their products or merchandise. There is also the feeling that some of the vendors or merchants are happy to receive your money but unwilling to follow through when the required product need service. In the short-run they can get away with this but with the full operation the Asean Free Trade Area (AFTA) increased globalisation and competition, these nonchalant vendors and merchants would soon find their customer base gone. They would be taken by the competition. In no time, just like the dinosaurs, they would become relics of history.

Creating Change to Manage Change

In this fast changing world enabled by ICT, everything is fluid. What is "in" today could be "out" tomorrow and what is "in" tomorrow could be "out" the next. In today's fast changing world, we are cautioned by an old adage, not to fight today's battles with yesterday's weapons and not to fight tomorrow's with yesterdays. What one can deduce from all the aforementioned aphorisms is that "no condition in life is permanent," stability, predictability and permanence are gone for good. The only thing that is permanent is change. But change is rather threatening to mankind. We are not comfortable with the unknown, things new or anything that is going to disturb our sense of permanence.

Yet it is true that tomorrows "victories will go to those who master instability by constantly working on responsiveness enhancing capabilities" (Peters, 1988). Shouldn't we then make change our friend by committing ourselves to change and in the process act as change agents? (Levy, 2000). One would think that in this era of globalisation with its iterant demands for continuous change, market shifts, the reshaping of cultures and business boundaries, change would be readily accepted (Kay 2000). Unfortunately, such is not the case. Change in any society, system or organisation or amongst people evokes an unsubstantiated fear and such fear causes people to build a wall of resistance. This observation is captured vividly by Alvin Toffler in his book, *The Third Wave*, in which he talks about how most people in our world today are terrified by change and are engaged in a desperate and futile flight into the past to try to restore a dying world that gave them birth (Toffler, 1980).

The next phase of Malaysia's effort to move to the k-economy would be a challenging one. It would need a change in the rhythm and tempo in the march. The drum majors and majores of the next phase of this effort must prepare for these new ever changing times by continuously asking the relevant questions, seeking the relevant answers. Armed with the correct answers, they must create change, a change that would bring about innovation. Creating change does not mean that one would be engaged in some kind of wheel spinning. Definitely change should not also be engaged in for change sake. It must be based on the analogy, which I would call "knowing where you are going and making the road that leads there." Creating real genuine change must first allow Malaysians to be able to control the change process, pace and direction. It would also afford the country the ability to develop innovative processes and products which are necessary to put the country in a competitive position in this competitive knowledge-era. Even fundamentals according

to Peter Drucker, after a long period of time do develop unexpected and hidden weak spots in areas most people would take for granted. Hence, new specific ways are needed to manage these conditions. But even those specifics do change (Drucker, 1980). For Malaysia to be able to create change, it must ask itself tough questions, such as, what is it that has already happened that will make the future? It should then look at what has happened and try to define potential opportunities within that which posse's potential opportunity for the country. Once it identifies such opportunities, it must define its "core competencies" and match such strengths to the changes that have already taken place and then produce a plan of action that would enable the country turn the unexpected into an advantage (Drucker, 1995). By being able to do that, change would no longer be a threat but an opportunity for Malaysia. The country must also see change as a process to engage when necessary. Today, everyone agrees that change is inevitable, and in a dynamic global economy, change is an absolute necessity to survive. Despite this, change evokes fear and fear, in turn builds resistance (Abisheganaden, 2002). But change also offers tremendous opportunities, even an opportunity to learn from mistakes.

Embracing and Managing Change

As already mentioned, change is a phenomenon that we as humans are not comfortable with. It disrupts our sense of permanence, our power domains, and what defines us. Hence, we usually do all in our power to fight change. But change also offers in what some futurologist refer to as "rhythms of tomorrow." It is through change that room for new ideas are created, that new industries arise out of the ashes of the old, a phoenix and thus teaches us the way of doing things differently. Indeed, change can be regarded as the "well of renewal." Hence, rather than fighting change, we should embrace it. Embracing

change will allow us to keep our eyes and focus on the sea of change around us to enable us navigate our boats to the shore. History has taught us that machines, living organisms, or nations who do not embrace change usually, become extinct. Empires like ancient Egypt, Rome, Greece, and most recently the British Empire and the Soviet Union are all history (Kennedy, 1987). These empires have been overtaken by the tides of change.

Malaysia can learn from the demise or the rise and fall of these nations, and embrace change to be able to manage it. In doing so, it will help Malaysia in its efforts to move to the knowledge-based economy and to attain a developed nation status by the year 2020. How would the country go about managing change when it is faced with it? The suggestions offered here are only some guidelines and not definitive. First, the social cultural environment and the necessary fundamentals must be undertaken, with the requisite risks involve clearly delineated and understood. A modicum of flexibility must be built into whatever plans are put in place to manage such change.

Second, there must be a clear mandate from the "top." This means that policy makers and the leadership of the country must give the mandate for any change management strategy to work. Most of the populace would not support any efforts to bring about change and indeed its management if they do not see the leadership support what is put into place. A third suggested way to manage change is to build a change team. Basically, all those who are going to be members of this change team must believe in change and its management. This team should comprise of members who are going to work as a support and guidance group and those who would actually do the work. The support group would serve more in an advisory role, hence they cannot make big decisions but they can help lobby for these decisions. Those who do the actual work should be people with some specific core competencies and skills germane to the process.

Above all, the team should be committed and it should be the overriding factor. Next, a governance structure should be set-up, this team should comprise of people interested in the successful outcome of the process, hence, their support should be unwavering and they should report to the executive committee. It should be made clear to them what kind of support is needed from them during the process. Finally, it is important to develop a project plan and sticking with it, all aspects of it must be spelled-out, with sequences and actions clearly outlined (Kay, 2000).

Building an Innovative Capacity

It was an eureka moment when Galileo, the Italian astronomer announced that "*Eppur Si Muove*" — the earth revolves around the sun. But Galileo's pronouncement was not based on a dream or a revelation received from a deity. It was based on tireless research and perseverance. Galileo's announcement of such an innovation is instructive to all who want to excel and that includes a developing country like Malaysia. In the case of Malaysia, the challenge surpasses the willingness to excel; if it is to survive and prosper in the competitive global knowledge-based economy it has no choice but to excel. Tom Peters in his book *The Circle of Innovation*, remarked that, "these are times of matchless peril for those who fail to grasp the nettle ... and times of matchless opportunity for those who do" (Peters, 1997). To excel require the ability to innovate, to lead in the creation of new competitive as well as unique products for the market place. One of the challenges that Malaysia will face as it moves to the next phase of its efforts to transit to the k-economy is to develop the innovative culture and produce innovative goods. This will require more than the building of facilities and sloganeering. It will require the requisite knowledge workers with dedication and perseverance to add.

Peter Drucker offers three conditions that need to be adhered to bring about innovation. The first condition is that, innovation is hard work. It requires knowledge and ingenuity and predisposition. Yet all innovators must be focused and the work they are undertaking must be purposeful, hence diligence, persistence and commitment are very important. According to Drucker, if these were lacking, no amount of talent, ingenuity or knowledge would avail. The second condition is that innovators must build on their strengths to succeed. Innovators usually look at the array of opportunities that have presented themselves and compares such opportunities to their capacities or areas they have shown a consistency of excellence and then focus their efforts on such. This is because innovation need persistence, hard work and dealing with frustrating times. The third condition is that innovation has to have an effect on the economy and society. Innovative products and processes usually affect the behaviour of the society or the process of how people work. It can thus be said to be market driven (Drucker, 1985).

As Malaysia moves to the next phase of its efforts to be a knowledge economy, it must take Drucker's observation into view and seek the requisite ways and means to build its innovative capacities and capabilities to be able to move the country to the knowledge economy. Dr. Mahathir echoed the same sentiment at the annual briefing of the Malaysian Industry Government Group for High Technology (MIGHT) at Seri Kembangan, Kuala Lumpur in December of 2002. According to Dr. Mahathir, "Malaysians must learn to become creative and innovative, and not be mere followers of new developments in the world today, especially in the field of Information Technology" (Abdullah, 2002a). Malaysia must build on its strengths and capacities, and develop the predisposition to use knowledge to innovate. To build this innovative capacity, all boils down to the development of knowledge workers as mentioned in the previous chapter. Craig Barrett, the CEO of

INTEL puts it best during his visit to Malaysia to celebrate INTELs 30 years of operation in the country, "a new breed of knowledge workers will be needed to fuel Malaysia's technology industry. Business and academia must work together to train tomorrow's innovators" (Emmanuel, 2002 p.B5).

How does Malaysia build an Innovative Capacity?

So what are some of the suggested ways that Malaysia would go about building and innovative capacity? First, Malaysians must develop the attitude and aptitude of asking the right questions about how to make things better that they currently are. This includes science and technology gadgets, findings, processes and programmes. Others include business methods, patterns and processes. By asking such probing questions and seeking answers to them either through in-depth study or through research can be said to be some of the most important steps on the road to innovation and building and an innovative capacity.

In most developed countries, innovation was arrived at by even the average citizen who was not satisfied with the way a particular gadget they bought works. In the spirit of such dissatisfaction, they set out to do something about it to make it better. Others just wanted to make things "user-friendly" for people, or find a solution to an ill plaguing society. One example is Tim Berners-Lee, the British who created what we know today as the World Wide Web (WWW). Berners-Lee was simply looking for a way to organise his notes. He developed software that would keep track of say things you come across in life, such as random associations. Berners-Lee believed his brain wasn't good enough at remembering such things. So when he was undertaking a six-month internship at the European Laboratory for Particle Physics (CERN) in Geneva, he wrote a software programme to address this problem. This software programme, which Bernes-Lee called "Enquire Within Upon Everything" gave

birth to what, we know today as the WWW. The impact today of the WWW on our lives cannot be emphasised enough. At the time of writing, Berners-Lee is thinking of a more intelligent version of the WWW to be called "semantic web." This proposed new intelligent version of the WWW would take the drudgery out of searching for information by evaluating its context (*Economist*, 2003, p. 17-18).

Another way Malaysia can build an innovative capacity is by encouraging Malaysians to develop the aptitude for taking risk — the risk of trying something new, to go where no man has ventured before, to introduce something new. Speaking on the same issue at the launching of Malaysian Debt Ventures (MDV) Berhad in Kuala Lumpur, Dr. Mahathir said, "to our young Malaysian's out there, you need to be daring enough to push the limits of the envelope, to go beyond the horizon. You just might discover something new that can do the nation proud" (*New Straits Times*, 2002, p. 2). The call for Malaysians to take risk is not urging a person to take senseless risks, that is, taking risk just for the sake of taking risk. To do that is senseless and pointless (*hodoh*). Here, risk taking is where an individual or groups push their ideas to the fore, despite hurdles and failures. In this case, there is usually a lot at stake. The risk taker can lose their career, reputation or self-esteem in the process. But to fail to take risk is to fall into inaction and as the old adage goes, "nothing ventured, nothing gained", indeed one must be willing to leave the shore to discover new lands. As Malaysia moves to the next phase, more Malaysians must be willing to take the commensurate risks that would translate into innovation. Writing in the book, *The Innovation Equation: Building Creativity and Risk Taking in Your Organisation*, Jacqueline Byrd and Paul Brown define innovation as:

$$\text{Innovation} = \text{Creativity} \times \text{Risk Taking}$$

According to Byrd and Brown, without the willingness to be creative and taking risks, innovations would not occur and if an organisation refuses to build their innovative capacity, they would not be able to modify, adapt, survive and even thrive in these competitive times (Byrd and Brown, 2002). The risk here in the case of Malaysia is to take calculated risks in research in science and technology, in letters and entrepreneurship and above all to dream the impossible dream. As the country moves to the next phase of the k-economy, this will be one of the challenges and indeed the watchword.

Finally, for Malaysia to build an innovative capacity as it moves to the next phase of the k-economy, Malaysians must develop the aptitude to be creative. Without creativity, no innovation is possible. But what is creativity? Creativity is a concept of multiple dimensions. Some of the approaches to defining creativity ranges from the social psychological, the personality, systems and the cognitive. To others, creativity comes from "experiential education" or what is often termed as graduating from "the university of hard knocks." Analysing each of these approaches is beyond the scope of this book. However, for the purpose of this chapter, the cognitive approach will be used to elucidate further on creativity as it pertains to Asians and Malaysians in particular. Basically, it is the ability to come up with an innovative or new idea, which would solve an existing problem or will make life easier. But before we attempt to suggest ways to enhancing Malaysia's creative capabilities, the question why Malaysian's are comparatively less creative than their Western counterparts should be ask. To answer such a question, we must first try to understand the assertion by some that Asians, which include Malaysians, are comparatively less creative than Westerners (Ng, 2001). Indeed, Kishore Mahbubani in the first chapter of his book of the same title, *Can Asians Think?* poses the same question. Ng Aik Kwang, an Asian academic in his

book, *Why Asians are Less Creative than Westerners* asserts, that the reason why Asians are less creative is because, they are products of a tightly organised, collective societies where they've been socialised from their youthful days to fit into "the social group of their society." This makes them psychologically dependent on the social group. Conforming to the social group meets their psychological need for validation. Uniqueness or being different does not (Ng, 2001). This psychological make-up which facilitates conformity according to Ng, produces this uncreative behaviour. In the book, he gives an example of an observation of a Japanese Nobel Laureate, Leo Esaki explaining why people in his country lack the penchant for original creations and inventions as, because they fear the loss of the psychological security that comes from standing apart from the group to "challenge the unknown" (Ng, 2001; Weisz et al, 1984).

Another reason given by Ng why Asians are less creative than Westerners is that the typical Asian society puts a lot more emphasis on its people to conform to a social order, harmony, and the avoidance of conflict. In contrast, the typical Western society places emphasis on an open and democratic exchange of ideas even at the risk of conflict. Furthermore, the typical Asian society according to Ng is hierarchical, while the Western is of an egalitarian nature (Ng, 2001). These basic differences are some of the reasons that contribute to why Asians are less creative than Westerners since creativity is an individuated and motivated behaviour influenced by culture.

By this analysis, one may think that Western and Asian societies are regarded as a monolith. Definitely not. Western and Asian societies are homogenous. Within the core of each of these societies, there are subtle differences and that is a fact. Yet the influence of each of these societies by a certain social philosophy cannot be ignored. For example, most Western societies are influenced by the social philosophy of "individualism." In

In contrast, most Asian societies are influenced by the social philosophy of "Confucianism" or "communalism." Despite such subtle differences within each of the two societies, the analysis leans heavily on these two social philosophical pillars as aids in the undertaking of these analyses.

So are Asians really that less creative? You would not know if you travel through Asia. Just look at the different and varied cuisines, the different and vibrant cultural clothing's, architecture and music. This to this author signifies that Asians are creative and have the aptitude to be as creative as Westerners. But having said that, if we were to use the number of Nobel Laureates as a standard of measurement between Asians and Westerners, promoting creativity and innovation, it would show that the number of Nobel Laureates earned by Westerners compared to Asians in all disciplines, across the board are significantly more. Why such a wide gap? One can only surmise at this point that the aforementioned social philosophy and general nature of the Asian societies are what stand in their way.

If Malaysia is to build a creative society to help in its move to the k-economy it must take these observations to heart and find workable ways to bring that about. A few suggestions here would suffice. First, there is the need to seriously consider the doubling of efforts to focus imbuing creativity and innovative culture in the youth. The youth according to Benjamin Disraeli is the future of any nation. Thus, the view often held that "parents know best" and the application of punishment and in some cases scolding to prove it, dampens creativity. Instead, the youth must be encouraged, complimented and given the utmost support when they do the right things. Where they go wrong, they must be guided and shown why they went wrong, so that they do not repeat it. They must be imbued with the confidence to dream, to see no limits to their abilities and should not fear to fail. Failure must be seen as a form of learning, not something to

be ashamed of or scolded for as it is often the case in Asian cultures. For example, for some Japanese "salary" men or businessmen who lose their jobs or encounter business failures, committing suicide is the best way not to bring shame to their families. In these tough economic times in Japan, it is reported that 600 Japanese kill themselves each week (Pesek Jr., 2003).

There must also be a true commitment in the private and public sectors to reward creativity and innovation. "Talk is cheap" as the old adage goes. Talking about creativity and innovation without actually being serious in rewarding it is not going to create an interest for people to be creative. Taking measured risks in creative and innovative endeavours should be encouraged. If people are scorned or avoided when they risk and fail in a creative endeavour, no one would dare to try for fear of the consequence when they fail. In the United States, entrepreneurs and companies who take risks and fall into financial difficulties are given the option of filing for bankruptcy protection to either reorganise or to start all over with a clean slate. In most cases, a company or individual would have difficulty to access credit for about seven years. This is a way to encourage risk taking and in most cases results in the development of creative and innovative products. This does not mean that Malaysia should follow such a system. Malaysia has its own norms, nuances and environmental specific challenges, yet it might be able to learn from the successes and failures of such an approach and that of ours to help it enhance its creative and innovative capacities as it moves to the next phase of the k-economy.

8.10 Ethics, Trust and Honesty Issues

At the Roslin Institute in Scotland in February 1997, a British embryologist, Ian Wilmut and his colleagues cloned a sheep called Dolly. Since the cloning of the late Dolly, a Pandora's box of sorts has been opened. Others have since followed Wilmut's

example and cloned their versions of "Dolly." From such an example, a Harvard trained physicist, Richard Seed proclaimed his intentions to clone humans for commercial purposes (Healy, 1999). At the time of this writing, a French scientist, Brigitte Boisselier, head of a company called Clonaid claimed (unsubstantiated) that they have successfully cloned a baby girl — "baby Eve" (*New Straits Times*, 2002, p.16). The example of Dolly and "baby Eve" are just to point to some of the ethical and moral challenges that Malaysia and Malaysians could face in the next stage of its movement to the k-economy. Granted that they might not be on the scale of that of Dolly, but what do we make of cases where intellectual property rights are violated with impunity? What about someone hacking into your company's computer just for the fun of it or to steal valuable secrets to break your monopoly stranglehold? Where do you stand with the issue of falsification of personal information? There are so many of such issues to mention here. Hence, just a few examples would suffice. There are some people who may see these acts as ethically and morally wrong, even criminal, others may beg to differ. This author does not claim in any way to be an ethicist or moralist, rather, I am pointing out some of the challenging issues that Malaysia would be faced moving forward. To show how solving such issues can be, here is a true-life example for each reader to test their ethical compass by.

In the seventies, B.F. Goodrich, an American company that manufactures vehicle parts won a military contract to design, test and manufacture aircraft brakes for the A7D U.S. Air Force plane. It was a lucrative contract that the company could not afford to refuse hence they gave specific guarantees. One of the employees named Kermit Vandivier was asked to write the report on the test of the brakes with the engineers of Goodrich for the government. But when the brakes were tested, the brake linings on the rotors repeatedly disintegrated. He was told by his

superiors to write a report for the government stating that the brakes have passed the test disregarding the results (Vandivier 1972, Velasquez, 1998). A further scrutiny of this case showed that at the time of this event, Vandivier and his wife had just bought a house with a mortgage to pay, thus he cannot afford to lose his job. What is clear is that if he refuses to write the report his employer would fire him. But he also knows from the tests the brakes have not passed the required standards. Should he write a false report or get fired? Most of such ethical dilemmas are going to challenge Malaysia and Malaysians as the country moves into the next phase of the k-economy and with globalisation.

Ethical issues apart, Malaysia's e-government initiative (see Abdul Karim and Mohd Khalid, 2003) are part of its goal of moving Malaysia to the k-economy and to a developed nation status by the year 2020. It would entail the handling of personal data by both private and public sector institutions in the country. What is clear is that such data in the hands of unscrupulous or insensitive and even unethical individuals or organisations could have immeasurable consequences. Despite the laws in place to safeguard this data, could it be compromised or erased by other people who might have an axe to grind? Furthermore, if one were in charge of such data, would you compromise the data at the orders of your boss? Indeed in issues of such magnitude there is the need for policy makers to develop a mechanism to uphold social trust as a way of enhancing social capital in the next phase of the k-economy. The issue of honesty is of immense importance in the k-economy. ICT can be used for good or for bad and in the k-economy where digitisation play an important role, dishonest gatekeepers can cause havoc and irreparable damage and might be able to get away with it. There are numerous cases of how dishonest personnel in financial institutions have used their knowledge of ICT to squirrel away funds or by engaging in financial improprieties. Honesty and

holding of ethical norms then would become an important issue in the next phase of Malaysia's movement to the k-economy, and where the level of sophistication of ICT products would increase. Indeed, the issue of ethics, honesty and trust are important issues even in the production economy; they would gain increase importance and currency in the digital and knowledge era (Boyette and Boyette, 2001).

Conclusion

As Malaysia moves to the next phase of its efforts to be a knowledge-based economy and a developed nation by the year 2020, it will be phased with dynamic challenges. To survive and prosper will require a change of the mindset, a new thinking and way of doing things as well as attitudes. It will also need the shift to a new value system, one that is innovative and willing to embrace and manage change. This will also be a phase where Malaysia would have to deal with challenging ethical and moral issues. Tough decisions would have to be made, fast and timely to address some of these challenging issues that might arise overnight. The ability to face such challenges, the undertaking of such decisions and effectively implementing them will enable the country move forward in the coming challenging era of its next phase to move to the k-economy and to become a develop nation.

9. KNOWLEDGE GENERATION, INTERNALISATION AND DISSEMINATION: MALAYSIA'S NEW CHALLENGE

9.1 Introduction

In today's knowledge-based economy, any country that wants to develop and indeed any of the developed countries that want to stay developed, must generate and control what it knows. The real capital today for any country that wants to develop therefore is knowledge. In another time, according to the Arthurian legend, if you wanted knowledge, you simply had to go to Camelot and seek out Merlin, the keeper of all knowledge. In today's globalised environment, where competitive advantage rules the day, one has to undertake R&D to create new knowledge. The creation or generation of knowledge require the prevalence of a conducive environment, the requisite talent or knowledge workers, financial resources, research facilities and dedication amongst others.

Even though the generation of knowledge is important, equally important are its internalisation and dissemination. Creating knowledge for the sake of it is of no use. Knowledge once created must be internalised by the appropriate sectors of the economy to bring about economic growth and development.

As Malaysia embarks on its efforts to move to the k-economy, the challenge before it in the next phase of this transition is its ability to internalise such knowledge and to be able to effectively disseminate it amongst the populace or to specific sectors of the economy that such specialised knowledge is required.

9.2 Rationale and Need for Knowledge Generation, Internalisation and Dissemination

The American abolitionist, Henry Ward Beecher (1813-87) once said that, "every tomorrow has two handles. We can take hold of it with the handle of anxiety or the handle of faith." Malaysia's efforts to attain a developed nation status and to move to a k-economy strikes many with an anxiety, that of fear, indeed a fear of resistance and clinging to the past. That past which some would call "the good old days." To this backward thinking lot, they should understand in no uncertain terms that "the good old days" of comparative advantage are gone. In an increasingly uncertain global economic environment, the era of competitive advantage is here, an era where Malaysia's global and regional competitors are busy innovating, creating new knowledge to afford them the now much sorted after competitive advantage in the global market place. Writing in *Harvard Business Review*, in an article about knowledge creating companies, Ikujiro Nonaka, a professor at the University of California, Berkeley said, "in an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. When markets shift technology, competitors multiply, and the products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organisation, and quickly embody it in new technologies and products" (Nonaka, 1991).

Nonaka's observation can be instructive, rather than a knowledge creating company, we can juxtapose it with a

knowledge creating country. In this context of juxtaposition, then in this era of economic uncertainty, any country be it developed or developing, must engage in constant knowledge creation and its dissemination to thrive and survive. Knowledge creation then fosters the creation of new products and services, it is a process of innovation that is able to stem the tide of obsolescence in an increasingly dynamic technological global environment. This therefore serves as one of the rationales that call for Malaysia to engage in knowledge generation as it moves to the k-economy, particularly in the next phase.

The other rationale that call for Malaysia to engage in knowledge creation, particularly in the next phase of its movement to the k-economy is to benefit from the legal advantages accorded to the creators of knowledge products, processes and services. These legal monopolies are called copyrights, and patents. Chapter six of this book has dealt with the issue of copyrights and patents under the topic on IPRs. Knowledge generation by Malaysia would enable it to enjoy real economic rents. For example, economists regard economic rent as any payment in excess of opportunity costs, then it follows that the opportunity cost for Malaysia creating its own knowledge and paying less for that knowledge compared to the high price they are paying for "other" people's knowledge can be regarded as rent. For example, if Malaysia is paying RM100,000 for the license of a particular knowledge product, if Malaysia can produce a similar knowledge product that can perform the same functions at a cost of RM40,000 then, difference between what the country is currently paying for the particular knowledge product and what it would cost them to produce it, RM60,000 is the economic rent. This is another rationale for encouraging knowledge creation in Malaysia's next phase of its movement to the k-economy.

Another reason why it is important for Malaysia to create its own knowledge as it moves into the next phase of the k-economy is because it enhances national pride, which has a certain ripple effect on the rhythms of innovation that can spur the innovative culture of the country — a real *Malaysia Boleh* spirit. For example, some of the advances in Malaysia like the development of the national car, Proton (about 90% of the components that go into the production of the car, are from Malaysia) the development of Malaysia's digital identity card (MyKad), one of the first passports with enhanced security features, one of the first countries to enact Cyberlaws, all from indigenous know-how, mention just a few, has given its people the pride to hold their heads high. It is a far cry from when previously anytime Malaysia was mentioned, most people around the world associate it with rubber, tin and palm oil. Malaysia's achievements in this sense are laudable for a developing country. But it cannot afford to rest on its laurels, its pace and tempo must be much faster if it wants to attain a developed nation status by the year 2020. The words of Pandit Jawaharlal Nehru (1889-1964), an Indian statesman are here. In Gunnar Myrdal's *Asian Drama*, Nehru is quoted as saying that "we are not going to spend the next hundred years in arriving gradually, step by step, at the stage of development which the developed countries have reached today. Our pace and tempo of progress has to be much faster," (Myrdal, 1968). Malaysia can borrow a leaf from this observation as it moves to k-economy and aspire to become a developed nation in an era where technology changes at light speed.

Once Malaysia generates or creates its own knowledge, it needs to internalise it. Internalisation is the process of the embodiment of explicit knowledge through action and practice. This process according to Nonaka includes the internalising, through on-the-job training, in order to actualise concepts and strategies or communications on innovation and improvement.

(Nonaka, 1999). Basically, it is the ability to commit to memory (not rote), having an in-depth understanding of a process or processes and by so doing, one can explicitly record such knowledge or be able to apply such knowledge in the production process and in creating new knowledge. Simply put, it is a process of the embodying of explicit knowledge into tacit knowledge. From this explanation, having a database therefore is not knowledge, but information. In the case of Malaysia, the explicit knowledge gained from external collaboration or the endogenous knowledge created within the country can be internalised and it becomes tacit knowledge and this can be turned to explicit knowledge, adding to the knowledge pool in the country. This can start the spiral up again but also increases the knowledge capacity as well as its refinement in the country. For this spiral to continue with the rhythm to spur innovation, this knowledge must also be shared or disseminated in its explicit or tacit form either through formal or informal channels. Formal channels can be universities, research institutions, public sector institutions and private sector consortiums to mention just a few.

Theoretical Underpinnings of Knowledge Creation and its Internalisation

From the outset it must be made clear that knowledge creation is entirely a different process from knowledge management. It is true that some aspects of knowledge management may emphasise how an organisation can capture, and exploit its internal knowledge, knowledge creation's emphasis is more on the "continuous" creation of new knowledge. One of the models that have captured the essence of knowledge creation is the Knowledge Conversion model by Nonaka and Takeuchi (1995). This model assumes that knowledge is dynamic and thus focuses on the dynamic process of knowledge creation, not the static aspect, as it is the case in knowledge management. The model

assumes that human knowledge is created and expanded through social interactions between tacit and explicit knowledge. Thus the dynamic interactions between the two afford what Nonaka and Takeuchi call "beyond experiences." They then offer four models of this knowledge conversion:

- Socialisation;
- Externalisation;
- Combination; and
- Internalisation

The first mode socialisation is the process of conversion from tacit to tacit. This is the process where mental models and technical skills for example are shared through shared experiences to create tacit knowledge. One way of acquiring the tacit knowledge is through observation, imitation and practice as it is with apprentices watching their masters. The second mode is externalisation. This is the conversion of tacit to explicit knowledge. This mode can be regarded as one of the important aspects of the knowledge creation process. For example, when we hear metaphors, analogies, and see concepts and models, it is the conversion of tacit knowledge to explicit. The third mode, combination, is where explicit knowledge is combined with explicit knowledge. Through the use of ICT for example, systemisation of concepts through the use of symbols such as language or figures combination can be achieved. Some examples of these figures are documents, meetings, telephone conversations or computerised communications. The final mode is internalisation. It is the process where explicit knowledge is converted into tacit knowledge. It is a process that deals with how the new knowledge that is created is internalised (embodied). For example, 'learning by doing' (Nonaka, 1999).

This knowledge creation model using these four modes is called the SECI (Socialisation, Externalisation, Combination and Internalisation) model. All the four modes in the SECI model need to be understood as an integrated process of knowledge creation. It is upheld by this model that to be able to leverage knowledge within an organisation, this knowledge must first be shared and articulated. Thus is the process of conversion, no part of the modes needs to be left out or remain imbalance. To illustrate the importance of this process, Nonaka gives an example of the case of a comptroller. According to Nonaka, if a comptroller in a company collects information throughout the company, which is then put into a financial report, this systemisation of explicit knowledge does not expand the knowledge base of the company. It is only when tacit and explicit knowledge interact that innovation occurs (Nonaka, 1999). Similar, just warehousing explicit knowledge in a database is not knowledge creation; it is the storing of information, a rather static affair.

Knowledge creation therefore is a dynamic process. There must be a continuous interaction between tacit and explicit knowledge to create new knowledge. Thus stopping at one mode without moving to the next does endanger the final outcome. There is the concern in many organisations that some individuals may feel reluctant or may not want to share their tacit knowledge. Such a concern is well founded. However, to be able to create new knowledge in any organisation, there must be self-transcendence. Individuals must also realise that without sharing their knowledge, they would not grow. But organisations in which these individuals work in must also create a conducive environment that encourages people to share their tacit knowledge and they should be supported in all ways to do so as they are the only source of tacit knowledge. Furthermore, workers must be involved in the innovative process, so that their

knowledge can be tapped rather than their keeping it to themselves. Also, the workers need a modicum of stability in the work place to enable them transfer their tacit knowledge to the innovative efforts of the company (http://www.apu.ac.jp/~ignasli1/busi_gene.html).

The SECI model is one that describes the process of self-transcendence in the context of an organisation to create knowledge. See Figure 9.1 below.

Figure 9.1: Four Modes of Knowledge Conversion (SECI)



Source: *The Knowledge Advantage*, p.68.

Figure 9.1, the SECI model shows how an individual transcends himself or herself through the socialisation process. Externalisation in this figure represents the help for teams to transcend their current stock of knowledge and through combination; they are able to reach the level of organisation. Internalisation in the SECI model represents the means to transcend the super-personal level to reach the personal level again (Nonaka, 1999).

Taking Stock of Knowledge Generation, Internalisation and Dissemination in Malaysia.

"Malaysia has shown itself to be adept in adopting and applying foreign technologies but, sadly, lags in developing its own," according to Dr. Azzman Shariffadeen, CEO of MIMOS Berhad, one of the companies charged with contributing to Malaysia's move to the k-economy (Chong, 2003). Such a frank statement from one of the people in the forefront in Malaysia's k-economy effort supports the thesis of this chapter. In a way, it validates the arguments put forth stating why the next challenge for Malaysia in its efforts to move to the knowledge-based economy is to intensify its knowledge generation, internalisation and dissemination. To help us put this into perspective, let us use data on registered patents and patent trends from the U.S. Patent and Trademark Office for the year 2000-2001 (see Table 9.1). The reason for using U.S. Patent and Trademark Office data is to allow us to compare the data of Malaysia with that of some countries in South East Asia including Japan and South Korea for which data is available for the aforementioned source. Another data that would be used to help us in this analysis would be data on total expenditure on R&D as a percentage of the country's GDP compared to selected countries. As well, data on the number of scientist, technicians and engineers per million in R&D would be used (see Table 9.2 and 9.3).

The patent registration data point to the fact that, compared to some countries in the South East Asian region, Malaysia is holding its own on the number of patents registered between the year 2000 and 2001. However, compared to Japan, South Korea and Taiwan, Malaysia has a long way to go. Not only would Malaysia have to work hard to catch-up with Japan, South Korea and Taiwan in knowledge creation, it must continue to work hard not to be overtaken by other countries in the Asian region. According to Dr. Azzman, "at one end, we have countries like

South Korea and Taiwan, which are far ahead of us, and at the other end, the likes of China, Thailand and Vietnam are emerging fast. It's bad to be caught between" (Chong, 2003). The importance of using the patent registration data is because patents are granted to only completely new innovations or innovations using old processes or technologies as a base. This thus point to the fact that knowledge generation in Malaysia needs to be raised to offer the country the competitive advantage as it transits to a k-economy. Dr. Craig Barrett, CEO of INTEL Corporation at a speech in Penang in 2002, made the same point. According to Barrett, "as the world's economy continues to expand, fuelled by the Internet and digital technology, success in this new environment requires Malaysia to further develop its ability to create and use technology" (Emmanuel, 2002). With the generation of new knowledge, there would be little to internalise and disseminate and would thus put the country at a disadvantage in its efforts to move to the k-economy and to become a developed nation by the year 2020.

**Table 9.1: Patent Trends for Selected Countries in East Asia
2000-2001**

Country	Year 2000	Year 2001	Total	Annual % Increase
China P. Rep.	163	266	429	63.2
Indonesia	14	10	24	-28.6
Japan	32,924	34,891	67,815	6.0
Singapore	242	304	546	25.6
South Korea	3,472	3,763	7,235	8.4
Taiwan	5,806	6,545	12,351	12.7
Thailand	30	47	77	56.7
Malaysia	47	56	103	19.1
Philippines	12	15	27	25.0

Source: *Patenting Trends Calendar year 2001*, U.S. Patent and Trade mark Office
(http://www.uspto.gov/web/offices/ac/ido/oeip/taf/pat_trends.htm).

Country	Engineers in R&D per million people	Technicians in R&D per million people	Total Expenditure on R&D % of GDP	High-Technology Exports US\$ Millions	High-Technology Exports % of Manufactured Exports	Royalty and License Fees Receipts US\$ millions	Royalty and License Fees Payments US\$ millions
	1990-2000	1987-1997	2000	2000	2000	1999	1999
Science and Technology							
Selected Developed Countries							
Germany	2,873	1,472	2.46	82,958	18.1	1,017	4,405
Japan	4,960	827	3.12	127,368	28.3	8,190	9,855
United Kingdom	2,678	1,071.7	1.85	72,616	31.6	7,942	6,401
United States	4,103	—	2.69	197,031	30.3	36,467	13,275
Australia	3,320	797	1.55	2,734	18.0	344	1,124
NIEs							
Hong Kong	93	—	0.48	5,155	23.3	—	—
Singapore	2,182	301	1.88	73,643	62.4	—	—
South Korea	2,339	318	2.65	51,950	34.9	455	2,661
ASEAN 5							
Indonesia	—	—	0.09	5,698	10.0	—	—
Malaysia	93	32	0.4	39,996	59.0	0	0
Philippines	156	22	0.08	8,465	26.3	6	110
Thailand	102	39	0.26	13,949	32.3	19	583
China	459	200	1.00	40,837	18.6	75	792

Notes: Data for 1999; Data for 1987-97

Sources: *The World Competitiveness Yearbook 2002*; *World Development Indicators 2003*; *World Development Report 2002* and *Human Development Report*

Table 9.3: Selected Information and Communications Indicators
(Select developed and developing countries, 1998-2000)

Country	Daily Newspapers per 1000 people	Radios per 1000 people	Television Sets per 1000 people	Telephones per 1000 people	Mobile Phones per 1000 people	Fax Machines per 1000 people	Personal Computers per 1000 people	Internet Hosts per 1000 people
	1998	2000	2000	2001	2001	1999	2001	2000 ^{1/2}
Information Age Selected								
Developed Countries								
Germany	305.0	948.0	586.0	635.0	651.7	79.1	436.0	308.8
Japan	578.0	956.0	725.0	604.0	528.4	127.0	430.0	384.0
United Kingdom	329.0	1,432.0	1.0	613.0	754.8	33.9 ²	492.0	401.8
United States	213.0	2,118.0	854.0	701.0	435.0	78.4	639.0	522.1
Australia	293.0	1,908.0	738.0	630.0	610.3	48.6	585.0	464.9
NIEs								
Hong Kong	792.0	684.0	493.0	583.0	846.4	58.0	389.0	427.4
Singapore	298.0	672.0	304.0	472.0	687.9	25.8	580.0	5,469.0
South Korea	208.0	1,033.0	364.0	457.0	608.9	8.9 ³	399.0	510.0
Mexico	98.0	330.0	283.0	137.0	216.8	3.0	76.0	52.6
ASEAN 6								
Brunei	71.0	271.0 ⁴	417.0 ¹	263.0 ⁴	-	7.0 ⁵		24.1 ⁶
Indonesia	23.0	157.0	149.0	34.0	29.3	0.9	12.0	14.9
Malaysia	157.2	419.0 ⁶	174.0 ⁶	204.0	311.4	8.1 ⁶	68.7 ⁶	27.6 ⁶
Philippines	82.0	161.0	144.0	46.0	141.3	0.7 ⁷	28.0	17.5
Thailand	64.0	235.0	284.0	96.0	126.8	2.5	40.0	58.2
Vietnam	4.0	109.0	185.0	26.0 ²	4.0 ²	0.4	22.0	0.0
China	n.a	339.0	293.0	138.0	116.0	1.6	22.0	26.3

Notes: 1/ Data for July 2000; 2/ Data for 1998; 3/ Data for 1997; 4/ Data for 1996; 5/ Data for 1995; 6/ Data for 1999

Sources: *The World Competitiveness Yearbook 2001*, *World Development Report 2002* and *World Telecommunication Development Report 2000*.

Identifying Some of the Possible Impediments and Solutions to Knowledge Generation, Internalisation and Dissemination in Malaysia.

One of the most important elements that foster knowledge generation is the development of an unyielding "willingness" to seek and develop new knowledge. This willingness serves as an impetus and fires the enthusiasm in those willing to seek and generate new knowledge. This is because the process of seeking new knowledge is time-consuming, frustrating at times, and requires a lot of dedication as well as resources. Without the unyielding enthusiasm that is required by those who seek to create new knowledge to keep on plugging even when there seems to be no light at the end of the tunnel, the quest can easily be abandoned by those who lack such persistence and perseverance. But having the willingness alone on the part of those who seek to create new knowledge is not enough. There must be adequate support in the form of resources and an effective legal infrastructure that protects the IPR's of those who create such new knowledge. For example, most of the great thinkers of the classical and neoclassical periods had patrons who bank rolled them or the king or queen was their benefactor. In most developed nations like the United States, apart from massive government grants to fund scientific and technological research and in the arts to create new knowledge, private foundations and private sector businesses are also deeply involved in the funding of scientific and technological research and the creation of new knowledge. Such an effort is rather limited in Malaysia and thus has an impact on the creation of new knowledge.

There must also be an enabling environment which gives rise to enabling conditions in a country to be able to create new knowledge. An enabling environment is the case where the leadership or government in power in a particular country puts

into place the necessary infrastructure and infrastructure and an air of encouragement to help in the process of knowledge creation. The putting at the disposal of both tangible and intangible resources to encourage citizens to engage in the quest to create new knowledge is very important. Such a process must receive continuous support and nurturing from the leadership of the country and the requisite heads of the institutions and organisations that this new knowledge creation is taking place. It would require the leadership of the government and organisations also in the private sector to invest in new knowledge creation beyond the short-term and profit motives. Definitely, profit can be an important reason why the private sector may fund research or encourage knowledge creation but should not be "the sole reason." Creative ways must be developed to encourage knowledge creation in Malaysia to aid the country in its efforts to move to the knowledge-based economy.

Underlying any continuous support from the public and private sectors in Malaysia to encourage and foster knowledge creation, there must be a strong vision, more of a challenge that would rally all Malaysians in their effort to move to the knowledge economy via the creation of new knowledge to give the country the competitive edge. Vision 2020 is an example of such a macro challenge. In this case, knowledge creation as alluded to by this author, is about a micro challenge, more of a supportive vision to the macro challenge. Developing a knowledge creation vision as one of the cornerstones of the new phase of Malaysia's effort to move to the k-economy would elicit the development of definitive methods, programmes, processes and their implementation to achieve the micro challenge. It would therefore serve as a reinforcing pillar to the macro challenge.

Finally, one of the things that can stifle or stand in the way of knowledge creation in general is hubris. It is common in human

nature, in most cases, to tend to be arrogant with the achievement of some successes after going through tough times. Once the storms are weathered, people tend to forget easily and as they gloat in their attained glory lose the enthusiasm to keep up the hustle. They in some cases are lulled into complacency, and satisfied with their gains (but complacency is the recipe for failure) and before they realise it, others soon overtake them, they fall behind, become frustrated in their inability to catch-up and finally wilt away. There are many examples to attest to this ranging from nations to companies to individuals. The example of the makers of the typewriter (Smith Corona) already given in this book is a particular case in point. Smith Corona at its height became complacent and never created new knowledge, neither did it innovated on the functions of the typewriter, nor anticipating the rise of a possible competitor(s) and was overtaken by the computer and the typewriter died a slow death. I am sure there are no tears for the typewriter from those using computers today. There are many examples like the latter to illustrate this point. Malaysia needs to take note of these two evils in its efforts at knowledge creation in the next phase of the country's move to the k-economy.

Other Suggested Approaches to Knowledge Creation

Other approaches to knowledge creation according to Nonaka (1999) are that one must have a strategy. Having a strategy would enable the development of the requisite capabilities to acquire, create, accumulate and exploit knowledge. According to Nonaka, one of the critical elements for an organisation or a country's strategy in the creation of knowledge is to be able to conceptualise a specific vision about the kind of knowledge it wants to develop and be able to operationalise it for implementation. Using Nippon Electric Corporation (NEC) as an example, Nonaka pointed to how the company earlier on made

the connection between computers and communications and made it an explicit vision of the company. It then set about operationalising it by coordinating R&D in the areas of computers, communications and semiconductors which has helped NEC in its knowledge creation efforts.

Another suggested approach to knowledge creation is by engaging in reverse engineering. Reverse engineering is the taking apart of an object or technological device to see how it works in order to duplicate or enhance it. For example, a vehicle manufacturer may purchase a competitor's vehicle, disassemble and examine the welds, seals and the general dynamics of the different components of the vehicle. One reason for such disassembling is to study the components of the competitor's vehicle and see how they can enhance their own. It could also be an effort to come up with new or cutting-edge technologies/performance than what both of them have. In the case of computer software reverse engineering entails the reversing of a programme's machine code back to source code. The purpose of such a reversal could be to study how the programme performs certain operations, either to improve it or to fix a bug or to adapt a programme written for one microprocessor for another that has been designed differently and for a specific purpose

(http://whatis.techtarget.com/definition/o/sid9_gci507015,00.html)

One of the ways reverse engineering could help with knowledge creation is that, first it gives insight into how a device works, it thus helps in the identification of the different components of a system and their inter-relationship and can be used in the creation of a similar or different representation of the system in another form (Chikofsky and Cross, 1990). It is the view of this author that reverse engineering can help Malaysia in its efforts to generate new knowledge. However, to engage in reverse engineering for the sole purpose of copying or duplicating is a violation of applicable copyrights and patent laws. In fact

reverse engineering is prohibited in some countries for certain software and products and their license use. In the United States, limits are placed on the rights of software developers for example, to reverse engineer software products. Reverse engineering in the U.S. is also forbidden by many shrink-wrap license agreements. Before the U.S. started clamping down on reverse engineering, San Jose based Phoenix Technologies reverse engineered IBM BIOS in the mid-1980s. The ability of Phoenix Technologies to do so served as a basis for the development of the entire PC clone industry (<http://www.cnn.com/2000/Tech/computing/05/08/reverse.engineering.1dg>).

Conclusion

One of the new challenges that Malaysia would face as it moves to the next phase of the k-economy would be to able to generate, internalise and disseminate knowledge. It will require a massive investment in R&D, availability of abundant talent and the development of a propensity to take risk and risk taking. Some of these knowledge generation programmes would require long gestation periods and some might yield zero results in relation to the capital and time invested. The challenge of knowledge generation or creation on the part of the government would have to be complimented by efforts from private individuals, foundations and the private sector, as is the case in developed countries. The next phase of Malaysia's movement to the K-economy would rest on the ability of the country to create new knowledge, internalise it and disseminate it effectively.



10. Managing What Malaysians Know

1.1 Introduction

Professor Ali Mazrui, Albert Schweitzer Professor in the humanities at Binghamton University in upstate New York once said that, "equity among citizens is based upon who owns what. But equity among nations is based upon who knows what," (BBC TV Programme, *The Africans*, 1986). Mazrui's observation is partially right. Rather, equity amongst citizens and nations of our world today is not only based on who knows what, but on who knows how and the ability to control and manage this know-how and what. Why such an assertion? This is because in today's knowledge era, the principal assets that individuals, corporations and nations hold dear are in an intangible form — knowledge. This is referred to in some quarters as intellectual capital or **smarts**. In physical form, it can be quantified as patents, copyrights, trademarks, service marks to mention just a few. According to Thomas Stewart,

"knowledge has become the pre-eminent economic resource — more important than raw material, more important, often, than money."

Considered as an economic output, information and knowledge are more important than automobiles, oil, steel, or any of the products of the Industrial Age" (Stewart, 1997).

Today, if you talk about know-how or core-competencies as a source of competitive advantage in an increasingly globalised environment, most business and political leaders will be all ears. The Cold War might be ended, but a different Cold War rages on, in a multi-polar fashion over knowledge and technological dominance. It is with such reasons that countries are accusing each other of "industrial espionage" and the stealing of trade secrets. Companies are dragging each other into court over mine issues that affect their patents, copyrights and innovative competitiveness.

Then, we can say in no uncertain terms that the knowledge that an individual, country or organisations hold must be managed carefully and effectively as it is their source of competitive advantage. In the previous chapter, we emphasised on the importance of knowledge generation and creation as one of the important challenges that developing countries like Malaysia would have to phase as they make the effort to attain a developed nation status and to transit to the k-economy. Equally important is the ability of developing countries like Malaysia to manage and apply effectively, the knowledge they have created and would be creating. It is not going to be a cakewalk, for it is sometimes hard to manage and contain knowledge, for it can "get-out" so to speak. Yet, it is important to minimise this "getting-out" or its "seepage." If this were not done, at the end of the day, there would be no knowledge left to manage. The example of Netscape's Internet browser technology and its co-founder Marc Andreessen can be a good lesson. The inability to effectively manage and protect their browser technology from competitors have severely eroded Netscape's market share,

driving it almost to extinction. Malaysian technologies (knowledge-how) or those it would create could face such challenges as it moves to the next phase of the k-economy.

2 What is Knowledge Management?

From the introductory chapter, we can deduce how the importance of knowledge and its management to a country or an organisation can decide their survival and competitiveness. Managing such knowledge is therefore important in this equation. To offer a precise definition of what knowledge management is and what it is all about, it would be appropriate to offer some pointers that encompass it. Such pointers include, the development, measuring, preserving, sharing and using of knowledge assets within an organisation or a country. Knowledge management therefore according to this book is how a country or organisation goes about developing, preserving, sharing, enhancing and managing of its assets or the totality of the knowledge products, patterns and processes it owns in both its tacit and explicit forms. Others view knowledge management as a way of managing people's brainpower and a company's collective memory (Neuhauser et. al, 2000). Yet, others see it as the harnessing and the organisation of information assets that reside in the databases of an organisation or in its employees' collective brainpower (Shahnon, 2000).

Beneath all the numerous definitions of knowledge management, what is certain is that knowledge has become an important indispensable commodity to value creation for companies and countries. These companies would therefore like to capture and analyse this information to enable them develop workable strategies to afford them a competitive advantage. Managing this knowledge would also help their employees to be able to access information worldwide to enable them work faster and better and to enhance their decision support systems.

Furthermore, it would help them be able to leverage accumulated knowledge from past experiences across the company (House and Bell, 2001).

10.3 Knowledge Management: A Paradigm Shift?

When we talk about a paradigm shift, we are usually referring to the supplanting of an old phenomenon by a new one. Usually, this new phenomenon offers a superior explanation of an idea than the old one. Reference can be drawn from how Newtonian physics was supplanted by Einsteinian physics in Einstein's $E=mc^2$ equation. Thus as the world and indeed Malaysia, transits from an industrial to a knowledge-based economy, a fundamental shift is also taking place in the way people were regarded in the industrial era as just labour, that can be replaced at will, to being an indispensable resource in the knowledge era that needs to be well managed. The move from an industrial to a knowledge-based economy therefore requires that organisations and indeed countries subscribe to a new paradigm of the management of labour as a complementary input to an important resource. This resource does not face diminishing returns but increasing returns. Similarly, the measurement and the valuation of this human resource require a new method of valuation since the old ways of its valuation are inadequate. This is not the focus of this chapter.

In this knowledge era, scientist who previously made decisions based on their fundamental understandings of the old paradigms to which they subscribe, would have to move to a modern era of managing knowledge and leveraging it as a key component to the economies of the information era. For example, in the industrial era, companies essentially competed on price rather than on product differentiation, and became successful in doing so. Companies in this era operated on assumptions rooted in tangible assets-based explanations, which dealt with the physical transformation of atoms into finished

goods in order to create wealth. Atoms represented the raw material used to create valued outputs. Thus companies who tended to operate under this old business model tended to have highly standardised operational procedures for relatively simple products (Housel and Bell, 2001). In the modern era, those who operate under this method, particular in the knowledge-based economy would not survive. Through reverse engineering, competitors can easily crack these procedures. In this knowledge era, the new paradigm calls for the ability to be able to capture and reuse knowledge in unique ways in the lines of codes, and ways of producing that code, like what Microsoft and other knowledge-based industries are doing and in the end have created more wealth than industries of the industrial era. Thus, the management of knowledge and knowledge workers in this new era would be completely different from that of the old industrial age era.

It will therefore be sound to argue that in this knowledge era, most managers will see knowledge assets distributed amongst its people, machines and process. They will therefore focus their efforts on how to effectively coordinate these assets to produce desired goods and services. The challenge in this era will be how best to manage and deploy this knowledge throughout their respective organisations. Their challenge also will be the explicit management of intangibles as oppose to tangibles for managers in the industrial era. In this knowledge era, as oppose to the industrial era, the manager in the latter cannot see how he can manage intangibles. In the former, managers see patterns based on knowledge as an output. Thus, in this new era, when companies view their operations in a larger framework based on knowledge and their assets as knowledge assets creating knowledge products, their view and valuation of these assets in its ability to provide them with the requisite competitive advantage, would lead these companies to develop and apply new ways to

managing this knowledge assets. This is indeed the new order of the day and could therefore be regarded as a paradigm shift from the old method of the management of labour to the new. As Malaysia transits from the old to the new economy, one of its challenges would be the ability to adopt and effectively apply this new method of managing its knowledge assets.

10.4 Knowledge Management Principles

Developing a common set of principles to manage knowledge successfully has been a thorn in the flesh of practitioners. The reason could be that practitioners are still grappling with ways to manage intangible asset like knowledge. Indeed changing from an old way of thinking to the new is not always an easy feat. Albeit, efforts have been made to evolve and develop principles based on theory and practice as well as the combination of the two. Housel and Bell (2001) has offered three basic principles as guidance for those attempting to find new ways to manage their knowledge assets. These include, customer knowledge, the deployment of knowledge in information technology (IT) and the monitoring and measurement of knowledge assets.

Customer knowledge is more about identifying the knowledge that customer's value most and the deployment of such in products and services. Ways of doing this include making the customer a part of the transaction process by activating knowledge embedded in the products and services the company offers. Another way is to have products meet customer expectations over time, as they are more discerning today. Thus, the customer product definition and company definition must be close as possible.

One of the important ways or principles of trying to manage knowledge assets is the ability to be able to capture and embed the knowledge in IT, which could be lost when an employee leaves the company. When an employee leaves the company,

they often take with them valuable and critical knowledge necessary for the continued operations of the company. In most cases, it may not be possible to capture the complex knowledge in the heads of the departing employee. But the realisation of the importance on the part of management of companies that their sustainability depends on their ability to capture critical technical knowledge in less volatile forms such as IT is to do something about it. The use of artificial intelligence and neural networks that employ an inductive approach and the learning from patterns, which are products of behaviours or quasi animate objects like electronic ant colonies are some examples. Another is trying to capture important knowledge assets from employees before they leave a company is through the establishment of groupware systems. These systems capture and index and store this critical knowledge with the help of intelligent agents. Others can then reuse this knowledge in the company. Most of the large consulting companies like Ernst & Young use this kind of groupware systems.

The monitoring and measuring knowledge is another important knowledge management principle. Its goal is to determine how well knowledge is producing value. This can be gauged from the customer's response to a product or a service by their increase demand for them. The interaction between the organisation and the customer can tell them whether a product works or not and it helps the organisation to develop better and more appealing products. Monitoring this knowledge from the market place and its effective application offers the organisation a competitive advantage. To maintain this competitive advantage and to find out what knowledge is needed for current operations and the creation of future value, an organisation must conduct periodic knowledge-gap assessments. It is a way to help the organisation and its managers to tap the knowledge residing in their employees and the current technologies in the organisation.

So far, this brief elucidation on knowledge management principles is an effort to enhance the study and practice of knowledge management using a common framework.

10.5 A Knowledge Management Conundrum?

The development of principles to enhance the study and practice of knowledge management are laudable, indeed steps in the right direction. However, what is not clear or at least where this approach sees some shortcomings on the part of the knowledge management "elites" is their inability to explain how to really manage knowledge in an employee's "head" — tacit knowledge. Much has been written about the management of explicit knowledge. Examples abound from Chevron, to Hewlett-Packard to Skania and other multinational companies managing their explicit knowledge with the help of IT. But for all who are familiar with organisational politics, personal idiosyncrasies and other behavioural patterns common with humans in their daily interactions with each other will agree that it is much easier said than done, to get people to share their knowledge with their employer and colleagues. Why such an observation? First, in the uncertain global environment of downsizing, mergers and acquisitions, and business failures, job security is a thing of the past. Why should an employee give up all they know and could be let go when they are no longer needed? For example, in companies where mergers and acquisitions take place, departments or divisions with similar work functions or roles are merged. When such happens, some employees are let go, despite their commitment, years of service and contribution to the knowledge assets of the company. With such uncertainty in today's business environment, you cannot fault the employee for zealously guarding their tacit knowledge. The thinking on the part of the employee could be that by guarding such knowledge and as long

as it is still needed by the employer, their services would continue to be relevant.

In cases where organisational politics get in the way, where there is fight for turf, power, superiority and recognition by the different groups in the organisation, the impact on sharing and management of knowledge becomes a problem. Teamwork and team spirit is lost making it difficult for those engaged in turf wars to see themselves as a team, let alone share knowledge. Furthermore, a devastating aspect of organisational politics that can affect knowledge management and its sharing is when favouritism rules the day and rewards are given to those who have not done the work or contributed to the basket of knowledge assets of the organisation. Those who feel slighted would in some cases refuse to share their knowledge or would have just enough to maintain their jobs. This can have an impact on knowledge management in the organisation.

There are those who would argue that fostering good employer/employee relations, boosting the morale of employees and in some case locking them in by means of a loyalty contract would bring about knowledge sharing and the management of such tacit knowledge (Camble and Blackwell, 2001). All such measures would contribute to enhancing the ability of organisations to manage knowledge, but because there is no cure for uncertainty and for organisational politics as well as personal idiosyncrasies, one would argue that they are "band-aid" measures. They might never be a solution to the management of tacit knowledge. Hence, despite the importance of knowledge management to organisational growth and success in an increasingly competitive global economy, the inability to effectively manage the tacit knowledge of employees poses a quandary for the knowledge management field. It will continue to be until an effective way is found to manage the tacit knowledge an employee has in his or her head.

10.6 The Challenge of Managing What Malaysians Know

As Malaysia transits to the k-economy, the ability to manage what Malaysia and Malaysians know would be extremely important. As already elaborated on in the knowledge generation and dissemination chapter, the ability to create knowledge would be one of the determining factors of Malaysia successfully transiting to the K-economy. But the creation of knowledge would be of no use when it cannot be managed and effectively directed to fuel the growth and development of the country. Indeed, the management of knowledge is an indispensable component of the k-economy. As appropriately observed by the Minister of Human Resources of Malaysia, Dr. Fong Chan Onn in his keynote address at the national Conference on Knowledge Management held in Kuala Lumpur in 2001, "it will be pointless and meaningless if the emphasis the government asserts on transforming the nation into a knowledge economy is not complemented by the effective and innovative management of knowledge at the grassroots" (<http://www1.jarring.my/ksm/bmver/spm152.htm>).

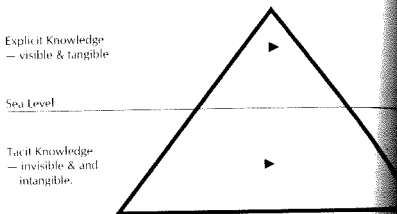
So far in Malaysia, what has been observed is the effort on the part of both private and public sector organisations busily storing and warehousing information of their respective organisations in servers and databases. These are referred to as "knowledge databases." On one hand, these "knowledge databases" are helpful in some cases because it helps to organise scattered information of the organisation that could be lost or hard to find when the need arises. It can therefore be argued that they contribute to enhancing organisational memory. But these databases are often criticised as being nothing more than warehouses for information, most of which become obsolete in no time and some of the information in these databases and websites are dated and not updated since they were transformed into electronic forms. Smaller organisations, which follow this trend, could be vulnerable to virus and computer attacks, which

could result in their losing of all their vital information. Hence, information warehousing cannot be regarded as a true knowledge management exercise. Daniel Bell, Henry Ford II Professor of Social Sciences (Emeritus) at Harvard, puts it best when he wrote: "merely possessing raw information, however, does not mean that you 'know' more. Knowledge comes from making judgments about and reorganising the information available. An example I often use to illustrate the distinction among data, information and knowledge, is the index found at the end of most academic books. All of the individual name entries in the index, ordered alphabetically, are simply data. Information is the subject index in which the author has arranged certain topics under selected headings to lend to some structure or guidance to the index. But it is the judgements made as to how to group these different items together, the reorganisation of the information, which is knowledge" (Bell, 2001).

As a developing nation, Malaysia can be lauded for such an effort. It has taken significant steps in the aforementioned direction. But it cannot be denied that such an effort is just dealing with the management of the explicit aspect of knowledge. Such a mechanistic way of warehousing information will not contribute in any significant way to innovation, which is one of the strong levers of the knowledge economy. It would therefore be imperative from the view of this author for Malaysian organisations to equally focus on the management of the tacit aspect of knowledge that exist in their organisations, especially in the brains of their employees. Granted that such would be an arduous task, but it's the definitive and important aspect of knowledge management and necessary to enhance innovation and the innovative capacity of the country as it transits to the k-economy. If we can use an iceberg analogy to illustrate this observation, the explicit aspect of knowledge management would be the visible aspect of the iceberg whiles the

tacit aspect would be the part of the iceberg submerged. See the Figure 10.1 below.

Figure 10.1: The Iceberg Analogy of Knowledge Management



The challenge therefore for Malaysia in the next phase of transition to a k-economy would be to be able to manage its tacit knowledge. Tacit knowledge as we know is a highly personal and an intangible resource. Thus it cannot be approached from the view of the separation of the knower from the known, the subject from the object as espoused by the Cartesian dualism concept of the work of French rationalist, René Descartes. In fact, Hirotaka Takeuchi, co-author of *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, points to how such a Cartesian approach is more of the Western tradition of managing knowledge, which is entirely different from that of Japanese, which emphasises the tacit aspect of knowledge management (<http://www.sveiby.com/articles/lessonsJapan.htm>). The advantage of this approach is that it is holistic and can be deemed much successful.

Another challenge for Malaysia to be able to manage its tacit knowledge in the next phase of its efforts to move to the k-economy would lie in its ability to reward adequately those who really produce the requisite knowledge in their organisations for the growth and development of these organisations or for the development of innovative products. Rewarding those who are good at "apple-polishing" and ignoring those who do contribute the requisite knowledge is a sure way of causing discontent and could lead to a lack of interest to share their tacit knowledge. Such knowledge workers are good candidates who will move to other competitors that will offer them a favourable environment and the remuneration they want. Any organisation, which continues to lose its knowledge workers, cannot survive for long. Hence the "push" factors as well as the "pull" factors, which bring this about, must be immediately addressed to enhance the retention of the tacit knowledge the employee will leave the organisation with.

Furthermore, in the era where countries are jostling for talents from other countries, Malaysia and Malaysian organisations should be proactive in retaining their talent. As already pointed out in this book, there is a war for talent even in South East Asia (Witcher, 2000). Also, it has been pointed out in this book that a large number of Malaysian talent are working across the causeway in Singapore. Thus effort on the part of Malaysian organisations of both public and private sectors to stop such talent loss is to start with the implementing of effective changes internally in their organisations that will remove the turf wars, jostling for positions and other personal idiosyncratic that are a drag on the development and managing of tacit knowledge. These should be part of their retention strategies. This is because the future of these organisations and indeed the country and its efforts to transit to the k-economy depend on the ability

to get knowledge workers to share their tacit knowledge and apply it to the development of the country (Tulgan, 2002).

Another knowledge management challenge that Malaysia will face as it transits to the k-economy is the ability to find balance between the hierarchical nature of most Asian countries and their organisations. Such an ingrained nature of Asian organisations works against knowledge management. In situations like that, brilliant junior officers and staff members are always afraid to voice out their suggestions and opinions. The fear that "the nail that sticks out gets hammered down," makes them to keep quiet and stifles the contribution of their tacit knowledge (Min and Yoon, 2002). Finally, another challenge as it pertains to knowledge management that Malaysia will face is the threat posed by the violation of the intellectual property rights of its knowledge workers. The impetus of such legal rights is to foster creativity and innovation, and to encourage the transformation of tacit knowledge to explicit for the benefit of the country and for society at large. Harsh punishment should be meted out to those who violate such copyrights. At this writing, it should be mentioned that the Ministry of Domestic Trade and Consumer Affairs is waging a serious war on copyright violators and are bringing them to book. Yet more still needs to be done. These violators are hydra-headed, just when it is believed that they have been shut down, they spring up elsewhere. Only a continuous and persistent effort on the part of the Ministry of Domestic Trade and Consumer Affairs would put them out of business for good. In tandem, a vigorous educational effort should be mounted to educate the populace about the importance and benefits of respecting copyrights.

10.7 Conclusion

The Importance of managing what Malaysia and Malaysians know as it moves to the next phase of the k-economy cannot be

emphasised enough. It is only through the preservation and effectively application and utilisation of both the explicit and tacit aspects of Malaysia's knowledge, its effective management and getting people and organisations to share what they know can this knowledge produce innovative products. This in essence would determine the competitive abilities of the country in its competition with its neighbours in the ASEAN region and in the world at large. As a last word, Malaysia and Malaysians have no choice but to manage what they know if it is to be able to compete in this knowledge era and in a global market place where its competitors are zealously guarding and managing their knowledge to get them on the good foot so to speak.



11. LIFELONG LEARNING AND THE KNOWLEDGE-BASED ECONOMY

Introduction

A certain strange wind is blowing across our global village. This wind is relegating to dump heaps old formulas of success, wealth creation and economic growth. It is confounding the so-called "specialist" and "forecasters" who have always held the view that the foundations of wealth and success were in the control of natural resources. Well, those old foundations of success are gone. For all of human history, the source of success has been the control of natural resources such as land, gold, and oil to mention just a few. Suddenly, the answer is "knowledge." For example, the world's wealthiest man, Bill Gates, owns nothing tangible — no land, gold, oil, no factories, no industrial processes, and no armies. For the first time in human history the world's wealthiest man owns only knowledge. Knowledge is the new basis for wealth. This has never before been true. In the past when capitalist talked about their wealth they were talking about their ownership of plant and equipment and natural resources. In

future when capitalist talk about their wealth, they will be talking about their control of knowledge (Thurow, 1999).

The importance of knowledge as the new lever for creating wealth and for fostering economic growth have prompted talk in diverse circles about how to deal with the new knowledge-based economy. If such is the case, then one can safely say that there is a paradigm shift from a production economy, for which the 19th and 20th Centuries are known for to a knowledge-based economy mostly evolving in the 21st Century. One of the important features for which this knowledge-based economy is renown is the process of lifelong learning. This chapter is about lifelong learning, which this author regards as the cornerstones of the knowledge-based economy (Abdulai 2002).

11.2 What is Lifelong Learning?

Lifelong learning is defined as an "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence, within a personal, civic, social and/or employment-related perspective," it is a learning process that is undertaken regardless of one's age

(http://europa.eu.int/comm/education/life/what_islll_en.html)

Others maintain that it is an attitude and a discipline that extends beyond vocational and work-focus on-the-job training which encapsulates soft-skills such as interpersonal communication, teamwork, emotional intelligence and problem solving. The principal focus of lifelong learning is to maintain longevity within one's working life. The power to maintain such longevity is under the control of the individual not the organisation he or she works for (Holmes, 2002). As the name implies, it means that an individual engaging in learning, formally or informally throughout their life time, not because they are forced to do it, but because they want to acquire knowledge, skills, and competence to enhance their productivity for the rest

of their lives and in a way to give meaning to their lives. In sum, lifelong learning therefore is:

- Acquiring and updating all kinds of abilities, interests, knowledge and qualifications from pre-school years to post-retirement. It promotes competences that will enable each citizen to adapt to the knowledge-based society and actively participate in all spheres of social and economic life, taking more control of his or her life.
- Valuing all forms of learning, including: formal learning, such as a degree course followed at university; non-formal learning, such as vocational skills acquired at the work place; and informal learning, such as inter-generational learning, for example where parents learn to use ICT through their children, or learning how to play an instrument together with friends.
(http://europa.eu.int/comm/education/life/what_islll_en.html)

It should therefore be made clear that an employee attending a training programme because top management forces them to cannot be classified as lifelong learning. This is because, the employee is forced to attend because of coercion and might be physically present at the training programme but mentally absent and may end up in learning nothing. Similarly, if attending a conference is regarded as part of one's continuous professional development, most employees would attend such a conference and might even keep logs of all conferences attended to please their top management. But it can be said that most would attend these conference but learn nothing, because for these people, learning is not the driving force for going to these conferences. Thus in a way, training and conferences as examples, even though they play a part in the whole equation of lifelong learning, they by themselves alone do not entail lifelong learning unless it is part of an "attitude" and an individuals "willingness to

learn" throughout their lives. It cannot be forced upon them, it must be something they want and like to do.

11.3 Forms of Lifelong Learning

Holmes (2002) offers in his book *Lifelong Learning*, four forms of lifelong learning. The first form is personal development, which is more of a way for individuals to develop their inter/intra personal skills and capabilities. The second is planned development, which refers to the individual undertaking formal courses leading to degrees and technical qualifications as well as various forms of training received during the working lifetime of the individual. This conscious effort on the part of the individual to pursue formal learning which could lead to their been awarded academic laurels is usually a concerted effort to better themselves. The third is accidental development, that aspect of learning, which is totally unplanned and occurs during ones working or non-working lifetime. These could be the case when by virtue of the fact that one is employed in a particular company or industry, they are sent for training or to attend a certain course to better enhance their abilities on the job. The final aspect is experience-based learning, which is through learning by doing, by observing others or skills acquired by continuously working on the same task. This aspect of learning is akin to the case of an apprentice, who acquires the skill of a certain job by doing the same thing over and over. Other ways one can learn is from the customers, colleagues, from the success and failures of others, from daily routines, a safe way to test new ideas or from books as well as working on projects.

11.4 How did Lifelong Learning Evolve?

Lifelong learning is not a new idea. Learning throughout ones lifetime has been around before the Renaissance but gained currency during the era of the Renaissance around the 14th

century. Today, lifelong learning is becoming increasingly popular because organisations, governments and individuals are becoming increasingly vulnerable to advancements in ICT, political and social globalisation, as well as a more competitive global economic environment. An increasingly competitive global environment has forced many corporations and businesses to merge, acquire others or move their manufacturing operations to cheaper countries outside of their home bases as it pertains to labour and production costs. Furthermore, there is an increase in the competition for the development and sale of knowledge products and services due to the advancements in technologies; companies who want to survive must develop competencies in this area. Knowledge workers are needed to develop these competencies. These aforementioned are some of the causes of uncertainty and have forced organisations and companies to rethink their hiring practices that would help them develop the requisite competencies to compete in the knowledge-era. It therefore requires a new kind of worker, one that is willing to unlearn, relearn and be engaged in lifelong learning to continuously update their skills.

One can also say that, in a way, the evolvement of lifelong learning began with the death of the concept of "lifelong employment" — the concept where one finishes college and got a job, where they worked until they retired. This was particularly common in Japan. Those days are gone and has ushered in a period of uncertainty where a persons longevity on a job depended on what they know now and how what they know now is of benefit to the organisation and for how long. When their usefulness to the organisation is over, the possibility of keeping them on the job much longer depended on their ability to unlearn what they know, relearn new techniques and skills and continue to learn throughout their lives to survive. If there is the feeling that we are now living in the era of "corporate

sweatshops," it is true. It is a new era where white-collar workers are increasingly over worked, under-paid, working longer hours under tight deadlines (Andresky, 2001). This creates a lot of stress, anxiety and ill health. This is due to the fear on the part of employees that they would lose their jobs. But equally, the companies these employees work for are now faced with competitive pressures from upstarts, more versatile competitors and the forces of globalisation. They must be innovative and competitive or would be forced to close shop. It can then be observed that this pressure is passed on to their employees. For the employees, embracing lifelong learning is one of the best ways to guarantee their survival in this competitive environment.

11.5 Lifelong Learning and the Knowledge-base Economy

Advances in ICT have changed forever the way we study, work, do business and live. Futurist like Alvin Toffler orchestrated the dawn of this era in his book, *The Third Wave*. In it Toffler mentioned that a new civilisation would emerge that would challenge our old assumptions, old ways of thinking, old formulas, dogmas and ideologies, no matter how cherished and useful they were in the past (Toffler, 1980). Today, one can comfortably say that the only thing that is certain is change, hence no condition in life is permanent. Ralph Waldo Emerson (1803-1882), the American author, puts it best when he said "there are no fixtures in nature. The universe is fluid and volatile. Permanence is but a word of degrees." Thus in the era of the knowledge-based economy, the idea that one could go to college and get a diploma and subsequently join a company and work until they retire is a thing of the past. One example that points to this fact is the plight of the "Salary Man" in Japan. The "Salary Man" during his day offers a good example of the aforementioned scenario. They finished school and gave their loyalty to the company they worked for and in return the company guaranteed

them employment until they retired. Times changed but the "Salary Man" refused to change and they are now becoming relics of history. Most of them in Japan today are jobless, homeless or have committed suicide (Pesek Jr., 2003).

Lester Thurow recounts a similar situation in his book, *Creating Wealth: The New Rules for Individuals, Companies and Countries in a Knowledge-Based Economy*, the example he gave is from Montana in the U.S. where he grew up. According to Thurow, high school graduates who started out as labourers in the copper mines could count on good wages as well as upward mobility at the time he was growing up. They were guaranteed movement from labourers to operators, to blasters to positions of contract miners. The earnings of these miners at that time were commensurate to that of college graduates (Thurow, 1999). Such is history today. Similarly, skilled workers and college graduates are losing their jobs due to downsizing, lay-offs, and the shift of large corporations to smaller companies as well as rapid technological changes. There are so many examples that serve as a testimony to this fact to list here.

The foregoing examples all point to the fact that it is thus imperative for workers and those who are seeking to be employed for all their lives to continuously learn throughout their lives. Peter Drucker puts it best when he said "continuous learning during one's working life will increasingly be a requirement for any knowledge worker" (Drucker, 1995). He adds in another book, *The New Realities*, that "engineers ten years out of school are already 'obsolescent' if they have not refreshed their knowledge again and again. And so is the physician, lawyer, teacher, geologist, manager and computer programmer" (Drucker, 1989). Louis Ross, Chief Technical Officer of Ford Motor Company adds to the importance of Drucker's observation in his address to engineering students when he said, "In your career, knowledge is like milk. It has a shelf life stamped right on

the carton. The shelf life of a degree in engineering is about ten years. If you're not replacing everything you know by then, your career is going to turn sour fast" (Tapscott, 1996). But so it is in the way things are today. One must continue to learn and enhance themselves or become relics.

It is not the issue of securing lifelong employment alone that is the push factor for lifelong learning. Another reason is in the significant difference in the organisation of production as it pertains to a production economy to that of a knowledge-based economy. In a production economy, production is organised in mass form, while in a knowledge-based economy, it is organised in a flexible form; this saves on inputs and labour cost, which is not the same in the production economy. Furthermore, innovation is the key driver of growth in the knowledge-based economy, and in the production economy, it is capital and labour. Innovation requires a continuous process of lifelong learning and research. The catalysts of such innovation are knowledge workers and they must engage in lifelong learning to give them the competitive edge of continuously enhancing their knowledge to be innovative (Abdulai, 2001).

Finally, people should undertake lifelong learning not only for employment purposes but also for self-improvement and enhancement. Today, "an expert is no longer someone who did something right once. An expert is a person who keeps up because knowledge doubles every 18 months" (Tapscott, 1996). In a constantly changing world where knowledge is constantly expanding, it is imperative for all those who seek self-enhancement and improvement to undertake lifelong learning and to see it as a natural part of their lives. Lifelong learning would also help citizens contribute as well as participate fully in their contribution to the socio-economic and political growth of their various countries. The continuous importance of lifelong learning in the era of the knowledge-based economy cannot be

emphasised enough. The foregoing reasons point to why lifelong learning is the cornerstone of the knowledge-based economy.

6 Some Characteristics of Lifelong Learning

Lifelong learning is a process and for those who must embark on such a journey, it is of utmost importance to change one's attitude towards learning, especially learning throughout your lifetime. Such an attitude must be one centred on the willingness to better oneself not because you are forced to do so, by circumstances or for job related purposes (Said, 2002). One must therefore be self-motivated to be able to undertake learning throughout their lifetime. Lifelong learning must therefore be seen as acquiring food to nourish the brain. Because it is an intangible process, one must be enthused to undertake it.

Another important characteristic of lifelong learning is that one must have the attitude and the willingness to move out of one's comfort zone. It thus requires a person who is willing to embrace change. But to embrace change, they must create change or be change agents as already elucidated on in this book. It thus requires the will to learn something new. Where one has the will, they would always find a way to undertake lifelong learning. These change agents see opportunities in change and are willing to take the chance and in the process they develop themselves. For most people who are comfortable in their current positions, they are not willing to take a chance and hence would only be forced to learn when they are out of a job or by circumstances. Such a move is more of a reactive measure and usually the results are not sustainable.

Another of the most important characteristics of lifelong learning is that it is not a linear product, like going through a formal learning process, attaining some academic laurels or knowledge or skill about an issue or process and that spells the end of learning. It should rather be viewed as long-term process

of gaining from both codified and tacit knowledge, and as a capacity for a person to expand his or her capabilities in this world of infinite opportunities. It also requires the willingness to challenge established assumptions and practices, yet at the same time, one must be adaptable to different environments and the changes that they entail. Lifelong learning also requires creativity and flexibility. Creativity to enhance the ability to synthesis and disseminate knowledge, and the flexibility to know when one is wrong and willing to change (Banjunid, 2001).

Finally, lifelong learning is the *sine qua non* of any learning society or organisation. In a knowledge-based economy, societies and organisations that refuse to learn, unlearn and relearn or for that matter continuously learn are doomed to be dinosaurs. As our world today grows in complexity, fostered by advancements in ICT, individuals, organisations and societies must regularly and rigorously learn to enable them to adapt rapidly to changes in the global environment. This will afford them a much better chance of survival and growth (Garrat, 2000; Tan, 2001).

11.7 Ways to Achieve Lifelong Learning

Lifelong learning can be achieved in many forms. Some of these include: Enrolling in courses, attending seminars, learning-by-doing, shadowing, secondments, self-directed learning and e-learning. Enrolling in new or cutting-edge courses in a different area of study after the college years is one of the ways to enhance continuous learning as one embarks on the lifelong learning journey. It teaches new skills and fits you with new lenses to see opportunities not previously opened to you. Attending seminars also offer such an advantage except that the time duration is shorter, usually a day or two. Seminars are particularly good for busy people. Learning-by-doing is more like on the job training, where the continuous performance of a task could lead to a mastery of such task. Shadowing is the case where a

trainee/associate is asked to follow closely behind a master or a more skilled person in a requisite area to learn either by observing or been asked to perform specific duties in the process.

Lifelong learning can also be in the form of an assistant or aide learning from observing his superior in action. Finally, lifelong learning can be achieved through the teaching of oneself something new. Of late, lifelong learning is enhanced with e-learning, where one can learn anytime, anywhere and at their own pace. E-learning has made it easier for those with busy schedules as well as those who otherwise were unable to undertake lifelong learning/continuous learning because of distance and time are now able to do so with the advancement in ICT.

Above all, achieving in lifelong learning require a commitment on the part of anyone who undertakes it. It must be a commitment to learn not because one is forced to do so. Also, it requires a commitment to unlearn old and archaic ways of doing things and most importantly, the willingness and the commitment to relearn new things. The final commitment is that of willingness to repeat the foregoing process in the future and throughout your lifetime in today's competitive global environment.

1.8 Lifelong Learning: Opportunities and Concerns

Lifelong learning offers numerous opportunities to individuals businesses and governments. For a country, the development of a lifelong learning culture would ensure continuous growth and development in an increasingly competitive globalised economy, which is knowledge-based. Without the continuous renewal of the knowledge of their citizens, they would not be competitive and it could adversely affect the productivity of the country. The outcome could be the non-competitiveness of exports from the country and it could affect balance of payments as well as government expenditure.

Furthermore, through lifelong learning, the knowledge and abilities of individuals are harnessed to enable them seize the opportunities afforded by an increasingly globalised world, which is now knowledge-based. It is true that human capital is becoming the definitive competitive instrument in the knowledge-based economy. Lifelong learning would therefore offer individuals the opportunity to benefit from the knowledge-based economy.

Similarly, business would need to produce innovative and competitive products for the global market place. The inability to produce innovative and competitive products could affect the growth of the business and in some cases the folding-up of operations. Businesses and their employees would therefore need to continuously train and learn to afford them the opportunity to be able to produce innovative and competitive products. The employees who are the knowledge-workers would need to engage in lifelong learning to be competitive and to be able to contribute to the production of innovative products for the continuous growth and sustainability of the business.

For individuals, lifelong learning would enhance their chances and would help them improve upon their skills and qualifications to help them in their job and income earning prospects. Lifelong learning would also open opportunities to people, who are economically inactive, by enabling them to gain knowledge and skills for subsequent employment. By so doing, it promotes social equity and inclusion in a society. But lifelong learning is another way to gain new knowledge for personal satisfaction and growth (ILO, 2002).

Unfortunately, not all people are going to be able to undertake lifelong learning. This could be due to lack of resources, amenities or opportunities. At the global level, poor developing countries face the task of the ability to finance lifelong learning programmes for its citizens, to enable them

seize the opportunities that the global market place as well as the knowledge-based economy has to offer. In most cases, they do not even have established policies and systems in place to foster lifelong learning (ILO, 2002). If such is the case, how can they benefit from the advantages lifelong learning has to offer its citizens? It is therefore a major concern and has been an issue added to the chorus of voices from the South against globalisation. This same observation can be applied at the national level in most countries where there are enclaves or segments of the people who are poor and are likewise are unable to take advantage of the opportunities the new knowledge-based economy offers, because of lack of resources to enhance their abilities, capabilities and skills.

Thus, as others talk about the digital divide, what would become apparent is the skills gap. For most people in developing countries who may not have the ability and the luxury to undertake lifelong learning, they may be condemned to low-paying and menial jobs. That is for those who are lucky to get a job. Consequently, the increasing skills gap would translate to a wider income divide. This skills gap in my view would be wider between developed and developing nations, and between well-off enclaves and the less well-off enclaves in developing countries. The social consequences for national and international governments are looming concerns that cannot be ignored.

Why Should Malaysians be bothered with Lifelong Learning?

As Malaysia moves to the knowledge-based economy and aspires to be a developed nation by the year 2020, lifelong learning would be an indispensable feature of such an effort. For Malaysians, embracing lifelong learning would be a process of investing in their future and as we know, those who do not invest in their future, as Ron Sommer said, would not have one. By

Malaysians embracing lifelong learning, they will be investing in their futures as well as increasing their employability, a potential of increased earnings and the ability to contribute to the movement of the country to the knowledge-based economy as knowledge workers.

Economically, embracing lifelong learning by Malaysians will contribute to the competitiveness of Malaysian businesses and indirectly contribute to the competitiveness of Malaysian goods and services in the global market place. This is because a highly trained and educated employee is an asset to any company and its bottom-line. It is also a pull factor for foreign direct investment, since most investors are looking to invest in locales where they can find a better-educated work force at competitive wage rates. The latter reason offer a strong reason why a company is willing to retain these workers. This will increase employment in the economy, the creation of satisfied workers which all go a long way to benefit the government through the realisation of individual and corporate taxes necessary for the undertaking of social projects and servicing of recurrent expenses.

Furthermore, Malaysians should realise that, the ability to learn is an essential skill they need if they are to cope and survive with the increasing demands of the modern workplace. This is because the organisations of today and in the future would need people with the ability to learn and change and as we are aware, over 50 percent of the skills of all employees become obsolete within 3-5 years and the necessity to learn and continuously learn just to keep up cannot be emphasised (Holmes, 2002). Furthermore, policy makers in Malaysia realise that if the country is to be able to attain its Vision 2020 and to sustain its movement to the k-economy, lifelong learning amongst its populace is indispensable. Thus the government has put in place the requisite platform to help the people acquire knowledge and to continuously learn. Ultimately, the responsibility to undertake

lifelong learning rests with each individual Malaysian. The government can only try but the people must take advantage of whatever programmes are put in place by the government. The Deputy Prime Minister of Malaysia, Abdullah Badawi puts it best when he said, "ultimately, attitude and an inclination to better oneself would be the most powerful tool in motivating lifelong learning," he added, "everybody should adopt the mindset that education is a process that is on-going from the cradle to the grave ... in some ways, lifelong learning is a difficult attitude to adopt as it requires people to keep moving out of their comfort zone to master new skills and absorb new knowledge" (Said, 2002). But even though it is a difficult attitude to adopt, it is what is going to define the survival of any worker in the knowledge era, which is defined by dynamic changes.

Malaysians should be bothered about lifelong learning because if they do not engage in lifelong learning, others, their competitors are going to and would enhance and leverage their knowledge to compete effectively with Malaysia and other countries in the global marketplace. If Malaysia cannot compete effectively, it would be swept away by this tide of competitive change. This realisation has sunk in amongst citizens of developed countries. In fact in some countries in the West, comprehensive programmes for lifelong learning are put in place. For example in the United Kingdom, they have in place what they call the "University for Industry" programme which helps to improve access to existing education and training opportunities as well as finding ways to fill new gaps and to exploit the potential of new technologies. Each individual is also provided with an "Individual Learning Account" to help him or her plan and save towards his or her learning and continuous learning process. In fact, the United Kingdom also appointed a "Minister for Lifelong Learning" pointing to how committed they are to such an effort. In Wales, the National Assembly has appointed a

Minister for Education and Lifelong Learning, a testimony to its commitment and as its strategy to develop an inclusive society where everyone has the chance of fulfilling their potential; it is a commitment to equality of opportunity and to make this a reality for Wales to prepare for the knowledge driven world (http://www.walesworldnation.com/wwn_english/econ/life_long.htm).

Canada has also developed programmes to enhance the lifelong learning capabilities of its citizens. Speaking at the launching of a joint-venture project between the National Literacy Secretariat (NLS) and the Social Sciences and Humanities Research Council of Canada, the Minister of Human Resources and Development of Canada said, "literacy remains a key factor in Canadian's ability to participate as full and active citizens in all facets of Canadian life and to meet the economic and social challenges of the globalised knowledge-based economy." The commitment and the enhancement of lifelong learning capabilities of all Canadians is the key to meeting these challenges. (<http://www.hrdc-drhc.gc.ca/common/news/hrib/99-73.shtml>)

11.10 Analysis and the Way Forward for Malaysia

In this chapter an effort had been made to show that with the movement towards the knowledge-based economy, individuals, businesses, organisation and nation states must continuously foster lifelong learning to afford them the competitive advantage to be able to benefit from an increasingly globalised world. Lifelong learning is then recognised as the cornerstone of the knowledge-based economy. It has also been pointed out that to be able to benefit from lifelong learning individuals and organisations must have the will and the attitude to continue to learn throughout their lives. The opportunities to be gained from undertaking lifelong learning for the individual, business or

organisation are numerous. These range from enhanced job prospects to the development of innovative products as well as personal satisfaction. For nations, lifelong learning can afford its citizens the ability to enhance their skills to contribute to economic development and growth. The lack of economic development and growth could lead to social problems, which no government wants.

It has also been pointed out that despite the benefits that lifelong learning hold, many in the developing world would not be able to benefit from it due to lack of the requisite resources to undertake lifelong learning. The concern is that it would lead to the widening of the gap in skills between the developed and developing countries. The adverse effect on incomes is clear. It would also widen the income divide. So what should be done?

At the international level, all countries should integrate lifelong learning into their institutional frameworks. This can be done through the following recommended ways:

- Build the foundations for lifelong learning with the emphasis on learning to learn skills.
- Develop policies and institutions for ensuring equity in access, particularly of the disadvantaged groups to lifelong learning opportunities.
- Mobilise the necessary resources to make lifelong learning opportunities widely available.
- Ensure collaboration among a wide range of partners and stakeholders.
- Develop policies and institutions to recognise all forms of learning, even informal learning.
- Design guidance counselling programmes for lifelong learning (ILO, 2002).

At the national level, the government of Malaysia should provide the basic infrastructure and infostructure that would enable lifelong learning to thrive in their societies. The requisite policies must be put in place to make it easy for citizens to undertake lifelong learning. Provision of study loans and grants to help people to pursue lifelong learning are steps in the right direction. Mention has already been made about how a country like the United Kingdom has appointed a Minister for Lifelong Learning. Others like Canada have elevated lifelong learning to a priority position in their national agenda. It is hoped that the government of Malaysia can learn from these examples.

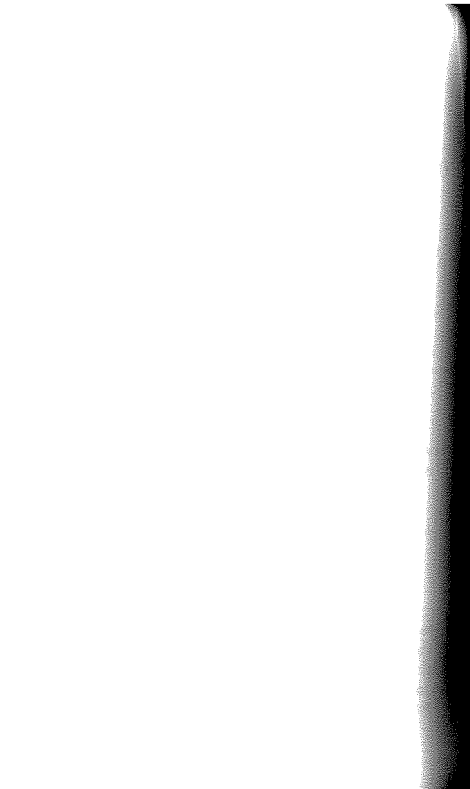
The government can also form public-private partnerships to help foster the growth of lifelong learning activities in the country. The government could contribute either seed money or tax incentives to companies to serve as an impetus for such a partnership. The private sector as whole in Malaysia can play an important role in fostering lifelong learning. For example, in countries like the United States, companies like Motorola, McDonalds, Xerox, have all set up corporate universities to foster continuous learning as well as lifelong learning for its employees and associates. The private sector could also contribute to support cutting-edge programmes in local universities that support lifelong learning opportunities for their employees. The benefit to the company and the nation as a whole has short-, medium- and long-term benefits, that cannot be measured in dollars and cents.

Finally, non-profit organisations in Malaysia can also contribute to enhance lifelong learning in their communities and throughout the country, especially in rural areas. This could be through the offering of short-term courses, workshops or seminars. Non-profit organisations can fill the gap that private businesses and the public sector are unable to fill. Their positive roles in the development of rural areas and their services to

under-privilege and less fortunate communities need to be applauded. It is hoped that they can also undertake work in the area of the promotion of lifelong learning.

11.11 Conclusion

The arrival of the knowledge-based economy has brought with it new ways and rules of success. Ownership of land, labour and capital alone now do not guarantee wealth and success. Rather the generation, ownership and control of knowledge is the key to success and wealth in this digital era. What is then true of this era is that, to be able to generate and effectively apply knowledge to the growth and development of a country, a business or an individual, must continuously learn, and indeed learn throughout their lifetime. Those who think learning stops once they graduate from school are in for a big surprise. In this increasingly competitive global environment, they will be left behind. Lifelong learning is therefore the *sin qua non* to those organisations, business and individuals who want to survive and prosper in the knowledge-era. Lifelong learning therefore is the cornerstone of today's knowledge-based society.



12. THE OTHER SIDE OF THE DIGITAL AND KNOWLEDGE ECONOMY

12.1 Introduction

In 1883, Herbert Spencer, the English philosopher wrote, "give us a guide," cried men to the philosopher. "We would escape from these miseries in which we are entangled. A better state is ever present to our imaginations, and we yearn after it; but all our efforts to realise it are fruitless. We are weary of perpetual failures; tell us by what we may attain our desires." "Have a little patience," returns the moralist, "and I will give you my opinion as to the mode of securing this greatest happiness to the greatest number" (Spencer, 1883). The cry of humans from the time of their creation until today has always been a discontent for their surroundings of both physical and non-physical. Fortunately, technology has enabled humans to modify these surroundings and have offered the ability to solve some of the problems they are plagued with.

But increasingly, humans are frustrated with the accompanying headaches that come with these gains in technology. Perhaps, humans have forgotten that, "technology demands more, not less, human work to function. And it

introduces more subtle and insidious problems to replace acute ones. Nor are the acute ones ever completely eliminated; in fact, unless we exercise constant care and alertness, they have a way of coming back with a kind of new strength to haunt us. We are on a treadmill that we can no longer dismount from. We cannot turn our back to a wholesome past, if only because the past, while sometimes more decorous, was far messier than we realise or perhaps can realise (Tenner, 1996).

This observation by Edward Tenner and many others like it points to the double-edge sword-like nature of technology. As our generation have started the embrace of ICT, we are beginning to see the proliferation of some of its "dark-sides" — identity theft, spam, unleashing of computer viruses, hacking, denial of service, cybersquatting, to mention just a few. All these new headaches fall under the rubric of Cybercrime. The issue of Cybercrime would be one of the most important problems that this generation would have to deal with in this ICT era. It is thus and issue this book has decided to touch on because as Malaysia moves to the k-economy and as its people, as well as businesses in the private and public sector increasingly embrace ICT, they would also be increasingly exposed to the threat of Cybercrime. This observation is in no way to raise any unnecessary alarms nor to say that because of foreseen increases in cases of Cybercrime, we should develop a Luddite mentality and slam the door on ICT. We cannot and should not. Rather, workable solutions and contingency plans should be put in place to mitigate against any future devastative effects of Cybercrime.

12.2 Technology the Double-edge Sword

Technology is regarded as a resource that can bring about the economic growth and development of nations. It can thus be regarded as a major instrument used in wealth creation. A testimony to this is by looking at most of the developed nations

our world today. Most of them have attained their wealth and development by effectively utilising technology. But technology is also an instrument that can allow its owners to exercise social control in various forms. George Orwell's famous book, 1984 attest to this. Furthermore, technology also can be said to have a way of affecting the modes of decision-making. More importantly, technology relates directly to patterns of alienation, a characteristic of affluent societies (Goulet, 1977). If we transpose ICT in place of the world technology, it would point directly to our current global digital environment, an environment where information and communication technologies have drastically affected our lives. It has also created a yawning-gap, a digital-divide. If so, to hold the view in this paragraph that technology is an instrument of alienation and division, would be an antithesis to the idea that technology can bring about economic development. This is so because in most cases it has succeeded to create a gulf between the "haves" and the "have-nots." Yet, the claim by others that technology has bridged the gap between the "haves" and "have-nots" is also strong and has been proven.

Before one gets carried away with the concept of technological determinism or technology as an instrument of alienation, there is the humbling lull of the numerous technological disasters to remind us of the indeterminate nature of technology. Furthermore, the double-edge sword nature of technology is humbling. It saves us from one constrain to introduce another. It bridges the gap in one way to widen it in another. Then, Jack Ellul's observation of technology as it pertains to its deterministic or indeterministic nature, if any would suffice here: "the technical phenomenon has assumed an independent character quite apart from economic considerations, and that it develops according to its own intrinsic casual processes, independent of external forces or human aims" (Ellul, 1965). Thus one can conclude that today's digital and knowledge

era crimes are part of these phenomena. To the technophobe and technophile alike, welcome to a brave new generation, the Cybergeneration with its attendant phenomena and headaches.

12.3 Cybernation, Cybergeneration and Cybercrimes

The digital and knowledge era has ushered in a new kind of nation — the Cybernation. Most of the inhabitants of this Cybernation are connected to each other and to the *Information SuperHighway* (ISH) by computer networks, the use of Cellular Phones, Personal Digital Assistants, Satellites and numerous electronic gadgets. They have developed a different kind of language and they speak in what I call "computereese" where the use of words like "bytes", "hertz", "firewalls", "downloads" to name just a few are common. In this new Cybernation, people "telecommute," "share and swap files," or "chat in chat-rooms," using their "e-mail accounts", to post their information/messages on their "websites", "SMS each other" and work in "real-time." It is also a "nation" where until recently, most of the profitable businesses which created "instant" millionaires were called "dotcoms." One important characteristic of this "nation" is that it is built on knowledge not brawn, nor does it have any regard for age, colour, religion or gender. What is for sure is that, it scares a lot of the population of the production generation (P-generation) because most of them have not or refuse to be part of the Cybergeneration. Many claim that those of the P-generation who refuse to become part of the Cybergeneration could go the way of the dinosaurs.

Most of the generation of this era, the Cybergeneration as this author prefers to call them, cannot "survive" without their Cellular Phones, Electronic mail (e-mail), PDA's, and other electronic gadgets. The reason they often give is that, it enables them to be organised and to be productive. These gadgets also enable the new Cybergeneration to be able to transact business

24/7/52/365¹. Thus, the challenge of distance, time and space has been defeated, they hold. Apart from the numerous advantages of this Cyber-era, it has also introduced numerous problems and challenges. One of the most important problems is Cybercrime or the use of the computer and other electronic devices common in today's Cybernation to commit crimes. These crimes are of economic, political and social nature. A recent survey of 500 computer practitioners conducted by the U.S. Federal Bureau of Investigations (FBI) and the Computer Security Institute, showed that 80 percent acknowledged financial losses to computer breaches. Of the 223 respondents who quantifies the damage, the average loss was US\$2 million; loss of proprietary company information cost averaged US\$6.5 million; while financial fraud averaged US\$4.6 million an incident (*New Straits Times*, 2003, p.10). Another example is the case of the 23-year college student, Mark Simeon Jakob, who with a single computer keystroke staged one of the biggest Internet frauds by manipulating the stock of Emulex Corporation. His scheme — sending a false press release designed to topple Emulex's share price netted him more than US\$241,000 in profits while costing investors US\$110 million (*The Star*, 2000, p.40). A variant example is the case where Philip Cummings, a former employee of Teledata Communications, in Bayshore, New York orchestrated one of the largest identity theft scheme in U.S. history. Cummings and his accomplices who had access to consumer credit information from three commercial credit bureaus — Equifax, Experian and TransUnion and sold this information to crooks who used them to steal millions of dollars by running up charges (*New Straits Times*, 2002, p.B20).

¹ 24 hours a day, 7 days a week, 52 weeks in a year 365 days a year.

12.4 Cybercrime and Cybercriminals

Globally, millions are connected to the ISH daily, millions use it to transact business, to communicate and to reach out and touch family and friends. The ISH or the Cyberworld as some would call it has gained popularity because it is considerably cheap, efficient and information can be sent and received from any part of the world instantaneously amongst others. The same advantages that have made the ISH appealing and much used are the same ones that have attracted the criminal elements of our world to shift their clandestine and dubious activities to the Cyberworld, thanks to digital technology. The shifting of their clandestine activities to the ISH and the increase use of computers for criminal activities has given rise to what is termed as Cybercrime. So what is Cybercrime⁷ and who is a Cybercriminal? In this book, Cybercrime would be describe as the engagement in any illegal or an authorised use of the computer or any digital devise to break into other computers, download information, engage in illegal lewd social unacceptable acts, identity theft or engaging in acts of sabotage. Some of these acts include, industrial espionage, credit card fraud, electronic funds transfer fraud, ATM fraud, cloning of mobile phones, deliberate introduction of viruses, software piracy to mention just a few. Some of these criminal acts have cause billions and millions of dollars in damages to businesses and their computer and information systems worldwide. The "I LOVE YOU" computer virus, which originated from the Philippines, infected over 3.12 million files worldwide and caused billions in damages

⁷ Other types of Cybercrimes included in this definition include all crimes committed in Cyberspace and others like, snooping, spoofing, spamming, mail bombing, hacking, domain name hijacking or cyber-squatting, denial of service, server takeovers, laundering money over Internet, electronic money transfer fraud, cyber-terrorism and sales/investment frauds to name just a few.

Other notorious viruses have been, the "Michael Angelo", "Wazzu" and "Mellisa" to name a few. Hence, in this book, anyone who is caught, tried and found guilty by a court of law for engaging in the above-mentioned criminal enterprises using the computer or any digital device, on the ISH can be classified as a Cybercriminal. Others would maintain that even if they have committed the crime using these devices and are not caught, they still fall in the category of been regarded as Cybercriminals. Obviously under this broad categorisation, Cybertorts could be added. Cybertorts are acts that may not carry the same weight as crime acts such as fraud using the computer or digital devices. Nevertheless, the impact of such Cybercrimes/torts on the society at large cannot be emphasised enough. So what is the motivation behind such Cybercrimes?

5 Motivations behind Cybercrimes

Jack Bologna and Paul Shaw writing in their book, *Avoiding Cyberfraud in Small Businesses*, offer four major reasons that serve as motivations for Cybercrime by Cybercriminals. These are:

- Economic
- Egocentric
- Ideological
- Psychotic

According to Jack and Paul, because there is a lot of money to be made in Cybercrime, the economic motive is rather easy to understand, credit card, financial and other trade secrets information that can be stolen by Cybercriminals often can be sold or turned into economic benefit. The egocentric motive usually entails some kind of bravado. It is always the desire of some of these Cybercriminals to prove that they are not afraid of technology and are thus not victims of it. In their world, they

have mastered, even control technology well to be able to use it for their criminal acts or to show that they can compromise it. Kevin Mitnick, convicted in 1989 of unauthorised invasion of computer databases is an example of an egocentric Cybercriminal. According to Mitnick, he got hooked on exploiting technology for adventure, the thrill and intrigue. This egocentric attitude is the example of an egocentric Cybercriminal and they always believe they will never get caught, because they are "too smart." Such a folly is usually their downfall as Mitnick's arrest and conviction proves (Mitnick, 2002).

The ideological motivated computer criminal is said to belong to a cult, extremist group, and a radical political group who undertake such computer crimes to further socio-political and religious goals. Others use such intimidating tactics to stop or harass professional researchers working on a specific project to abandon or alter a research. Those who undertake such crimes due to a psychotic motive may be because of their distorted sense of reality, or due to some delusion, obsessions or compulsions (Bologna and Shaw, 2000). For example, a group calling itself Electronic Disturbance Theatre (EDT), regarded by some in ICT world as "hacktivists" or "electrohippies" have been conducting Web sit-ins against various sites for various political causes. This is achieved through the mobilisation of masses of "hacktivists" to point their browsers at a targeted site and using software developed by them flood the targeted website with repeated and constant download requests and end in shutting it down.

Finally, an often-overlooked motive for Cybercrime is that of revenge by an ex-employee or an employee that has an axe to grind. Disaffected employees might feel slighted by a certain action on the part of the management; disaffected ex-employees who are fired from the company or made redundant usually can sought revenge especially if they hold a grudge in this technological era. This does put most companies at a

disadvantage or exposes them to the vulnerabilities of Cybercrime (Marsland, 2000, p.v).

2.6 Cyberterrorism and Cyberwarfare

Another very important challenge that Malaysia will face as it moves to the next phase of its transition to a K-economy is Cyberterrorism or the possibility of being entangled in a Cyberwarfare. But what is Cyberterrorism? Is it different from Cybercrime? Cyberterrorism can be classified as Cybercrime, the only difference from the view of this author is the magnitude, strategic and hostile nature of the Cyberattack especially against the "critical infrastructure" of a country. Cyberterrorism can be described as an unprovoked, deliberate, premeditated, planned and targeting of an unlawful attack with the intention to harm and destroy computers, networks or any such critical infrastructure of a country or organisation, and the information/data stored in them as a coercive or intimidation or malicious malign tactic to force a government, business or organisation to act or acquiesce to the terrorist's demand. If such is achieved, the terrorists have furthered their socio-political or economic objective. According to Professor Dorothy Denning of Georgetown University in Washington, D.C., for a Cyberattack to qualify as Cyberterrorism, it should also result in violence against persons, property, or at least cause enough harm to generate fear. Some of these attacks could also lead to death or bodily injury, explosions, or severe economic loss. According to Professor Denning, attacks that disrupt nonessential services or that are a costly nuisance would not fall under the category of Cyberterrorism, they will fall in the same category of other Cybercrimes (<http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html>), (<http://www.cs.georgetown.edu/~denning/infosec/cyberterror.GD.doc>).

So what are some of the known methods that Cyberterrorist use? Some of these include, Radio Frequency Weapons, Transient Electromagnetic Device (TED), Electromagnetic bombs, computer viruses and Tempest monitoring devices. Most of these weapons enable the Cyberterrorist to be able to attack from a distance and can enable them to be undetectable. Radio Frequency Weapons can be used to enter the electronic system of the victim through the "front or back door" and can burn or destroy the system of the victim. TEDs are used by Cyberterrorist to emit large burst of energy, which can "spike" multiple targets. In the case of the electromagnetic bomb, Cyberterrorist use them to inflict severe and devastative damage on the target. Its impact is similar to the destructive effects of the striking of lightning, especially when it hits the target (<http://ntrg.cs.tcd.ie/undergrad/4ba2.02/terrorism.html>). One thing that can be said about the methods used by Cyberterrorist would depend on the advances in technology. Advances in technology enable these Cyberterrorist to come up with new and sophisticated ways to carry out their acts. We should also add that the motives of the Cyberterrorist fall under the ideological and psychotic explanations for Cybercrime, already given in this chapter. There are those who may feel the need to separate political motives from ideological. I will contend that they are intertwined and it would be difficult to draw a fine line in this instance.

Despite the dangers posed by Cyberterrorism to the critical infrastructures and other Achilles heels of countries, there are some who hold the view that Cyberterrorism is a myth. One of the people who hold the view that Cyberterrorism is a myth is Joshua Green, an editor at *The Washington Monthly*. According to Green, "there is no such thing as Cyberterrorism — no instance of anyone ever having been killed by a terrorist (or anyone else) using a computer. Nor is there compelling evidence that al Qaeda or any

terrorist organisation has resorted to computers for any sort of destructive activity. What's more, outside of a Tom Clancy novel, computer security specialists believe it is virtually impossible to use the Internet to inflict death on a large scale, and many scoff at the notion that terrorists would bother trying". As a further support of Green's observation, he gave an example of how the U.S. Naval War College contracted with a research group to simulate a massive attack on the nation's information infrastructure. In an exercise dubbed operation "Digital Pearl Harbour," the U.S. government assembled a group of hackers and security analysts in Newport, Rhode Island for the aforementioned war game. The result according to Green was that the hackers failed to crash the Internet, though some serious sporadic damages were caused. The conclusion was that if terrorist were to undertake such an attack, it would require significant resources and country-level intelligence (<http://www.washingtonmonthly.com/features/2001/0211.green.html>).

One may therefore ask, are Green's observations in place? I will contend that Cyberterrorism is not only going to be caused by external terrorist. Internally, within countries and organisations, there could be "insiders" who know the layout of the "critical infrastructure" of their various countries and organisations and could inflict such damages or attacks aimed at the Achilles heels of their respective countries or organisation for an ideological or political motive. Secondly, the mere fact that a simulated war game (Digital Pearl Harbour) did not crash the Internet does not mean that it cannot crash it in the future. As technology advances at the speed of light, it is the ability of these new technologies to arm these terrorists with the abilities to cause such damages to the critical infrastructures of countries that is frightening. Furthermore, Green is only drawing on the U.S. as an experience and example. The U.S. is unique as the world's only superpower with the requisite resources and

technologies to support its strength. Thus, what the U.S. can withstand, other countries would crumble, even if a third of such an attack of such magnitude was launched. Thus, Green's observation that Cyberterrorism is a myth is unfounded and unsound. Rather, it can lull a lot of countries, particularly developing ones to sleep and would be caught off-guard by Cyberterrorist attacks on their critical infrastructures. Developing countries, particularly Malaysia should not fall for such an observation; rather, they should err on the side of caution and be prepared, for as the old adage goes, "prevention is better than cure."

So what should developing countries, particularly Malaysia do? The first suggestion is to borrow a leaf from the Americans, take a critical analysis of the Critical Infrastructure Protection Board they set up and the appointment of a "Cyber Security Czar" to see whether some good aspects of these precautionary measures can be emulated. As Malaysia moves to the next stage of the k-economy, a critical debate should be held on this issue, a cost-benefit analysis applied and the appropriate decisions must be made. Secondly, vigilance must be maintained over the security of the critical infrastructures and computer systems of the country. Any negligence to patch security flaws and having alternative methods in place can be costly if there was ever an attack. Furthermore, as part of the work of the Critical Infrastructure Protection Board, the authorities might consider setting-up a Critical Infrastructure Protection Directorate to assess all and potential Cyber threats as well as undertake simulations and war games of proposed attacks on Malaysia's critical infrastructure and coming-up with appropriate coordinated remedies and alternatives. Finally, there should be greater cooperation internationally in the bid to fight Cyberterrorism and its threats. Malaysia should work with other countries and organisations internationally in the bid to fight

Cyberterrorism and its threats. This is one war that no single country no matter how powerful can win by themselves.

12.7 Cybercrime, its Prosecution and the Adequacy of Laws

One thing that is clear is that cybercrimes or digital crimes usually occur due to opportunities created by an individual or organisational carelessness. For example in organisations where system audits and controls and administration are lax, they could be vulnerable to Cybercrimes. Also, in management environments where controls such as standards, procedures, and policies are ambivalent, contradictory or not documented are also vulnerable to Cybercrime. In management environs where a poor climate exists between the employees and management, these environs could also be vulnerable to Cybercrimes (Bologna and Shaw, 2000).

One of the most important challenges of Cybercrime is that because technological advances are dynamic, it is rather difficult to catch-up with the criminal elements of the Cybernation who are adept at the employment and exploiting the latest advances in technology, particularly ICT, to engage in crime. In fact, these criminals are getting smarter by the day and are beating the system. One can therefore say that, it is rather difficult to catch these Cybercriminals most of who are always one step ahead of law enforcement agents. Not only are law enforcement agencies playing "catch-up," the laws in most countries, developed and developing also have to play "catch-up." Although there might be laws on the book, the existing laws may not be specific enough to bring some of these criminals to book when they are caught and in many cases, the actual law that is broken is usually not very obvious (Barret, 1998). It is also becoming increasingly clear that in certain instances, additional legislation may and is often required in order to deal with certain kinds of Cybercrime

(<http://www.aic.gov.au/conferences/other/urbas-gregor/2001.04cybercrime.pdf>).

In cases where the crime is committed offshore, it is even harder to trace and prosecute such criminals. The problem of the lack of adequate laws to cover Cybercrimes in Asia are of concern, because many cases like on-line fraud and theft cannot be prosecuted in some of the countries without specialised laws. Most of the countries are moving fast to fill such legal vacuums. Hong Kong has set-up a special group to advise the territory's government on new Cyberlaws, South Korea have established an advisory committee on Cybercrime and hope to come up with recommendations to develop Cyberlaws for the country, Philippines and Thailand are rolling out new laws to cover e-commerce and bank secrecy, Malaysia has passed some Cyberlaws. Despite such efforts, it would take a while for all these laws to be put in place and for the courts to be well versed with these laws (*Far Eastern Economic Review*, 2000).

12.8 Cybercops and the Cybernation

Like any nation, the Cybernation also attracts people from all walks of life, without regard to race, sex, religion and class. It also attracts criminal elements such as con men, vandals, crooks, paedophiles, terrorist, and anarchist to mention just a few. The use of the ISH for educational and research as well as communication purposes is now hijacked by these criminal elements. If such acts are not checked and are allowed to get out of hand, it would drive fear into peace and law abiding citizens of the Cybernation. They will fear that by getting on the net, their identities can be stolen, their computers can be hacked, that their kids would be victims of paedophiles prowling over the net or that they are susceptible to a virus attacks, they would keep away from the Cyberworld or some draconian laws may be passed by governments, which could end up with disastrous impacts for the

Cybernation. Just like in real-life, the fear of rampant crime at one's door would cause fear and could result in the slamming of the door in the face of even genuine people. Hence, governments of the world must police the Cybernation to make it safe for its citizens. The issue of Cyber-security should dominate the agenda of governments in this Cyber era. The enhancement of computer and security of technology especially with advanced encryption technologies should be high on technology policy plans of governments (Schneier, 2000). Where laws are drawn to help against Cybercrime, governments must provide adequate resources to enforce them. This includes the recruitment of a new kind of cop, the Cybercop. These Cybercops would work hand-in-hand with regular cops on the beat, but the domain of the Cybercop would be the policing of Cyberspace and dealing with other aspects of new crimes using digital technology and gadgets. The Cybercop must be able to think like the Cybercriminal on the job to be able to catch this new kind of criminal. They must understand the culture and ways of this Cybercriminal to be able to catch them. Thus, if peace and stability is to sustain in the Cyberworld, it would depend on how effective Cybercops are going to police the Cybernation and how dynamic Cyberlaws are going to be to back the work of Cybercops.

12.9 Malaysia and Cybercriminals: A Growing Challenge?

The effort of the Asia region of which Malaysia is a part to benefit from the ICT revolution and the knowledge era is evidenced by the numerous projects put in place for these reasons. They range from Singapore's Intelligent Island effort to Hong Kong's Cyberport efforts to Malaysia's Multimedia Super Corridor. These efforts need to be applauded. But as Asia becomes increasingly wired and ICT savvy, so too are the criminals in the region. These criminals have moved most of their vice activities to the web. In addition to some of the Cybercrimes mentioned in this chapter,

the Cybercriminals in Asia use the web to engage in on-line trafficking of women, drugs, money laundering, extortion and hacking to mention just a few. For example, car smugglers in China are reported to place their orders for cars from Hong Kong via e-mail and websites; Japanese gangs recruit women from the Philippines to work in their brothels using websites; and Hong Kong gangs send intimidation letters by e-mail (*Far Eastern Economic Review*, 2000). In addition, in Hong Kong alone, the number of reported hacking cases rose from just 13 in 1998 to 238 in 1999 and the numbers are rising. In South Korea, the number was 158 in 1998, 578 in 1999 and is growing exponentially (*Far Eastern Economic Review*, 2000).

In Malaysia, cases of Cybercrimes reported are rising. According to the Energy, Communications and Multimedia Ministry, 5,300 reports of Cybercrimes, including 1,400 cases of illegal withdrawals from ATMs were received in 2002 (Abas, 2002). One of the notorious Cybercrimes incidences registered in the country was when hackers identifying themselves as *Topeira* hacked into two websites in the country, one was that of the Malaysian Parliament (www.parliament.gov.my) and the other was that of a local university, University Technology Mara (www.utm.edu.my). The hackers were able to deface the website by removing the front pages of the sites and left the following messages. "Just hacked by topeira.propaganda assim naum.vale.naum ... hauhauhuhahuhaha.mas ... vamo la ... <http://canalgarbage.cjb.net> (naum sei comot tu gosta de uma porra de uma banda dessas)" (Chua, 2000). Hacking of websites in Malaysia has seen an increase from 28-recorded cases in 1998 to 47 in the first eight months of 1999 (<http://www.landfield.com/isn/mail-archive/2001/jan/0073.html>). These are just the cases that are reported. It is believed that many companies who may have their computers hacked may have not reported for fear of bad publicity and the effect on their firms.

These kinds of new crimes are those law enforcement agencies in Malaysia would have to deal with in this digital era.

Apart from the increase in the number of hackers, the law enforcement agencies must also brace themselves for the new "digital criminals" specialising in credit card information. Recently, the Commercial and Computer Crimes Unit of the Royal Police of Malaysia were able to arrest some members of a credit card syndicate, who used high-tech equipment to tap telephone lines of banks to obtain credit card transaction details and subsequently downloading them to cloned cards, ripping off some banks to the tune of millions in Ringgit Malaysia. The syndicate were said to have rented an office space on top of one of the banks they ripped-off (*The Star*, 2003, pp.1&2). These kinds of new criminals are technology savvy and pose a real danger to law enforcement bodies in the country.

Another syndicate had a different way of stealing information from ATM cards. Until the Malaysian police caught-up with them, ATM theft was on the rise. At one point, 130 cases were reported that involved a single bank. How do these digital criminals carry out this act? They do so by stealing the Personal Identification Number (PIN) and the magnetic strip data from a victim's card. This is done by hiding a close circuit camera above the keypad to capture the finger movements of the victim. This affords the criminal the ability to determine the victims PIN. A close-range transmitter is usually connected to the close circuit camera, and images are transmitted to a nearby laptop and a videocassette recorder. The criminals also attach an ATM card reader or skimmer to the card slot, and it copies data from the victims ATM card and the data is downloaded to a laptop computer. They then proceed to clone ATM cards used for unauthorised withdrawals (*New Straits Times*, 2002, p.5&7). It must be mentioned that Malaysian banks are moving away from

magnetic strips to chip embedded ones as a way to eradicate this type of crime.

Fortunately, Malaysia is one of the few countries in the world that have put in place the requisite laws to combat Cybercrime. These include the Computer Crime Act of 1997, the Digital Signature Act of 1997, the Telemedicine Act of 1997, the Copyright (Amendment) Act of 1997, the Communications and Multimedia Act of 1998, the Personal Data Protection Act. The government have also set up the Malaysian Computer Emergency Response Team (MyCert), which operates under the Malaysian Administration Modernisation and Management Planning Unit (MAMPU) to assist both the private and public sectors to identify expertise to help with network and security issues in this growing era of digital crime. Other functions of MyCert in the effort of stemming the tide of Cybercrime in the country, include serving as a centralised point for the reporting of security incidents and to facilitate communication to resolve security incidents; disseminating security information, including system vulnerabilities, defence strategies, and mechanisms, acting as the repository of security related information, acquired patches, tools and techniques; finally, playing an educational role in educating the public about matters relating to computer security in the country (Yeang, 2002).

The government has also set-up an E-Sovereignty Working Group to help in the efforts of Malaysia to combat computer related crimes and other abuses and misuse of the Internet (<http://www.mycert.mimos.my/newscutting/news0025.html>).

Despite such laudable efforts, much needs to be done and Malaysia cannot rest on its laurels, because daily, new technological developments enable the Cybercriminals to keep step ahead of law enforcement officers. The Deputy Prime Minister of Malaysia orchestrated the same sentiment at the opening of the InfoSoc Conference in Kuala Lumpur, when he said, "lately, we

have seen negative elements such as misuse of the Internet, violation of and virus attacks on databases and computer crimes, creeping in and threatening the peace of individuals and society ... the government is sensitive to this and is taking steps to stop such problems from spreading, including tightening legislation" (<http://www.mycert.mimos.my/newscutting/news0025.html>).

The challenge for Malaysia as it pertains to effectively containing Cybercrimes is to "effectively" enforce the laws on the books. To be able to effectively enforce the laws on the books, the law enforcers must be adequately armed with training and the necessary hi-tech gadgets and equipments. The requisite authorities should understand the damage Cybercriminals can cause Malaysia can run into the billions of ringgit as the damage caused by many of the Cybercrimes around the world attest. Thus, spending even a quarter of any perceived amount of potential damages for the protection of the country and its infostructure is worth it.

Another important challenge is that of building a global constituency of nations united in the fight against Cybercrime. In such a constituency, collaboration is going to be the glue (*New Straits Times*, 2002, p.17). Collaboration by Malaysia with other countries would help to enhance investigation efforts against Cybercriminals. This is because some of these Cybercriminals may be in another foreign countries and if law enforcement agents in Malaysia were to try to access the computer of the Cybercriminal by downloading data from the suspects network, and say the network was located in a foreign country, according to Janet Reno, former U.S. Attorney General, the law enforcement agents may soon find themselves in the case of international proportions, where they could be charged with the violation of the laws of that country (http://www.sans.org/rr/country/malaysian_law.php). Furthermore, one of "the physical problems that arise from

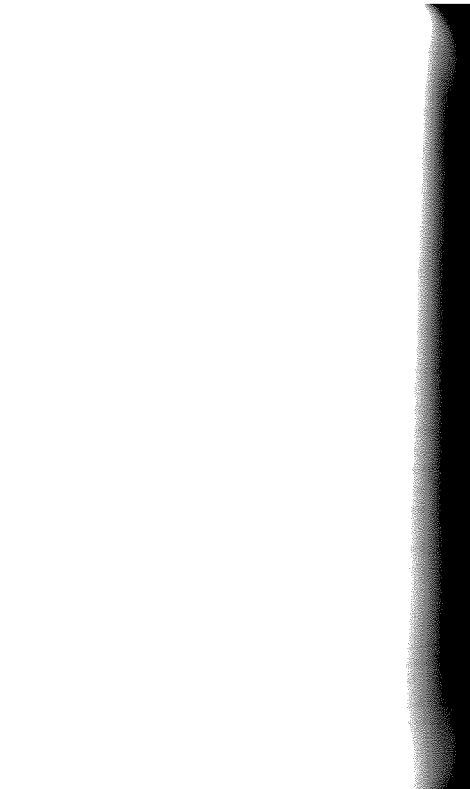
dealing with computer criminals are the difficulty in tracing, prosecuting, and reaching a desired verdict. If a crime crosses borders, it may be almost impossible to secure extradition or decide which country deserves ultimate jurisdictional power over a given case" (http://www.niser.org.my/news/2001_07_12_01.html). In such instances, international cooperation and collaborations become very important (*New Straits Times*, 2001, p.4B). For example, it is reported that, Malaysian law enforcement authorities are getting help from their counterparts in France and Brazil, pertaining to the attack on the websites of the Malaysian parliament and UTM, where the Cybercriminals were traced to have originated. The role of Interpol would become increasingly important in the concerted efforts to fight Cybercrime especially as it pertains to cross-border Cybercrime. Thus, Robert Bishop the CEO of Silicon Graphic's observation, "as the threats (Cyber) become more visible, there will be a greater need to create regional and global common functions in executing of Cyberlaws" is the way international efforts in fighting Cybercrime should move (Rahman, 2002).

Despite such laudable efforts, policing the Cybernation is not going to be an easy job. To give the readers an inkling of how tough it would be here is an example: Most of the readers by now know that Napster, the music file sharing company was shut down by a group of American record companies for copyright infringement in 2002. These companies went after another company like Napster called Kazaa and took it to court. The intricacies they found points to the difficulty of policing the Cybernation we are talking about. They found out that, the distributor of the software used by Kazaa, Sharman Networks was incorporated in the South Pacific islands of Vanuatu, managed from Australia, with its computer servers in Denmark, its source code is believed to be stored in Estonia, and its

developers live in the Netherlands. The fact is that if even the courts in the U.S. were able to pass a judgement against Kazaa, they would be unable to enforce it (*Economist*, 2003, p.17-18). Malaysia could face case's similar to this in the next phase of its movement to the k-economy.

Another challenge for Malaysia as it pertains to Cybercrime is in the arena of the expansion of Cyberlaws in the country to cover contracts. For example, what would the legal recourse be for Malaysians in Cyberspace if a dispute in such lines occurs? Can the traditional courts interpret the common laws and have them apply in this case in Cyberspace? Also, in the passage of the Consumer Protection Act, which was passed in 1999, it is reported that e-commerce was taken out from the protection of such an act. If so, consumers who fall victim to e-commerce scams could have a tough time bringing the crooks in for prosecution. Thus the government need to tighten-up or plug such loopholes, which could have been created unwittingly. But, Malaysians can find solace in the fact that, when the Cyberlaws were created in 1997, according to the Energy, Communications and Multimedia Minister, Leo Moggie, "the government was prepared to modify and amend these laws as we went along." Such flexibility would go a long way to enhance Malaysia's Cyberlaws and the country's efforts to fight Cybercrimes (http://www.asiafeatures.com/current_affairs/0104_1117_02.html)

As Malaysia moves to the next phase in its efforts to move to a k-economy and attain a developed nation status by the year 2020, Cybercrime is indeed one of the areas that authorities should keep a vigilante eye on because of the dynamic nature of technology. Such dynamism would give rise to different types of Cybercrimes and a more sophisticated type of Cybercriminal. Authorities should be able to come up with new laws where necessary and when needed in the future. But the education of the populace about Cybersecurity and how to avoid Internet



13. MALAYSIA AND THE POST K-ECONOMY ERA

13.1 Introduction

"No condition is permanent," the philosophers would have us believe. If such is the case, then any talk about the "Circle of Life" is right on. Everything has a beginning and an end, so are economies and so will be the k-economy. The end of the k-economy like anything else would be because a newer and better competitor supplants it. To some, this might be a *déjà vu*. To those who do not think so, here is some food for thought, "hunting and gathering economies ruled for hundreds of thousands of years and was overshadowed by the agrarian economy, which ruled for about 10,000 years. What came next was the industrial economy, which started in Britain around 1760 and started unwinding in the U.S. in the 1950s. We are half way into the Information economy and from start to finish, it will last 75 to 80 years, ending in the late 2020s" (Davis and Meyer, 2000).

If this observation by David and Mayer (2000) is true, then we are in the matured state of our current information economy. Then this economy has already been through its gestation and growth stages. Thus after this maturity state that it is in, comes

decline. So what is going to be next economy after the decline of the information economy? Some futurists are predicting a *bioeconomy*. This is an entirely different topic for another book. For now the task of this author is to look at post 2020 when Malaysia would have attained a developed nation status and a *k-economy* (a period between the end of the information economy and the emergence of the proposed *bioeconomy*). Thus, if I can "think aloud" for a minute, and suppose I can snap my fingers and by uttering the magic word "*abracadabra*" Malaysia would see itself in the year 2020. At this time, Malaysia has attained its vision of a developed nation status; it is also now a knowledge-based economy. So what next? What is going to follow the knowledge-based economy? The importance of these questions lie in the perception that, because of rapid changes in technologies, that countries who become knowledge-base economies can also become poor and impoverished the next day if they rest on their laurels. Ancient empires like Rome, Greece, Egypt and even modern day British Empire are cases in point. All these empires lost their greatness with advances in technologies and change in events and the times (Kennedy, 1989). The following is a bird's eye view, peering into the future and some of the snapshots that Malaysia could expect post 2020.

13.2 The Post K-economy Era: A Very Intelligent Era (VIE)

If Malaysia rests on its oars after attaining its vision of a developed nation status by the year 2020 and as a knowledge-based economy, it can face the fate similar to that of Rome, Greece or Egypt and other great civilisations in history. The challenge now is for policy makers and thinkers to start thinking of Malaysia beyond the knowledge-based economy era — say the year 2050. This is because the year 2050 would in my opinion be a period of the "Super Knowledge-based era (Super K-era) or the "Very Intelligent Era" (VIE). It would be an era that

begins and precedes the end of the information age. Tell tale signs of this era are the advancement in wireless technology or artificial intelligence. Bluetooth technology is a case in point. It is a worldwide wireless technology specification for a small-form factor low cost radio solution that provides links between mobile computers, mobile phones, other portable handheld devices, and connectivity to the Internet (<http://www.bluetooth.com/util/faq1.asp>)

Before the ascension of the *bioeconomy*-era, there will be an overlap between information technology and biotechnology. This will see the digitisation of many of the biological processes. It will be a period where smell, taste, touch, imagination and intuition will be developed to become commercially viable. In this era, weapons and products of yesterday, today and the day after today would not work tomorrow or the day after. There might be some readers of this idea who might think that it is a crazy thought. One cannot argue with such observations. All that can be said at this point is that the chapter of Malaysia in the year 2050 is yet to be written. Albeit, the challenges such an era would pose for the future generations of Malaysians cannot be wished away and should be thought of today and the foundations laid if future generations of Malaysians are to stand a fighting chance in the Super K-era.

3.3 Era of the Virtual Marketplace

In the post k-economy era, the Virtual Value Chain (VVC) will gain dominance over the Physical Value Chain (PVC). The PVC, which is synonymous with, seeing, touching and feeling mode of the production and exchange of good and services in the traditional *marketplace* will be supplanted or will wane and eventually wilt away. We will move into the *marketplace* era where the VVC will be king. Goods and services will exist in this virtual domain and can be easily delivered through the virtual domain.

Since this will also be a VIE, virtual reality will enhance this process. For example, there is a musical group which exist only on the Internet called the Internet Underground Music Archive (IUMA), who with the help of technology, record their own music, post digital audio tracks from unknown artist on the Internet, distribute and market their music over the Internet and can test customer or consumer reactions to their music, build an audience for their recorded performances and distribute their products entirely in *marketspace* (Rayport and Sviokla, 1999). This example and many more of its kind sprouting are telling signs of what is ahead in the post k-era. It is also a clarion call to all that guiding principles that dominate in the *marketplace* will have limited or no application in *marketspace*. Among the several reasons for this move, here are a few.

First, because this will be a VIE, digital and wireless assets will predominate. Unlike physical assets, the creation of these digital and wireless assets have a variable cost close to zero and furthermore, they are not used up in consumption like physical assets and can be reused over and over again. Because of this, the potential infinite number of transactions that these digital products can be used for will change the dynamics of competition, as it is becoming evident daily. In this era, economies of scale and economies of scope will be redefined by the virtual value chain. This will allow kitty cats to roar like lions — very small companies to be able to achieve low per unit production cost for their products and services and compete effectively in markets formerly dominated by conglomerates. As it pertains to economies of scope, it will be redefined. For it will now be possible for a small company to use a single digital asset to provide value across many different markets in *marketspace* (Rayport and Sviokla, 1999).

The post k-economy era would see also the increase in virtual manufacturing. It will rival or surpass the bricks and mortar

factory that we know. Increase specialisation and global collaboration using advanced electronic and digital networks will foster this. Information about designs, production information, inventory, delivery schedules to mention a few, would be exchange over cyberspace at Internet speed, creating flexibility and inexpensive production possibilities. It will also link customers in the *marketspace* directly to these virtual factories, eliminating the problem of space and time. Payment systems would be eased, as digital currencies become the order of the day and would be used extensively, cutting down transaction cost. For now, a few examples attest to this coming phenomenon. One is by AeroTech Service Group out of St. Louis, Missouri in the U.S. that have helped McDonnell Douglas Aerospace build a highly effective virtual factory and it has in the process created a sizeable virtually linked manufacturing community (Malone and Laubacher, 1999).

13.4 Era of "Coopetition"

We have moved from an era of comparative advantage, where a country or an individual could compete based on natural resource endowments. The arrival of the information and knowledge era changed all that. It ushered in an era of competitive advantage where having natural resources alone did not offer one an advantage. Knowledge and the ability to effectively apply and exploit this knowledge offered one a competitive advantage. Examples like Bill Gates who controls no mineral resources, and small countries like Singapore, Taiwan and Liechtenstein created wealth and higher standards of living for their citizens with no natural resources. But as the information or knowledge era reaches its maturity, cooperating, collaborating and competing at the same time amongst individuals, companies and nation states is increasingly becoming the norm. Such will pertain for

sometime before the ascension of the bio-era. Why such a view and how does it work?

First, the proliferation of information has made it easy for people, business organisations or even nation states to be informed about the least and up-to-date disturbance in the marketplace or in any part of the world. This enables them to react swiftly to such new changes. It therefore reduces the capability of any person or organisation to have a monopoly over information to enable it exploit such a monopoly. Hence, competition becomes rife and in specific industries, cut into profit and operating margins. To survive, alliances and collaborations are formed to share experiences and marshal resources to produce goods and services for the market place for their survival. Yet, this does not mean that these companies still do not compete in the global marketplace for market share, far from that. They compete but collaborate where necessary for their survival and continuous growth. In some cases, "coopetition" is the only way to be able to enter a certain industry because of the prohibitive cost outlay that makes it otherwise impossible for a single organisation or country. The consortium that formed the Airbus industry is an example. Specialisation and different knowledge competencies of different individuals, organisations or countries is also one of the reasons why countries increasingly cooperate and collaborate.

13.5 Era of the Constant Re-invention of the Self

Jack Welch, the former Chairman and CEO of General Electric Corporation once said that, "when the rate of change outside exceeds the rate of change inside, the end is in sight" (Welch Jr., 2001). In today's global environment where change is at warp speed, individuals, organisations and nation states must constantly change with the times or face the danger of being left behind. This can be done through a constant re-invention of the

self to stay attuned with the times. The post k-economy era would be a time where the survival of each individual, organisation or nation state would depend on how fast they can re-invent themselves to be able to avail themselves with opportunities in the global marketplace.

As already pointed out in this chapter, the post K-economy era would be a VIE, with such an era, a forecast of very intelligent systems will rule the day. One thing that is sure with very intelligent systems is that they would need less and less knowledge workers, few engineers, computer and information technology experts, for they can virtually survive on their own with limited help from a few of these knowledge workers. People would have no choice but to re-invent themselves to be more intelligent than these machines to survive. Organisations would have to re-invent themselves as well, for they would be competing with formidable virtual companies, which are nimble on their feet and can exploit Cyberspace to the disadvantage of brick and mortar organisations. Nation states would have to do the same. Sadly, those, who have not been able to scale, the "digital heights" would surely be left out of the "digitalpolis." Those nations that have scaled the "digital heights" cannot afford to be complacent, they must constantly re-invent themselves to stay alive or become relics of history. Developing countries like Malaysia do not have the luxury to be left behind and must gird its loins, roll-up its sleeves, grab the chisel and hammer, to shape its destiny for the post k-economy era. This coming era is going to be a truly challenging era.

3.6 Era of a Heightened Need of Trust

The last word on this chapter about the post k-economy era will deal with the issue of trust. One of the numerous advantages of the information era is that it has broken down hierarchy and evened the playing field for the prince and the pauper alike. Such

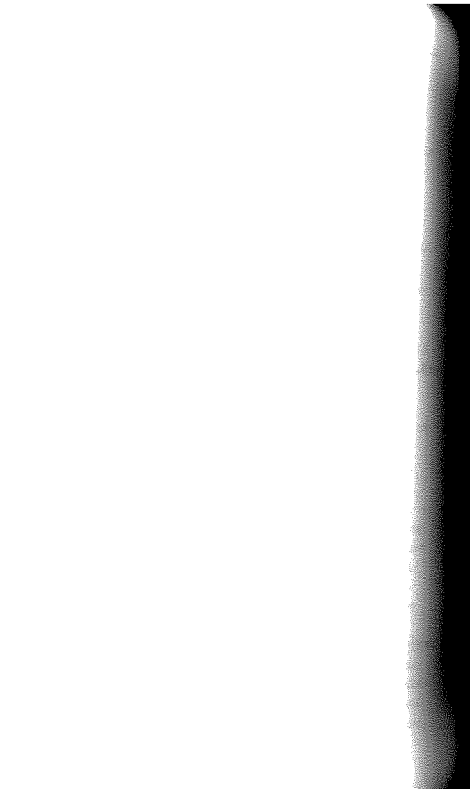
egalitarianism is stressed when it is often said that on the information superhighway, no one knows whether you are a kid or adult, a giant corporation or a mom and pop operation. I am all for the levelling of the playing field. But the anonymity aspect of this egalitarianism has created new problems. It is that which keeps me up at night. Unscrupulous individuals have hidden behind such anonymity to dupe and destroy others (Lewis, 2001). The section on Cybercrime in this book has dealt at length about this issue. One can say that the information era has created a "community" of sorts for all who travel or use the information highway, just like a physical highway used by say a village community, if there are constant robberies of caravans travelling a said highway, when the news spread to the village, there will be fear to use that road out of distrust. Already, we are seeing the lack of trust on the part of many in the use of the information superhighway for certain transactions.

In the post k-economy era, issues of trust will escalate. As technologies of that era become more intelligent, humans will try even harder to find ways to evade or go around them to dupe others or use them for criminal acts. Francis Fukuyama in his book, *Trust: The Social Virtues & the Creation of Prosperity* and in an article in *Forbes Asap*, echoes the same sentiment about the importance of trust in the virtual and physical world. According to Fukuyama, "trust does not reside in integrated circuits or fibre optic cables. Although it involves an exchange of information, trust is not reducible to information. A 'virtual' firm can have abundant information coming through network wires about its suppliers and contractors. But if they are all crooks or frauds, dealing with them will remain a costly process involving complex contracts and time-consuming enforcement" (Fukuyama, 1995). In *Forbes Asap*, he adds, "in a human capital intensive environment, all you bring to the table is your own intellectual property. You will not share this precious resource with others unless you trust

them to reciprocate and not to abuse the favour ... Trust becomes all the more important in a high tech environment" (Fukuyama, 1996). Already, there is an exponential increase in digital crimes. The fear that they could become commonplace are well documented in Richard Power's book, *Tangled Web: Tales of Digital Crime from the Shadows of Cyberspace*. The observation then in this chapter that such activities will increase in the post k-economy era cannot be emphasised enough. The challenge going forward for policy makers in Malaysia would be how they could boost trust in the post k-economy era with this observation as a watchword. One can only surmise that the foundation for such would have to be erected today and the structure added as the country moves to the k-economy and the post k-economy eras.

13.7 Conclusion

The observations offered in this chapter about the post k-economy era in no way qualifies this author as a futurologist. The observations here are garnered from a curious observer of techno trends. It is possible that it might come to pass that some of these observations would come to naught. The effort here is to sound the clarion call, to get policy makers thinking that if Malaysia is going to control its future, it must invent it. Such can only be done if that tomorrow is thought of today, with all its promises and failures. The process must be started in the dawn of today. As Nicholas Arthur Rimbaud (1854-74) said, "in the dawn, armed with a burning patience, we shall enter the splendid cities."



14. SUMMARY AND CONCLUSION

Malaysia's efforts to attain a developed nation status and to be a knowledge-based society would be regarded by some cynics as impossible and indeed a pipe-dream. But so it has been said of the many who dared to dream the impossible. Indeed we have been cautioned by the adage that it is the person who stays in the race that wins the race. But if there are still some doubting Thomas' out there, Theodore Roosevelt, the 26th U.S. President's observation might offer some wisdom, "far better to dare mighty things, to win glorious triumphs, even though chequered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the grey twilight that knows not victory, nor defeat." Malaysia's efforts thus are laudable; it is indeed better to dare mighty things and if in the process, the country fails, it would be able to learn from such failure and that is what progress is made of.

This book set out to look at this effort from its beginning as a vision and the translation of the vision into reality. The first chapter looked at the how the vision was born and how it served as a strategy to move the country up the value chain and also as a response to the changing dynamics in the global environment. Even though the journey will be a long and tedious one, the first step(s) has been

taken. According to Lao Tzu, the ancient Chinese sage, the journey to any one thousand miles begins with but one step. Looking at the vision from a development perspective, a summary of the different growth theories and trying to find out which of these theories it subscribed to was tackled in chapter two of the book. For other developing countries that might want to emulate Malaysia's example, it is hoped that they might be able to learn from it to supplement their own developmental plans and trajectories. Offering an overview of where Malaysia came from, from an economic growth and development perspective and how it achieved such a remarkable goal was dealt with in chapter three. In a way, it helps our understanding to some point why the country is moving to a k-economy. Government efforts to see the vision into reality were also looked into in the book. Issues pertaining to its development of the requisite infrastructure and infostructure were looked at and critically assessed. The putting into place of the requisite Cyberlaws can be regarded as one of the laudable achievements of the government. It puts Malaysia ahead of even many developing countries in this aspect.

In Malaysia, the government has always worked in collaboration with the private sector to develop the nation. This has been described as the Malaysia-Inc. concept. The movement of the country to a k-economy and its efforts to attain a developed nation status is no exception. The private sector must play and is playing an important role in this effort. This private-public sector partnership to achieve this goal was looked at in chapter five. Efforts so far by the government to achieve this vision have been regarded as the first phase. The challenges so far the country had to face and is still facing in this first phase were elaborated on. More of these challenges that the country will phase as it moves to the next phase or the second phase of this effort were also looked at. Some of these challenges include, the increased need for highly skilled labour force, enhancing the innovative and productive capacity of the country, the issue of capital, intellectual property rights and its wrongs, to mention a few.

Chapter seven in phase two of the book dealt at length with the issues of knowledge workers and why it is an important element in Malaysia's efforts to move to a k-economy. Then dealing with the next phase, a look at some of the current and future challenges that policy makers and Malaysians in general must tackle was dealt with in chapter eight. The resounding theme in this chapter is about the changing of the mindset and the developing of a new thinking, indispensable elements needed if Malaysia has to transit to the k-economy.

In the next phase of Malaysia's movement to the k-economy and to attain a developed nation status, it must generate, internalise and disseminate its own knowledge. Without the ability to create its own knowledge, the country will continue to pay rent for the usage of other people's IPRs. But what is also clear is that all those countries that have attained developed nation status are known for their innovation and the generation of new knowledge. If Malaysia is to become a developed nation, it must do likewise. As Malaysia transits to the k-economy and moves towards achieving its goal of a developed nation status, it must be able to manage what its people know and the store and wealth of knowledge in the country. These are the IPRs and other inventions and patents of the country or businesses and citizens in the country. If it does not adequately do that, it is going to lose its store of knowledge to other countries or to Malaysia's competitors. This issue was dealt with in chapter ten of the book. Chapter eleven of the book dealt with the issue of lifelong learning, another important element in Malaysia's efforts to move to the k-economy. Because technology is dynamic and our global village constantly changes, lifelong learning will afford Malaysian's the ability to be competitive. Efforts therefore must be put in place to embrace this cornerstone of the k-economy. One cannot talk about the k-economy without touching on the issue of ICT and the convergence of technologies and their impact on our lives. These impacts are of both positive and negative. One of the negative

aspects of these impacts is the issue of Cybercrime. Chapter eleven of the book dealt with this all too important issue. One of the unique aspects of this book that sets it apart from others that deal with the issue of Malaysia's move to the k-economy is that it moves beyond the now and goes out on the limb to look at what could be in store in a post k-economy era and what should be expected. Its importance is that it offers policy makers an inkling of what to look for and how to start working towards such opportunities and their threats.

It can therefore be said that, Malaysia's efforts to move to a k-economy and to become a developed nation by the year 2020 is based on the realisation that if the country is to survive and prosper in a continuous changing global environment, it must respond to change. The country's efforts to move to a k-economy can be described as a brilliant move based on necessity for as Charles Darwin, the English naturalist aptly put it, "it is not the strongest of the species who survive, nor the most intelligent, but the ones most responsive to change." Thus, as Malaysia moves to the k-economy, will the numerous changes the country will face be "painless"? Absolutely not. Will the country face twist and turns on the road? Definitely. Will it make mistakes? Yes it will. But these mistakes will be its mistakes. The country will not lay it at anyone's door. The challenge is not to fear to make mistakes, but whether Malaysia is willing to learn from these mistakes. If it does, then it will continue to grow, develop and prosper. At the end of the day, Malaysia's transition to the k-economy and its effort to become a developed nation by the year 2020 should be guided by the *obiter dictum* "no condition in life is permanent." Malaysia's current success or future success does not guarantee continuous success. Its continuous success must be seen as a moving target and it must work assiduously to secure and maintain that. In the words of Ralph Waldo Emerson, the renowned American author, "there are no fixtures in nature. The universe is fluid and volatile. Permanence is but a word of degrees." Need we say more?

APPENDICES

"COMPETING FOR TOMORROW"

Keynote Address by the Deputy Prime Minister of Malaysia, Ahmad Badawi at Sunway Convention Centre, Petaling Jaya, Kuala Lumpur, March 6, 2003.

Source: <http://www.smpke.jpm.my/WebNotesApp/tpmmain.nst/le>.

Let me first express my gratitude to Tan Sri Abdullah Ahmad and all the other members of the Oxbridge Society of Malaysia for giving me the honour to address such an August gathering. As graduates of Oxford or Cambridge, you are members of an elite intellectual tradition — a tradition which I am sure you will all cherish for the rest of your lives. Many of you have or will reach the pinnacles of your profession. Many of you are opinion makers and leaders in our community. So for me to be able to share some of my thoughts with you is a tremendous honour and privilege.

Although I did not attend Oxbridge, or a university abroad for that matter, I am uniquely qualified to speak to this combined society. My son read law at Cambridge and my son-in-law studied P.P.E. at Oxford. That forces me to mediate at family dinners. So today, I speak as impartially and as objectively as possible.

Ladies and Gentlemen,

After having given your society's invitation careful thought, I decided to speak on the theme of "Competing for Tomorrow." I chose this subject because I want to impress upon you the key challenges that lie ahead for our country.

After 45 years of independence, we have emerged as a confident and forward-looking country. We are seeing in our lifetime the emergence of a national identity that binds us as Malaysians. We have transformed our economy, not once, but twice and beyond. Globally, we are the envy of the developing world because we punch above our weight. Most importantly, I believe, is that we know where we want to go.

I have been increasingly asked the same question by journalists, fund managers, political analysts and others interested in the future of Malaysia. They ask me what my vision is for Malaysia. And I have always given the same answer. My vision for Malaysia is Vision 2020 that was articulated by YAB Dato' Seri Mahathir Mohamad in 1991. Anybody who has read the nine strategic challenges of Vision 2020 will find it difficult not to subscribe to its goals. It is holistic, progressive, modern and yet rooted in what is uniquely Malaysian. It pushes the country toward development and prosperity, yet calls for advancement to be tempered by justice, values and compassion. Dr. Mahathir's vision has become my vision, and the vision of all Malaysians — we need not dream another dream.

The more interesting question that people should be asking me, and one other, is how do we get there? We see our destination, but our road map has yet to crystallise. We know what we want to be. But we are uncertain how to become. We want to be a fully developed economy, but the global economy — to which we are greatly dependent and exposed — becomes more volatile and unpredictable. We want to create a *Bangsa* Malaysia, yet our children are growing apart. We want to be a mature and liberal society, but signs of intolerance and exclusion are beginning to emerge. We want to foster a scientific society, yet we still remain consumers and not creators of technology.

There can be no room for wishful thinking or complacency. Our success today does not guarantee success in the future. We cannot plan as if the future will unfold in a linear manner. To give you an example, it was not long ago that our soccer team could beat South Korea and Japan. Today, we struggle against Laos. Our badminton players used to stand at the top of the world rankings. Where are we today? Our hope of recapturing that glory now rests on people like Hafiz Hashim. Similarly today we pride ourselves on being the standard bearer of the Third World — a model, developing Muslim country. But as our sporting analogies demonstrate, there are no guarantees that we will remain successful, let alone reach greater heights.

If we are going to realise Vision 2020, we must compete for it and work hard to achieve it. It will require changes in the way we do things and in the way we manage our country. It necessitates a more heightened level of commitment from all segments of society. It calls for sacrifices from all communities and courage to see beyond our respective communal prisms. Most importantly, we need to think differently.

Ladies and Gentlemen,

In an increasingly globalised world, competition will come to us even if we do not seek it. We will have to compete for investments, for markets and for ideas. What we consider today as factors that enhance Malaysia's competitiveness are increasingly being provided by other countries. We are, for example, already seeing the erosion of our wage-based competitiveness with other countries providing skilled labour at a fraction of our costs.

We must move up the value chain. I believe we are more than capable of doing so. We have invested heavily in laying the foundations for a competitive Malaysia. Nowhere is this more evident than in the physical infrastructure that we have built. In the last fifteen years, we have developed a system of highways, ports and airports that is world-class. In the Eighth Malaysia Plan from 2001-2005, we have set aside RM21 billion to further improve our infrastructure, from laying new roads, to enhancing the connectivity of our ports and bringing more amenities to the rural areas.

We have set up world-class facilities with regional, even global aspirations. The Multimedia Super Corridor is one of the world's first integrated environments for multimedia. The MSC was an international vision. It was planned as a vehicle to attract world-class technology companies, a platform for producers of cutting edge multimedia applications and a test bed for research and development. The Kuala Lumpur International Airport was built with global ambitions. We wanted it to be a regional hub for passengers and cargo. The port of Tanjung Pelepas was similarly positioned as the region's leading trans-shipment hub.

We have planned well, but have we been able to execute effectively? While there have been successes, there are also many examples of projects that have not yet taken off. Some have not realised their potential — and show little prospect of doing so. Some are growing sluggishly, with low utilisation rates. Some have even become too embarrassing to mention.

If we are to successfully compete for tomorrow, we need to understand that being world-class does not begin and end with building world-class facilities. We need, above all else, world-class management and working practices. Investors have become more discerning. What distinguishes one country from another is not merely labour cost or physical infrastructure any longer. It is increasingly going to come from other sources. Innovation, productivity, service and efficiency are all potential hidden benefits of doing business in a country. Conversely, the lack of these factors may incur hidden cost, thereby eroding our competitiveness even further.

What will continue to make a difference is the human factor. There are countries that have no natural resources to speak of, which have successfully positioned themselves as producers of fine finished products and providers of value-added services. They understood their limitations and worked around them. On the other hand, there are also many countries with abundant resources — with fertile land and vegetation — which have not been able to transform this natural advantage into a competitive advantage. What makes the difference is the human mind and whether it is capable of creating wealth and value, even under great constraints.

Ladies and Gentlemen,

The way I see it, the malaise affecting Malaysia that may well jeopardise our way forward is a case of having first world infrastructure and third world mentality. From poor execution and inept management to shoddy maintenance and appalling customer service, Malaysia is in danger of possessing the hardware, but little software

This mentality affects the public and private sector, as well as society in general. In the public sector, it manifests itself in layers of bureaucracy that impedes effective delivery. In the private sector, it is evident in low service levels and lack of global best practices. Socially, we lack the quality of civic virtue — an indispensable value that ensures shared responsibility for our community.

As an illustration on the IMD World Competitiveness Report 2002, Malaysia was ranked seventh in the world for infrastructure planning. But when it came to bureaucracy hindering business, Malaysia fell to 13th place. And when it came to customer satisfaction, Malaysia finds itself in the 24th place. Another example that many of you will be able to relate to is service standards. In a prestigious ranking of service for Asian hotels, only one Malaysian hotel makes the list out of 56 that were selected.

If you operate a hotel in Malaysia, you need approximately 64 separate approvals every year from multiple agencies. Surely this can be streamlined. We are also aware of excruciating delays at the land office with six months or more being the norm for a simple approval for the transfer of land. You can imagine what that does to the liquidity of private assets. Loan documentation in Malaysia can take months, when international benchmarks are measured in days. These are some of the unseen costs of the Malaysian economy that a new Cabinet committee on Competitiveness, which I chair, will be focusing on rectifying.

This is not to say that we are incapable of meeting international standards. The national oil company Petronas is an example of a globally competitive player unencumbered by Third World thinking. It has successfully grown from meeting domestic needs to having numerous successful international investments across the value chain. Our I.N.G. facility in Bintulu is well run with on-time delivery to meet the exacting standards of international customers. Forbes.com recently ranked the MAS Golden Lounge among their top 10 airport lounges in the world.

Gone are the days when our success stories were bloated and leveraged conglomerates with natural monopolies and big concessions. If

we are to survive and succeed, we must reach beyond our borders and demonstrate that we are able to meet global standards.

Ladies and Gentlemen,

In order for Malaysia to move forward, there needs to be a change in how stakeholders are positioned. Today, individuals are seen as a labour base. Corporations are insulated in a paradigm of local competition. And the Government acts as an administrator. Competing for tomorrow will mean significant changes in these roles. Individuals will form a knowledge base that rewards excellence and is increasingly judged on merit; corporations must embrace global competition and therefore be customer focused and quality driven; and the government will move to become a facilitator that is service oriented, efficient and proactive.

To compete effectively, we need more than a handful of global players. We need to ensure that all stakeholders are committed to a new regime of thinking. If it suffices for us to merely aspire to become *jaguh kampung* and just *makan gaji*, Vision 2020 will be an elusive dream.

We must address some key concerns that cannot be ignored or set aside. The first that comes to my mind is corruption and the abuse of trust. This happens both in the public and private sectors. It is perpetrated by Malaysians of all races. We regularly hear anecdotal evidence about someone who has been asked to pay a bribe. Again the problem is effective management. In this case it is enforcement. Malaysia has among the most stringent anti-corruption laws and codes for corporate governance. But creating a tough framework is not sufficient if we are unable to empower legislation with enforcement.

If corruption is to be rooted out, it is incumbent upon everybody to work against it. Once again, our mentality must change. We cannot dismiss the problem by saying that this is just the way things are done in Malaysia and offer to pay a bribe instead of settling summonses. In fact, in a recent study commissioned by the government, 87 percent of respondents from across the country disagreed with using bribes to get things done; proof that the majority of Malaysians do not believe that this is the way to do things.

Secondly, we must respect property. Malaysians have yet to see property in terms beyond what they privately own. We are notorious for not respecting intellectual property. Piracy of music, film and software are still grave concerns. Again the problem is both enforcement and complicity of the public.

We are equally disrespectful of public property. I do not need to dwell at length about the state of public lavatories. Public telephones are frequently vandalised and seldom fixed. We increasingly park our cars haphazardly because we are too lazy to walk. And of course, when we drive on the highway we prefer to throw rubbish out of the window because we do not want it in our car.

Our greed and ignorance continues to drive us to despoil our God-given natural resources. Our forest and rivers — once abundant sources of sustenance and wealth — continue to be destroyed and polluted. This irresponsible behaviour does not come without an economic cost. For every river that needs to be cleaned, for every landslide that needs to be cleared, taxpayers' money must be spent. This "Ugly Malaysian" disposition demonstrates the lack of civic virtue in our society. We are oblivious to others around us and yet we expect someone else to clean up after us. More often than not we expect the Government or local authorities to mop up our mess. We increasingly abrogate to others what it is to be a responsible citizen because we simply cannot be bothered.

Third, we must abandon the notion that the government owes us a living. It is this mentality that breeds dependency and promotes rent seekers. When the government is seen, not as a facilitator of business, but a provider of contracts and concessions, genuine entrepreneurs will be crowded out by commission agents with "know-who" abilities and no "know-how" talents.

There is no doubt that socio-economic policy must continue to focus on correcting historical economic imbalances along racial lines. However, as we endeavour to create a competitive economy, we must assess the manner in which a re-distributive justice is carried out. We may have to admit that certain cases simple transfer of wealth from the

Government to certain private companies has not yielded the results that were hoped for. A more competitive economy cannot afford to continue to absorb unproductive economic rents. Hence, we must now make sure that re-distributive justice is carried out on the basis of identifying genuine need and that opportunities are given to those with value-added potential.

Similarly, successfully combating poverty goes beyond monetary assistance and the provision of opportunities. Escaping poverty is not just escaping deprivation; it is about abandoning a state of mind. Above and beyond government policies, it is incumbent upon individuals to empower themselves with knowledge, skills and self-belief to improve their lot in life.

Ladies and Gentlemen,

Realising Vision 2020 requires us to push ourselves in ways we have never imagined. It requires us to come to terms with our shortcomings, honestly and openly. We must not hide behind the exuberance of short-term successes, or inflate our self-importance. Confidence is indispensable to nation building, but confidence can easily be misplaced and abused. When we are lulled into a false comfort zone, we become oblivious to the many things that still need to be done. We avoid introspection and dismiss criticism. We must not live in such a state of denial.

What I have outlined today is by no means an exhaustive list of some of the challenges that lie ahead for us. I have attempted to offer examples of where we can improve and what we do. But the key message that I want to reiterate is that without changing our mindset, attitude and mentality, we will not usher in the future that we envision. Building a better Malaysia means being better Malaysians. If we cannot step up to this challenge, we will almost certainly be poor Malaysians — left behind.

Thank You.

Federal Government Development Expenditure by Sector

	RM million	RM million	RM million	Change (%)	Change (%)	Change (%)	Share (%)	Share (%)	Share(%)
	2001(1)	2002(2)	2003(3)	2001	2002	2003	2001	2002	2003
Economic services	12,725	14,925	12,693	9.3	17.3	-15	36.1	42.2	36.3
Social Services	15,384	14,535	16,127	38.9	-5.5	11	43.7	41.1	46.1
Security	3,287	3,080	3,063	41	-6.3	-0.5	9.3	8.7	8.8
General administration	3,839	2,802	3,080	32.7	-27	9.9	10.9	7.9	8.8
Total	35,235	35,342	34,963	26.1	0.3	-1.1	100	100	100
% of GDP	10.5	9.9	9.1						

(1) Estimated actual

(2) Revised estimate

(3) Budget estimate, excluding 2003 measures

Source: *Department of Statistics.*

Federal Government Revenue

	RM million	RM million	RM million	Share (%)	Share (%)	Share (%)	GDP (%)	GDP (%)	GDP (%)
	2001(1)	2002(2)	2002(3)	2001(1)	2002(2)	2003(3)	2001(1)	2002(2)	2003(3)
Tax revenue	61,491	67,472	73,114	30.4	9.7	8.4	77.3	80.8	81.4
Direct tax	42,098	46,125	50,587	44.4	9.6	9.7	52.9	55.2	56.3
Indirect tax	19,393	21,347	22,527	7.6	10.3	5.5	24.5	25.5	25.1
Non-tax revenue	18,076	16,078	16,679	2.4	-11.1	3.7	22.7	19.2	18.6
Total revenue	79,567	83,550	89,793	28.6	5	7.5	100	100	100
% of GDP	23.8	23.5	23.4						

- (1) Estimated actual
 (2) Revised estimate
 (3) Budget estimate, excluding 2003 measures

Sources: Department of Statistics, Ministry of Finance

Gross Exports

	RM million	RM million	Change (%)	Change (%)	Share (%)	Share (%)
January-June	2001	2002	2001	2002	2001	2002
Manufactured goods:	145,486	146,446	-3	0.7	86.1	86.5
Electronics, electrical machinery and appliances	101,188	103,044	-5.7	1.8	59.9	60.9
Textiles apparel and footwear	4,647	3,964	-6.8	-14.7	2.8	2.3
Wood products	4,518	4,344	-7.8	-3.9	2.7	2.6
Rubber products	2,296	2,246	-1.8	-2.2	1.4	1.3
Food, beverages and tobacco	2,812	3,090	2.4	9.9	1.7	1.8
Petroleum products	5,203	3,781	15.3	-27.3	3.1	2.2
Chemicals, chemical and plastic products	8,792	9,142	11.9	4	5.2	5.4
Non-metallic mineral products	1,193	1,384	-3.7	16	0.7	0.8
Iron and steel, and metal products	4,328	4,319	3.5	-0.2	2.6	2.6
Transport equipment	1,264	1,660	-10.2	31.3	0.7	1
Miscellaneous manufactured products	9,245	9,472	9.6	2.5	5.5	5.6
Major agricultural commodities:	8,050	9,631	-7.8	19.6	4.8	5.7
Palm oil	4,546	6,259	-11.4	37.7	2.7	3.7
Sawn timber	1,177	1,053	-25	-10.5	0.7	0.6
Rubber	1,001	1,027	-24.2	2.6	0.6	0.6
Saw logs	751	688	-38.6	-8.3	0.4	0.4
Palm kernel oil	434	505	-26.1	16.3	0.2	0.3
Pepper	113	52	-45.4	-58.8	0.1	0
Cocoa	28	47	124.6	66.7	0	0
Major mining commodities:	12,239	9,778	0.2	-20.1	7.2	5.8
Crude oil	6,337	5,236	-1.7	-17.4	3.7	3.1
LNG	5,683	4,268	2.8	-24.9	3.3	2.5
Tin	219	274	-9.6	25.1	0.1	0.2
Other exports	3,203	3,481	-33.1	8.7	1.9	2
Gross exports	168,978	169,336	-3.8	0.2	100	100

Source: Department of Statistics.

Major Destinations of Manufactured Exports¹

	RM million		Share (%)		Change (%)
(January-June)	2001	2002	2001	2002	2002
US	32,351	34,330	22.8	23.6	6.1
Singapore	24,644	25,290	17.4	17.4	2.6
EU	20,875	18,502	14.7	12.7	-11.4
Japan	17,187	13,680	12.1	9.4	-20.4
Hong Kong	6,787	7,792	4.8	5.4	14.8
China	4,828	6,410	3.4	4.4	32.8
Taiwan	4,146	5,519	2.9	3.8	33.1
Others	31,116	33,973	22.0	24.2	9.2
Total	141,934	145,496	100.0	100.0	2.5

¹ Includes Standard International Trade Code (SITC) 1, 5, 6, 7 and 8

Sources: Economic Planning Unit, Department of Statistics, Bank Negara Malaysia.

Manufacturing Product Index

January-June	Change (%) 2001	Change (%) 2002	2002 Q1	2002 Q2	Share (%) 2001	Share (%) 2002
SECTORS						
Exported-Oriented Industries:	-6.7	1.9	-5	9.3	52	52.3
Electrical, electronics and machinery	-9.3	5	-3	13.6	39	40.3
Semiconductors	-14	10.4	-0.8	23.5	28	40.5
Ventilating & air conditioning	19.9	12.7	13.5	21.8	2.2	2.5
Wood products	6.6	-10.8	-15.4	-6.2	4.2	4.7
Rubber products	6.2	-2.6	-4.6	-0.5	4.6	4.4
Textiles, wearing apparel and footwear	-3.5	-10.9	-14.9	-6.7	3.4	3.1
Knitting mills	-6.6	-5.7	-23.7	11.5	0.3	0.3
Wearing apparel	-8.3	-12.2	-17.5	-6	1.3	1.1
Professional, scientific, measuring & controlling equipment	-17.4	-0.3	-12.9	12.2	0.8	0.8
Domestic-Oriented Industries:	3.3	0.9	-1.6	3.3	48	47.7
Transport equipment	18.7	15.4	17.4	13	4.2	4.8
Construction related products	10	5.5	4	10	11.1	11.5
Food, beverages and tobacco	7	3.2	2	0.4	10	10
Chemicals and chemical products	3	-5.3	-4.9	-5.8	11.5	10.7
synthetic resins	-9.3	9.5	1.3	18.6	1	1.1
paints, varnishes and lacquers	8.4	14.1	24.5	4.7	0.4	0.4
Plastic products	-12.1	-5.9	-15.4	4	7	6.5
Paper and paper products	4.8	7	-2.1	16.3	1.4	1.5
Crude oil refineries	19.6	0.9	4.3	-2.4	1.4	1.3
Miscellaneous products of coal and petrol	-2.2	-14.1	0.3	-26.8	0.3	0.3
Glasses and glass products	-5.3	-9.2	2.7	-18.5	0.4	0.4
Non-ferrous metal	-18.3	1.8	-9.9	13	0.7	0.8
Total	-2.2	1.4	-3.4	6.4	100	100

Sources: Industrial and production Index, Department of Statistics, *New Straits Times*, Saturday, September 21, 2002.

Federal Government Debt

	RM million	RM million	Share (%)	Share (%)	GDP (%)	GDP (%)
	2001 (1)	2002 (2)	2001	2002	2001	2002
Domestic debt	121,396	130,257	83.3	77.6	36.3	36.6
Treasury Bills	4,320	4,320	3.6	3.3	1.3	1.2
Investments Issues	4,000	5,000	3.3	3.8	1.2	1.4
Government Security	103,450	109,550	85.2	84.1	30.9	30.8
Other domestic loans	9,626	11,387	7.9	8.7	2.9	3.2
External Debt	24,328	37,578	16.7	22.4	7.3	10.6
Market loans	17,683	27,223	72.7	72.4	5.3	7.7
Project loans	6,646	10,355	27.3	27.6	2	2.9
Total	145,724	167,835	100	100	43.6	47.2

(1) Estimated actual

(2) Revised estimate

(3) Mainly syndicated loans from foreign banks incorporated in Malaysia and loans taken for Treasury Housing Loan Fund

Sources: Ministry of Finance, Economic Planning Unit.

Gross Domestic Products (GDP) By Aggregate Demand (1987 Prices)

	Change (%)	Change (%)	Change (%)	CGDP (%)	CGDP (%)	CGDP (%)	Share of GDP (%)	Share of GDP (%)	Share of GDP (%)
	2001	2002 (4)	2003 (5)	2001	2002 (4)	2003 (5)	2001	2002 (4)	2003 (5)
GDP				0.4	+5.0	6-6.5			
Aggregate Domestic Demand (1)	2.8	4.8	7.3	2.4	4.3	6.7	89.8	90.3	91.5
Private Expenditure	-3	5.1	9	-1.8	3	5.4	58.8	59.2	61.5
Consumption	2.8	5.9	7.6	1.2	2.8	3.6	46.4	47.1	47.9
Investment	-19.9	1.8	14.4	-3	0.2	1.8	12.4	12.1	13.1
Public Expenditure	15.9	4.3	4	4.2	1.3	1.3	31	31.1	30.5
Consumption	17.6	4.7	8.5	2	0.6	1.2	13.5	13.6	13.9
Investment	14.5	4.1	0.5	2.2	0.7	0.1	17.5	17.5	16.6
Change in stocks				-2.3	1.6	-0.5	-1.1	0.5	0
External Sector	3.1	-15.1	-2	0.3	-1.7	-0.2	11.3	9.2	8.5
Export (2)	-7.5	3.6	7.5	-8.8	3.9	8.1	108.2	107.3	109.1
Import (2)	-8.6	5.8	8.4	-9.1	5.6	8.3	96.9	98.3	100.6
GNP(3) (RM billion)	309	327.7	353.1						
(in current value)	-1.4	6.1	7.8						

CGDP (%) contribution to GDP growth (percentage point)

(1) Excluding change in stock

(2) Goods and non- factor services

(3) Gross National Product

(4) Estimates

(5) Forecast

Sources: Economic Planning Unit, Ministry of Finance

Global Economic Indicators

	Real GDP (%)	Real GDP (%)	Real GDP (%)	Inflation (%)	Inflation (%)	Inflation (%)	Unemployment (%)	Unemployment (%)	Unemployment (%)
	2001	2002e	2003f	2001	2002e	2003f	2001	2002e	2003f
World	2.5	2.8	3.7	NA	NA	NA	NA	NA	NA
Advanced countries	1.2	1.7	2.5	2.2	1.3	1.8	6	6.4	6.2
Developing countries	4	4.2	5.2	5.7	5.8	5.1	NA	NA	NA
Newly industrialised countries	0.8	3.6	5.1	1.9	1.3	1.9	4.3	4.1	3.3

e = estimated, f = forecast, NA = Not available

Source: IMF Economic Outlook, April 2002 and various sources

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