

ICT Strategic Review 2010/11

e-COMMERCE

for Global Reach



“E-Commerce for Global Reach”

The National ICT Month 2010 (NIM2010) from July 13th to August 12th 2010, with the objective of not only to increase the consumption of domestic ICT products and services, but also to promote the ability of businesses, both SMEs and large corporations, to better reach out to customers, domestically as well as globally.

This is the second year that the National ICT Month is organised. The theme this year is “E-Commerce for Global Reach” which reflects PIKOM’s firm belief that E-Commerce is, and will become more vital not only to businesses, but also to society as a whole and presents opportunities for all consumers and small businesses to obtain easy access to the world market via the Internet. It is also inline with the Government’s vision to transform the society into having an innovative and creative mindset to face globalisation and stiff competition among countries.

Among the events during NIM2010 will be a major conference - the Leadership Summit, the SME Success with ICT Series, the Business Success Forum, the National level World Cyber Games (WCG2010), PIKOM PC Fair, the release of the PIKOM ICT Strategic Review 2010/11, and other major networking events. These events are focused at addressing ICT as the key driver for innovation to play a vital role in the nation’s development strategy.

The National ICT Month will be a very important ICT event which is able to complement the recently launched New Economic Model and the Malaysian Creativity and Innovation Year 2010, and also to support the Government’s objectives to put in place a system to drive high performance at all levels of society, to take a new approach based on innovation, creativity and high-value high income activities.

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PIKOM as the National ICT Association of Malaysia is a not-for-profit organization. It is the largest association representing the Information and Communications Technology (ICT) players in Malaysia. Since its inception in 1986, PIKOM has come of age as the voice of ICT industry. It has become an ICT referral centre for government and industry players, as well as international organizations. With this regard, PIKOM is poised to publish ICT relevant information in a periodic manner.



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**Foreword by
The Minister of Science, Technology and Innovation**



It is a pleasure once again to see PIKOM's commitment to launch the *ICT Strategic Review* series for the second time. The Ministry of Science, Technology and Innovation (MOSTI) is glad to be a partner in this endeavour.

The publication's focus on e-Commerce is a timely emphasis. The Government recognises the immense potential of e-Commerce in creating new wealth and will continue to render its support to leverage upon the opportunities abound in the connected world. However, the new opportunities are not without threats, especially when dealing with a borderless environment and all shades of cultures and traditions. Hence, good economic sense and prudence are essential in this dynamic endeavour.

I sincerely commend PIKOM on this effort. This issue augurs well with the New Economy Model (NEM) that the Prime Minister, Y.A.B. Dato' Sri Mohd Najib bin Tun Abdul Razak, unveiled in March 2010. The NEM is poised to be the next guiding path to charter our future. Like in the past, the role of the private sector and not-for-profit players like PIKOM is imperative to make the NEM a success.

Once again, congratulations to PIKOM for this collaborative effort, not only with MOSTI but also with industry players and academia in producing this publication.

A handwritten signature in black ink, appearing to be 'Maximus Ongkili', written in a cursive style.

YB Datuk Seri Dr. Maximus Johnity Ongkili

Message by PIKOM Chairman



Wei Chuan Beng
(PIKOM Chairman)

The year 2010 is not without economic and political conundrums. Though global community has come out of 2009 Global Financial Crisis, the financial challenges are not over yet. Countries like Greece and Spain were almost at the verge of bankruptcies. Adding to the woes is the irrevocable environmental degradation due to unprecedented oil spill in the Gulf of Mexico. Billions of dollars are lost in damages. Despite these calamities, we Malaysians remain once again resilient and unperturbed. The country is celebrating its top ten ranking in the global competitive ladder. However, we cannot afford to be complacent. Thrive for excellence must be continued.

As the Chairman of PIKOM, once again I applaud the contributors who made the second release on *ICT Strategic Review 2010/11: e-Commerce for Global Reach* into a reality. As envisaged, this series continues to provide the platform for policy formulators, industry players, investors, traders and academia to air their voices and disseminate their research findings for the amelioration of the ICT industry in the country. This time around, a collection of articles focused on e-Commerce. Indeed, a timely theme to move forward with the New Economy Model.

It is long overdue to promote e-Commerce vehemently, despite being the largest virtual shopping mall. Opportunities for buying or selling any goods or services are global. Nonetheless, e-Commerce uptake in the country is still at the infancy stage. Issues such as security, authenticity, vendor reputation, safe payment options, service level quality, cost of delivery and cultural barriers were the major considerations. I believe, we have come of age and e-Commerce is poised to proliferate in the country. The success is imminent with growing XY generations in the workforce.

Conclusively, I take this opportunity to thank the Ministry of Science, Technology and Innovation (MOSTI), particularly the Minister, YB Datuk Seri Dr. Maximus Johnity Ongkili for rendering unceasing support for PIKOM in realizing this series again.

Preamble from the PIKOM Research Committee Chairman



Woon Tai Hai
(PIKOM Deputy Chairman)

This publication, *ICT Strategic Review 2010/11: e-Commerce for Global Reach*, is second in its series. The inaugural series was in 2009. The first publication was well received by both policy makers and industry players. The industry players gave the encouragement to continue this series but wanted more focus on business and market developments. Taking cognizance of user demands, the current series is themed on e-Commerce, it is in line with the theme of National ICT Month 2010 (NIM 2010).

Once again I would like to thank the contributors for their generosity and willingness to share their thoughts on the e-Commerce development in the country. As reckoned, e-Commerce in Malaysia is as old as MSC Malaysia (previously known as MSC), which started in mid-nineties. Nevertheless, e-Commerce in Malaysia is still considered at its embryonic stage of developments except in multi-nationals or large corporations like AirAsia. This poor reception and acceptance of e-Commerce, especially among small and medium businesses (SMB), has been a major concern. PIKOM is fully aware of the digital gaps between the large organizations and SMBs. Being the leading industry representative, PIKOM once again through NIM 2010, is rendering its expertise to increase the efficiency and efficacy of SMBs in the country. PIKOM's aspiration is in line with the Tenth Malaysia Plan (2010-2015) and the New Economy Model (NEM), premised upon high income, inclusiveness and sustainability.

In this endeavour, awareness is the first step needed for acculturation with e-Commerce practices. Reckoning the imperative, the *ICT Strategic Review 2010/11* publication has collated a number of e-Commerce practices, culled from experiences of public sector, industry and academia.

I hope this strategic publication will provide you with a more holistic view and understanding of the state of affairs of our current ICT environment, in particular the areas of e-Commerce, and you will also benefit from it in pursuing your goals for your organizations and institutions.

The essence of content presented in each of the chapters is as follows:-

Enhancing Competitiveness of ICT Industry: PIKOM's Policy Advocacies and Interventions

Since the formulation of 5x5 strategy in 2008, PIKOM has been actively engaged in various forums nationally and internationally. Within the country, PIKOM participates in not less than 40 committees in the public sector alone. It may not be practical to list them all. However, this chapter has made an attempt to collate the key policy and market advocacies and interventions that have been made to key ministries and government agencies in the mainstream.

Uptake of e-Commerce in Malaysia: A Policy Perspective

Having gone through almost two decades with the promulgation of information age phenomena, the Ministry of Science, Technology and Innovation (MOSTI) provides a public policy perspective on the e-Commerce development in the country. The chapter reviews e-Commerce in the context of MSC Malaysia, Cyber security, e-payments, bridging digital divide, broadband and green technology.

Malaysian Economic Outlook

In an attempt to expound the Malaysian economic outlook, the authors in essence highlight "ubiquitous opportunities", aftermath the infamous Global Financial Crisis 2009 is over. Global nations, including Malaysia, are registering spectacular growth except for some pocket areas of unprecedented debt crisis. However, the question remains how well the Malaysian industry is responding by citing the famous Chinese tenet, "When the direction of the wind changes, some (people) build walls, other make windmills".

e-Commerce Adoption in Malaysia: Trends, Issues and Opportunities

This is a central chapter for the publication. It depicts the working definition, history, performance, trends, e-payment framework and options, uptake in SMBs, drivers and impediments of e-Commerce in the country.

Malaysian C2C auction e-Commerce sites: A case study on eBay and Lelong.com.my

This paper describes Malaysian C2C (consumer to consumer) online auction sites and the top auction sites in Malaysia; lelong.com.my and eBay. Based on the examination of these two sites, this paper proposes four critical success factors; security, transaction costs, online market volume and website performance.

e-Payment in Malaysian Public Services: A Model Framework for Evaluation

PEMUDAH claims that a total of 278 e-Payment services available in public services. Using the Gartner Model this paper investigates the quality aspect, specifically to what extent those e-payment websites are meeting generic criteria of an e-service and at the same time fulfils users' expectations.

What is Branding in e-Commerce Context?

Has the concept of branding changed because of the advent of the digitised age? And how should we do branding in a digitised context? These are the two pertinent questions of direct relevance to e-Commerce practices being addressed in this paper. Succinctly, branding in e-Commerce is differentiated from the traditional brick-and-mortar businesses.

Symantec Asia Pacific and Japan (APJ) Internet Security Threat Report XV

Symantec, being a global leader in providing security, storage, and systems management solutions to help consumers and organizations secure and manage their information-driven world, has collated a report on the extent of cyber attacks prevalent in the Asia Pacific and Japan region. In essence the report elucidates a number of metrics pertaining to malicious codes, spam zombies, phishing website hosts, bot-infected computers, and originating attacks as well as top ten countries in APJ region.

The e-Commerce Ecology: Leapfrogging Strategies for Malaysia

The author provides a model framework and empirical evidence where Malaysia is today in the uptake of e-Commerce in the country. The benchmarking includes competitive nations to Malaysia. The paper also provides a number of suggestions as a way forward to move forward in e-Commerce.

Official Definition of ICT Sector: Concordances and Gaps Viewing from Industry Perspectives

This is generically an informational paper relevant to all ICT segments including e-Commerce. The United Nations Statistical Division (UNSD) provides the requisite guidelines for defining ICT sector for national statistical offices to follow suit. However, this paper highlights that the MSIC 2008, though for the first time has introduced a special section on “information and communication” sector but has its limitations when viewed from ICT industry perspectives. The paper discusses the concordances and gaps in this regard.

A vision of smarter cities: How cities can lead the way into a prosperous and sustainable future

This is another informational paper, which discusses the vision of smarter cities. The writers succinctly put it that smarter cities are crucial for nurturing ICT practices, including e-Commerce and *vice versa*. ICT practices like e-Commerce make cities ‘smarter’.

Acknowledgements

A number of persons and organisations have contributed to this publication. First of all, we would like to thank all PIKOM Executive Council members for rendering their valuable counsel, guidance and support.

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PIKOM would also like to register sincere appreciation to everyone in the PIKOM Secretariat, for their individual support in the course of preparation of this report.

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XIII



CHAPTER 1

1

Enhancing Competitiveness of ICT Industry: PIKOM's Policy Advocacies and Interventions

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1. Introduction

This paper attempts to expound the policy and market interventions contributed by The National ICT Association of Malaysia (popularly known as PIKOM) towards enhancing the competitiveness of the Information & Communications Technology (ICT) services sector in this country. The paper primarily focuses on policy advocacies made since 2008, when PIKOM's 5x5 strategy was formulated in PIKOM's Strategic 5-year Plan (PIKOM, 2009).

In addition to enhancing competitiveness, the strategy also entails the adoption of ICT for all; globalizing the Malaysian ICT industry; enhancing partnership between the industry and the government; and strengthening PIKOM as an association representing the local ICT community.

The strategies are interrelated. In particular, PIKOM expects the nation to become more competitive when ICT pervades all segments and spheres of life. Furthermore, attaining competitive edge can help to globalize the Malaysian ICT products and services. When industry and government work hand-in-hand, efforts will be made a lot easier and faster in attaining the requisite comparative and competitive advantage in the sector.

After its institutional review and realignment two years ago, including a new set of vision and mission apt for the Information Age, PIKOM has been in the forefront in various consultation processes involving ICT development in the country, organised by the Government of Malaysia (GoM). PIKOM's active participation in the global arena as a key player in the ICT industry, as reflected by its various roles, including the Chairmanship of World Information Technology and Services Alliance (WITSA), Presidency of the Asian Oceanian Computing Industry Organization (ASOCIO), and Host Secretariat of the Asia and Pacific Internet Association (APIA), ameliorates the local ICT industry. Currently, PIKOM provides its representation in more than 40 government related committees. It will be a tedious and a formidable task to highlight all of them in this exercise. Nonetheless, the key ministries and institutions that PIKOM has been constantly dealing with, in its policy advocacies and interventions attempts, include the following:-

- Ministry of Science, Technology & Innovation (MOSTI)
- Ministry of Information Communications and Culture (MICC) – (Prior to 2006, the provision of communication infrastructure was under the Ministry of Energy, Water and Communications (MEWC))
- Ministry of International Trade and Industry (MITI)
- Economic Planning Unit (EPU)
- Ministry of Higher Education (MOHE)
- Ministry of Education (MOE)
- Ministry of Domestic Trade, Cooperatives and Consumerism
- Malaysian Communications and Multimedia Commission (MCMC)
- Multimedia Development Corporation (MDeC)

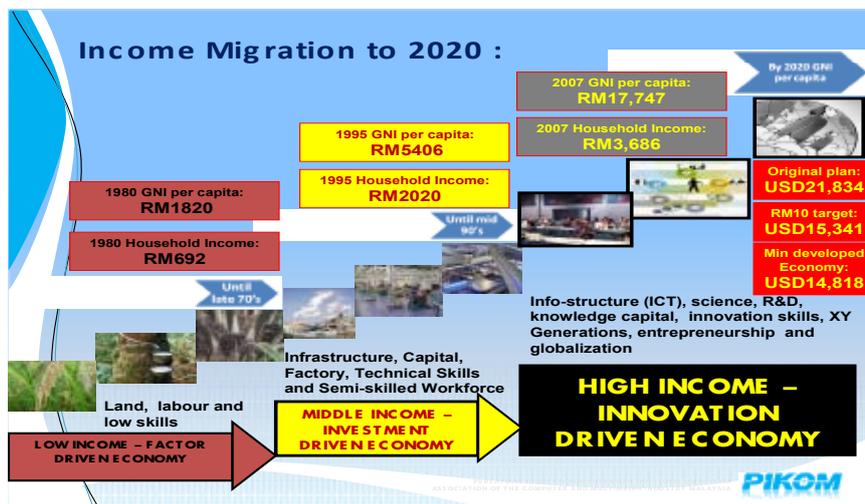
The policy advocacies and interventions that PIKOM has undertaken in the past are numerous and extensive, and in some cases overlapping. However, this exercise makes a succinct attempt in surmising PIKOM's policy advocacies and interventions under seven broad areas. They are:

- A role for ICT in migrating Malaysia towards a high income economy
- Provision of infrastructure
- Bridging the Digital Divide (BDD)
- Institutional Capacity Building
- Capability Building
- Policy and Market Research
- ICT Industry and Market Development

2. A Role for ICT in Migrating Towards Higher Income

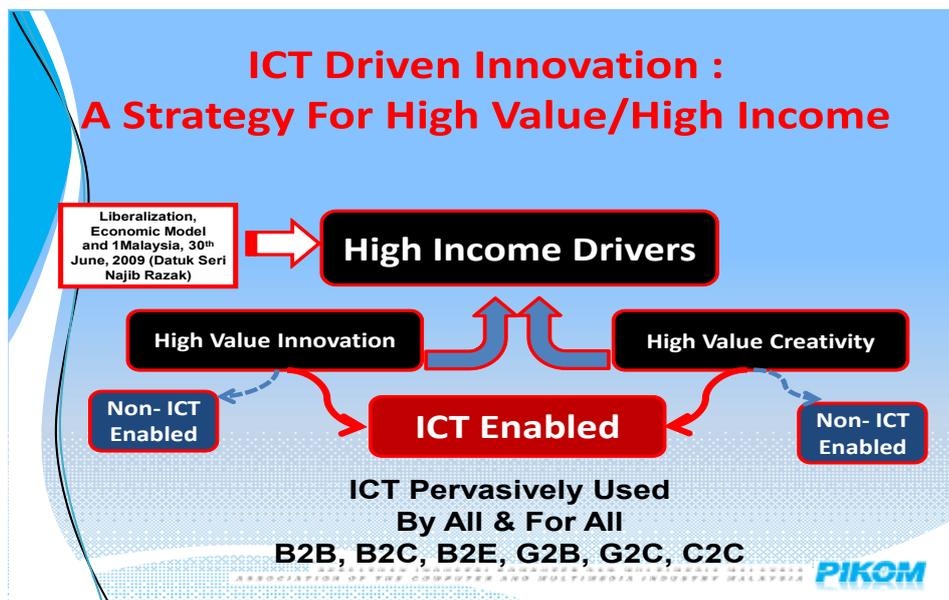
Malaysia is now moving towards becoming a high-income and innovation-driven nation. In the past, the country thrived mainly as a factor-driven economy. Land, labour and capital were the main drivers of the preceding agro-industry economy thrust (refer to Figure 1). During this era, the Gross National Income (GNI) at fixed prices registered a spectacular growth of ten-fold increase from RM1,820 per capita in 1980 to RM17,747 in 2007. During the same period, the average household income only grew five-fold from RM692 to RM3,686. With the ICT and Knowledge Economy thrust, the New Economy Model (NEM) projects that the nation will achieve a GNI level of RM58,413 by 2020 from its current level of RM17,747 (NEAC, 2010).

Figure 1



On the downside, if the country were to continue pursuing the agro-industry economy, it would have lost its economic advantage and competitive edge to the other low cost nations in the region. In response to this, the country has to capitalise on creativity and innovation to steer the Malaysian economy to its next phase of development. As such, new drivers emerge such as info-structure, R&D, science and technology, and knowledge capital. ICT has been identified as the key development thrust in the creation of a new age economy (EPU, 2000), and its success largely depends on the way the Malaysian society embraces the knowledge or innovation based economy. This change process will depend on the measures undertaken by the Government and also on the ability of the society to seize new opportunities.

Figure 2

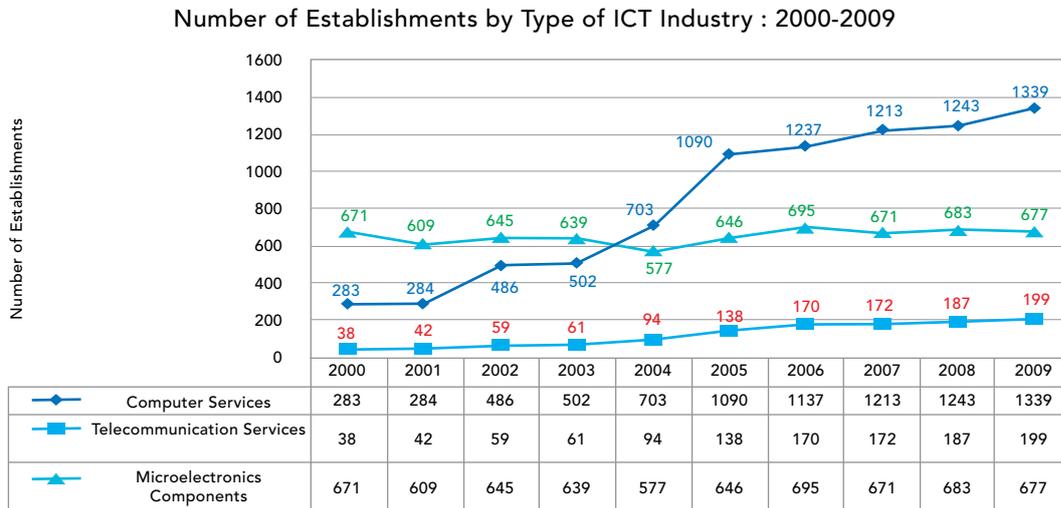


The services sector is the Government's current emphases in realizing the knowledge-based economy (KBE). Indeed, the Government, under the leadership of the present Prime Minister, is targeting to increase the contribution of the services sector from 55% in 2008 and 60% in 2009, to possibly 70% by 2020, when the nation attains its fully-developed status. (Refer to the announcement on Second Stimulus Package, Ministry of Finance (10 March 2009) and a second announcement made by the Prime Minister, Datuk Seri Najib Tun Razak on Liberalization of 27 services sub-sectors - 22nd April, 2009 (MOF, 2009)).

PIKOM projects that the ICT services elements of Shared Services and Outsourcing (SSO), such as Information Technology Outsourcing (ITO) and Business Process Outsourcing (BPO); the provision of e-services such as e-Commerce, e-Government, and e-Learning; and software and hardware consultancy, repairs and maintenance services; ICT solutions; and exports and imports of ICT services, could play a significant role in spearheading the services sectors. There is no doubt that the promotion of the ICT services sector could be the next engine of growth and this will be the focus of PIKOM's recommendations. Compared to many competing nations in this sector, Malaysia has a number of competitive advantages. The local ICT community, which is generally fluent in the English language and several other languages and dialects, coupled with a stable political environment and a multi-cultural society, are among the strengths that can be leveraged upon.

Traditionally, the country has been dependent on the electronics component industry that has contributed significantly to the overall growth in the ICT sector. However, the tide has changed. As shown in Figure 3, in recent years, the investments in the services components of the ICT sector have been on the rise significantly (PIKOM, 2009)

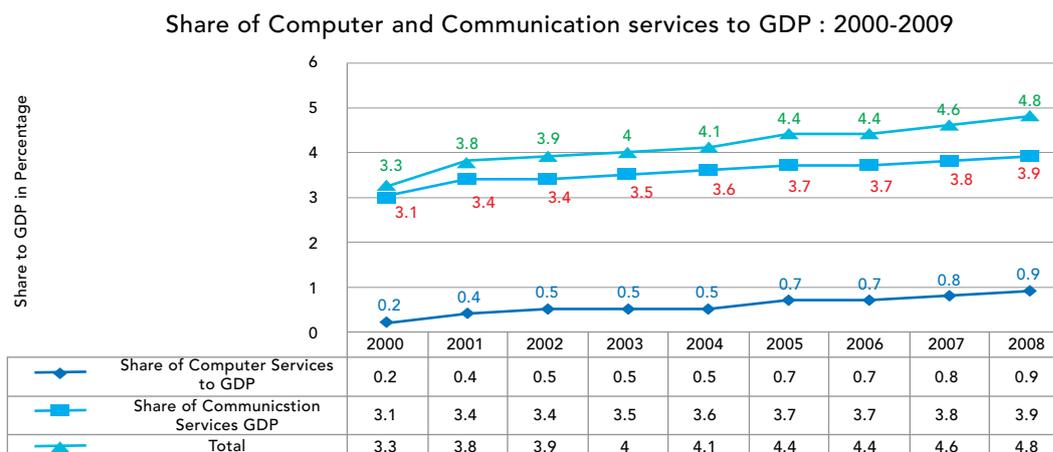
Figure 3



Source: Department of Statistics, December 2009; PIKOM estimated for the year 2009

While in the past decade investments in the microelectronics or ICT production sector have been largely fluctuating, we observe that investments in the ICT Services sector – computer and telecommunication services – have registered exponential growth (refer to Figure 4).

Figure 4



Source: Department of Statistics, May, 2009

In terms of economic value contributions by the broadly-defined ICT Sector, in the year 2000, the ICT services industry constituted only 25.5%, compared to 74.5% from the microelectronics component industry. But this gap has been drastically narrowed, whereby the ICT services component has reached the 42.9% mark, while the micro-electronics components accounted for only 57.1% in 2006 (PIKOM, 2009). If this trend continues, by the turn of the current decade, the ICT services component is projected to constitute not less than two-thirds of the total ICT sector contribution.

This trend is not surprising from three perspectives. Firstly, Malaysia is no longer seen as a competitive nation for its micro-electronics sector, compared to other low cost countries. Secondly, the Government of Malaysia has, since the year 2008, been aggressively promoting the services sectors with a target of contributing 70% of GNI by 2020, in its efforts to turn ICT services sector to become the next engine of GDP growth. Thirdly, the prolific growth registered in the ICT services sector, in particular, is largely attributed to the following ripples of development wave:-

- Heavy investments in the telecommunications sector targeted at the provision of broadband services.
- Uptake of Internet and mobile banking in the financial services sector.
- Continuing efforts in the expansion of e-government activities at all three-tiered levels of administration (Federal, State and Local Government).
- Growing e-Commerce activities with the introduction of secured credit card transactions and Pay Pal system of payments.
- Increasing investments in the outsourcing businesses, which are ICT-driven.
- Expansion of online and computer-mediated distance learning programmes by the private higher education institutions (PHEIs).

3. Provision of Infrastructure

As previously mentioned, Malaysia has the vision to be a fully-developed economy with a knowledge-based society (KBS) by 2020. This vision will be a formidable task to achieve, unless all segments of the Malaysian population become information rich. Indeed, among the many facets of a knowledge-based economy (KBE), the pervasive use of ICT is crucial: in the government, businesses, organisations and citizenry. The provision of the right and proper infrastructure is of utmost importance in order to succeed in this challenge to bridge the digital divide (BDD).

3.1 Level Playing Field in the Telecommunication Sector

Limited policy options and openness, and the lack of a level playing field, are detrimental to the healthy competition we hope to see among the telecommunication industry players (PIKOM, March, 2010 (a)). It is generally viewed that TM's role as both a "wholesaler" and a "retailer" of telecommunication infrastructure, services and content creates an uneven playing field as retailers find it difficult to compete efficiently and effectively. This would be to the detriment of the industry as they hesitate to make further investments in the industry.

The provision of local broadband services is limited to five main players, namely TM, Time dotCom, Maxis Communications Bhd, Jaring and PenangFON (only in Penang). (This excludes licencees of WIMAX providers). These industry players are dependent on the incumbent for wholesale services, who is ironically also a player in the retail market. But the situation also applies in the fast growing content businesses. Such market forces and unlevelled playing field will be detrimental to an otherwise healthy national economic growth. This summarily explains the root causes of Malaysia's lacklustre broadband development, and consequently, a number of other challenges that we are experiencing:-

- In the last couple of years, the Malaysian Communications and Multimedia Commission (MCMC) has awarded several of these licenses to providers with the condition of a speedy rollout to address the low penetration rate. As of 31 December 2007, under the NFP category, a total of 66 individual licensees and 28 class licensees have been appointed. Similarly, under the NSP category, a total of 29 individual and 368 class licensees have been appointed (MCMC, 2009). Nevertheless, the provision of broadband infrastructure has not been very encouraging. However, not much is heard about in terms of execution of these projects. It is known that the awarded companies are finding it difficult to raise capital and operate in an environment with limitations on accessibility.
- At policy level, a proper monitoring and evaluation mechanism to address the non-performing licensees needs to be enhanced. There is also a lack of collaboration between various ministries and the private companies to effectively address the pertinent issues at the implementation stage. Given overlapping of functions between ministries and government agencies and sometimes, the lack of coherent synergies among the government agencies, this can lead to a state of "feudalism". In other words, regulating and management should be segregated, or "siloed", with little across department collaboration or interaction.
- The lack of availability of price-competitive optical fibre domestically. There is no "dark fibre" market in Malaysia, which is available at a competitive cost in advanced markets such as the United States and Europe.
- Insufficient submarine cable capacity internationally with only TM having any significant investment in submarine cables, and the nation's need for high-end ICT facilities continues to grow rapidly.

The reasons for this are:-

- The bulk of Malaysia's fibre network (about 96%) is controlled by TM, especially with the acquisition of competitors such as Fiberail Sdn Bhd and Fibercomm Network Sdn Bhd.
- The lack of investment by celcos - Maxis, Celcom, Digi - in submarine cable systems and optical fibre infrastructure beyond their primary market zones (urban areas).
- Until recently, the ability of Timedotcom to provide significant alternative.
- The strictly-regulated Network Facilities Provider Individual licensing, which prevents privately-funded fibre providers from deploying their fibre optics cables in any location outside their territory nationwide.
- Inability to utilise MCMC's Universal Service Provision Fund (USPF), amounting to RM5 billion, to build optical fibre backbones into rural areas.

In the current “near single player dominance” market environment, it is important and imperative that MCMC regulatory approach enables the creation of a competitive market, with greater transparency. Failure to implement adequate control over the near monopoly of the market will only cause the demise of some promising private ISPs and eventually, leading to a snail pace development of the industry.

Jaring provides a classic case study. Jaring, Malaysia’s first commercial Internet Service Provider (ISP) in the early 90s should have flourished with the explosion of Internet usage. Unfortunately, under the burden of leasing bandwidth and with unfair “Local Loop Unbundling” terms, Jaring’s financial performance did not enable them to grow. If Jaring had been able to lease “dark fibre” on a long term basis, and with access to true unbundled local loop, today they would be a major player in the fixed Internet access market.

The reason for the lack of fibre optics network in Malaysia should not be blamed on the size of the country. Bureaucrats have often cited that Singapore and Hong Kong are geographically smaller than Malaysia, and it is relatively easier to wire up the entire nation. The assumption is, however, flawed, as countries like Korea and Taiwan have made great strides in the provision of broadband services. As a result, these countries have a competitive advantage over others in attracting new age investors, where the priority is on high-speed telecommunication infrastructure, capacity and quality as one of the primary considerations for high value adding investments. Therefore, it is not the size of the country, but committed leadership is the key driver to the advancement of ICT in this country.

Take for example the level of funding committed to the HSBB. The HSBB total project cost is approximately RM11.3 billion over 10 years for the high speed capabilities of 1Gbps. Contrast this to South Korea, which is spending approximately US\$25 billion (approximately RM83 billion) to achieve 1Gbps speeds by 2012. Australia’s broadband initiative is valued close to AU\$43 billion (approximately RM112 billion) for the provision of 100 Mbps. Singapore will spend SG\$1 billion (RM2.5 billion) in 2009 for its Next Generation National Broadband Network rollout in first quarter of 2010. In other words, these figures indicate that Malaysia is under investing in the provision of broadband infrastructure vis-à-vis its regional peers.

Malaysia is not short of gateway service providers who are continuously seeking landing rights. And the demand for quality bandwidth is growing. Is the Malaysian Government prepared to take aggressive steps to break the telecommunication dominance held in order to improve competitiveness and see faster broadband being offered at lower cost? Perhaps, the nation can learn from the experience of Thailand, as highlighted in Box 1.

Box 1

Extract from *The Malaysian Insider*, 05 March, 2010:

“Last month, Thailand broke a state-owned enterprise hold on submarine cable landing rights in the country by granting a licence to the first private operator, True Internet Gateway Co Ltd, which pointed out it would be able to source submarine bandwidth capacity from a wide range of providers directly, resulting in greater bandwidth being available at more competitive prices”.

Acknowledging the challenges faced by the telecommunication industry, PIKOM made the following explicit recommendations to the Government (PIKOM (a), March 2010).

- Revamp the Malaysia Internet Exchange (MyIX), in particular, make MyIX an independent cost recovery legal entity, supported and managed by MCMC. Expand MyIX to provide connectivity at all levels within the country (state, district, urban and rural areas) and with the outside world with help of international links that would greatly enhance the efficiency and efficacy of TM and Jaring ISPs. MyIX can acquire a fibre backbone company such as Fibercomm to ensure it has super-high backbone capacity (100 Gbps). All fixed and mobile service providers with any available technology (fibre, xDSL, 3G, Wimax, WiFi, broadband over powerline, fixed wireless, satellite and last mile technology) who need to connect to the Internet backbone can do so by co-locating at MyIX at state/*daerah*, to allow service providers to focus all their investments in the last mile infrastructure to connect to users at high speed and low cost.
- Mandate all Network Facilities Provider (NFP), Network Service Provider (NSP), ISP and Application Service Provider (ASP) license holders to roll out services based on their business plan. MCMC to actively facilitate and ensure resources, such as spectrum, are allocated and optimally utilized. There are some parties that may have spectrum resources, including government agencies, but not utilizing the resources for the purpose of broadband. MCMC should take a serious stand on this, by either revoking licenses from such providers who fail to comply with the terms of the contract or cease providing the requisite funding and mechanism under the second stimulus package.
- Ensure effective competition to force service providers to upgrade their quality and value-added content for the benefit of users. Naturally, prices will come down and more innovative content and applications will be bundled by service providers in order to compete and retain customers.
- TM, with the support of RM2.4 billion grant from the Government, should be mandated to complete full implementation of their business plan within 3 to 5 years, instead of the proposed 10 years.
- Formation of a new Government ministry, combining both MICC and MOSTI to spearhead Malaysia's ICT industry. A single ministry would simplify important processes and procedures by providing a one stop centre for the industry.

3.2 Provision of Broadband

Several studies undertaken globally as well as regionally have indicated that Malaysia's broadband services, in terms of quality and capacity, are below par, and this is turning away investors (PIKOM (a), March 2010); an example cited in the Box 2.

Box 2

Extract from *The Malaysian Insider*, 05 March, 2010: "The lacklustre quality and high cost of broadband is hurting the country's knowledge aspirations come on the heels of warnings by Australian businesses that slow Internet speeds were putting them off investing in Malaysia.

Malaysia Australia Business Council vice-chairman Michael Halpin said large technical documents from Australia had difficulty getting sent over because of the poor quality broadband.

"Australian and American investors see this as a nuisance and an impediment to them to do business successfully here," he said.

In comparison to the other “Asian Tiger” economies, the penetration of broadband services in Malaysia is only 29% in 2009, compared to Singapore (99.9%), South Korea (93%), Hong Kong (83.8%) and Taiwan (76.8%). The Tenth Malaysia Plan (2011-2015) reported that the penetration was only at 32% in 2009. In the mid-90s, when the Multimedia Super Corridor (now MSC Malaysia) was launched, Malaysia was on par with the other Asian tiger economies. PIKOM welcomes the target of achieving a 50% household penetration rate by the end of 2010, but hopes that this is measured off computer mediated devices only. While the nation might have reached more than 100% cellular phone penetration rate but by the international norm and practice, the non-smart phone devices cannot be considered for estimating the penetration of broadband. Some quarters in the policy making circles are attempting to justify the achievements of the envisaged targets by including cellular phones. PIKOM opined that the computation of household broadband penetration rate has to be strictly computer-mediated.

Different speed and location of access will affect various applications and content running on broadband. A good example is when there is a high broadband penetration to offices, business and government entities, this will lead to the mushrooming of e-Commerce; high household penetration could promote Internet Protocol Television (IPTV), home content and home shopping. The argument is that, in comparison to the cellular phones, the computer mode and means provide the requisite capacity for undertaking jobs requiring high capacity performance. This is why it is imperative to measure broadband penetration by taking cognizance of characteristics of population or household or business or government, besides speed, quality and capacity—and there is no two ways about it!

PIKOM also welcomes the distribution of one million netbooks bundled with broadband access to poor and deserving students. However, PIKOM hopes that such ICT and broadband enabling efforts and expense is truly of substance and not just form.

A pertinent question which has been asked in the ICT industry is: What is the definition of broadband? The International Telecommunications Union (ITU) has defined the broadband as of 1.5 – 2 Mbps. The Broadband Quality Service (BQS) measures revealed that the average broadband quality has increased across the globe – average download throughput increased by 49% to 4.75 Mbps while average upload throughput increased 69% to 1.3 Mbps. The leading countries offer broadband speeds way above the average and at highly competitive prices too, like “in Singapore where a 100 megabit per second (Mbps) broadband line costs US\$85, while Malaysians who want a 4Mbps speed need to pay US\$76. On average comparison, Singaporeans pay US\$0.85 for every 1Mbps, and Malaysians pay over 20 times more – a whopping US\$19 for the same speed rate” (The Malaysian Insider report, 5th March 2010). As such, the quality and capacity of Malaysian broadband is much lower compared to its competitors like Korea, where the penetration capacity is six times more, and Singapore where the penetration capacity is four times more. Australia's National Broadband Initiative involves an investment of A\$43 billion over eight years where 90% of homes, schools and businesses will be connected at 100Mbps. Shall we in Malaysia set a minimal link that is always on at 2 Mbps as broadband?

Malaysia's home broadband capacity is mostly 1 Mbps (on a best effort basis) with at most 4Mbps in very limited areas. The recently launched TM's UniFi service offers 5 Mbps at RM149 per month; 10 Mbps at RM 199 per month; and 20 Mbps at RM 249 per month to selected pockets of the population, while the general population will be offered access a maximum of 2 Mbps under the Streamyx offering. Businesses are also offered packages of 5 Mbps, 10 Mbps and 20 Mbps. All these are still way below the speeds typically available in our neighbouring Asian countries. The triple-play bundling (voice, data, video) by TM may solicit positive response from many, while others who had hoped for clear options may prefer unbundled offerings. If the service level proves to be at the quality and speed it promises, the announced pricing, even if it is still higher than some neighbouring countries, may still prove to be of value. Thus, PIKOM hopes that over time, the price level will be further reduced and/or the speeds raised to a level competitive to that of our regional competitors. PIKOM is also concerned about the planned nationwide rollout, which may also be too slow to acculturate the entire nation to the HSBB service in the quickest time hoped for. With a poorly equipped infrastructure capacity, the nation cannot move forward into an innovation-driven economy, in particular, the ICT-driven innovation and knowledge-based economy with e-Commerce and e-businesses that deal with high value-added products and services.

With regard to the broadband penetration rate, PIKOM has made a number of pertinent recommendations. A promising start in order to face the current inefficiencies would be to lower the cost or to provide free broadband services for all, and adopt different strategies to address different segments. Moreover, this would also help to close the existing technology, information, knowledge and innovation gaps.

Another improvement would be to mainstream all marginalized communities, irrespective of regions and backgrounds by initiating a National ICT Programme specific to disabled communities like the deaf, blind and the physically challenged. Coping with the broadband challenges will require avoiding monopolistic policies in the provision of broadband at all levels and promoting market liberalisation policies to increase competition among industry players that can bring forth improved quality and competitive pricing for the ultimate customers.

The Government should take the necessary steps to reduce the price of broadband services in order to increase the technological uptake towards reaching 50% rate by end of 2010. See Box 3, to learn from Cameroon's experience to see how the country aggressively pursued the provision of broadband for its citizenry.

Box 3

Internet prices drop by 90% in Cameroon

Wednesday, 26 August 2009

Internet prices in Cameroon have fallen more than 90 percent since the beginning of the year. But some want them even lower. Cyber cafes dot the streets of Yaounde. Across the country, they are still among the best spots to get a cheap connection to the Internet. But because of falling prices, many people can afford to set up connections in their homes and offices. The use of mobile phones to access the Internet has also shot up. Internet cyber cafes, like this one in Yaounde, are the products of the low Internet fees being charged in Cameroon. Ringo, a new Internet-service provider, estimates that prices have dropped about 90 percent since the start of the year. The mobile telephone giant Orange Cameroun has introduced a monthly Internet flat rate of about \$21, the lowest in the country. Others charge about \$50 monthly, down from hundreds of dollars a few years ago. Subscription costs have also fallen by over 50%. The drop in prices is mainly the result of more competitors offering Internet service.

It is also crucial to ensure local broadband prices are comparable to those in other countries in the region. PIKOM proposes to the MCMC to liberalize all telecommunication and multimedia-related licenses, especially addressing the licensed institutions or establishments that failed to deliver the products and services in stipulated time. In addition, the Government needs to promote free WiFi in large cities and urban areas at least for three years in order to accelerate and create the critical mass for the uptake of new age technology and emerging socio-economic practices, which influences the contemporary lifestyle.

Market liberalisation can speed up not only the 50% target envisaged of provision of broadband infrastructure but also inherently catalyze the growth of various forms of network and content services. The growth rate can accelerate further when the prices of broadband can be brought down to a level competitive enough when compared to neighbouring countries. This can boost the broadband penetration rate to at least 83% by 2012, if 50% level can be reached by 2010. Indeed, such new age developments are fundamental and instrumental for the growth of e-Commerce, e-Government, online learning, tele-working, to name a few.

4. Bridging Digital Divide (BDD)

The country's ICT penetration is relatively low by comparison to high income economies in Asia. Malaysia's computer penetration per 100 people stood at 26.2 in 2007, compared to 67.3% in Korea (MCMC, 2009). Similarly, Internet usage per 100 people in 2007 was only 55.9%, compared to 72.9% in Korea (MCMC, 2009). The ICT penetration is not only low but also highly skewed, in terms of geographical distribution, accentuating urban-rural disparities. Another pressing issue which affects the effective bridging of digital divide is the provision of equitable access, affordability and affinity for ICT usage, especially among the rural folks, marginalized communities in the urban areas and disadvantaged groups. For the more ICT literate but trivial users, specific policies and programmes, especially with incentives and financial support, can motivate them to produce innovative and knowledge-based products and services to help realize a high income economy. PIKOM considers the provision of a Universal Service Programme (USP), the efficient implementation of Universal Service Programme Funding (USPF) and the EPF PC Withdrawal Scheme to play a crucial role in addressing BDD issues.

4.1 The Universal Service Programme

In 2003, the USP was initiated and its implementation is subjected to the provision of Section 204 of the Communications and Multimedia Act (CMA) 1998. The aim of the programme is to provide collective and individual access of basic telephony Internet services to the underserved areas and underserved group within the community. The USP was established to prevent the network facilities providers (NFP) and Network Service Providers (NSP) from focusing on only commercially viable areas/ markets. NFP licensees are allowed to build and own high speed networks (e.g. TM & Asiaspace Dot Com), while an NSP is usually a party that buys and sells bandwidth (e.g. Jaring & Timedotcom). In the absence of such a programme, it would create a gap between the underserved communities in urban and rural areas. The MCMC manages the USP. The USPF was initiated to provide the requisite infrastructure funding for the last mile-connectivity to underserved areas, which are defined as those localities where the penetration rate for Public Switched Telephone Network (PSTN) subscribers in Malaysia is 20% below the national penetration.

As per USP regulation, each NFP, regardless of whether it is a fixed or mobile network operator, is mandated to contribute 6% of its weighted revenue from designated services to the Fund. As of 2008, the USPF size was RM4.7billion, and it would have surpassed the RM5billion mark in 2009, as about RM800 million is collected each year for the USPF. Since 2004, the MCMC has been rolling out multiple USP programmes in an effort to bridge the digital divide throughout the country using the USPF. As of 31 December 2007, a total of 71,125 individual lines and 3,259 payphones have been completed under USP. In addition, the USPF also undertook successful implementation of 44 broadband libraries. However, the number is significantly lower than MCMC's initial target of providing broadband libraries to 350 underserved areas in the country through USPF, indicating weaknesses in the management of USPF. The original intent of the USP was for providing last-mile connectivity solution. It now includes financing the deployment of broadband, cellular uses and content development activities. Recognizing the USP and USPF implementation challenges, PIKOM recommends a number of solutions in addressing the BDD concerns. They are as follows:-

- Enhance the transparency of USP and USPF implementation regulations, processes and procedures;
- Expand the USP and USPF scope to cover indigenous content development activities, establishment of ICT-driven knowledge and innovation centres, provision of info-mediation services to ICT illiterates and rural folks, and ICT and Information Literacy programme for low income families;
- Provide free or lower the cost of broadband services for all;
- Mainstream all marginalized communities irrespective of regions and backgrounds by initiating a National ICT Programme specific to the disabled communities - the deaf, blind and physically challenged;
- Design a USPF strategy based on segmentation approach instead of general public developments. For example, focus on specific geographical areas and demographics to close the technology, information, knowledge and innovation gaps;
- Promote specific incentive and financial support programmes targeted at advanced ICT users to produce innovative and knowledge-based products and services.

4.2 EPF Withdrawal Scheme for PC Purchases

Another obstacle to the pervasive use of ICT is the low uptake of PC and Internet adoption. The revival of the EPF Withdrawal Scheme for PC Purchases will increase PC and broadband penetration (PIKOM, April 2009; PIKOM, December, 2009). Though the prices of personal computer and its accessories have reduced substantially in recent years, the uptake of PC across all strata of society has yet to be realized. There could be many factors contributing to such low uptake of PC and Internet adoption, but affordability is definitely one of them as a substantial number of Malaysian families (about 40%) are living on an average household monthly income of RM2,000 to RM4,000, as reported in the mid-term review of Ninth Malaysia Plan (2006-2010) (EPU, 2008). For such families, the new age technology adoption is lower than other competing demands such as food, clothing, shelter and schooling. When such families are not integrated into new age system, not only the adult or the working population becomes displaced from new age technological impact, but also their children. Therefore, it is imperative for the Government to formulate schemes that can help every segment of the population enjoy and reap the benefits of emerging technologies. Various industry players, including PIKOM, have called on the Malaysian Government to make the requisite interventions to reduce the price of usage of the Internet.

PIKOM has recommended to the Government to revive the EPF withdrawal scheme for PC purchases to provide the requisite assistance to poor and needy families to acquire PC, broadband, and the associated accessories. In this regard, PIKOM pledged to provide the requisite institutional and industry support to operate the scheme and manage the manufacturers, retailers, EPF, contributors, and the Ministry to ensure that the abuses of the past scheme are not repeated. PIKOM has a hold on the retailers through its PC Fair event and, as such, is the best party to ensure compliance in handling the process and procedures.

PIKOM estimated that the proposed initiative would generate additional PC sales of about 300,000 units per year and add about RM700 million to the ICT industry a year, or approximately 2% of additional growth over the then 5% growth for 2009. PIKOM estimates that this will add about 10% to the broadband penetration rate, or about one-third of the 30% gap to reach the objective of the 50% penetration by the end of 2010. The current tax relief of RM3,000 for purchase of a new computer is also to be extended to include the purchase of ICT parts, peripherals and accessories, which can promote auxiliary and downstream activities. The proposed EPF scheme is poised to increase the uptake of PC from its 30.2% in 2008 to 50% by 2012; otherwise, by its normal course of PC adoption, the rate is expected to reach only 40.2% by then. Similarly, the Internet adoption will increase from 23.2% to 83.3% by 2012. This initiative also can help in the acceleration of broadband services. Such growth rates are crucial for narrowing the digital divide, thus minimizing the info-rich and info-poor gaps, even reducing the knowledge divide.

Taxation wise, the current tax deduction for purchases of computers once every three years should be made once every year. Annual deductions would relieve consumers of the need to consider tax issues when making purchases. This would encourage faster product adoption rates and increase sales. Higher sales will likely offset any reductions in sales revenue and create greater economies of scale which would likely to lower prices. Simplifying the tax code and making more products such as network equipment, basic hardwares such as memory, hard disk drives, graphics cards, monitors, qualify for deductions would also encourage quicker adoption of new technologies.

5. Institutional capacity building

Institutionally, the ICT sector is facing a number of challenges to move forward aggressively (PIKOM, April 2009). In the mid-90s, the Government promoted ICT in a big way to transform the nation from agro-industrial economy to a knowledge-based economy (EPU, 2000). But, over the years the momentum has lost its vigour. Today, there is a lack of focus to achieve the vision to develop ICT services as the next engine of economic growth. It must be duly reckoned that the ICT landscape itself has undergone tremendous changes. In order to spearhead the ICT services component as the next engine of growth, it is imperative for the Government to put a number of institutional measures in place, including policies, programmes and strategies. PIKOM views these challenges seriously by seeking explicit recognition for ICT sector, promotion of e-services, exemplary leadership by the Government and its agencies, promotion of e-Commerce and associated e-payment schemes, role of institutes of higher learning in R&D and innovation as well as commercialization of patents, tax incentives, job market and uptake of funding.

5.1 Need for an Explicit ICT Services Task Force

The absence of specific focus on ICT Services development represents an important issue. Despite being positioned as a key enabler and a major development thrust in OPP3 (Third Outline Perspective Plan (2001-2010)) and Malaysia Plans thereafter, the ICT services sector has yet to gain an explicit recognition as a key strategic thrust during the implementation stage. In particular, within the organisational structure of the Cabinet Committee on Services Liberalization (CCSL), there is no ICT Services Task Force Group under the Malaysian Services Development Committee (MSDC), with ICT services generally considered or thought of as ancillary to the traditional definition of services. As shown in the Table 1, ICT Services components comprising telecommunication and computer services alone, contributes significantly to Gross Domestic Product (GDP), accounting for 15.9% of value added services to GDP in 2008, showing a significant growth from 13.3% in 2000. In comparison, the share of primary sector comprising agriculture and mining has registered a declining importance from 19.2% to 17.4% over the same period. The share of secondary or manufacturing sector, taking into account of ICT production component, also registered a fluctuating trend. Despite its growing importance, the ICT Services component has yet to gain an explicit mainstream recognition.

Recognising the growing significance of ICT Services, PIKOM has appealed to the Government to set up a specific focus group or task force under the purview of the MSDC. The recommendation seeks to make ICT services a distinct service category, which will provides better policy and strategic development for the industry. This would promote the ICT services and ensure its sectoral growth in a comprehensive and holistic manner. In this regard, PIKOM also pledged to provide a full-fledged support to drive this focus group so that the ICT services sector is accorded equal attention similar to business and professional services, construction, distributive trade, education & training, health, tourism, maritime transport, land transport, air transport, and integrated logistics and supply chain management services. Moreover, the EPU with the support of other mainstream agencies such as the Department of Statistics, Bank Negara Malaysia and Treasury needs to provide a distinct recognition of the ICT sector in the national economic classification system. Indeed, ICT has gained an equivalent standing compared to manufacturing, agriculture, construction, mining and quarrying. PIKOM has made a clarion call to institute a dedicated ministry to oversee the development of ICT sector and its impact on society and economy.

Table 1: Share of Value Added to Gross Domestic Product by Major Sectors and ICT Services: 2000-2008

Year	Primary Sector	Secondary Sector	Tertiary Sector	
	Share of Agriculture & Mining	Share of Manufacturing including ICT Production	Share of Other Services Components	Share of ICT Services
	%	%	%	%
2000	19.2	34.8	32.8	13.3
2001	18.9	33.4	34.1	13.6
2002	18.6	32.9	33.7	14.8
2003	18.6	33.7	33.4	14.2
2004	18.2	34.2	34.0	13.6
2005	17.4	34.0	32.4	16.2
2006	16.8	34.0	32.5	16.7
2007	16.1	33.1	34.9	15.9
2008	15.6	32.1	36.1	16.3

Source: PIKOM, using data from DOSM

5.2 Promoting e-Services

The lack of promotion to drive e-Services happens to be another important issue in the development of ICT as the next engine of growth (PIKOM, April 2009; December 2009). Indeed, despite recognising the ICT for Development (ICT4D) initiatives promoted in the World Summit on Information Society (WSIS) 2002 and 2004, the development and promotion of e-Services is long overdue. Deployment and adoption in the public and private sectors remain pervasively weak. Indeed, Malaysia strongly supported the ICT4D initiative during the WSIS forums. However, Malaysia was thereafter seen to be regressing in her pursuit of the initiatives at both policy and implementation levels.

Expansion of e-Services, especially e-Commerce activities, broadens the opportunities for business, learning and social interactions, which tend to become global. In particular, value of e-Commerce transactions estimated at RM29.6 million involving B2B and RM2.7 million for B2C in 2005 (Kaur, 2005). This figure subsequently grew to RM76.7 million by 2007 (EPU, 2008), indicating double the growth within a two-year period. However, Frost & Sullivan estimated much higher figure than that of the Government's or academia's estimates. In particular, Frost & Sullivan estimated that in 2007, the Malaysian e-Commerce revenue or sales value amounted to USD13.61 billion, up from USD9.3 billion in 2005. Should the Government provide the requisite incentives, legal and regulatory framework and institutional support, such as removal of service tax for new technology imports, double taxation reduction for computer-mediated business automations, cost reduction on cost of services solicited via online by customers, paying online bills at discounted rate, the e-Commerce component within the ICT Services sector is poised to register exponential growth. If e-Commerce can contribute 1% to current GDP, it would have a net total value worth of RM6 billion per year. This is achievable by 2015, if the market is stimulated to grow at least 40% per year within the next five years.

5.2.1 Exemplary Leadership on e-Services by Government and Government-Linked Companies (GLC)

According to Waseda University's ranking (refer to Table 2), Malaysia is one of the top ten countries in the world where its Government has a National Portal which disseminates information effectively, and provides the convenience of downloading relevant Government forms. However, it has failed to secure similar ranking where solving development issues and problems using new technological capabilities and capacities are concerned. This is partly because of a lack of exemplary leadership by the Government and Government-Linked Companies (GLCs) in ICT services. The Government and GLCs collectively form the largest organisation in the country; it has the capability of being the largest driver of ICT services and outsourcing, not only to gain the cost efficiencies through outsourcing its non-core functions, but also to provide Malaysian ICT services and outsourcing companies with the necessary scale and strong track records to compete globally.

An area of e-Services, which should be more aggressively developed is outsourcing. Private sector investments in the outsourcing business can be enhanced if Government agencies and GLCs make outsourcing a policy, especially in the outsourcing of their non-core functions.

The adoption and adaptation of all government institutions and GLCs to ICT4D as an explicit activity in addressing the traditional development problems and challenges should be promoted, accelerated and catalyzed. For instance, government agencies should aggressively promote and pursue the outsourcing of its business processes towards increasing quality, efficiency and effectiveness of providing civil services. In re-inventing the quality of civil service, the Government should benchmark its current practices against best practices around the world, where the outsourcing industry is gaining prominence in the civil service sector. Malaysian outsourcing players will be given greater track record opportunities to better compete in the global markets.

By the end of the Tenth Malaysia Plan (2011-2015), ICT services and outsourcing activities can be the main engine of economic growth, if concerted efforts are taken to implement ICT4D initiatives in all public services. When ICT4D services are integrated appropriately with the high value-adding private e-services such as online banking, insurance, tourism, shipping and hotel management, there is a strong tendency for Malaysia to be a leading nation for attracting new investments and ease of business activities that are crucial for sustained positive growth. Moreover, the outsourcing programme can help the Government reduce its annual budget by containing the cost as fixed contract sum over a period of time. Furthermore, outsourcing can help to improve the quality of civil service through improving the efficiency and effectiveness of delivery mechanisms of non-core areas.

Table 2: Waseda University Ranking on e-Government

TODAY'S SCENARIO: PUBLIC SECTOR
INFRA-, INFO-CENTRIC IMPLEMENTATION & LACK OF PROMOTION LIMIT SUCCESS

RANK	Interface Functions & Applications	Mgt. Optimization	National Portal	CIO in Government	E-Gov promotion
1	USA	Singapore	Singapore	USA	Sweden
2	Singapore	Germany	USA	Korea	Japan
3	Canada	Taiwan	Korea	Singapore	Korea
4	France	Italy	Malaysia	Japan	UK
5	Australia	France	Sweden	UK	USA
6	UK	Spain	Canada	Thailand	Canada
7	Japan	Japan	Finland	Canada	Singapore
8	New Zealand	Sweden	Hong Kong	Germany	Australia
9	Belgium	Finland	UK	Malaysia	Mexico
10	Spain	Thailand	Taiwan	Taiwan	Norway

Source: Waseda University
Note: Malaysia ranked top 10 in National Portal & CIO Government segments, but not in the top 10 for interface functions and applications, which entails Cyber Laws, e-lander system, e-tax system, e-Payment system, e-voting system, social security, civil registration, consular and labour related services. Overall Malaysia ranked 22 out of 34 countries investigated in the study.

Source: Compiled from: http://www.giti.waseda.ac.jp/GITS/news/download/e-Government_Ranking2009_en.pdf

5.2.2 Compelling Motivation for e-Commerce

Lack of compelling motivation reflects poor uptake of e-Commerce in the country (PIKOM, March 2010). Indeed, the invention of the computer triggered the information revolution, but the advent of e-Commerce revolutionizes the new age society and economy by creating a virtual geography. However, Malaysia finds it difficult to accelerate or catalyze such societal and economic revolution for various reasons. It is conjectured that due to a long established trading culture, the business communities in the country, especially the small and medium industry players, find difficulty in migrating their businesses to the new age modes. Basically, the business communities lack trust, confidence and motivation to carry out business transactions in online and real time modes and means, which differ from traditional business models, making adoption difficult. But what makes e-Commerce adoption among businesses weak is the lack of knowledge and skill. While consumers still have issues on security and reliability. In other words, businesses are not versed in the concepts and structure of e-Commerce, while consumers are unfamiliar with a business model which requires no physical inspection of the goods and places more emphasis on trust than traditional modes.

Besides that, another impending factor that affects the uptake of e-Commerce is the poor legal infrastructure and institutional framework, especially slow in formulation and implementation. Thomas Vartanian cited that "Laws give people certainties about their rights and responsibilities and make life more predictable. Without predictability, business will not be able to act efficiently or price services effectively". The list of Malaysian cyber laws that have been enacted since 1997, are shown on Box 4.

The Personal Data Protection Act was passed and made into a law in 2010, more than a decade since its promulgation. This Personal Data Protection Act is crucial especially for online and real time transactions so that data or information privacy can be considerably protected. Without a comprehensive data protection act, it is a formidable challenge to convince consumers to embark upon online shopping or e-payment and business to deploy e-Commerce solutions in the absence of a legal framework in which to operate in. Both business and consumers wonder to what extent the current cyber laws in Malaysia provide adequate litigation against credit card fraudulent practices and what protection merchants' logistics and policies offer on delivery, return or refund of goods and services transacted in the virtual environment. Despite the different cyber laws that have been passed in Malaysia, the key Electronics Government Activities Bill is still in the formulation or debate stage since 2001. Similarly, without the Government and Government-Linked Companies setting the exemplary leadership in e-Commerce practices, it will be another formidable challenge to acculturate Malaysian private businesses and individuals to migrate into new ways of performing transactions.

Box 4

Since 1997, some of the cyber laws that have been passed by the Parliament include:

- Digital Signature Act, 1997
- Computer Crimes Act, 1997
- Copyright (Amendment) Act, 1997 (also read Copyright Act, 1987)
- Telemedicine Act, 1997
- Communications and Multimedia Act, 1998
- Communications and Multimedia Commission Act, 1998
- Personal Data Protection Act, 2010
- Electronic Commerce Act, 2006
- Electronics Government Activities Bill

5.2.3 Incentives for e-Payment

The ICT industry players perceived that there is a lack of adequate incentives for both service providers and vendors to switch to e-payment modes (PIKOM, April 2009; PIKOM, March 2010). With regard to this, PIKOM proposes to the Government to remove service tax for ICT services for two years in order to promote emerging new technologies. In addition, PIKOM also recommends the Government to provide incentives such as double tax deductions and depreciation allowances for corporations to automate and convert to e-Services and Outsourcing as well as for the e-promotion of corporation's services. Moreover, the Government could also allow corporations double tax deductions for the incentives that they give to their customers for using their e-Services. Such moves will help to reduce both capital expenditure and operation costs for business operators who typically need incentives to migrate into new modes of business processes and uptake of new technologies. On such a note, the business sector could share its cost saving elements with their customers and clients. For example, telcos give rebates for accepting e-bills; similarly, banks can give rebates for e-statements, and the list is endless.

On the public sector side, a big step will be for the Government to promote its e-Government services at all levels. One pertinent area is for the Government to drive e-Payment for all federal and state departments and agencies and Government-Linked Companies throughout the country e.g. state land offices, local municipalities, etc, without passing the transaction fees to consumers. This could be developed along with incentives for the public to use the e-services, such as 1% rebate off the tax payable for e-Filing (subject to a maximum rebate of RM200) and promoting appropriate discount for paying utility bills via e-payment mode.

Another alternative for the Government is to set up a National e-Payee Directory for electronic bill presentment, rather than to have physical bills being sent the old fashioned way. This will help to promote e-payment as the default mode of payment, rather than for each and every bank having to recruit its own e-payees. This can perhaps be managed by Bank Negara Malaysia. Moreover, an e-Payment strategy should be adopted such that all entities which accept payments have to be e-enabled. This may bring forth reduction in operational cost for utility service providers; indeed, such cost reductions and cost savings should be passed on to the customers, especially those who do not seek printed receipts and statements. The regulatory institutions must also ensure that promotion of online mode payment should not be a burden to the customers from the perspective of pricing or technology. In this aspect, the Government can take note of the Financial Services Industry (FSI)'s adoption of e-Services. FSI use of e-Services include adoption of Automated Teller Machines (ATM) for most Over-the Counter (OTC) services, and expanded to include making bill payments. With the increasing use of the Internet, the FSI move towards online / Internet banking. With the advent of mobile phones and faster cellular technology, came mobile banking. Today, consumers find it convenient to conduct the majority of banking transactions online, including bill payments, loan application, fund transfers, and even purchase of investment products.

5.3 Globalisation of Malaysian ICT

Although the Global Financial Crisis of 2009 has forced many economies to slow down, the positive side is that it has created new opportunities. On the one hand, the economic dominance of the G-7 is over (NEAC, 2010). Indeed, following the crisis, countries like Greece and Spain were plagued with unprecedented sovereign debt requiring foreign assistance to bail them out. Many developed economic blocs are at a crossroad and compelled to review their growth strategy. On the other hand, economic recoveries in the developing world are faster. Countries like Brazil, Russia, India and China, often referred as BRIC countries, are populous nation and poised to become economic giants in the near future. As a result, such changing global scenarios are advantageous to economies that are in the process of reviewing and realigning their competitive edge and comparative advantages. Malaysia is one of such countries, which aims to become a knowledge-based economy or an innovation-driven economy.

Malaysia has traditionally good trade, political and cultural ties with BRIC nations, in particular, with China and India. However, the question is to see whether or not Malaysia is in a position to leverage upon the growth of BRIC nations and for that matter, maintain or sustain its present growth? Due to globalization, competition has become fierce. Every emerging economy competes for foreign direct investment (FDI) that is becoming increasingly scarce. In fact, since the dawn of the new century, FDI into Malaysia has been dwindling, especially in the manufacturing sector. As cited in the NEM, the Government is looking towards innovation strategy that hinges upon not only producing and retaining a quality workforce, but also globalizing Malaysian brands, venturing into new markets and beefing up small and medium enterprises (SME). In line with the Government's innovation strategy and aspirations, PIKOM made pertinent suggestions on globalizing products and services in terms of ICT brands, gaining access to new markets and enhancing the capacity of SMEs.

5.3.1 Strong Global ICT Brands

In comparison to countries like South Korea, Singapore, Taiwan and India, Malaysia has not been successful in creating reputable and recognizable global brands in the ICT sector. The ICT services components comprising telecommunication, computing, content development and outsourcing services have grown from 25% of the ICT sector in 2000 to 43% in 2007, mainly attributed to MSC Malaysia and its flagship applications pertaining to e-Government, smart schools, privately run e-services such as Internet banking, insurance, logistics, and a number of PEMUDAH-driven initiatives. It is timely for the Government to provide specific incentives and institutional and logistics support for the ICT services sector. Market access overseas has not been fully exploited due to perceived low quality mentality, lack of proper quality, standards measurements and accreditations, or lack of confidence, motivation and risk taking. Many local ICT companies are not adequately leveraging on the bilateral opportunities created by the Malaysian Government with Japan and Pakistan, for example, and through the AFTA agreement with ASEAN nations. In order to compete with ICT products and services produced by countries with bilateral agreements, it is imperative for Malaysia to produce and export high value adding ICT products and services. Malaysian ICT companies also need to explore non-traditional markets like in Eastern Europe, Africa and Latin America, which are fast growing and have great potentials.

- Improve overseas market access for Malaysian ICT companies through Government-funded ICT industry representations, at least for three consecutive years towards building adequate institutional capacity and human capability;
- Provide financial incentives or tax breaks, as well as institutional and logistics support for Malaysian ICT companies to venture into new markets like in Eastern Europe, Africa and Latin America;
- Provide annual grants to industry representatives such as PIKOM for policy, market, trade and industry feasibility studies;
- Provide explicit funding amount for the Services Export Fund (SEF), Market Development Grant (MDG) or Brand Promotion Grant of MATRADE for industry associations such as PIKOM for globalizing and promoting Malaysian ICT products and services;
- Promote maximization of benefits from the bilateral agreements or the ASEAN Free Trade Agreements (AFTA) among local ICT companies;
- Enhance the Small and Medium Enterprises (SME) competitiveness and visibility globally through SMECorp by:-
 - o Reviewing appropriateness of current financial support;
 - o Promoting Search Engine Optimisation (SEO) and Search Engine Marketing (SEM);
 - o Initiating a dedicated Shared Services and Call Centre Services for SMEs to increase the effectiveness of their website marketing.

5.3.2 Globalising Malaysian ICT Products & Services

Currently, software and content development companies face difficulties in globalizing their businesses due to the lack of internationally recognized accreditations and certifications (PIKOM, December 2009). In addition, companies also lack adequate process and quality improvement capabilities in order for them to venture globally. Lastly, most SMEs in the country lack both the financial capability and experience to venture abroad.

With regards to this, PIKOM has proposed to the Government to identify, with the idea of offering assistance to potential ICT companies in priority areas that are well-managed, financially stable, with proven track records domestically, and which aim to expand their operations overseas. PIKOM then recommends adopting a highly accredited process and quality improvement methodologies like Six Sigma, Lean Six Sigma, Capability Maturity Model Integration (CMMI), Information Technology Infrastructure Library (ITIL), People Capability Maturity Model (PCMM) and ISO.

The recent SME Competitive Rating for Enhancement (SCORE) programme undertaken by MDeC and Small Medium Enterprise Corporation (SMECorp) is applicable to all MSC status companies. It has the objective of rating MSC status companies based on a five star rating system. Companies rated five stars will be assisted in venturing overseas. PIKOM has recommended that SMECorp should extend such facilities to all ICT companies in the country including non-MS status companies. As such, all SMEs should be accorded the requisite policy, institutional, administrative, logistics and financial support to be star-rated, and helped to venture their businesses overseas. For the non-MS status such as ICT SMEs, PIKOM is keen to champion this programme but will need to be funded by MDeC & SMECorp.

5.3.3 Low Technology take-up Rate among SME's

Because of the low technology adoption rate among SMEs, the pervasive use of ICT in all sectors of the economy may leave the bulk of the SMEs behind in the envisaged knowledge economy (PIKOM, December 2009). The reason is that most of the SMEs are in the manufacturing sector or the goods producing side of the economy. This will not only make the SMEs becoming marginalized within the country's economic growth, but they will also lose their competitive and market edge, in the wake of globalisation and market liberalisation trend, that is increasingly driven by the borderless phenomena.

Under the assistance and supervision of SME Corp, the SMEs can move up in economic and business value chain, thus reducing the gap, against the large corporations and multi-nationals. With immediate attention to this proposal, the envisaged business integration and business process re-engineering can be realized before the end of the Tenth Malaysia Plan. Such economic and business elements are increasingly becoming important factors for attracting foreign investments.

To cope with the low technology adoption rate of SMEs, the SME Corp could review its current financial support offerings to SMEs in order to increase the utilisation of ICT. Some efforts have already been made. When the Internet took strong footage in the country, SME Corp played an aggressive role in providing financial and institutional support to SMEs in the setting up of their websites. This assistance greatly helped to move SMEs up in the industry value chain. In order to move forward, SME Corp should complement its website assistances with financial and institutional support to promote SEO and SEM with Call Centre services for SMEs. This would increase the effectiveness of their website marketing, possibly through an appointed panel of service providers.

6. Capability Building

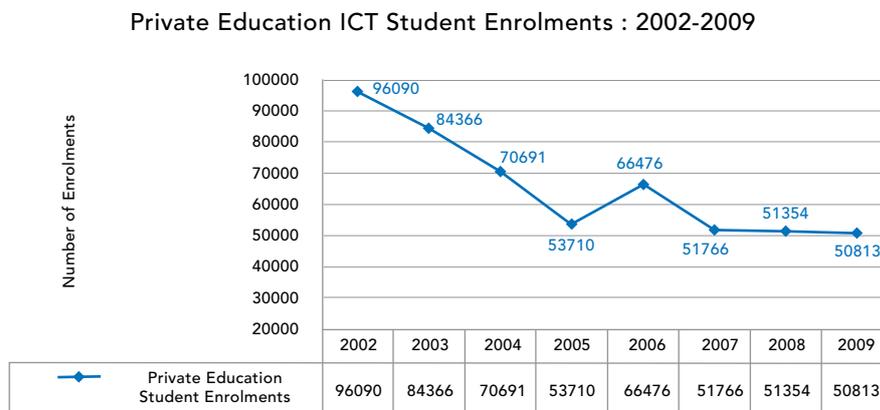
Malaysia is facing dismal performance in the much anticipated new wealth creation activities in the ICT sector (PIKOM, December 2009; PIKOM, March 2010; PIKOM, April 2010). This is partly due to weak research and development and innovation culture, and partly to inadequate supply of human capital, both in terms of quantity and quality. Acknowledging that the problem is highly present in the ICT sector, PIKOM has forwarded a number of recommendations to the Government to take appropriate efforts in addressing the development of quality human capital that the industries require. In particular, PIKOM addressed the issue in the context of adequate supply, quality of graduates compatible to the industry needs, process and quality improvement skills, employability, soft skills, linguistic skills and R&D skills. Furthermore, PIKOM also recommends, in line with the 10th Malaysia Plan, to focus on selective skills developments, with a strong emphasis on specialization, particularly areas where Malaysia can establish niche positions.

6.1 Supply of ICT Graduates

The development of the ICT sector suffers from continuously plagued inadequate supply of qualified personnel (PIKOM, 2008; PIKOM, April 2009; PIKOM, December 2009; PIKOM, March 2010). The industry needs can be broadly seen from two aspects. One is the ICT graduates equipped with specialized technical skills in engineering, programming and software skills are very much sought after in the ICT and micro-electronics sector. The other is the general technical skills in the application of ICT knowledge is used in running day-to-day administrative, finance, logistics, sales, project management and process improvement operations that are often sought after in the ICT services sector such as outsourcing.

Official statistical numbers reveal that the proportion of fresh graduates enrolled in or currently pursuing or freshly entering job markets with ICT qualification have been on the declining trend. In particular, as shown in Figure 5 that the number of graduates pursuing ICT courses in private institutions of higher learning has almost halved from 96,090 in 2002 to 50,813 in 2009 (MOHE, 2008; DOSM (a), December 2009; PIKOM, 2009).

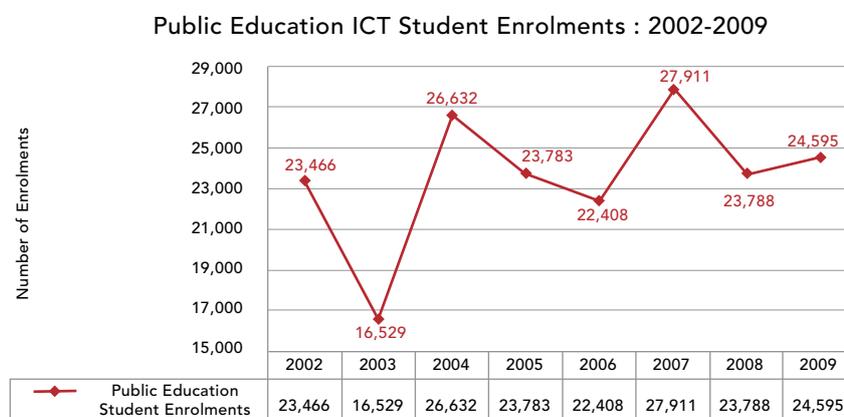
Figure 5



Source: Department of Statistics Malaysia; PIKOM Estimates

The same trend can be observed in public sector institutions where the numbers declined 14% between 2007 and 2009, dropping from a peak of 27,911 in 2007 to 24,595 in 2009 (refer to Figure 6).

Figure 6



Source: Department of Statistics Malaysia; PIKOM Estimates

A private sector study revealed the decline in the number of enrolments is attributed to a decline in interest and a perceived lack of glamour (PIKOM, 2009). Moreover, employment prospects have been perceived as generally unfavourable *vis-à-vis* other industries. ICT careers are deemed to require long and sometimes irregular working hours, while the remuneration is perceived to be less attractive than other industries.

Thus, to increase the supply of ICT graduates, PIKOM has made the following recommendations to the Government:-

- Provide financial incentives for private institutions of higher learning to run specialised ICT courses to increase the pool of graduates with specialised ICT skills;
- Consult industry representatives / groups, when identifying industry skill demands and in the formulation of ICT curriculum for the education system;
- Expand the scope of the National ICT Literacy initiative to cover all 11 years of the public education system from the current coverage of upper secondary school levels (Forms 4 and 5) only;
- Promote and fund programmes for “Finishing Schools” students especially after Sijil Pelajaran Malaysia (SPM) or Sijil Tinggi Pelajaran Malaysia (STPM). These courses will provide should focus on developing the soft skills.

6.2 Quality of Graduates Incompatible with Industry Needs

Besides coping with the quantity issue, the industry is also facing more serious problems with the quality issue (PIKOM, December 2009). Indeed, the quality of graduates often does not match the needs of the ICT industry. This includes areas which are considered important by the industry, namely:-

- English skills
- Soft skills
- Innovation and creativity learning
- Multi-linguistic skills

6.2.1 Linguistic Skills: English

Declining linguistics competency has been identified as a problem, particularly the decline in the command of the English language (PIKOM, December 2009; MOHE, 2007). In 2006, the Ministry of Higher Education (MOHE) revealed that only 11% of fresh graduates scored a distinction in SPM level English, as highlighted in the “Laporan Kajian Pengesanan Graduan IPT, 2006” by the MOHE, indicating poor linguistic skills among local graduates.

Towards enhancing the English language skills, PIKOM proposes to the Government to provide financial incentives for university students to pursue English courses that have accreditation from recognized institutions. It has also suggested the option for English as the medium of instruction for Mathematics and Science subjects at all levels, as English has emerged as the global language. Since the Government has decided to revert back to Bahasa Malaysia as the main medium of instruction in the teaching of Mathematics and Science, to avoid further deterioration in the command of the English language, PIKOM is proposing the number of teaching hours for English to be increased. One of the ways this can be achieved is either teaching Moral lessons in English or completely replacing Moral lessons with an English subject. If the recommendation on improving the command of the English language is pursued aggressively now, it is estimated by 2015, local institutions of higher learning should be able to churn out graduates meeting industry needs and graduates having competitive edge globally.

However, given the current direction is to increase the number of minutes per week for the teaching of English, an alternative recommendation is to allow students to substitute Moral education with a language subject such as Mandarin and Tamil. This would complement and strengthen the country's multilingual advantages in the ICT services industry.

6.2.2 Soft Skills

The level of soft skills among the local graduates is considered lacking, in addition to the below industry expectations in their level of technical knowledge and skills pertaining to ICT. In particular, technical knowledge in advanced programming and sophisticated system development. For instance, in the recently concluded ICT Skill Gap analysis conducted by PIKOM, the study showed that 40 job titles had 20% or lower employable candidates; 32 job titles had 10% or lower employable candidates; while 9 job titles had no employable candidates. In essence, out of 9,132 applicants, the (simple) average employable rate is just 10.9% (PIKOM, December 2009; PIKOM, March 2010). In other words, 1 in 10 candidates do not actually meet or possess the required skills for employment.

The acquisition of ICT “soft skills” among fresh graduates entering the job market should be promoted under the proposed Finishing School Funding mechanism. With immediate implementation, this programme should be able to train a total of not less than 80,000 new graduates, that is about 35% of 220,000 new graduate entrants annually waiting for job placement for more than a month. It is acknowledged that a substantial number of them lack the requisite employability skills especially in ICT, and lack fluency in the English language. An independent study has shown that those having adequate command in the English language have greater potency and propensity to acquire new age skills (Nair, 2009: Monash University BDD in Rural Areas), which is fast becoming a basic requirement for most jobs in the manufacturing and services sectors. If the recommendation on the need for mastering English language skills among university students is pursued aggressively with immediate effect, by 2015, both the local and private universities should be able to churn out a substantial number of quality graduates compatible to the industry needs and graduates having competitive edge globally.

In an effort to increase the technical know-how among students, PIKOM is also recommending that at the university levels, students should be free from compulsion of learning Moral subjects, which takes a heavy toll in terms of energy and time on the part of students, especially those in the technical streams. The spare hours can be converted to study or acquire the requisite working knowledge and experience that the industry desires. MOHE, in particular the Malaysian Qualification Agency (MQA), is to work with industry players to ensure that local institutions of higher learning produce graduates compatible with industry needs.

6.2.3 Innovation and Creativity Learning

The Malaysian education system, from primary to tertiary levels, emphasizes more of rote learning than innovation and creative learning, thus posing great challenges for the development of innovative and knowledge workers (PIKOM, December 2009; PIKOM, March 2010).

Due to a lack of craving for knowledge, innovation, and research and development, as well as entrepreneurial and commercialization skills, the country is lagging behind other developed nations in the filing of patents and intellectual property rights. Moreover, Malaysia lacks a holistic and pragmatic approach to develop the entrepreneurship activities, especially for the young ones. However, recognising the inherent limitations in resources, Malaysia should encourage greater commercialisation of findings, and focus R&D efforts on selected or targeted industries. Instead of focusing on the number of patents, the country should seek to patent specialised areas, where the country possess competitive advantage in.

In view of promoting a knowledge seeking and innovation culture, PIKOM made the following recommendations:-

- Review and realign the total education system to incorporate 21st century skills that entail creativity, innovation, technology affinity and savvy, multi-linguistics skills and multi-cultural elements;
- MOHE to promote ICT as one of the integral subjects at all tertiary level disciplines;
- Entrepreneurial spirit should be promoted beginning from school going days for the younger generations of Malaysians.

6.2.4 Multi-Linguistic Skills

Malaysia is endowed with diverse languages, cultures, traditions and belief systems. Multi-cultural and diversity of culture is seen as an asset, especially in a globalised world, where the market opportunities and cross-cultural dealings are proliferating at an unprecedented rate (PIKOM, April 2009; PIKOM, December 2009). Recognizing this endowment, PIKOM has recommended that elements of multi-culturality should be promoted in the education curriculum. Specifically, the Ministry of Education (MOE) should leverage on the multi-culture nature of the country by promoting multi-linguistic skills among students to promote content development activities in various languages, in particular, literature on ICT in Bahasa Malaysia for regional market; and Chinese language for the global market as Chinese is now the second language of the Internet. Indeed, even though English has pre-dominated the Internet since its inception in the early eighties, in recent years the quantum of Internet content in the Chinese language is now comparable to those in English. MOE is also to strengthen Bahasa Malaysia for ICT technology and ICT driven content development activities, especially to cater for the regional market, where the language is widely spoken. In other words, the country should reverse the decline in the “three language”

strengths the country possessed in the 1980s and 1990s (Bahasa Malaysia, English and a third language). Students should be encouraged to take up a third language, particularly for those who only speak Bahasa Malaysia and English.

The advantages of a multi-lingual labour force are clear. Indonesia's population of 225 million speaks Bahasa Indonesia, which is similar to Bahasa Malaysia. China has more than 1 billion people speaking Mandarin as the official language and a multitude of local dialects, which are also spoken in Malaysia. India also has 1 billion people who speak Tamil and Hindi, both also spoken in Malaysia. Last but not least, there are 6 billion people in the world, of which half use the lingua franca, English to communicate with one another. Malaysia has the unique position of having an education system that teaches two languages as part of its curriculum, and a third language developed from its multi cultural heritage. It would be a waste if such endowments were to disappear.

Therefore, aggressive pursuance of multi-linguistic skills and associated content development activities in the new media form will eventually translate into integrating 17 million Malays or 63% of country's population with 225 million people of Indonesia; similarly, 6.2 million Malaysian Chinese or 23% of total population can be integrated with not less than 1.4 billion people in China including diasporas; and 7% Indian population can be integrated with 1.2 billion Indians including diasporas. Such integration can be seen not only from social and cultural perspectives but also from economic dimensions of involving online transactions in the virtual space. If Malaysia can rake an e-Commerce market share of 1% of total population of China, India and Indonesia, its ICT products and services can be marketed to not less than 30 million people in a year. In other words, in the new age economy multi-cultural elements and diversity is recognized as a national asset, opposed to being viewed as a liability in the past.

6.2.5 Process and Quality Improvement Skills

Most of the ICT companies in Malaysia, being small and medium sized enterprises, face resource constraints and operational difficulties, in terms of finance and expertise in providing training for fresh graduates (PIKOM, December 2009). Furthermore, SMEs also face shortfalls securing highly skilled staff. As a result, most of the ICT companies experience a shortage of qualified staff with the right academic and technical skills. Industry players have also highlighted that the level of confidence, self-esteem, project management skills, and positive attitude towards process and quality improvement culture, is at a disappointing level.

With regard to this, PIKOM proposes to the Government to increase investment in education and capacity development. The private higher education institutions (PHEIs) and training institutes should be given adequate incentives to enhance the skills of the Malaysian workforce by improving the productivity, quality and process improvement capability through acquiring world renowned certifications such as the Capability Maturity Model Integration (CMMI), People Capability Maturity Model (PCMM), Information Technology Infrastructure Library (ITIL), Six Sigma and Lean Six Sigma programmes. These certifications at individual or organizational levels are very crucial to drive the envisaged knowledge-based economy and innovation-driven economy. With such certifications, the Malaysian ICT companies and workforce tend to gain international recognition for their expertise. Such recognitions also can pave the way for Malaysian companies to go abroad for investment or to globalize Malaysian ICT products and services, especially in the developed countries. It is also imperative to enact legislation for certification of ICT professionals in the country to boost their societal and market recognition, to overcome the lack of "glamour" perception as compared to bankers, doctors and accountants.

6.2.6 National Standards Employability (NSE) Programme

Due to a lack of adequate technical knowledge, experience, exposure and expertise, fresh Malaysian ICT graduates find it difficult to cope with the work exigencies and private sector demands as well as meeting bottom-line expectations (PIKOM, March 2010). Recognizing such challenges, especially for fresh entrants into the job market, PIKOM initiated the National Standards of Employability (NSE) programme, similar to India's NASSCOM Assessment of Competence (NAC). The aim of NSE is to provide specific ICT technical skills and industry relevant soft skills. The NSE programme, which was managed by PIKOM in the past, targets to train in one year 500 fresh entrants of less than six months in the job market and another 500 students in the final year of studies. PIKOM carried out the NSE programme on a pilot basis, using its own funding mechanism. Pertinently, the results showed that only 10% of ICT graduates were employable without being provided with any further training. Such survey findings in a periodic manner are needed for planning purposes. However, as a not-for-profit organization, it will be a challenge for PIKOM to expand it from its current pilot status to a recurring programme. Nonetheless, PIKOM is prepared to provide its knowledge and expertise in the formulation of ICT curriculum for the country. Thus, PIKOM requires policy, financial, logistics and administrative support in addressing the issue of skill mismatch among local graduates through the NSE programme. With regards to this, PIKOM is already engaging in a discussion with MOHE to provide grants to run the the NSE programme in the near future.

6.3 Incentives for Private Sector Researchers and Investments

Concerning research and development, investments in R&D made by the private sector, including multinational companies operating in Malaysia, are generally limited (PIKOM, December 2009). Local Malaysian companies generally lack R&D knowledge and innovation culture. Moreover, R&D activities are expensive. MNCs in Malaysia are mostly focused on assembly line activities that usually require low cost and low value-adding workforce. The R&D efforts by the Government sector and public institutions of higher learning have inherent inefficiencies and ineffectiveness, and have no significant successes in producing products and services of high commercialisation values despite huge spending in the past years. Such R&D practices and economic settings are not conducive enough for creating patents and trademarks, and producing commercial products and services that add high value to the economy. This is partly due to the lack of private sector consultation/participation and market driven R&D initiatives. In response to these challenges, PIKOM made a number of recommendations, as follows:-

- Establish collaborative research and development (R&D) partnerships between the private sector and government agencies/GLCs, supported by a specific funding mechanism;
- Government to provide direct incentives (patent rights, royalties) for innovators and researchers, academics and students to produce commercializable products and services;
- Promote R&D on cloud computing, targeted specifically for SMEs;
- Promote R&D on green ICT;
- Review and realign all due diligence processes to speed up funding approvals for R&D activities;
- Provide financial support for local ICT companies to engage in joint R&D efforts in partnership with reputable foreign entities ;
- Provide incentive for placement of private sector researchers in renowned foreign R&D entities to build credibility and a high level of competence;
- Create a mechanism to reduce or share the risks involved in private venture capital activities;
- Provide fully-paid sabbatical leave incentive for researchers in both private and public sectors to venture into beneficial research activities.

Production of local graduates, both in terms of quality and quantity, will be able to meet ICT industry manpower needs and this will help to stem a flow of billions of ringgit annually, in terms of foreign exchange. At the moment, there are about 2.2 million, constituting 20% of Malaysian workforce officially registered foreign workers. Of this total, 1% is foreign knowledge workers, that is 20,000 having ICT and engineering requisites based on MDeC definition, which demands information technology as one of the main criteria. On an average, a foreign knowledge worker earns not less than RM24,000 per annum. Conservatively, this translates into RM4.8 billion, of which a bulk of it can be saved from flowing out of the country in the form of remittances, if supply of local ICT graduates is adequate.

By introducing ICT curriculum to all levels of education in a systematic and organized manner, including certifications and accreditations, the country should be able to produce an ICT literate student population (including primary, secondary and tertiary) of 1.8 million by 2015. The current student population stands at 0.93 million in 2008, of which a substantial number, especially those from poor and rural areas, lack adequate access or opportunity for ICT literacy.

7. Policy and Market Research

PIKOM reckons that the current R&D level in the ICT sector is not very encouraging (MOSTI, 2008). Due to a lack of adequate and comprehensive ICT data, policy making by the mainstream agencies becomes difficult. Furthermore, R&D activities are often not aligned to market demands resulting in a lack of commercial value. Hence, a comprehensive programme should be initiated to better inform both the public sector and businesses on the benefits of R&D, including providing information on:-

- **National R&D direction:** Inform companies on the government's and country's target areas for development. Emphasis placed on the core competencies that have been identified as growth areas.
- **The R&D process:** From project scoping, initiation, development and rollout, companies should be informed on R&D issues such as duration, rate of return, return on investment issues, financing options, budgeting process, etc.
- **Industry structure:** Networking opportunities between public and private institutions including higher education institutions.
- **Funding options:** Inform companies on the funding options available to them.
- **Filing a patent:** Educate companies on the processes involved in patenting their R&D findings, and the advantages of patents.
- **Commercialisation of patents:** Explain to companies how to commercialise their patents and explain how patents work to the benefit of the patent holder.
- **Focus R&D strategy:** The only rule in R&D is, it never guarantees success, or there is never guaranteed success. The risk of failure, where the R&D fails to deliver any findings, or the findings have little commercial value is a way of life. As such, the national R&D strategy should be articulated as activities aimed at adding value to the field or area of interest first, than commercial viability.

- **Streamline and simplify grant disbursement process:** Numerous R&D grants are available in the country especially in the public sector. However, the disbursement process is very bureaucratic and discourages the private sector, especially the SMEs and SMBs, to pursue them. With regards to this, PIKOM has made a clarion call not only to simplify the application processes and procedures but also to create a user-friendly environment for businesses.
- **Establish a One-Stop centre / portal for private – public partnerships:** PIKOM has also proposed to provide a one-stop centre physically or virtually for researchers seeking funding an avenue to publicize their research projects and obtain funds, while providing funders with an avenue to seek opportunities. In addition, such a centre would behave like match-makers, matching researchers with suitable funding entities.

Venturing into new areas of ICT such as cloud computing and green technology is at the infancy stage. Thus, in view of promoting and nurturing R&D culture in the ICT sector, PIKOM made a number of recommendations pertaining to ICT statistics at macro level, “soft factor” research and institutionalization of ICT research (PIKOM, December 2009).

7.1 Inadequate Scope and Coverage of ICT Statistics

Current concepts, definitions, methodologies, processes and procedures of compiling official statistical systems are based on an agro-industrial system (Ramachandran, 2008). This has given rise to inherent inadequacy in meeting the policy and planning needs of the Information Age. According to OECD reporting, Malaysia collects and disseminates only seven types of ICT data at a household level, namely television, radio, fixed line, cellular, video, fax, PC and the Internet. Commencing from the Population and Housing Census 2000, the Department of Statistics Malaysia (DOSM) has regularly been collecting the ICT statistics at the household level via the Basic Household Amenities Survey (BHAS), which is a tagged-on survey carried out with either the national Household Income Survey (HIS) or Household Expenditure Survey (HES) (DOSM, 2005). However, no ICT probe is carried out at the individual level.

The Malaysian Labour Force Survey (MLFS), in its annual data collection process, canvasses information pertaining to ICT occupations, such as computer programmers, system designers and analysts, and Information Technology managers, based on the Malaysian Standard Classification of Occupation, 1998 (MASCO, 1998). Nonetheless, due to sampling limitations, explicit data on ICT workforce are not disseminated. A close scrutiny of the MASCO 1998 also revealed that the ICT occupation classifications do not adequately cover and generally lack timely updates and reflections on a number of new occupations pertaining to the Internet technology, outsourcing, provision of e-services, networking specialisation, database formulation and administration.

Under the establishment approach, the scope, coverage and level of ICT related information published in the “Information and Communications Technology Services Statistics” by the Department of Statistics is limited to only the ICT sector. Diffusion and usage of ICT items by the user agencies and organisations such as the Government, banking and insurance sectors have yet to be initiated.

Further investigations showed that, the trade figures cited in the ICT publication captured only the imports and exports of merchandized goods. The exports and imports of intangible components of ICT Services sector, such as external trade carried out on software solutions, hardware and software consulting services and outsourcing activities, are not accounted for in the official trade statistics. It is only estimated under the Balance of Payment (BOP) but subsumed as an aggregate of “other services”.

In essence, the current level of ICT information in the country is far from adequate for policy, industry and market research, and analysis as well as for international benchmarking involving the Information Age phenomena, in particular KBE and KBS developments in the country. When compared to countries like Singapore and Hong Kong in the region, the probe on ICT items in these countries not only covers those seven items mentioned earlier, but also collects additional information pertaining to the following items:-

- Methods of access / bandwidth for Internet access;
- Location of the most frequent use of Internet;
- Frequency of Internet use;
- Purpose of PC use;
- Purpose of Internet use;
- Services/ activities that the Internet used for;
- Language of visited Internet;
- Type of goods / services purchased over the Internet;
- Value of goods / services purchased over the Internet;
- Barriers to use the PC;
- Barriers to use the Internet;
- Barriers to purchase over the Internet;
- Geographical location where Internets are used.

Source: Guide to measure the Information Society. (OECD, 2009)

Malaysia has yet to commence (at a service level employee level) on the collection and collation of ICT business indicators that OECD has recommended, namely:-

- Presence of fixed telephone line
- Presence of mobile devices
- Presence of computers
- Number of computers
- Presence of Internet access
- Methods of access / bandwidth used for Internet
- Presence of local network
- Presence of web site
- Presence of ICT investments
- Percentage of employees using a PC in their normal work routine
- Percentage of employees using a PC connected to the Internet in normal work routine
- Concrete services / activities the Internet is used for
- Value of Internet purchases
- Value of Internet sales

- Customer groups / destination of Internet sales
- Training / formation in ICT use for employees
- Barriers to PC use
- Barriers to Internet use
- Barriers to e-Commerce use
- Geographical locations where Internet goods are sold

Source: Guide to measure the Information Society. (OECD, 2009)

Of the items listed above, civil war torn countries like Rwanda compiles 13 items; Tanzania compiles 18 items; 14 items by Zimbabwe; and 11 items by Mauritius. Ironically, Malaysia is lagging behind these African nations in the area of ICT data collection.

Recognizing the gaps in the Malaysian ICT statistical system and also growing demands at the policy front, PIKOM recommends to the Government to broaden the scope and coverage of ICT data through adopting the following strategies:-

- Provide the requisite policy, institutional and financial support for migrating the current agro-industrial based statistical system into a full-fledged info-age statistical system;
- Realign the current statistical system through reviewing and updating the concepts, definitions, structure, scope and coverage of industry, product, occupation and trade classification systems;
- Review and incorporate Information Age concepts and probe into all on-going national surveys entailing household and establishment approaches;
- Incept new statistical studies at a macro level pertaining to Information Age developments (Ramachandran, 2003; Ramachandran, 2008). For example:
 - o Internet Subscriber Study: At ISP Counters;
 - o Internet User Study: Individual and Organization Perspective;
 - o ICT Impact Study: Household / Establishment / Public Sector Approach;
 - o ICT Impact on Education Sector : Students / Academics.

Source: Extracted from: Ramachandran R. (2003). "Measuring Knowledge Development and Developing Official Statistics for the Information Age". International Statistical Review, 71, 1, 83-107. Hague.

7.2 Soft Factor ICT Research

It has been more than a decade that the country lacks organized efforts to conduct soft factor (or “non-technology”) research pertaining to ICT, in particular, that which evaluates the impact of the ICT on the nation’s competitiveness, productivity, rise of knowledge workers, market liberalization, globalization, internationalization, tele-working and net citizenry, which is a pre-requisite for creating an ICT-led innovation economy and society. Some of the emerging concerns include accentuating digital divide across all segments of society and SMEs/SMLs; globalization and market liberalization phenomena affecting investment and trade as well as cultural and political affiliations; emergence of net citizenry; the new age technological and work culture demands of XY generations; and cross border disputes arising from borderless transactions.

Recognizing the need for undertaking ICT relevant policy research and also to provide strategic think-tank research services on ICT, KBE and KBS related matters, PIKOM made a clarion call to the Government to establish the National Information and Knowledge Society Institute (NIKSI) to conduct strategic research, focusing on the following areas (PIKOM, December 2009; Ramachandran, 2003):-

- National economic competitiveness;
- Social digital inclusion;
- Bridging digital divide;
- Rise of knowledge workers and emergence of new work culture;
- Tele-working;
- Lifelong learning;
- Internet security and sovereignty;
- ICT Technology trends;
- Globalization and market liberalization in the Information Age;
- Developing Knowledge Economy Model (KEM) and Knowledge Imperative Index (KIX);
- Benchmarking Malaysia in the Global Information Society (GIS) ladder;
- Formulating and maintaining Policy, Market and Technology Intelligence (POMATI) database at national level, relating all new age developments.

7.3 Research Collaboration through Public-Private Partnership

In the past, most of the public policy driven research (such as the policy on bridging the digital gap) has been the responsibility of the public sector, while the market and industry related research (such as cloud computing and e-Commerce technology) has largely been undertaken by the private sector. However, the demands for new areas of statistical collection and research on new age phenomena are on the rise at a prolific rate. As reckoned, administratively and logistically, it will be a costly affair for the public service to create new research institutions or even expand the research staff in the system to cope with new policy and market demands. Outsourcing research activities to academia would also be a big challenge, considering that academics have to cope with exigencies of academic and student activities, making it sometimes impossible for them to complete a task within a stipulated time. Taking cognizance of emerging research demands and challenges in the fast growing ICT sector, PIKOM suggested exploring the possibility of partnership between the Government and the industry in undertaking data collation and research activities (PIKOM, December 2009; PIKOM, March 2010). In particular, in the partnership arrangement, the public sector should assume the role of content formulation, quality control and funding. The industry players like PIKOM would be better positioned to play a role in the data collation and processing activities, since it is closer to industry members to be able to net higher response rate from industry representatives. Such arrangements presumably would relieve the burden on the part of the Government, especially from the clutches of ever rising expenditure. On the other hand, such innovative collaboration with the private sector would greatly enhance the efficiency and efficacy of the public sector activities.

8. ICT Industry and Market Development

Besides making policy interventions in the mainstream, PIKOM also made efforts to enhance the competitiveness of the ICT industry through carrying out explicit research and dissemination of market and industry information pertaining to three key areas (PIKOM, March 2010), as follows:-

- Goods and services tax;
- ICT job market and salary trends; and
- Provision of ICT public funding.

8.1 Goods and Services Tax (GST)

An arising issue concerns the implementation of Goods and Services Tax (GST) and its impact on ICT. In the recent announcements, the Government failed to include ICT components in the GST exemption list. The industry fears that the prices of ICT components and services will go up with the implementation of broad based GST. Consequently, the businesses and the average man on the street may end up paying higher prices for the purchase of the computer and its accessories. This, in turn, will have adverse effects on the sales of computers and its accessories. Moreover, the small and medium sized computer enterprises may not have the economy of scale to cope with the new tax imposition scheme. When the sales of computers are affected, it will have direct detrimental effects on the country's ICT penetration rates, which is crucial for creating an economically and socially-viable critical mass for a number of new age activities, in particular, embracing and harnessing new technologies, and developing the knowledge-based economy (KBE), and innovation-based economy (IBE) which we aspire. Currently, the industry enjoys tax exemptions for personal computers and certain accessories and as a consequence of this, the prices of computer goods and services have come down substantially in recent years.

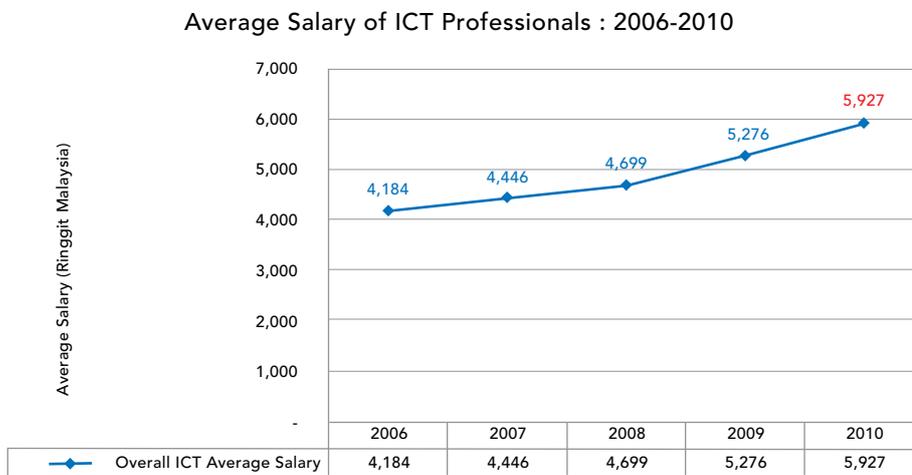
By recognizing the adverse implications of GST on the ICT industry, PIKOM strongly proposes a special exemption or imposition of zero rated tax on all computer hardware and services, in order to keep the prices of these items always affordable.

8.2 ICT Job Market Outlook

Since 2007, PIKOM in collaboration with Jobstreet.com and KPMG Malaysia has been disseminating market information on average salary of ICT professionals in the country (PIKOM (b), March 2010).

The average monthly salary of ICT professionals moved up between 2006 and 2009, registering a geometric growth rate of 6%. With this trend in line, the average salary is poised to reach at RM5,927 by end of 2010 (refer to Figure 7).

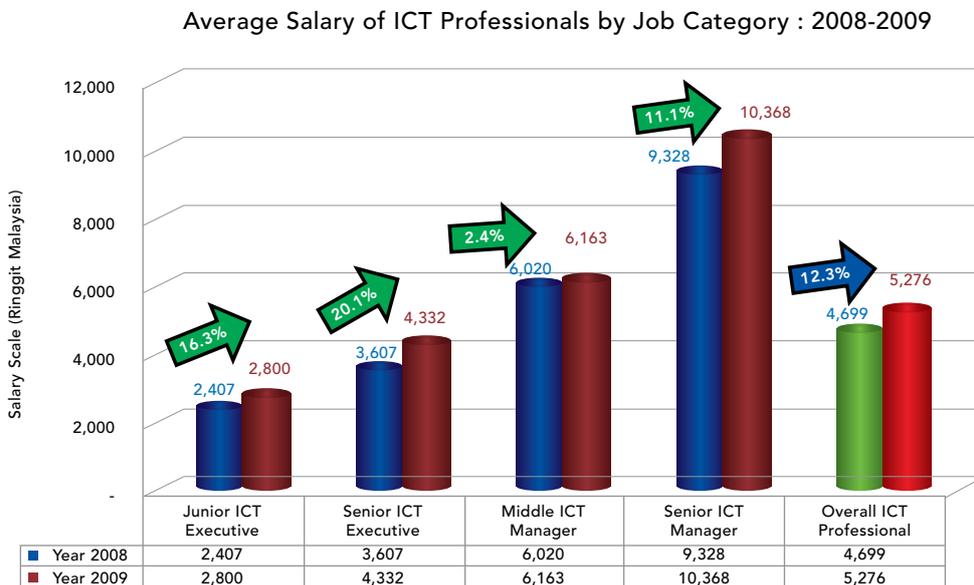
Figure 7



Source: ICT Job Market Outlook March 2010, PIKOM

Figure 8 shows the ICT salary trends by professional category for the years 2008 and 2009. The Senior ICT Executive category registered highest rise in the monthly salary between 2008 and 2009.

Figure 8



Source: ICT Job Market Outlook March 2010, PIKOM

Table 3 shows the breakdown of average monthly salary of ICT professionals by job category, working in the areas of hardware consultancy, software consultancy and call-centre. It can be observed that ICT professionals in the call-centre on an average tend to earn higher than their counterparts in both hardware and software consultancy. In particular, ICT professionals in call-centre earned an average monthly salary that is 4.4% higher than in the ICT hardware or software consultancy.

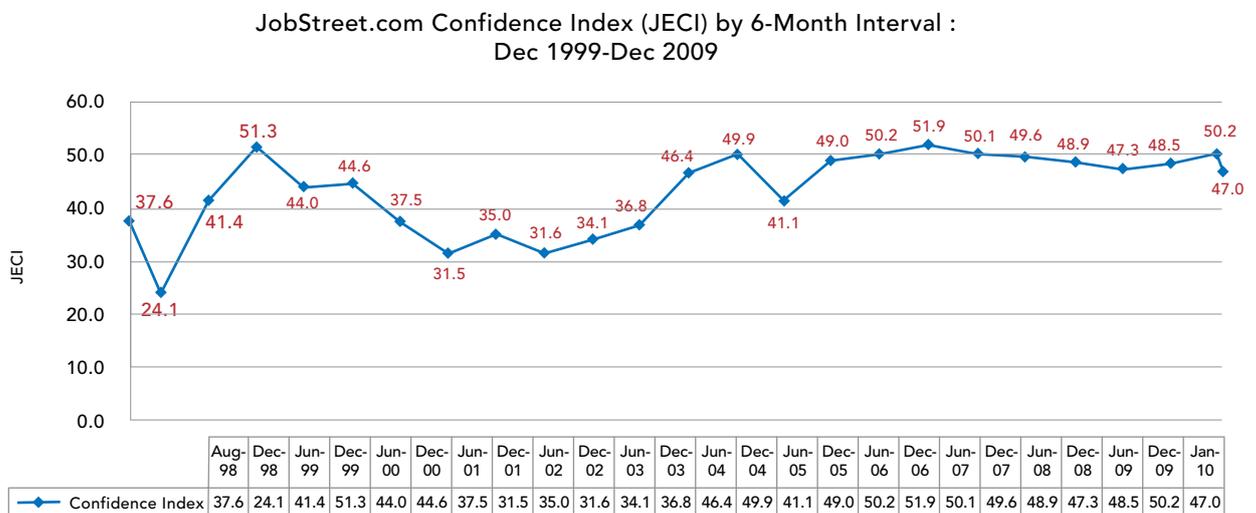
Table 3: Average Salary of ICT Professionals by Job Category and by ICT Segments, 2009

ICT Job Category	ICT Hardware Consultancy	ICT Software Consultancy	Call-Centre
Junior ICT Executive	RM2,767	RM2,557	RM2,748
Senior ICT Executive	RM4,130	RM3,869	RM4,190
Middle ICT Manager	RM5,057	RM5,930	RM4,018
Senior ICT Manager	RM9,405	RM8,998	RM11,350
Average	RM5,340	RM5,339	RM5,577

Source: ICT Job Market Outlook March 2010, PIKOM

Figure 9 below shows that the job confidence in the ICT job market in January 2010 was high, despite the economic slowdown due to the Global Financial Crisis in 2009.

Figure 9



Source: ICT Job Market Outlook March 2010, PIKOM

8.3 Provision of ICT Funding by the Public Sector

The Government has initiated a number of funding mechanisms for the growth of the ICT sector. However, there is a low uptake of ICT funding among industry players due to a lack of awareness on the availability of funds and lack of motivation among potential beneficiaries. An overview on types of Government grants applicable for ICT sector can be found in the "ICT strategic review 2009/10: Innovation, the Way Forward".

There are at least 14 types of Government grants for the development of the ICT industry aimed at developing products and services from the concept stage all the way to the commercialization stage (PIKOM, 2009). These grants are provided principally by MOSTI, MDeC, MTDC and MATRADE (refer to Box 5). Although these grants and funds are available for the ICT industry, the private sector applicants find it difficult in some cases to access them due to unwarranted bureaucracies.

Box 5: An Overview on Types of Government Grants Applicable for the ICT Sector

Ministry	Funding Nomenclature	Funding Focus	Agency Responsible	Focus Area
MOSTI	SCIENCEFUND	Basic research	MOSTI	General
	TECHNOFUND	Technology development	MOSTI	General
	INNOFUND	Innovation	MOSTI	General Community Innovation Fund (CIF) Enterprise Innovation Fund (EIF)
	e-CONTENT FUND	Content Development	MOSTI	ICT
	Demonstrator Application Grant Scheme (DAGS)	Proof-of-Concept	MOSTI	ICT
	MSC Malaysia Research & Development Grant Scheme (MGS)	Research & development	MDeC	ICT
	MSC Malaysia Intellectual Property Programme	Intellectual Property Rights (IPR) development	MDeC	ICT
	MSC Malaysia Pre-seed Fund	Idea generation	MDeC	ICT
	Commercialisation of Research Development Funding (CRDF)	Commercialization of R&D results	MTDC	General CRDF 1 CRDF 2 CRDF 3 CRDF 4a CRDF 4b CRDF 4c
MITI	Technology Acquisition Fund (TAF)	Strategic technology acquisition	MTDC	General TAF1 TAF2
	Market Development Grant (MDG)	Market development	MATRADE	General
	Brand Promotion Grant (BPG)	Branding	MATRADE	General
	Services Export Fund	Export promotion	MATRADE	General
MOF	Cradle Investment Programme (CIP)	Idea generation	Cradle Fund Sdn Bhd / MOF	General

Source: ICT Strategic Review 2009/10: Innovation, the Way Forward

9. Conclusion

The foregoing has highlighted PIKOM's policy advocacies and interventions that have been made for the betterment of the ICT Services industry in the country. These interventions will not only further strengthen PIKOM's reputable position in the industry and its global image, but also help the Malaysian society to move towards a KBE.

As can be noticed throughout the paper, the continuing commitment and responsive role of the Government is crucial to the successful development of Malaysia as an ICT hub. In 1982, when the Malaysia Incorporated policy was first introduced to encourage the private-government partnership in spearheading the nation into industrialization process, it clearly shows that since three decades ago, the GoM has done away with the "Government knows the best" approach. However, this is not adequate to spearhead the nation into the Information Age. Moreover, this approach cannot ensure a sustainable development. It is not all encompassing to realize a resilient and progressive society.

The participation of the third sector, that is, not-for-profit organizations like PIKOM, is crucial to pursue a balanced development in the ICT sector. However, in the wake of market liberalization, the private-government partnership will not suffice to globalize local businesses. It requires global partnerships and collaborations.

As a result, the role of institutions like PIKOM is gaining increasing recognition in the arena of policy, market, industry, innovation and research and development efforts. The overview of the recommendations made by PIKOM in this paper is a good illustration of the roles that PIKOM can embrace in order to further enhance the Malaysian society.

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CHAPTER 2

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Uptake of e-Commerce in Malaysia: A Policy Perspective

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1. Introduction

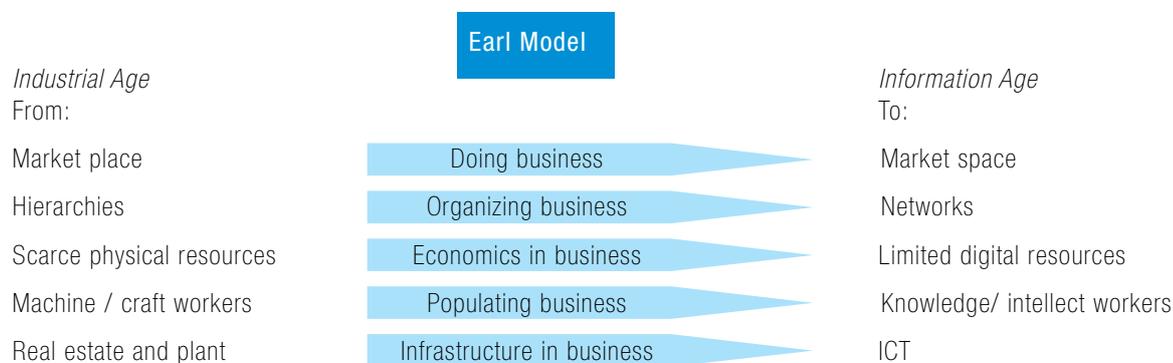
By the dawn of 21st century, the Government of Malaysia has recognized the Internet technology as the key driver of new economy. On this premise, Malaysia's third long term plan, namely the Third Outline Perspective Plan (2001-2010) has emphasized that the contemporary Information Communications Technology (ICT) as the key enabler of society, economy and politics. In the recently announced 10th Malaysia Plan, ICT had been identified as one of the 12 New Key Economic Areas (NKEA) to move the country towards high-income economy (EPU, 2010). It is, however, not the technology *per se* but it is the information and knowledge nexus, as well as networking of people of various cultures and traditions across the globe bringing about the new age developments; this is what matters (Shariffadeen, 2000).

Distinctly, the contemporary ICT provides the requisite ubiquity and pervasiveness of economic and social transactions that were not that apparent and explicit in the preceding agro-industrial era. Indeed, the current ICT trend is unprecedented in the human history. In essence, the new shades and forms of ICT changes the governance processes in all spheres of life. It changes the traditional rules, roles, rights and regulations. Institutional arrangements, including its processes and procedures, as well as divisions of responsibilities that are obsolete and irrelevant, are now being replaced. Technologically, the changes can be ascribed to "online connectivity and real time interactivity" modes and means (Ramachandran, 2008). But, for a layman, this translates as "anytime and anywhere" (Pepper et al, 2009) of performing business transactions and social interactions, irrespective of geography, time, cultures and traditions.

As Drucker succinctly put it, the introduction of e-Commerce is bringing about fundamental changes to structure and institutions governing society, economy and politics as well as individuals (Drucker, 1999). The steam engine, Drucker notes, when first applied to the spinning of cotton in 1875 triggered the industrial revolution just as the computer triggered the information revolution. By early 1800s, the steam engine had been employed to mechanize the production, created huge demand for low-cost labour, rise of the factory, tremendous increase in output, gave rise to new breed of consumers and consumer products, creation of working class, breakup of the nuclear family as the industry took worker out of the home. Drucker also pointed out that in subsequent development, it was the railroad that truly revolutionized the economy and rapidly changing the mental geography. Analogously, Drucker cited that the invention of the first computer in the mid 1940s has only transformed processes step by step, with tremendous saving in time and often, in cost. But computers hadn't helped mankind to do new and transformative things. It is the Internet driven e-Commerce like the railroad which started the industrial revolution, which eliminates the distance and is creating totally new development phenomena.

2. Embracing the Change

There are many ways the on-going new phenomenal changes can be depicted. However, for illustration purposes, a simple model depicting the essence of changes from Industrial Age to Information Age is shown below:-



Source: Earl (1999): *The Shift from Industrial to Information Age*

The model simply illustrates that the traditional market place is increasingly replaced by market space in the virtual space that the Internet technology offers. Traditionally, businesses are organized in a hierarchical manner but in the virtual space communications and networking are possible with anybody, and with anytime, irrespective of status, culture and traditions. Businesses and transactions have simply become global with no regard to time, geography and demography. Land, labour and capital, including technology, are prime movers of agricultural and industrial activities. But, in the information and knowledge base economy, the digital resources such as telecommunication and computer networks, Internet, satellites, hand phones, high level software programming languages, among others, have become the investment priorities for organizations poised to embrace the emerging changes. The office environment is populated with highly-skilled and intellectual workforce ingrained with computer literacy and skills, research and development culture, affinity for innovation, branding and commercialization. In comparison, in the industrial settings, the workforce primarily are skilled and semi-skilled workers qualified for large scale production activities usually of low value adding economic activities. In other words, the factories, skilled and semi-skilled in engineering, drive the industrial order, while ICT and knowledge workers drive the Information Age order (Drucker, 1999; Castells, 1996).

3. e-Commerce in the Public Sector

Acknowledging the importance to embrace changes from the onset, the Government of Malaysia even before the formulation and implementation of the OPP3, in mid-nineties Malaysia spearheaded the MSC Malaysia (formerly known as the Multimedia Super Corridor). At its inception stages, MSC Malaysia was confined to a geographically defined area of 15x50 square km, stretching from the city of Kuala Lumpur in the north to Kuala Lumpur International Airport (KLIA) in the south. The area contained the new administrative capital of Putrajaya and new age business centre of Cyberjaya township. This locality aimed at providing the world class infrastructure and state-of-art technology, for developing the requisite impetus and test-bed for the formulation and implementation of various types of Knowledge-Based Economy (KBE) flagship applications. The flagships include namely e-Government, Multi-purpose Card, Smart School, Tele-health, R&D cluster, e-Business and Technopreneur Development (EPU, 1996). Thus, it can be seen that with the advent of MSC Malaysia programme, Malaysia is considered as one of the early promulgators and adopters of e-business, which entails elements of e-Commerce, while many nations in the region are still grappling with agro-industry policies and growths (Mahathir, 1997). In essence,

the programme is aimed at realizing the Earl Model through creating the ripples of e-Commerce. Now, it has been more than a decade since the promulgation of e-Commerce programme in the country but the success is still much of a challenge for policy makers. This paper explores the status of e-Commerce in the public sector under six broad aspects:-

- MSC Malaysia and e-Commerce
- Cyber security and e-Commerce
- e-Payments and e-Commerce
- Broadband and e-Commerce
- Bridging Digital Divide and e-Commerce
- Green Technology and e-Commerce

3.1 MSC Malaysia and e-Commerce

The implementation of MSC Malaysia was compounded with the deployment of the Seven Flagship Applications, namely Multipurpose Smart Card, Smart School, e-Government, Tele Health, R&D Cluster, Borderless Marketing and Worldwide Manufacturing Web. Of the seven, three of them were environmental in nature and they included the R&D Cluster, Borderless Marketing and Worldwide Manufacturing Web. In early 2000, Borderless Marketing and Worldwide Manufacturing Web were combined to form the e-Business Flagship Application of MSC Malaysia. With the combination, the e-Business Flagship began placing focus on programs development and gradually moving away from its initial environmental approach. For the 10-year period of development since 2000, the e-Business Flagship has spearheaded the implementation of a number of significant e-Business projects, both horizontal and vertical in nature. These projects include those implemented in the sectors of Manufacturing, Retail, Tourism and Agriculture.

The e-Business Flagship has also undertaken an instrumental role in developing a number of strategic documents in support of the e-Business direction for the country, in alignment with the vision of the National e-Commerce Committee (NECC), a body consisting of a large number of key representations from Ministries, Agencies and the private sector. In solidifying the way forward for e-Business development in the country, the NECC recommended that the direction be guided by three core principles:-

- a. Partnership of Government, Business and Community
- b. Recognising borderless and global nature of Electronic Commerce
- c. Creating the greatest possible opportunity for all Malaysians to benefit from Electronic Commerce

The guiding principles are supported by 4 strategic thrusts:-

- a. Building trust and confidence in Electronic Commerce: Security & Privacy
- b. Enhancing the legal and regulatory framework :-
 - Intellectual property, Uniform commercial codes, Disputes settlement, Tariffs & taxation
- c. Strengthening Infrastructure and logistic support for Electronic Commerce :-
 - Networks, Payment systems, Logistics
- d. Optimising the economic and social benefits :-
 - Content, Core competencies

The NECC has also identified 10 key goals of e-Business development for Malaysia, where upon achieving all the intended goals, our country would already be at the forefront of e-Business leadership:-

- a. e-Commerce underpins the reorientation of Malaysia's industry base leading towards growing international competitiveness
- b. Malaysia as a trusted e-Commerce infomediary
- c. Malaysia consumers always have the choice of a competitive Malaysian e-Business supplier to meet their needs
- d. Malaysia attracts more inbound consumers than it exports
- e. Malaysia serves wider extra-territorial markets, thus scaling up its e-Commerce base
- f. Malaysia establishes expertise and competitive production capabilities in the new growth markets associated with e-Business
- g. Malaysian companies are the partners of choice within regional markets
- h. Malaysian branded content and services are globally recognised, respected and trusted
- i. Malaysian hosts significant international institutions serving global e-Business
- j. All Malaysians can benefit from e-Business opportunities

In meeting the 10 key goals indicated, NECC has outlined 5 pre-requirements for effective participation in e-Business and 8 pillars of the country's E-Business Competitiveness:-

Pre-requirements:-

- a. Good bandwidth
- b. Widely available fulfillment systems and logistics
- c. Efficient and trusted payment systems
- d. Stable and supportive institutional environment
- e. User-friendly and affordable access devices and interfaces

Pillars of Competitiveness:-

- a. Innovation
- b. Content creation
- c. IP protection
- d. Distribution
- e. Market Access
- f. Brand identity
- g. Quality products and services
- h. Trusted service interfaces

Guided by the national e-Business direction developed by the NECC and upon realizing the long existence of a Digital Divide between the group of larger corporations and the SMEs in general, MDeC in the year 2008 conducted a study entitled “SME e-Enablement Study” to ascertain the readiness level and business appetite of SMEs to embrace e-Commerce as a key function in their day-to-day business operation. The study was conducted in collaboration with SME Corp, SME Bank and Bank Negara. The need for such study is driven by the understanding that whilst SMEs represent some 99.2% of total businesses in the country, SMEs largely face bigger challenges to expand their business potential locally and internationally, mainly due to smaller capital accumulation. Feedback from the industry also showed that whilst large corporations have begun utilizing more advance IT applications including CRM and ERP, most SMEs have only basic PC packages to operate, for example, word processing and simple browsing functions.

e-Commerce, on the other hand, is deemed to be a potent approach to business process optimization and growth, as it requires less capital and operational expenditure. The results of the SME e-Enablement Study confirmed the high percentage of acceptance by the SMEs to adopt web-based applications to initially e-enable their business processes. It needs to be noted nevertheless that overall active participation of SMEs on such platform would largely depend on the reciprocal participation of their suppliers and buyers, to form complete online supply-chains amongst them. The study also highlighted that there is a strong and positive potential uptake of B2B e-Commerce in Malaysia, as the study found out that:-

- a. Almost all (survey) respondents have a personal computer in the business premise – and are connected to the Internet.
- b. There is a huge potential for B2B payment transactions amongst SME respondents – over 60% of transactions are conducted with other enterprises.
- c. 47% of respondents are ready to embrace e-Commerce within the next 2 years.
- d. 10% of SME respondents are already conducting e-Commerce sales.
- e. 11% of the respondents are already utilizing existing e-Commerce platforms.
- f. Almost 70% of the (survey) respondents believe that e-Commerce would help to ease the pain of the current economic crisis. Hence, they are encouraged to try out doing business online provided that minimal upfront investment is needed.
- g. e-Commerce portal is seen to be an avenue to generate additional sales leads and facilitate online sales. (Survey) Respondents are willing to be part of an e-Commerce portal – and would recommend/encourage clients/suppliers to use the portal if/when available.
- h. SMEs are very encouraged with the possibility of reducing payment cycles of sales through e-Commerce as an e-Business platform would require prompt payment of goods/services by buyer for transactions to be completed. Thus, with an online payment system, the cash flow for the SMEs can be improved.

The results of the study led to the development of MDEX or Malaysia Digital Enterprise Exchange, an online service delivery platform providing web-based applications for businesses to operate their daily procurement and transactions. In the initial phase, MDEX will be providing two key applications including e-Documentations and Online Payment. MDeC, together with SME Corporation and other partners, are geared towards achieving high proliferation rate and usage of MDEX amongst SMEs in the country. It is expected that by actively participating on the platform, SMEs would obtain MDEX’s long list of benefits including faster procurement and shorter payment cycles, reduced human error, traceable business transactions and the visibility to all other participating businesses and partners.

According to SME Corp chief executive officer, Datuk Hafsa Hashim, "92 per cent of SMEs have Internet access. There is always the perceived notion that online financial transactions are not secure and if they dispel those negative perceptions, the world is their market". "The goal in the long term is to link the Malaysian platform with international SMEs platform," MDec chief executive officer, Datuk Badlisham Ghazali. The programme has 100 pre-subscribers now and they aim to have 2,000 SMEs by the end of July next year. Some of the firms already have a Web presence but through this platform, they can expand their export and revenue operations beyond their traditional direct buyers market. Similarly, MDEX is a suitable platform to accelerate export growth for companies across the industry. By providing adequate focus on B2B transactions, companies will be present amongst the network of other MDEX users and those participating on platforms that collaborate with MDEX. This will soon become a reality, as MDeC has since received a number of requests for collaboration from international online service providers. MDeC expects that with a significant level of e-Commerce usage by the SMEs, the potential for SMEs to grow their business out of the traditional market is very strong. When this takes place, many more local SMEs will break the barriers to penetrate international markets, become successful players and eventually reinvest into our domestic market for continuous growth.

3.1.2 MSC Malaysia: Its Contribution in ICT Services Sector

In further refining the participation of e-Business-based companies in the MSC Malaysia project, e-Business has since been formalized as the fourth Cluster of MSC Malaysia companies. The Cluster represents a group of companies whose businesses focus on either of the sub-categories:-

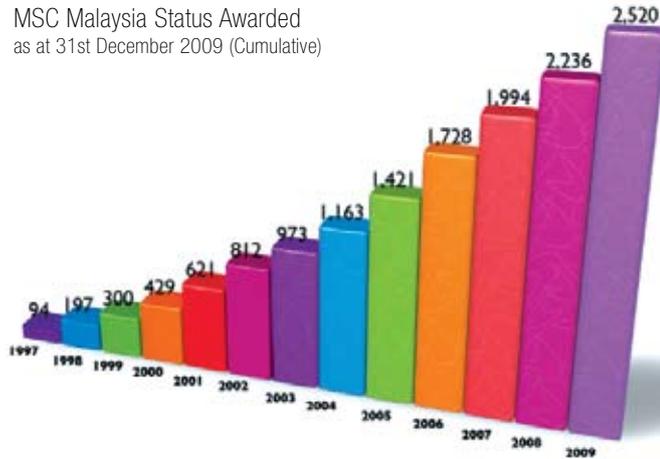
- a. e-Marketplace
 - i. Trade portals
 - ii. e-Communities and Multimedia portals
- b. Online Service Providers
 - i. e-Payment
 - ii. e-Government
 - iii. Online Advertising and Classifieds
 - iv. Vertical Services

As the nature of electronic businesses is dissimilar to physical way of doing business, MDeC has identified the need for companies within the e-Business Cluster to be given adequate focus to grow its subscribers base, in an effort to turn these subscribers to be core revenue generators. This is destined to be achieved through collaboration with and participation with local and international partners, and other relevant online platform operators. Programs have also been designed to ensure that the e-Business Cluster companies receive sufficient exposure to latest and emerging online technologies and business trends.

MSC Malaysia plays a significant role in the promotion of ICT services. It is a national initiative spearheaded by the Government to promote the national ICT industry. The growth of the MSC Malaysia Status companies, with the start of 94 companies in 1,997, over the last twelve years till 2009 (MDeC, 2009) are as shown in the Figure 1.

Figure 1

MSC Malaysia Status Awarded
as at 31st December 2009 (Cumulative)

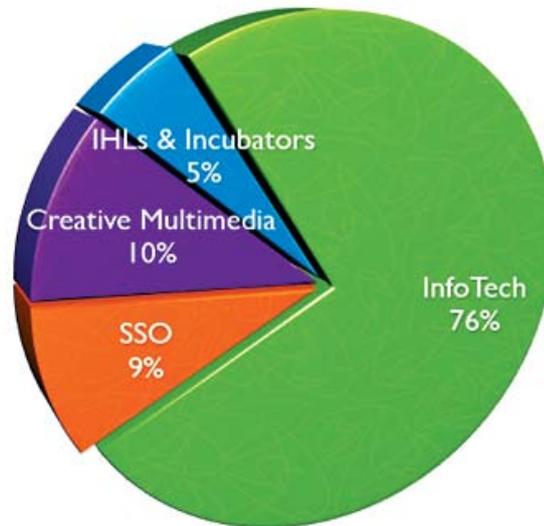


Source: MDeC (2009)

The distribution of operational companies with MSC Malaysia Status by cluster is shown in the Figure 2.

Figure 2

MSC Malaysia Status companies
Operational as 31st December 2010
Breakdown by Cluster

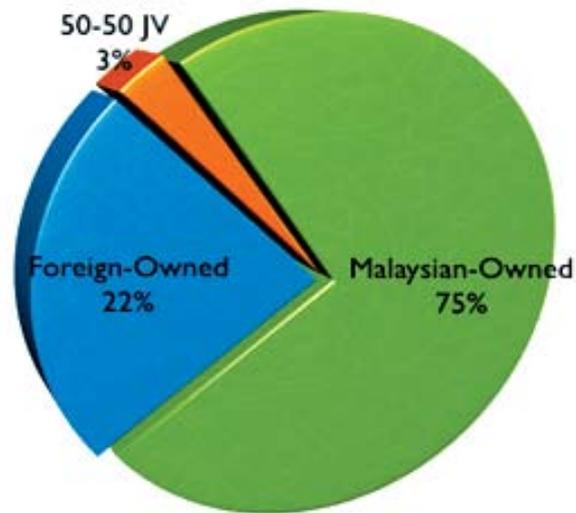


Cluster	Awarded	Operational
Creative Multimedia	275	200
IHLs & Incubators	105	98
InfoTech	1,940	1,477
SSO	200	181

Source: MDeC (2009)

Of the total of 2,520, **MSC Malaysia Status** approvals granted to companies as at the end of December 2009, 1,956 or 78% are in operation. Of the total number of MSC Malaysia status companies in operation, Figure 2 shows the distribution of companies by technology cluster. As it can be seen, 76% of the MSC Malaysia status companies in operation are in the Information Technology (InfoTech) cluster, followed by another 10% in the Creative Multimedia cluster.

Figure 3

MSC Malaysia Status awarded by Equity Ownership
As at 31st December 2009

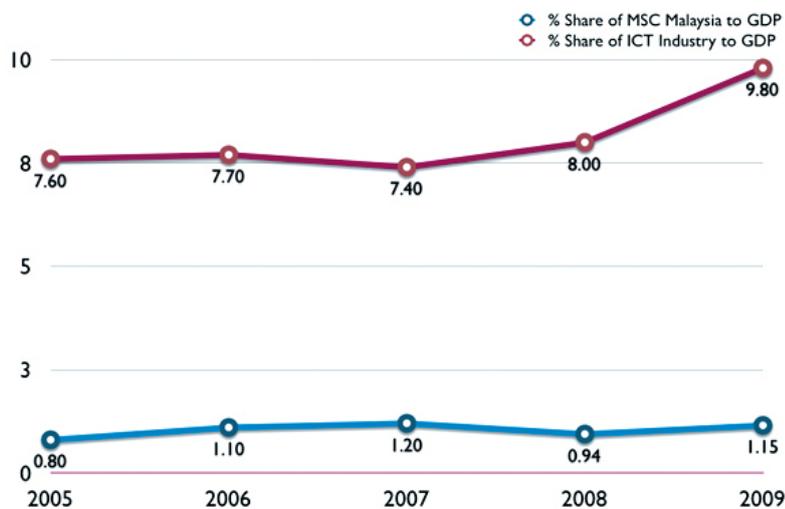
Equity Ownership	No of Companies Awarded	No of Companies Operational
Malaysian-owned	1,879	1,497
Foreign-owned	566	399
50-50 JV	75	60
Total	2,520	1,956

Source: MDeC (2009)

As illustrated in Figure 3, it is interesting to note that almost three quarters (1,879) of the approvals granted were for local companies; 566 (or 22.4%) for foreign majority earned companies and another 75 (or 3.1%) to 50:50 local and foreign joint venture companies.

Figure 4

Contribution to GDP : MSC Malaysia Status Companies and ICT Industry 2005-2009

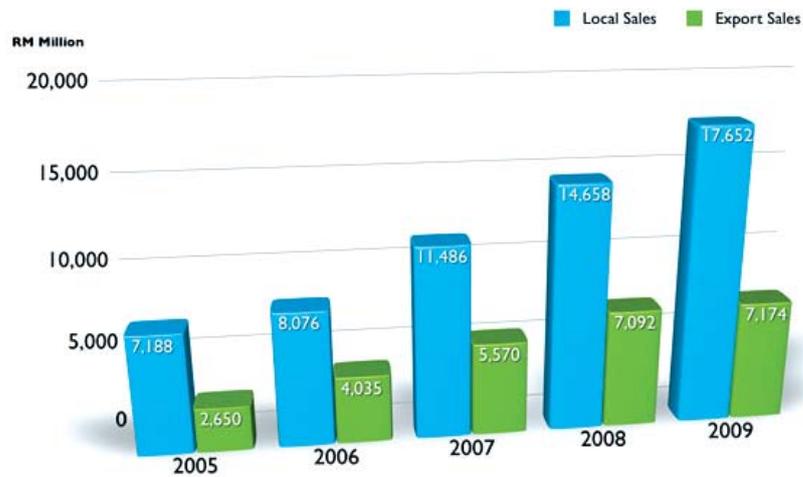


Source: EPU, MDeC

The share of value added services to GDP by MSC Malaysia Status companies is shown in Figure 4. During the past five years, the MSC Malaysia companies have made significant contributions to the national economy, from 0.8% in 2005 to 1.15% in 2009, with contribution to GDP of RM6 billion.

Figure 5

Export Sales and Local Sales of MSC Malaysia Status Companies (2005-2009)

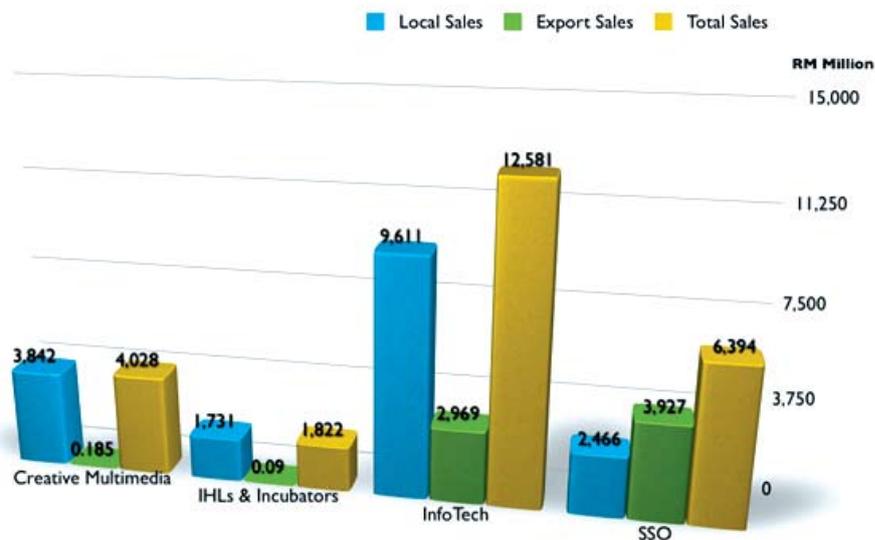


Source: MDeC (MSC MALAYSIA ANNUAL INDUSTRY REPORT 2009)

The total sales grew RM3.076 billion to RM24.826 billion from 2008 to 2009, registering a geometric growth rate of 26.07%. But, the total export sales that expanded from RM2.65 billion to RM7.174 billion during these periods recorded a 28.27% geometric growth, which is higher, compared to local sales growth rate of 25.18%; see Figure 5. Indeed, such growth trend is in line with the Government's aspiration of creating a knowledge based economy. Further breakdown by technology cluster, the records showed that the Shared Services & Outsourcing churned out the largest export value of RM3.927 billion or 55% of the total MSC export in 2009, despite constituting only 9% of the total MSC status operational companies. See Figure 6.

Figure 6

Total Sales and Local Sales of MSC Malaysia Status Companies 2009
Breakdown by Cluster



Source: MDeC (MSC MALAYSIA ANNUAL INDUSTRY REPORT 2009)

The InfoTech companies ranked the highest technology cluster in the MSC Malaysia programme and raked about 51% or RM12,581 million of the total revenue contributed by the MSC Malaysia status companies. It is also of interest to note that of the total revenue sales netted by SSO companies, 61% or RM3,927 million constituted the export sales, as shown in Table 1. Moreover, it is only in the SSO technology cluster the export sales exceeded significantly than the local sales, which is indeed in line with the government's aspiration to promote export orientated earnings.

Table 1: Total Sales by Technology Cluster 2009

Distribution of Local and Export Sales by Technology Cluster of MSC Status Companies, 2009

Cluster	Local Sales	Export Sales	Total Sales	Local Sales	Export Sales	Total Sales
	RM million			%		
Creative Multimedia	3,842.99	185.71	4,028.69	95.39%	4.61%	100.00%
IHLs & Incubators	1,731.06	91.46	1,822.52	94.98%	5.02%	100.00%
InfoTech	9,611.93	2,969.55	12,581.48	76.40%	23.60%	100.00%
Shared Services & Outsourcing	2,466.50	3,927.67	6,394.17	38.57%	61.43%	100.00%
Total	17,652.48	7,174.38	24,826.86	71.10%	28.90%	100.00%

Source: MDeC (MSC MALAYSIA ANNUAL INDUSTRY REPORT 2009)

An examination on the performance of MSC Malaysia status companies by ownership status revealed that 59.14% of the total sales revenue came from fully Malaysian owned entities, as shown in Table 2. However, of the total sales netted by the Malaysian companies only RM1,670 million or 11.38% constituted an export market, which is rather low.

Table 2: Total Sales by Ownership, 2009

Distribution of Local and Export Sales by Ownership of MSC Malaysia Status Companies, 2009

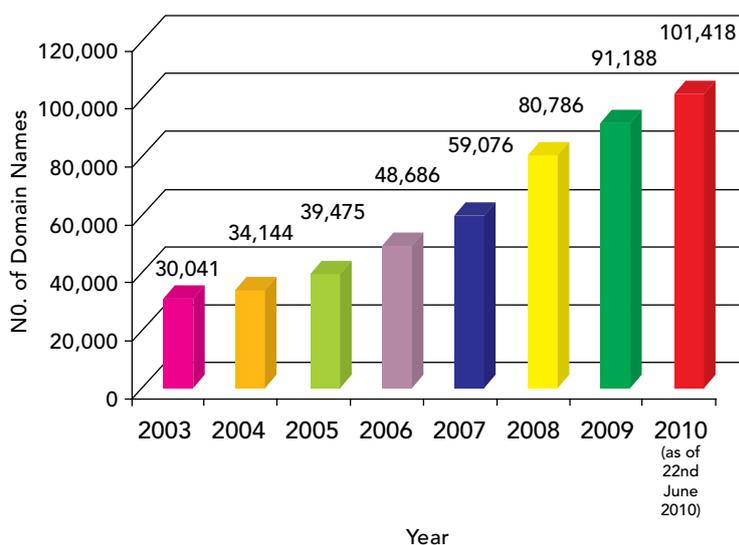
Ownership	Local Sales	Export Sales	Total Sales	%	Local Sales	Export Sales	Total Sales
	RM million				%		
C50-50	1,819.01	102.08	1,921.10	7.74%	94.69%	5.31%	100.00%
Foreign-owned	2,821.82	5,401.54	8,223.36	33.12%	34.31%	65.69%	100.00%
Malaysian-owned	13,011.64	1,670.76	14,682.40	59.14%	88.62%	11.38%	100.00%
Grand Total	17,652.48	7,174.38	24,826.86	100.00%	71.10%	28.90%	100.00%

MDeC (MSC MALAYSIA ANNUAL INDUSTRY REPORT 2009)

3.2 Cyber Security and e-Commerce

Figure 7 shows the growth of .my domain names in Malaysia. It can be seen from a period of 7 years from 2003 to 2010, the rate of growth of .my domain names has been very consistent. But, the number of .my domain names shot up prolifically to 101,418, as of 22nd June 2010.

Figure 7: Number of Domain Names as of 22nd June 2010



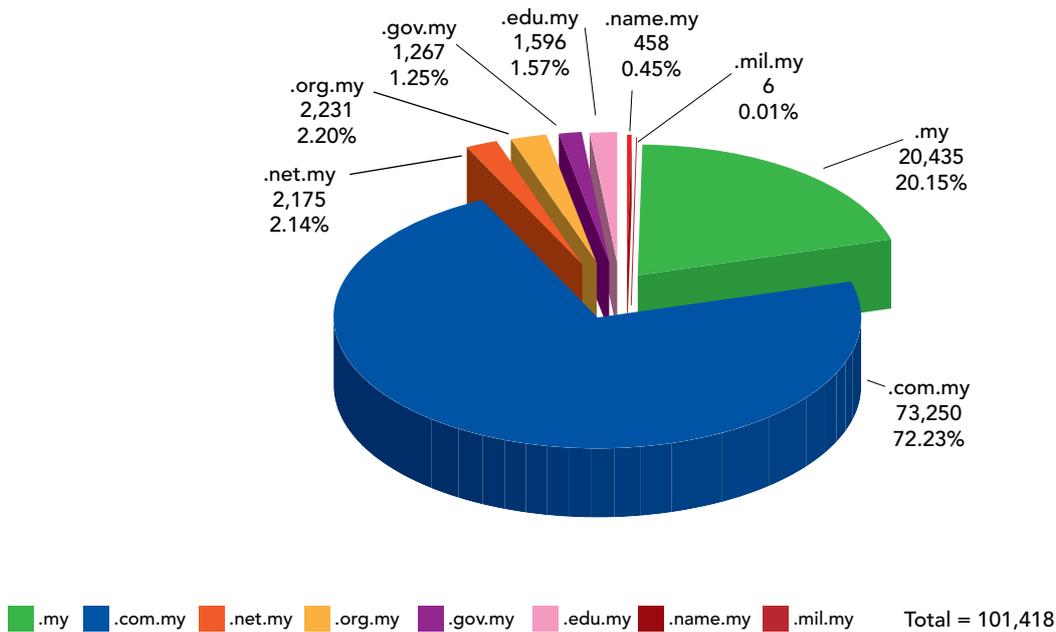
Source: MyNIC (Now known as .my DOMAIN REGISTRY)

The tremendous growth starting from 2006 onwards shows the boom of the Internet in Malaysia whereby most Malaysian household turn to the Internet to seek for information and creating more information for their companies, to be easily identified by consumers or blogs and sites of personal hobbies and pleasure. In 2008, the number of .my domain names increased by 36.7% due to the re-introduction of 2nd level domain (2LD) in Malaysia. This is the shorter version of domain name in Malaysia which is “.my”.

In 2009, the increase was predominantly due to the 50% promotions .my DOMAIN REGISTRY had, during the Merdeka month as well as Project 1nita, an initiative to get women entrepreneurs to sell their products and services online. Each participant of Project 1nita received 1 year free .my domain names (consisting of .my and .com.my with the right papers provided). To date, Project 1nita secured 450 participants since its start in mid 2009. In 2010, significant increase happened in June due to the 50% promotion .my DOMAIN REGISTRY is currently having till the end of June 2010.

The next pie chart shows the number of .my domain names by categories. “.com.my” & “.my” are the predominant categories. Due to the flexibility of “.my” which can be used for companies or individuals, and also with the shorter domain name, it has gotten significant attention. “.com.my” still leads the board, as this category is mainly registered by companies and businesses. With this category, it shows the existence of the companies and businesses in the cyber world.

Figure 8: Number of Domain Names as of 22nd June 2010 (by category)

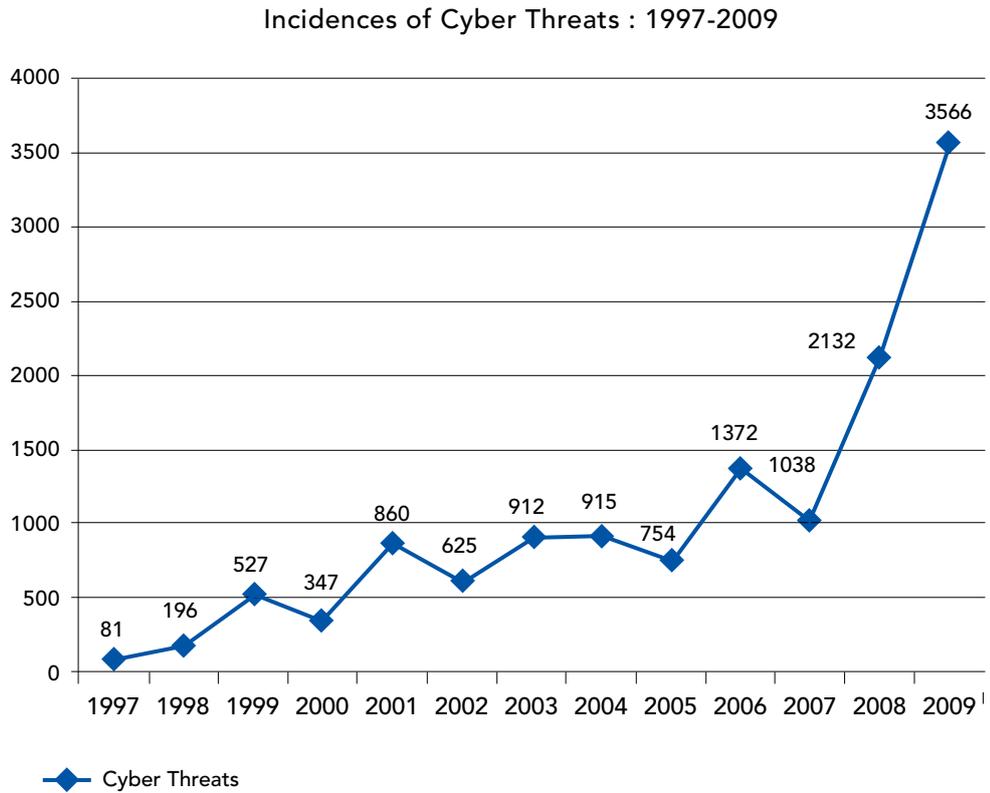


Source: MYNIC (Malaysian Network Information Centre – now known as .my DOMAIN REGISTRY)

- *.my: Malaysian and resident foreign individuals and entities
- *.com.my: Commercial organizations/activities
- *.net.my: Network-related organizations/activities
- *.org.my: Organizations/activities which do not qualify for other categories
- *.edu.my: Educational organizations
- *.gov.my: Government organizations
- *.mil.my: Military organizations
- *.name.my: Malaysian citizens and non-Malaysians residing in Malaysia

In tandem with increase in Internet activities, incidences of cyber threats also grew significantly. It can be seen from Figure 9, that the number cyber threats that were referred and handled by CyberSecurity Malaysia, has peaked to 3566 in 2009. The incidences include mail-bomb, harassment, forgery, hack threat, virus, denial of service, destruction and intrusion.

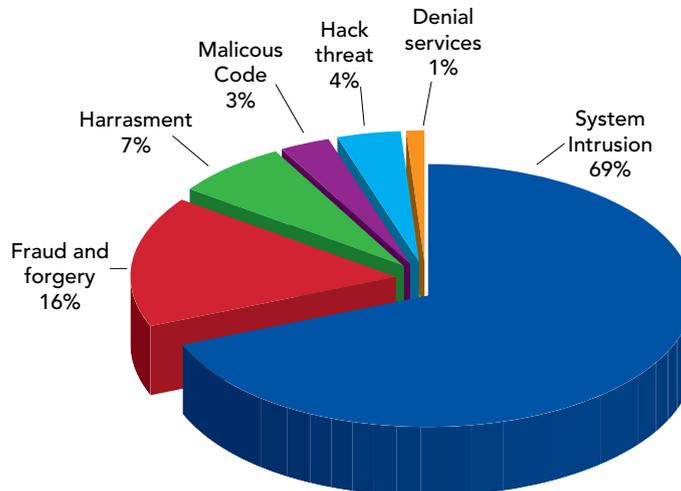
Figure 9: Incidences of Cyber Threats: 1997-2009



Source: CyberSecurity Malaysia

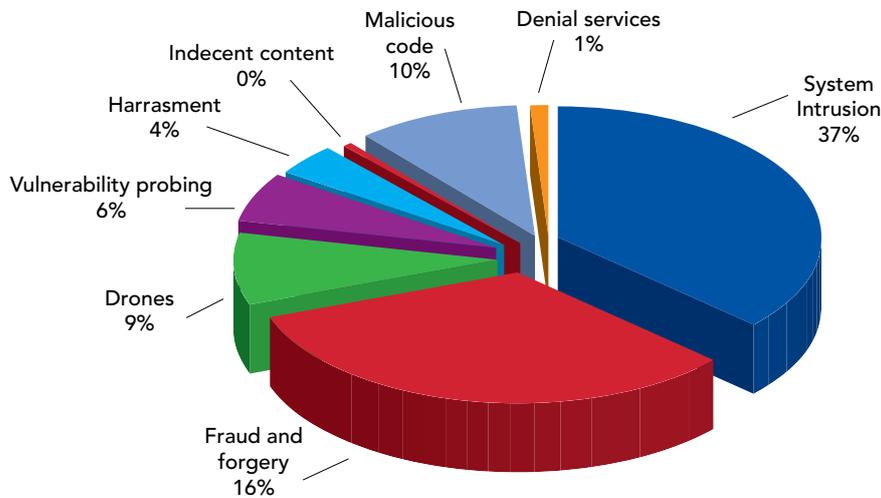
Further investigation as shown in Figure 10 showed that system intrusion alone accounted for 69% of the total cyber threats netted in 2006. This is followed by 16% forgery and 7% harassment. However, in the past five years, the pattern of cyber threats has changed. It can be seen that in 2010 as shown in Figure 11 that system intrusion has risen to 37%, followed by fraud and forgery by 33%, accounting for 70% of the total cyber incidences. Drones, vulnerability probing and indecent content are new classifications that CyberSecurity Malaysia is monitoring.

Figure 10: Share of Cyber Threats and Attacks Q4 2006



Source: CyberSecurity Malaysia

Figure 11: Distribution of Cyber Threats and Attacks: Q1 2010



Source: CyberSecurity Malaysia

The Internet growth and increasing cyber incidences in terms of IDR and cyber threats provides a good indication on increasing incidences of virtual space, where people and institutions share ideas, learn new things, build communities and promote new ways of doing business and networking. When the Internet started to gain momentum in mid-nineties, people and institutions were initially very reluctant to participate in e-Commerce, analogous to the experiences of automated teller machine (ATM) banking uptake when it started in the seventies. Typically, people will be reluctant to embrace any new technology until it is proven useful for adoption. In the case of e-Commerce, which involves online payment issues such as security, vendor reputation, reliability of web based business transactions, cultural barriers, purchasing preferences to look, touch and test, cost factors, delivery of goods and services in the desired form and quality, safe payment options in the virtual space and business attitudes were major considerations. However, now more than a decade has passed and trust and confidence of buying and selling things via online and real time has come of age. Apparently, e-Commerce is emerging as a major business force in the country.

6th Annual "UK Online Fraud Report 2010 Edition - Online Payment Fraud Trends, Merchant and Consumer Response" reports that Malaysia has been listed as number 3 out of 14 countries, after Nigeria and Ghana that businesses in UK had stopped accepting orders due to repeated online fraud. That report result was also mentioned in United Nations Office on Drugs and Crime (UNODC) report on CyberCrime in "The Globalization of Crime: A Transnational Organized Crime Threat Assessment". The gist of the report has a negative impact on Malaysia's aspiration of e-Commerce. Malaysia is now facing tough challenges to rebuild the trust and confidence amongst local and foreign users towards its e-Commerce security. In view of this, cyber security shall be made as a central strategy towards a successful implementation of e-Commerce. The strategy shall be implemented in a holistic manner addressing people, process, and technology.

Technology that consists of network, network devices, hardware and application are some of the main enabler of e-Commerce. They should provide certain level of protection that would ensure information security of e-Commerce. In essence, those security products need to be verified whether they are trustworthy and being tested and verified by an independent and trusted party. CyberSecurity Malaysia spearheads the Malaysian Common Criteria Scheme (MyCC) that aims at increasing Malaysian competitiveness in quality assurance of information security using the Common Criteria (CC) standard and to build consumer confidence in Malaysian information security product and systems. The testing laboratory is now accredited with MS ISO 17025 and ready to perform CC evaluation to local information security products.

In addition, the Ministry of International Trade and Industry (MITI) has been appointed to drive the implementation of Malaysia Trustmark - a program that allows businesses that meet high standards to display a seal on e-Commerce websites. Seal signifies trustworthiness and due diligence for secure e-Commerce transactions. In strengthening consumer confidence and build the trust in e-Commerce markets, the implementation of Malaysia Trustmark is very vital for the country, especially in encouraging the usage of e-payment system. There are four major stakeholders, namely Operator, Certifier, Merchant and Consumer. CyberSecurity Malaysia has been appointed as the Certifier of Malaysia Trustmark, which will conduct the assessment for Malaysian merchants. For the time being, the Trustmark implementation scheme is still pending for cabinet approval.

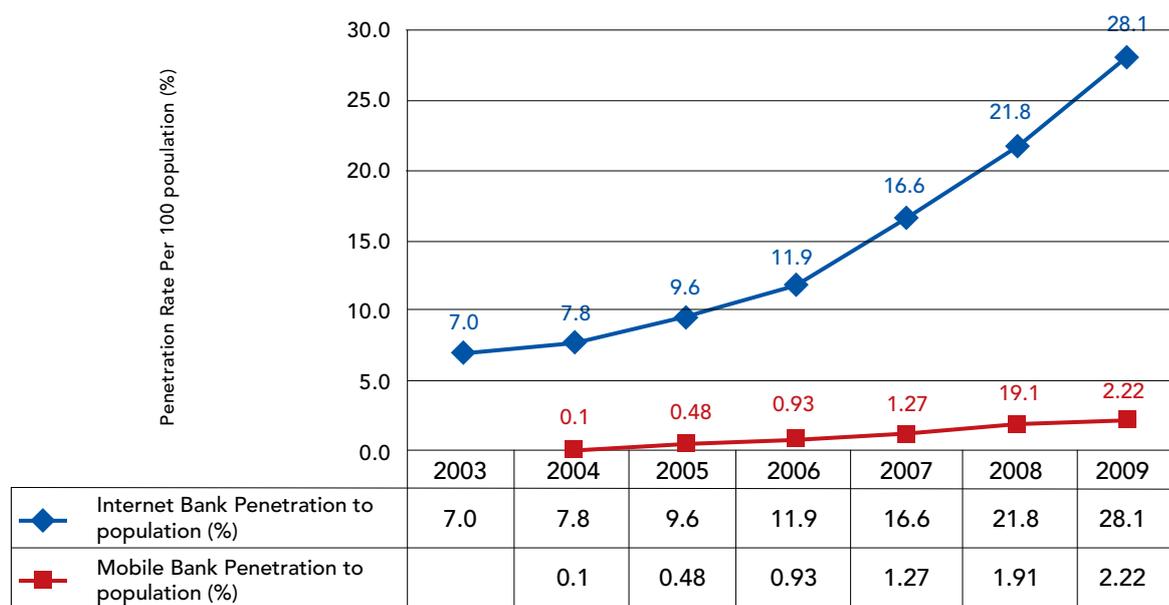
The 2009 Security Mega Trends Survey stated that mobile devices will be the trend of computing. It is expected that mobile computer will be a popular device amongst Malaysians as it provides the convenience. With the growth of e-Commerce activities and the popular use of mobile computing, the protection of confidential data and end-to-end communications will become a major security concern. In view of this, cryptography is an area to be given a special attention in years to come.

The primary cause of most security breaches is human ignorance; an area has not and still is, not adequately addressed. People are the weakest link in any cyber security ecosystem and social engineering is the technique used by cyber criminals to exploit human weaknesses. The rise of financial fraud cases is often associated with human ignorance because in most cases, financial frauds occur when users' identities and financial critical information have been stolen. Recognizing the importance of human factor, MOSTI through CyberSecurity Malaysia has conducted a study on the development and implementation of the National Strategy for Cyber Security Acculturation and Capacity Building Program. Aligned with the National Cyber Security Policy (NCSP), the study is timely and crucial towards supporting the Government's aspiration of creating a knowledge based economy through the utilization of ICT.

3.3 e-Payment and e-Commerce

Being e-Payment options are integral components, it can be seen from the Figure 12 that, Internet and mobile banking are taking stronger footage in the country. For instance, the Internet banking has grown four folds from 7.0 per 100 populations in 2003 to 28.1 per 100 populations in 2009 (BNM, 2009). Similarly, the mobile banking that started slightly later than the Internet banking also catching up in its growth of 0.1 per 100 populations in 2004 to 2.22 per 100 populations in 2009.

Figure 12: Internet and Mobile Banking Penetration Rate 2003-2009



Source: Bank Negara Malaysia

Figure 12 shows the value of e-Commerce transactions in Malaysia. In the absence of official data, the records of private consulting agencies were used to illustrate the e-Commerce trends in the country. Indeed, The Special Task Force to Facilitate Business, popularly known as PEMUDAH abbreviated for “Pasukan Petugas Khas Pemudahcara Perniagaan”, has reported that as of 17 December 2009 a total of 278 e-Payment services offered by 118 government agencies (PEMUDAH, 2009). In comparison to as of 31 December 2008, it was only a total of 148 public services; that is, an increase of 87.8% within a year, indicating the dynamism in the provision of e-Government services. In other words, there is also a growing concern for Internet security.

3.4 e-Commerce and SMEs

Despite registering spectacular growth, the major challenge remains with SME, where the e-Commerce adoption is low (MPC, 2009). Of the 44 companies investigated by Malaysia Productivity Corporation (MPC), only 17.0% indicated some form of e-Commerce transaction conducted in the year 2009. The other challenges plaguing the poor uptake of e-Commerce among SME were as follows:-

- 35.3% indicated that new technology driven modes are not suitable for their businesses such as professional architectural firm, clinic and pharmacy;
- 31.9% indicated that they do not have the requisite working knowledge to adopt e-Commerce as part of their businesses;
- 17.2% are still not ready to conduct e-Commerce;
- 10.3% indicated financial constraints or cost considerations;

The MPC report also revealed that of those embraced e-Commerce, 52.5% or slightly more than half indicated presence stage where only one-way communication to any potential user is performed. Another 18.7% were at portal stage where two-way communication, including feedback between businesses and customers exist, besides disseminating information about products and services offered. Moving up the value chain, 14.6% were at transaction stage and 14.3% were at enterprise integration stage, where financial transactions and profitability possibilities were main focus.

The study also investigated the sophistication of payment method used by SMEs harnessing the e-Commerce practices. It can be seen that most of them were at elementary modes of payment. In particular, 65.3% were at online transfer modes; another 57.4% use bank deposit options; and 51.1% using cheques. Only 34.6% were using credit card method of payment. Similarly, only 12.8% were using PayPal system that is being widely used as a payment mode for transactions involving across boundaries. These trends in a way indicate Malaysia is still at infancy stage as far as e-Commerce adoption is concerned.

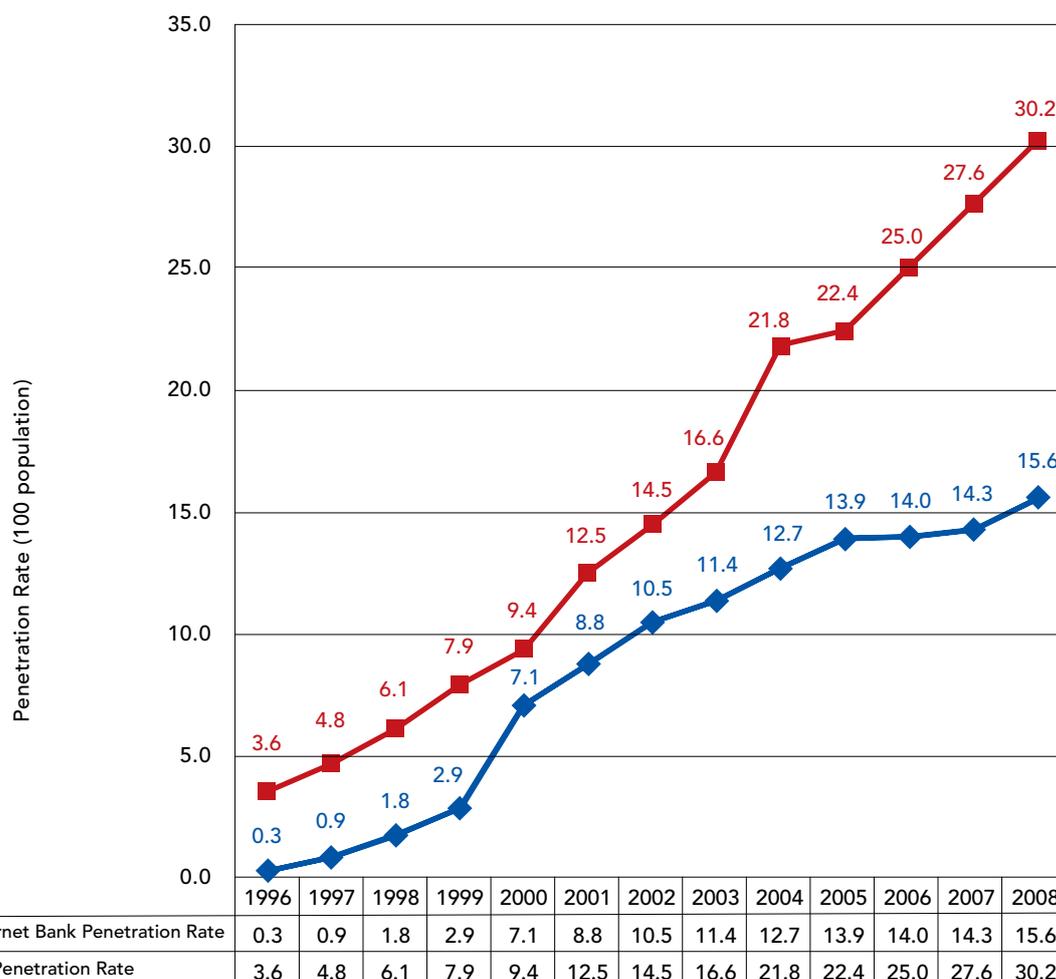
3.5 e-Commerce and Digital Divide

Despite opportunities, it is also a known fact that the country is facing a number of new development challenges and threats. Among others, within the country, the key challenge is coping with the growing digital divide that presumably further accentuates the existing socio-economic disparity within the country. The existing socio-economic differential is measured in terms of household income, employment, education and health, among many others. At the international front, the country is facing a declining competitive edge in attracting foreign direct investments (FDI), which nowadays show very highly fluctuating trends. As duly reckoned, arising from the market liberalization and globalization phenomena, the FDI is now being shared with many new entrants in the global market. Therefore, it is timely that a study has to be undertaken to understand the dynamics of the ICT sector in Malaysia, which in its production form, aggressively spearheaded the nation to a greater economic growth and subsequently in its services form, being re-positioned to drive the knowledge economy and take the nation to a new height. Indeed, it has been already more than a decade since the notion of knowledge based economy has been in the mainstream development agenda and it is also the attention of policy makers and development practitioners, as well as the academia to assess the role of ICT in spearheading the Malaysian economy. Thus, to facilitate the mainstream planning agency, it is imperative to define the ICT sector not only in qualitative perspective, but also quantitatively so that its contribution can be assessed at various levels, including international comparisons.

The uptake of PC, Internet and broadband are interrelated. Cellular phone can also be Internet or broadband mediated but its usage is very much confined to personal level communications. In comparison, the Internet or broadband mediated PCs are widely used at work places, besides at personal level. Jobs requiring high performance capacity are easily done with PC driven modes and means rather than with mobile phones. Nonetheless, with the advancement of technologies in terms of speed, size, convergence, ubiquity, pervasiveness, user-friendliness et cetera the boundaries between PC and cellular phone usage likely to become blur in the near future.

The uptake of PC, Internet and broadband are shown in Figure 13. It can be seen from Figure 13 below that both PC and Internet penetration in the country is relatively at low level. The PC penetration grew from 3.6 per 100 populations in 1996 to 30.2 in 2008 and poised to reach 40.5 by 2012, based on PIKOM's projection on the number PCs shipped shown in the Figure 14. It also can be seen in Figure 14 that since the year 2006 the lap top PC shipped has outweighed the number of desk top, indicating users are increasingly looking for mobile computing. As acknowledged, the mobile computers provide the convenience of using computers at work places and in the houses without going through much hassle.

Figure 13: Internet and PC Penetration Rate per 100 Population: 1996-2008



Source: Malaysian Communication and Multimedia Commission; Department of Statistics; PIKOM

Meanwhile, Internet uptake among Malaysia population grew from 0.1 users per 100 population in 1995 to 15.5 dial-up users per 100 people over the same period. The low uptake is simply due to lack of motivation and application contents. Certain studies have shown that PC and Internet are gadgets for young educated and professional populations. In ordinary household or small-medium business level, usage of PC and Internet is considered to be costly and not affordable. As reported in the mid-term review of Ninth Malaysia Plan (2006-2010) that 40% of the households are in the middle income group, earning between RM2,000 to RM4,000. For this group of people the competing needs such as food, housing, utilities, furnishings, health, transport and education than spending on communication and recreational items. In 2005, the Household Expenditure Survey (HES) revealed that a typical Malaysian household allocates most 12.3% of its total expenditures, that is, between RM246 to RM492, for communications and recreations activities (DOSM, 2006). This amount is considered far from adequate for purchasing computers and Internet services given that this amount also needs to be expensed for acquiring other leisure and entertainment services such as radio, television and cinema-going. Generally, it is conjectured that people tend to spend more on leisure and entertainment stuff, rather than on computers and the Internet, unless there is a compelling motivation to do so like educating children with ICT literacy, paying bills over the Net, communicating with children studying abroad, et cetera.

3.6 e-Commerce and Green Technology

“Going green” means to pursue knowledge and practices that can lead to more environmentally friendly and ecologically responsible decisions and lifestyles, which can help protect the environment and sustain its natural resources for current and future generations. The burning of fossil fuels, agriculture and land clearing are increasing the concentration of carbon dioxide in the atmosphere, which traps heat and warms the earth’s surface. Projected changes in climate will have worldwide impacts. Thus, one of the ways that “going green” strategy encompasses is the deployment of ICT usage and disposal of ICT products in a responsible manner. The key is not the technology, but how it is implemented and used (Plepys 2002). However, it must be reckoned that the linkages between ICT and the environment are complex and multi-faceted (Daly 2003). It has both positive and negative impacts. The negative and positive effects of ICT usage and disposal are intertwined. The positive impacts can come from the dematerialization and online delivery; transport and travel substitution; a host of monitoring and management applications; greater energy efficiency in production and use; and product stewardship and recycling. The negative impacts can come from energy consumption and the materials used in the production and distribution of ICT equipment; energy consumption in use directly and for cooling, short product life cycles and e-waste, and exploitative applications (e.g. remote sensing for unsustainable over-fishing).

Some of the important environmental concerns in the IT sector today are increasing power consumption and cooling for data centres, the increasing use of PCs worldwide, e-waste management challenges and sustainability particularly as it relates to data centres and hardware, software and buildings. This is all part of an information and services supply chain, that begins with raw materials and ends with the disposal of waste. The chain includes people, the space they occupy, the cars they drive and the air travel they take. The chain increasingly gobbles energy and emits greenhouse gases.

For instance, the research firm Gartner says, 37 million secondary PCs were refurbished and exported to emerging markets in the year 2008, and this is expected to hit 69 million by 2012 (Rozana Sani, 2009). Such figures from the onset provide a reflection on the diffusion of ICT technology. However, at the same time these figures also sending a signal on the growing potential of e-waste menace. The e-waste disposals quantum may be small today but given the technological advancements and its proliferation at an unprecedented rate it can emerge as a great menace to mankind in the future, if not managed efficiently and effectively. The e-waste includes disposals of all kinds of electronic equipment such as TVs, video players, PCs, monitors, printers, batteries, scanners and mobile phones. Indeed, they are highly toxic (Ramachandra and Varghese, 2004). The scheduled electronic wastes (SW) come from electrical and electronic parts containing components such as accumulators, mercury switches, glass from cathode-ray tubes and other activated glass or polychlorinated phenyl capacitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated by phenyls. When these elements are disposed randomly and irresponsibly they can leach into the soil and affect the affect the quality of water and affect the rate of vaporization, which in turn affects the climate and rainfall patterns. When e-wastes are burnt in incinerators, heavy metals such as mercury, lead and cadmium are released into the air and affects the quality and natural constituents of air. Whichever the sources may be, e-wastes when handled irresponsibly bring detrimental effects to the environment and pose great threat to ecology and climate as well as huge threat to our health.

Generically, a number of positive strategies in addressing the environment degradation challenges, which broadly can be surmised as:-

- **Infrastructure innovation**

Firstly, the strategy deals with areas where many of the most significant and immediate impact can be made on energy savings and reductions of Green House Gases (GHGs). This includes the large scale physical environment consuming the most energy, which includes buildings, public utilities & infrastructure, and manufacturing. It also captures opportunities for innovation within the energy grid and efficiencies for energy distribution.

- **Behavioural change and green enablement**

Secondly, the strategy focuses on the need for global measurement and tracking of carbon reduction, as well as tools that impact positive behavioural change. This includes software tools for carbon impact measurement, and the use of innovative technologies and opportunities that reduce travel and transportation, such as those for virtual meetings, telecommuting, and on-line services (e.g. eHealth, eTaxation, and eBanking).

- **Energy efficiency of ICT Products and solutions**

Thirdly, the strategy covers energy efficiency of data centres, electronic devices & solutions. Even if ICT products themselves have only a marginal environmental impact, there is a great risk that the public will judge the whole sector as environmentally unfriendly if the sector does not address its own carbon footprint. On one hand, this would impact ICT's credibility, making it difficult to deliver on the points above and on the other hand, the rapid increase and penetration of ICT products can, if no action is taken, result in increased energy demand.

- **Corporate Social Responsibility**

Fourthly, and more importantly, the strategy deals with the responsible behavior in managing the impact on environment in compliance with ISO certifications, increasing awareness about Green IT. Cooperation with universities or non-governmental organizations and favoring greener suppliers and greener products.

- **Minimising Environmental Footprint**

In this regard, on the positive side, the ICT plays a crucial role by promoting IT solutions as:-

- o **Avoiding CO2 emissions** - by tele- and videoconference / remote work / logistics solutions / waste management;
- o **Multi-standard base station** - software upgradable from GSM to EDGE, WCDMA to HSPA and HSPA to LTE;
- o **Use of Advanced Chips** - Use of advanced chips also enables increased spectral efficiency by transmitting more bits in a given time and stopping transmission during pauses;
- o **Remote Software Upgrades** - Ability to make remote software upgrades to boost capacity as and when needed, and to make air interface upgrades eliminates the need to transport and replace hardware, thus makes significance savings;
- o **Carrier Ethernet (CE)** - CE is a very cost-effective transport mechanism especially when the layer 1 medium is fiber. The intelligent base stations or the intelligent next-gen base stations, in combination with flat architecture of next-gen networks, allows backhaul communications to be optimized and this will enable a significant reduction in the energy requirements of radio access networks (RANs). Similarly, the flexi base stations, instead of using RAN one-to-many, the peer-to-peer deployment can allow most of the functionality to be moved to the base stations, which can make intelligent handover decisions and communicate directly.

- **Energy Saving**

Similarly, on addressing energy saving aspects the role of ICT is significant in the promotion of data center energy efficiency / server virtualization / optimize power usage for idle computers and printers.

4. Malaysian Green Technology Policy (GTP)

The Green Technology Policy was introduced in August 2009. In essence, the policy entails that development and application of products, tools or systems that can preserve environment and natural resources, as well as minimizing or reducing negative effects on human activities. In support of this policy, the Government of Malaysia has adopted four prong strategies, as shown in the Figure 14 below.

Figure 14



Thus, the Green IT is considered as an integral component of the four pillars of GTP and gives rise to the benefits to the society at large in the following manner:-

- **Green IT Reduces Costs**

ICT is virtually ubiquitous in the business world. There is virtually no product or service that does not rely on ICT in some ways for its development, production, commercialization or distribution. While ICT equipment does consume energy, Green IT can be very much part of the solution to help reduce energy cost of an operation, not only within the ICT industry itself, but for other sectors of the economy that rely on ICT. This is particularly important now that there is increased pressure on businesses and industries to cut costs. Green IT can help make a wide spectrum of local businesses more agile to compete in the global economy.

- **Green IT Creates Opportunities**

Increasing demand for ICT-based innovations that can reduce energy and materials used, while improving the efficiency of business systems will generate global opportunities for ICT businesses and professionals. Such innovations may include software applications (e.g. virtualization technology to realize power savings) and hardware technologies (e.g. server with energy-saving features). ICT and its linked industries have a wealth of talents that can make a real difference and achieve recognition and success in developing ICT-based green innovations.

- **Green IT Maximizes Environmental Benefits**

Apart from the economic benefits, embracing Green IT practices in business operations can tackle climate change issues associated with greenhouse gas emissions and it can also play a vital part in helping to promote the low carbon economy. The ICT industry can also create a green image while acting as a responsible global citizen.

- **Government as a Green IT User**

The Government is one of the major users of ICT and indeed has a significant impact on the health of the ICT industry. As a major influencer, we believe that the Government shall take the leading role in adopting Green IT technologies and measures for improving its operational efficiency as well as promoting an environmentally responsible and sustainable culture to our society. The Government must take the lead in using ICT-based innovations that can help reduce resources and increase energy efficiencies as a role model for the rest of the business sectors.

- **GTP and Budget 2010**

Acknowledging the significance of GTP, the Government of Malaysia through the Budget 2010, announced a number of initiatives to boost the green technology, including ICT products and services that directly or indirectly helps in the preservation of the environment. The essence of Budget 2010 for Green Technology included the following: -

- o Restructuring Malaysian Energy Centre as the National Green Technology Centre;
- o RM20 million allocated to intensify awareness activities and practise environment-friendly lifestyle;
- o Organizing an international exhibition on green technology in April 2010;
- o Developing Putrajaya and Cyberjaya as pioneer townships in Green Technology, to be emulated by other towns in later stages;
- o Giving priority to environment-friendly products and services that comply with green technology standards in Government procurement;
- o Green Building Index (GBI);
- o Government direct financial support 60% and 40% by private sector for deploying the GTP products and services, including ICT products and services;
- o Income tax on employment income at a rate of 15% compared to 26% for Iskandar project knowledge workers or ICT savvy workers.

5. Role of e-Commerce in GTP

The e-Commerce, being an integral of ICT services, in a way directly helps in the preservation of our environment. ICTs offer the potential for transport and travel substitution. In particular, e-Commerce and online shopping can save time and travel in searching and pricing. Delivery supported with online ordering can replace many thousands of individual trips, not only saving energy directly but also through potential reductions in traffic congestion. ICT and the Internet are enabling an increasing number of products and services to be delivered online or de-materialisation such as scientific journals, books, music CDs, film and videos, software, to name a few. In the same vein, e-mail communication, though a generic ICT application, it constitutes a part of any e-Commerce transaction and has also helped in replacing many millions of letters that used traditional buying and selling activities (Schmidt and Klooverpris, 2009). With tele-work or e-work, the reduction of transport and commuting time can be substantial and considerable benefits can accrue for individuals, employers and the community. In the case of e-Commerce transaction, the "work travels", instead of people travel. Thus, the reduction of long distance travels is possible as a result of the use of data, voice and video applications over IP for webcasts, tele-conferencing and video-conferencing. Succinctly put, the impacts can also be significant, and there are both direct impacts, in terms of the environmental footprint and indirect impacts such as reduced demand on transport infrastructures and office facilities. The Climate Group (2008) has conjectured that the environment friendly ICT driven initiatives can potentially help to reduce the global emissions.

6. Conclusion

Malaysian e-Commerce has attracted much attention from governments, businesses and regional bodies and this importance was attributed to several factors, such as the growth in the use of the Internet where 356.8% Internet penetration growth was seen for the period of 2000-2009, affordability of personal computers/net books and the increase in their computing capability, and also the wide use of open standards. According to the Nielsen Company 2007 research, 39% of Malaysians made their purchases online and 70% of the Internet users in Malaysia had made a purchase online at some point in the past. As for the future of e-Commerce in Malaysia, the scenario looks optimistic, if the increasing number of ISPs and Internet penetration in the country is being taken into consideration.

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CHAPTER 3

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Malaysian Economic Outlook

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1. Executive Summary

2009 will be remembered as the worst recession since the Asian Financial Crisis. As the US sub-prime crisis of 2007 transformed into a global financial crisis, countries, governments and people find themselves in a crisis not seen since the Great Depression. In the United States, continued government intervention staved off deeper damage to the economy. In Europe, the Greek debt crisis was brewing and in the Middle East, the “red hot” Dubai economy jolted to a sudden halt as the Dubai debt crisis led to new fears of another financial crisis. At home, the Malaysian economy, suffered a 1.7% contraction.

Still, as the year rolled on, there were signs that things were improving. In the United States, the economy was showing signs of recovery. China, having to carry the weight of the world on its shoulders while the developed economies worked their way out of recession, began posting double digit growth. By the fourth quarter, the Malaysian economy turned around, posting a 4.5% annual growth. The recovery continued into the first quarter of 2010 with the economy growing 10.1%.

The tabling and launching of the 10th Malaysian plan was timely. With a RM230 billion development budget to propel the country towards becoming a high income and high productivity economy, it was the boost investors and businesses were looking for. ICT has been identified as one of the National Key Economic Areas (NKEA), with the sector’s contribution to the economy expected to reach 10.2% of Gross Domestic Product by 2015. Such developments augur well for the ICT industry (EPU, 2010).

In last year’s PIKOM Strategic report, we started with a Chinese tenet that goes by **“There are always opportunities in the midst of danger”**. To signify that, despite the challenges the year had in store for the industry, if we looked intently and examine the available information, opportunities could be found.

This year, our Chinese tenet will go by **“When the direction of the wind changes, some (people) build walls, others make windmills”**. While things have turned for the better, and will continue to do so in 2010, and while there is no doubt that opportunities will flow once again, the dynamics governing the ICT industry have changed. At home, the Government is committed to changing the way we use and think of ICT. Abroad, the centre of economic activity is moving east from developed economies to emerging markets, while new technologies emerge to challenge the status quo. It is how we adapt to this change that determines whether we succeed or miss the golden opportunity.

With global and Malaysia ICT expenditure expected to grow once again and the initiation of the 10th Malaysian plan, the industry should take the opportunity to strengthen their operations and seek exponential growth, be it locally or globally. However, in line with the 10th Malaysia Plan’s focus on specialisation and upgrading, a key success factor will be for the industry to move up the value-chain, to specialise and find niche segments, to seek new defensible segments to grow rather than follow what our competitors do. In so doing, it is hoped the country can be a net exporter of ICT products and services, instead of a net importer (as in the current state) (EPU, 2010).

2. Economic Turbulence: Light at the End of the Tunnel

Looking back, after the sharper than expected decline in the fourth quarter of 2008, Bank Negara Malaysia (BNM) responded by cutting the Overnight Policy Rate (OPR) by 125 basis points in two months, while the Government announced a RM60 billion stimulus package that increased the budget deficit from 4.8% of Gross Domestic Product (GDP) in 2008 to 7.4% in 2009 (EPU, 2009). As the economy contracted 6.2% in the first quarter, the steepest retreat since the Asian Financial Crisis. Singapore, the United States and Japan, the top three export markets, reported first quarter GDP contractions of 9.4%, 3.3% and 8.9% respectively (Bloomberg, 2010). The downward trend would continue into the second and third quarters.

By the fourth quarter, things were beginning to improve. The United States posted a small but important 0.1% growth while Singapore's economy grew 4.0% (Bloomberg, 2010). The economy also received a timely boost from China, with exports to the world's third largest economy rising 61%. Manufacturing exports rose 12% with electronics and electrical (E&E) exports, accounting for more than half of the total manufacturing exports, rising 17%. The turnaround led to a fourth quarter growth of 4.4%, which allowed the economy to post a narrower contraction of 1.7% for the full year.

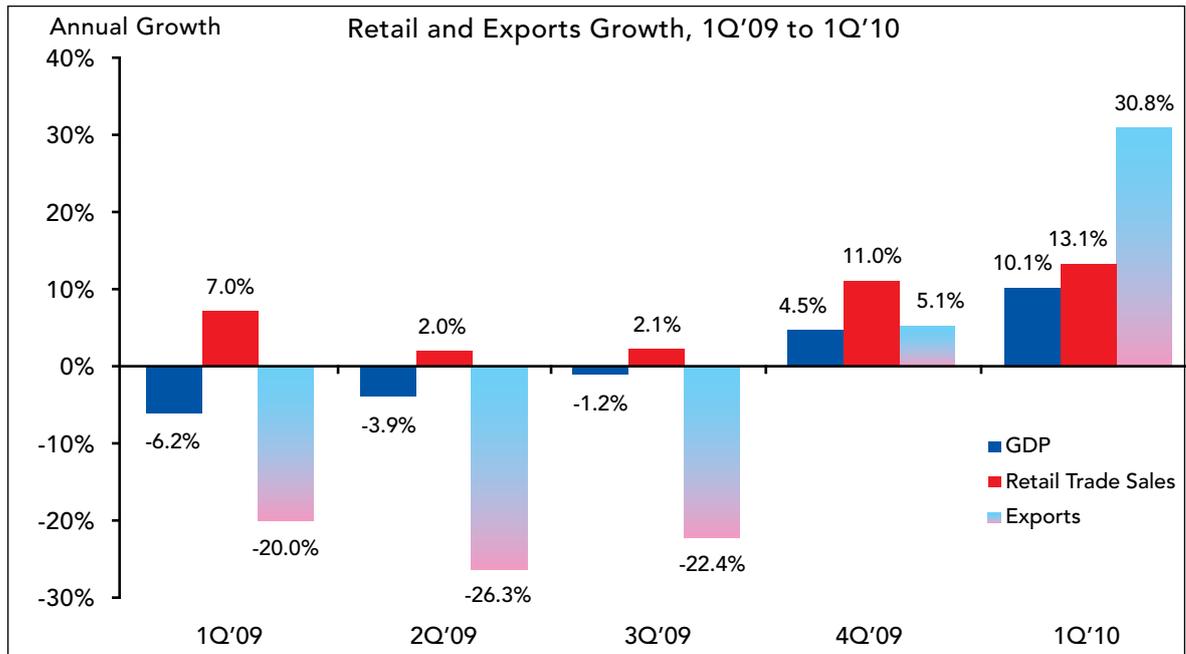
While businesses certainly felt the brunt in 2009, consumers weathered the storm generally well. Banks reported robust consumption credit loans growth of 7.7%, while total lending to households rose 9.8%. Furthermore, asset quality continued to improve with Non-Performing Loans (NPL) declining 18% (BNM, 2010). In addition, the retail trade sector posted a 5.4% annual increase in sales, and increased the number of employees by 5.4% (DOS, 2010).

Lastly, despite the sliding economy, equity markets had a sterling year with the FTSE Bursa Malaysia Kuala Lumpur Composite Index (FBM KLCI) rising 45% in 2009. The Finance Index was the best performing, rising 63%. Properties took second spot, rising 52% with the Technology Index taking third spot with a 32% increase.

3. A Roaring Start to the Year of the Tiger

As befitting the Tiger, 2010 started with a bang. First quarter exports jumped 31% with manufacturing exports rising 36%. E&E exports, the country's top export earner rose 36%. Domestically, the retail trade sector reported sales growth of 13% (DOSM, 2010). Combination of improving domestic and external economic conditions allowed the economy to grow 10.1%, the highest since 2000.

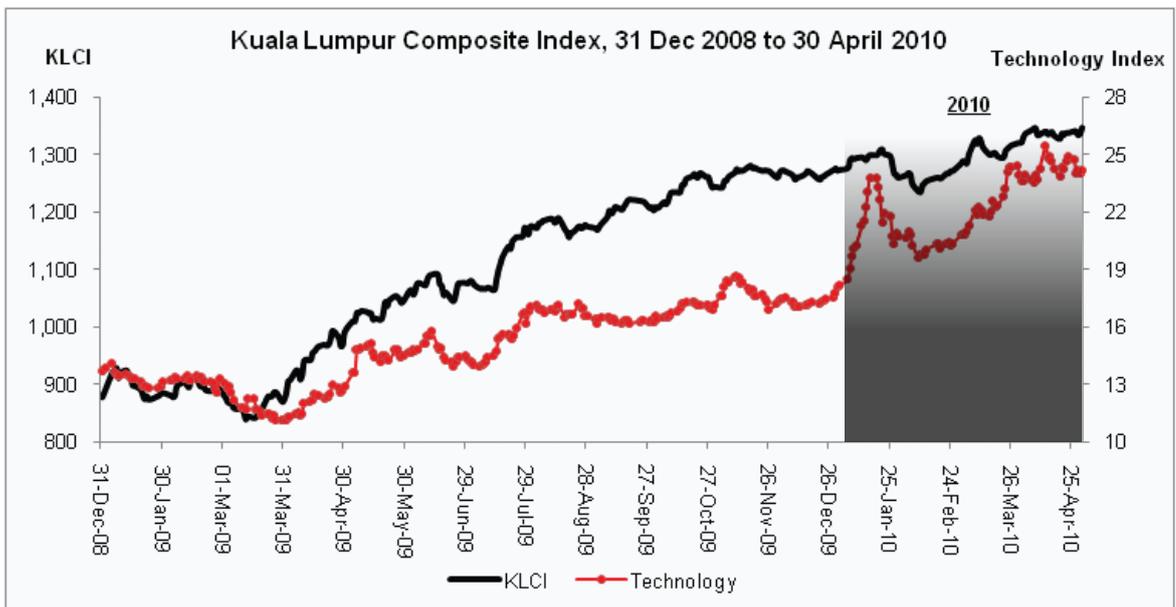
Chart 1: Strong Domestic and External Growth Drive First Quarter Growth



Source: Bank Negara Malaysia and Department of Statistics

The equity market extended its 2009 gains; with the KLCI up 4% over 2009's closing by the end of April. The Technology Index also rose, outperforming the KLCI with a 30% increase.

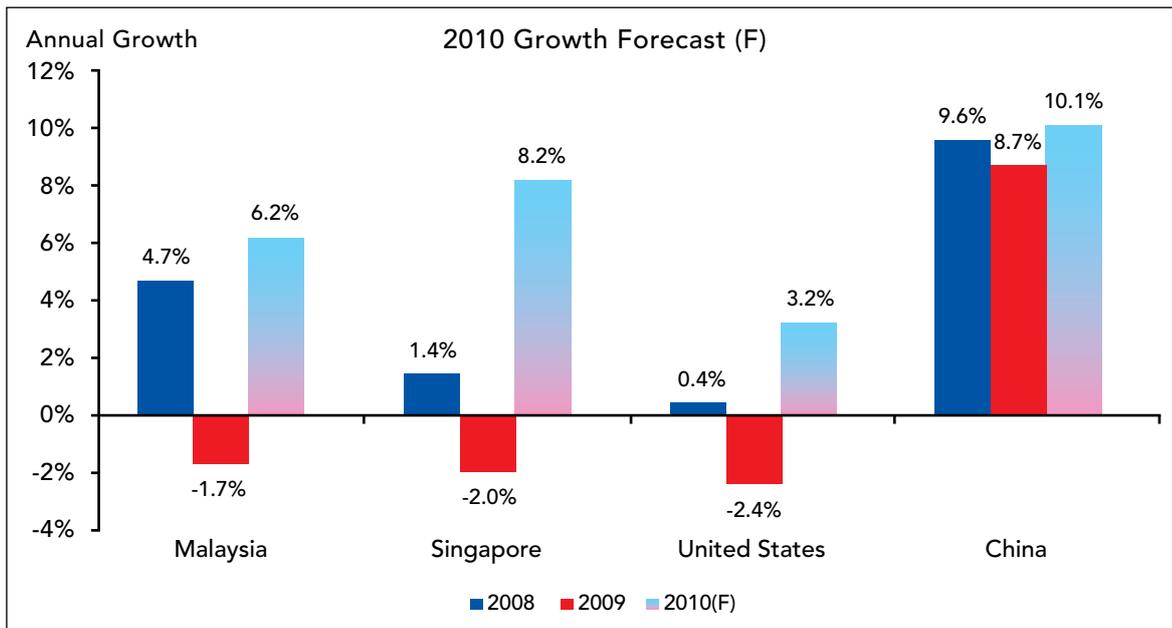
Chart 2: Kuala Lumpur Composite Index vs. Technology Index



Source: Bloomberg

Across the causeway, Singapore reported first quarter growth of 15.5%. The United States economy grew 2.5%, the highest in two years while China's economy surged to an 11.9% growth, the highest in two and a half years (Bloomberg, 2010). With such positive first quarter numbers, analysts have raised Malaysia's 2010 growth forecasts. A review of ten forecasts indicates an average forecasted growth of 6.3%, while the highest forecast given was 8% and the lowest 4.9%. Growth forecast for our key trading partners were also revised upwards, with Singapore forecasted to grow 8.2% in 2010, the United States growing 3.2% while China returns to double digit territory with a 10.1% growth (Bloomberg, 2010) (refer Appendix: Table 8).

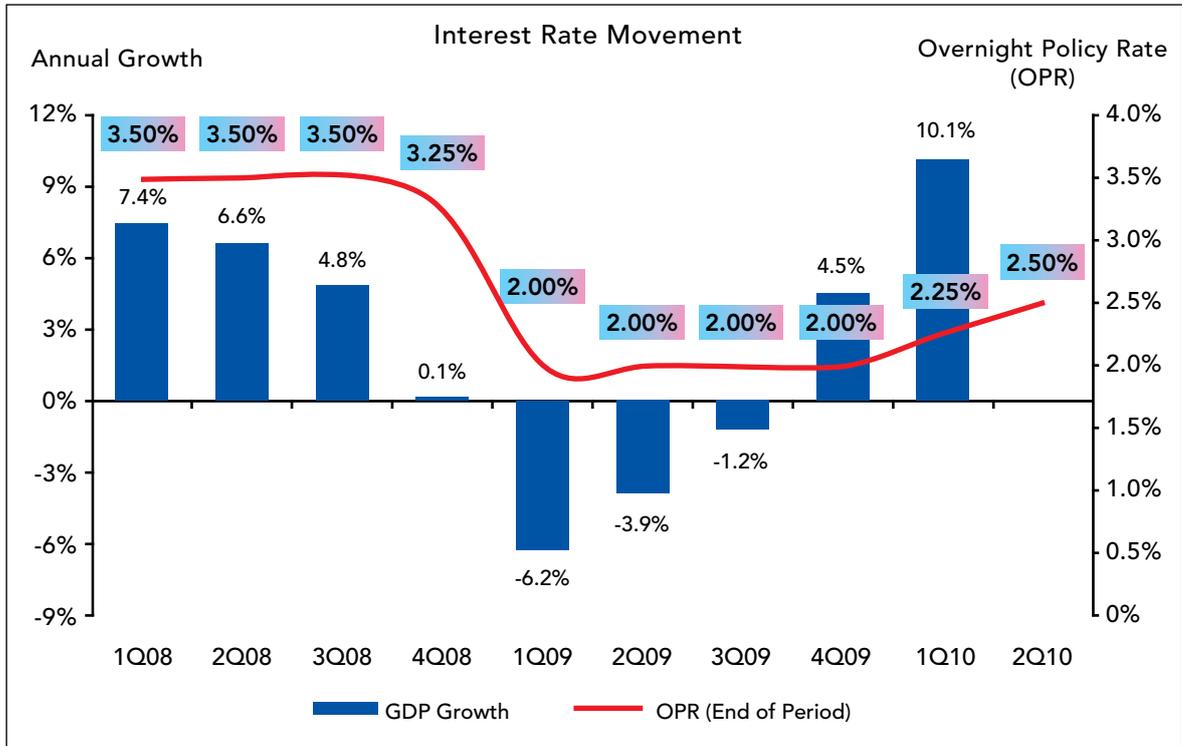
Chart 3: Economic Growth Forecasts



Source: Bloomberg

In a show of confidence, BNM raised the OPR by 25 basis point in March and a further 25 basis points in May 2010, citing improved economic conditions and the need to normalise monetary conditions (BNM, May 2010). A Bloomberg Composite forecast, based on 13 sources forecasts the OPR will end the year at 2.75% (Bloomberg, 2010).

Chart 4: Interest Rate Movements



Source: Bank Negara Malaysia

As most of you are aware, the Ringgit sentiment was mixed in 2009 with the Ringgit depreciating 26% against the Australian Dollar (AUD), 9% against the British Pound (GBP), 2% against the Euro Dollar (EURO) and 1% against the Singapore Dollar (SGD). However, it appreciated 1% against the US Dollar (USD) and 0.8% against the Chinese Yuan (CNY or RMB).

In the first four months of 2010, the Ringgit turned around, rebounded against all major currencies as the Greek debt crisis and concerns over the Euro led investors to safer havens. In addition, investors were likely to be buoyed by BNM, which signaled its intention to raise interest rates with most forecasts indicating a 75 basis points rise by year end (the OPR having already risen 50 basis points by May).

For the remainder of the year, the Ringgit is forecasted to appreciate against the Euro and the GBP, with the Euro-Ringgit rate expected to fall below the 4.00 mark. Against the USD, the Ringgit will also improve with a forecast of 3.16 in the fourth quarter, following through into the first quarter of 2011 with a 3.13 rate. The Ringgit is expected to stay relatively unchanged against the SGD throughout the year while against the AUD, the Ringgit is forecasted to depreciate in the middle of the year before recovering in the fourth quarter.

Chart 5: Exchange Rate Forecasts for 2010



Source: Bloomberg, 30 May 2010

4. Europe Woes - Volcanic Ash, Greek Debt and Sliding Euro

While the world economy celebrated a return to strength in the first quarter, the volcanic eruption in Iceland dented much of the enthusiasm. The closure of the busiest airport in the world, Heathrow, alone would have led to significant disruptions, what more all of Western Europe. The International Air Transport Association (IATA) estimates losses to the airline industry could top US\$1.7 billion (Frost & Sullivan, 2010).

Once the ash cleared, stranded passengers reached their destinations and flight schedules got back on track, the Greek debt crisis entered a new phase as investors concerned over the lack of conclusive action by the Greeks and contagion fears caused them to dump the Euro. In a span of 12 days, the Euro depreciated 8% against the dollar, hitting a then low of US\$1.220 from US\$1.329 on April 30th, despite the European Union (EU) announcing a US\$1 trillion intervention to support the Euro. But when things are just bad, the US\$1 trillion looked to investors as nothing but sugar coating on an already rotten cake. The Greek economy is still in tatters while debt levels in some Euro zone economies remain worrisome. Unsurprising then, investors send the Euro sinking further, dropping to a record low of US\$1.218 a week later before recovering to US\$1.231 at the end of May. Year to date (31st May), the Euro has depreciated 16% against the US dollar (Bloomberg, 2010).

Malaysia felt the impact when its high flying equity market had its wings clipped. The KLCI tumbled 4.6% in the month of May while the Technology Index fell 7.7%. Investors, spooked by a potential second financial crisis, retreated from equity markets across the region. However, with the exception of retreating equity markets, economic fundamentals remain intact in Malaysia and its key trading partners. At the moment, the Euro giddiness looks more likely to be a minor hiccup.

5. Malaysia Ranked 10th Most Competitive Economy

In the latest edition of the IMD World Competitiveness Yearbook (WCY) 2010, the country's ranking improved from 18 in 2009 to 10 in 2010. Malaysia improved its ranking in all four measured factors. Economic Performance improved from 9 to 8, Government Efficiency from 19 to 9, Business Efficiency from 13 to 4, and Infrastructure from 26 to 25.

Among its Asian peers, Malaysia was ranked fourth globally for Business Efficiency, outranked only by Singapore, Hong Kong and Taiwan. In terms of Government Efficiency, Malaysia was the fourth highest ranked among its Asian peers with a global ranking of nine. The weakest link in the country's ranking was Infrastructure, where the ranking of 25 was little changed in the past five years.

Table 1: Malaysia's WCY Ranking, 2006-2010

Factor	2006	2007	2008	2009	2010
Economic Performance	22	23	19	18	10
Government Efficiency	10	12	8	9	8
Business Efficiency	19	15	14	13	4
Infrastructure	27	26	25	26	25
Overall Ranking	22	23	19	18	10

Already lagging China in terms of Scientific Infrastructure (refer Appendix: Table 11), Malaysia needs to do more on improving Tech, Scientific, Health and Environment, and Education infrastructure if it is to compete with regional countries especially Singapore and Taiwan. Already lacking the Economic Performance in terms of the size of China, particularly in areas of Domestic Economy and Employment, Malaysia's advantage in Government and Business Efficiency will be negated if its infrastructure capacities are not improved.

Table 2: Malaysia's WCY Global Ranking Compared to its Asian Peers

Country (By Ranking)	Overall Global Ranking	Economic Performance	Government Efficiency	Business Efficiency	Infrastructure
Singapore	1	5	2	1	11
Hong Kong	2	4	1	2	23
Taiwan	8	16	6	3	17
Malaysia	10	8	9	4	25
China	18	3	25	28	31
South Korea	23	21	26	27	20
Thailand	26	6	18	20	46
Japan	27	35	37	23	13
India	31	20	30	17	54
Indonesia	35	27	23	34	55
Philippines	39	34	31	32	56

6. What's in Store for the ICT Industry?

PIKOM estimates Malaysia's 2010 ICT spending to grow 8% (PIKOM, 2010), while IDC estimates growth of 6.5% (IDC, MIS Asia, 2010). Both noted improvements in hardware spending as the biggest mover with PIKOM estimating hardware spending growth of 10%. Much improved operating environment, aided by economic recoveries in the United States, Singapore, Japan and continued strength in the Chinese economy, in addition to recovering growth at home, will support growth prospects. But it is at home that the greatest opportunities are to be found in the next few years as the programmes and initiatives of the 10th Malaysia Plan unfold. The focus on Public-Private-Partnership (PPP) collaborations also mean the industry should not only look at the Government for new opportunities, but also direct their attention to the private sector. As ICT cuts across all sectors, the development of the other NKEAs will create additional multiplier effects for the ICT industry giving more impetus for its growth and sustainability.

Table 3: Total IT Spending

US\$ billions	2008	2009(E)	2010(E)	2011(F)	2012 (F)
Global	1,448.6	1,382.6	1,391.1	1,469.0	1,566.3
US	504.2	488.0	501.0	521.6	543.2
Japan	123.7	113.5	129.0	131.6	136.3
China	68.4	75.4	86.5	102.0	118.0
India	21.6	20.3	24.4	28.2	32.9
Singapore	6.4	6.1	6.8	7.4	7.8
Malaysia	5.7	5.4	6.0	6.6	7.4
Middle East & North Africa	12.9	13.0	14.4	16.4	17.9

Source: Economist Intelligence Unit (EIU) / E = Estimates / F = Forecast

Table 4: Total IT Spending Growth

Annual Growth	2008	2009(E)	2010(E)	2011(F)	2012 (F)
Global	3.4%	-4.6%	0.6%	5.6%	6.6%
US	2.0%	-3.2%	2.7%	4.1%	4.1%
Japan	0.4%	-8.2%	13.7%	2.0%	3.6%
China	3.2%	10.2%	14.7%	17.9%	15.7%
India	2.9%	-6.0%	20.2%	15.6%	16.7%
Singapore	12.3%	-4.7%	11.5%	8.8%	5.4%
Malaysia	3.6%	-5.3%	11.1%	10.0%	12.1%
Middle East & North Africa	1.6%	0.8%	10.8%	13.9%	9.1%

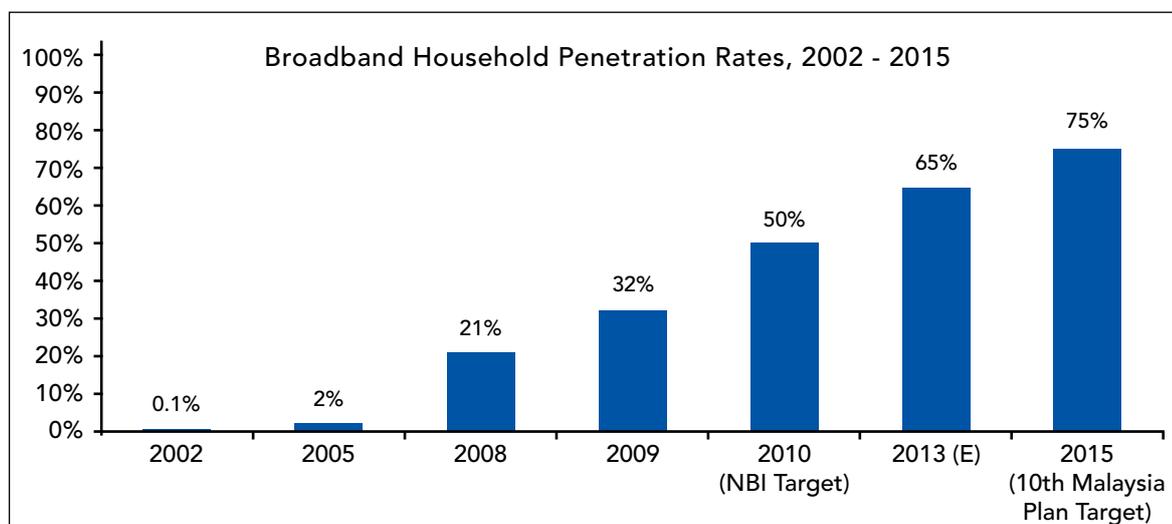
Source: Economist Intelligence Unit (EIU) / E = Estimates / F = Forecast

7. Local Catalysts to Spearhead Growth

Over the past years, apart from the domestic demand, the ICT sector (like any other sectors) has also been reliant on external demand including the state of health of the global economy. With the global economic crisis swirling around for the past 18 months, domestic ICT expenditure has also bordered on the cautious side resulting in a slowdown in domestic consumption. The Government has taken steps to boost the local economy by initiating a number of catalytic programs in their stimulus plan.

One of the key programmes is the Government's broadband efforts. Under the National Broadband Initiative (NBI), the target is to achieve 50% household broadband penetration by the end of 2010. Under the 10th Malaysian Plan, the Government aims to increase the rate to 75% by 2015 (EPU, 2010). To achieve the target, the Government has embarked on a two-pronged strategy (TM, 2008) – the most critical of which is the High-Speed-Broadband (HSBB) initiative. HSBB will offer speeds of up to 1Gbps (Gigabits per second) and will form the country's broadband backbone. As such, HSBB has been identified as an immediate high-impact project which will unlock economic activities currently not possible. The second initiative is Broadband to General Population (BBGP). While HSBB is designated to cover "high economic impact areas" and selected "industrial parks/ FTZ", BBGP will cover urban, semi-urban and rural areas (EPU, 2010). BBGP will be driven by a combination of wired and wireless broadband, but will primarily rely on fourth generation cellular technologies such as WiMax and LTE.

Chart 6: Household Broadband Penetration Rates



Source: 10th Malaysia Plan

While HSBB is in full throttle, fourth generation rollout has been slower so much so that the Government has gone so far as to fine three of the four WiMax license holders in 2009 for failing to meet coverage requirements (The Star, 2009). To further encourage the development of wireless broadband, the Malaysia Communication and Multimedia Commission (MCMC) plans to begin LTE auction as early as 2011 (Telecomasia.net, 2010).

As an indication of how much impact the broadband initiatives is expected to generate, the HSBB's 10/100Mbps speed for consumers and up to 1Gbps for business is at its slowest (10Mbps), two times faster than what is currently available (4Mbps). In the area of wireless technology, WiMax and LTE, offers up to twice the speeds over HSPA+, currently the fastest in wide use; as based on the theoretical maximum data downlink of 100Mbps for LTE, 128Mbps for WiMax and 56Mbps for HSPA+, currently the fastest in wide use.

8. For the Specialised ICT Players, the Financial Sector is a Gold Mine

For more specialised ICT players, where business is less dependent on the differences between 10Mbps and 4Mbps broadband, but more dependent on demand for specialised skills, the Financial Services Industry (FSI) is a gold mine of opportunities. With the sector contribution to GDP at 11.7% in 2009 and expected to rise to 12.7% in 2015, the sector has been identified as a NKEA. From complex regulatory compliance, to basic document management and driven by competition and ever more sophisticated regulatory demands, the industry looks to ICT more often as a necessity rather than an enabler. From things as simple as bar coding and storage of documents to complex and specialised regulatory compliance requirements such as Basel II and Financial Reporting Standards (FRS), the industry is never short of opportunities.

In the coming years, as banks move towards the Basel II Internal Ratings Based (IRB) approach, a new wave of ICT expenditure is expected. Given the substantial leap in requirements, IRB demands compared to the current approach, ICT players can expect new investments in hardware, software and specialised skills. The opportunities are magnified by the further liberalisation of the financial sector with the issuance of two new Islamic banking and five new Commercial banking licenses to foreign banks between 2009 and 2011 (BNM, 2009), augmenting the 39 existing banks. In addition, as the FSI is identified as one of the NKEA, continuous policy driven initiatives will likely support ICT budgets.

ICT players working with the financial services industry can also look beyond the country's borders. With operations in Cambodia, China, Hong Kong, Indonesia, Singapore and Thailand to name a few, Malaysian banks have become regional players. ICT companies, having successful track record in Malaysia, should look beyond Malaysia for opportunities. Lastly, with the rapid growth of Islamic finance both at home and abroad, coupled with Malaysia's position as the established leader in the development of Islamic financial services, having a successful track record deploying solutions in the field of Islamic financial services in Malaysia is by itself, a seal of approval for companies wishing to venture abroad, particularly in the Asia Pacific region where Islamic Finance is still undeveloped.

9. Shared Services and Outsourcing (SSO)

Beyond hardware and software sales, another growth area is in Shared Services and Outsourcing (SSO). In AT Kearney's 2009 Global Services Location Index (GLSI), Malaysia was again ranked third best location globally, behind India and China, for SSO services (ZDNet, 2009) with over 130 SSO companies registered with MSC Malaysia and 250 call centres (MSC Malaysia).

A multilingual, English speaking, educated labour force and a low-cost operating environment are some of the country's strengths. Moving forward, the ongoing improvements in the country's ICT infrastructure will allow Malaysia to maintain, if not strengthen its position in this field. With an estimated US\$571 billion spent globally on IT services, the market potential is tremendous. For Malaysia, Outsourcing Malaysia (OM), a local SSO industry group and a chapter of PIKOM, estimates the local industry, worth an estimated US\$1.1 billion in 2009 to grow 20% in 2010 (PTI, 2010). The growth potential of SSO is also highlighted in the 10th Malaysia Plan, where the Government has identified SSO as a niche ICT area to be further developed.

Table 5: IT Services Spending

US\$ million	2008	2009(E)	2010(E)	2011(F)	2012 (F)
Global	583,809.0	571,095.0	565,879.0	589,834.0	623,526.0
US	211,492.2	209,814.0	212,715.0	218,474.0	224,998.0
China	9,560.9	10,442.0	12,055.0	14,666.0	17,370.0
India	5,608.3	5,759.0	7,075.0	8,443.0	10,163.0
Singapore	2,166.9	2,217.0	2,509.0	2,732.0	2,857.0
Malaysia	1,328.1	1,210.0	1,341.0	1,482.0	1,657.0
Asia & Australasia	92,290.0	93,488.0	105,660.0	113,004.0	122,409.0
Middle East & North Africa	3,652.0	3,642.0	3,892.0	4,379.0	4,865.0

Source: Economist Intelligence Unit (EIU) / E = Estimates / F = Forecast

Table 6: IT Services Spending Growth

Annual Growth	2008	2009(E)	2010(E)	2011(F)	2012 (F)
Global	5.2%	-2.2%	-0.9%	4.2%	5.7%
US	4.2%	-0.8%	1.4%	2.7%	3.0%
China	13.3%	9.2%	15.5%	21.7%	18.4%
India	10.5%	2.7%	22.9%	19.3%	20.4%
Singapore	14.1%	2.3%	13.2%	8.9%	4.6%
Malaysia	8.2%	-8.9%	10.8%	10.5%	11.8%
Asia & Australasia	6.0%	1.3%	13.0%	7.0%	8.3%
Middle East & North Africa	4.3%	-0.3%	6.9%	12.5%	11.1%

Source: Economist Intelligence Unit (EIU) / E = Estimates / F = Forecast

However, Malaysia must not rest on its laurel as countries like China, India and Philippines will continue to develop these areas of services. In fact, Outsourcing Malaysia (OM) expects 2010 to be a year of consolidation. According to an IDC report commissioned by Outsourcing Malaysia and the Multimedia Development Corporation (MDeC), operational scale, “portfolio” services, “vertical” solutions and the development of management capabilities to engage competitively with global clients are some of the areas that Malaysia needs to improve (ZDNet Asia, 2010). In essence, while the country remains an attractive SSO centre, much like the rest of the economy, it needs to consolidate, create economies of scale, and move up the value chain.

Furthermore, based on EIU forecasts, Malaysia’s IT services spending as a percentage of total IT spending will average around 22% between 2010 and 2012 compared to India’s 30%, Singapore’s 37% and the wider Asia and Australasia’s rate of 31%. This suggests domestic businesses have yet to embrace outsourcing, consistent with the findings of the IDC report.

Table 7: IT Services Spending as a % of Total IT Spending

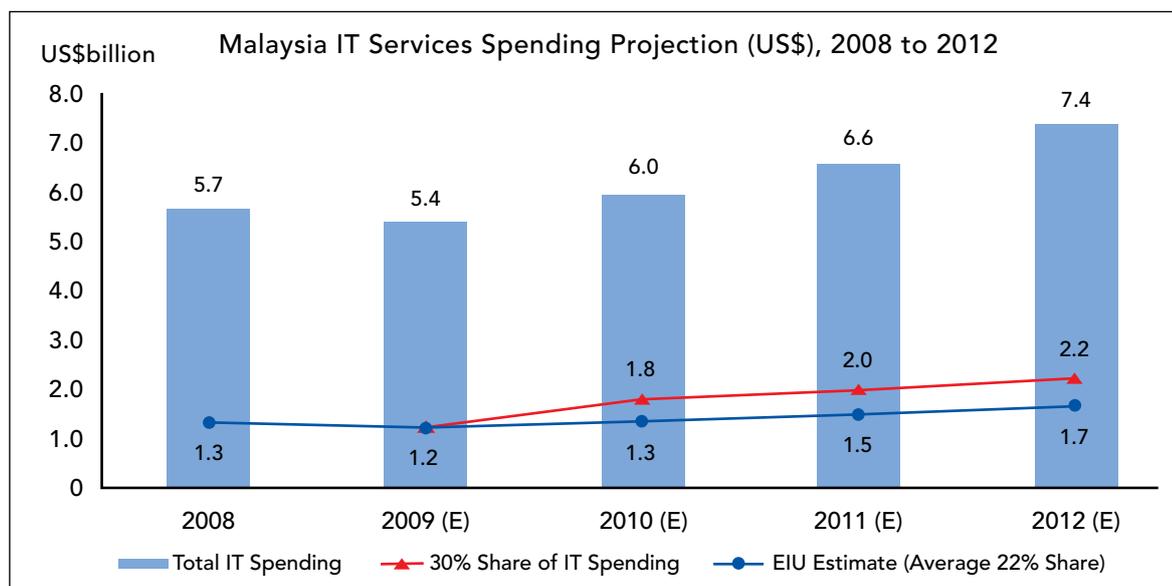
% Share of IT Spending	2008	2009(E)	2010(E)	2011(F)	2012 (F)
Global	40.3%	41.3%	40.7%	40.2%	39.8%
US	42.0%	43.0%	42.5%	41.9%	41.4%
China	14.0%	13.9%	13.9%	14.4%	14.7%
India	26.0%	28.4%	29.0%	29.9%	30.9%
Singapore	33.9%	36.3%	36.9%	36.9%	36.6%
Malaysia	23.3%	22.4%	22.4%	22.5%	22.4%
Asia & Australasia	30.4%	31.2%	31.4%	31.0%	30.8%
Middle East & North Africa	28.3%	28.0%	27.0%	26.7%	27.2%

Source: Economist Intelligence Unit (EIU) / E = Estimates / F = Forecast

On the other hand, if total IT spending were to remain unchanged, a 30% IT services spending rate will translate into 34% higher IT services spending; raising total IT services spending from EIU estimates of US\$1.3 billion to US\$1.8 billion in 2010.

However, when looking at the SSO market, one must also take note of the multiplier effect on the ICT industry. After all, what services are there to be rendered without the hardware and software? The pervasiveness of ICT in all aspects of economic activity, be it agriculture, construction, manufacturing, power generation, transportation and government services means greater SSO proliferation into these industries will certainly generate multiplier effects on the overall ICT industry.

Chart 7: Malaysia IT Services Spending Estimates, 2008 to 2012



Source: Economist Intelligence Unit (EIU)

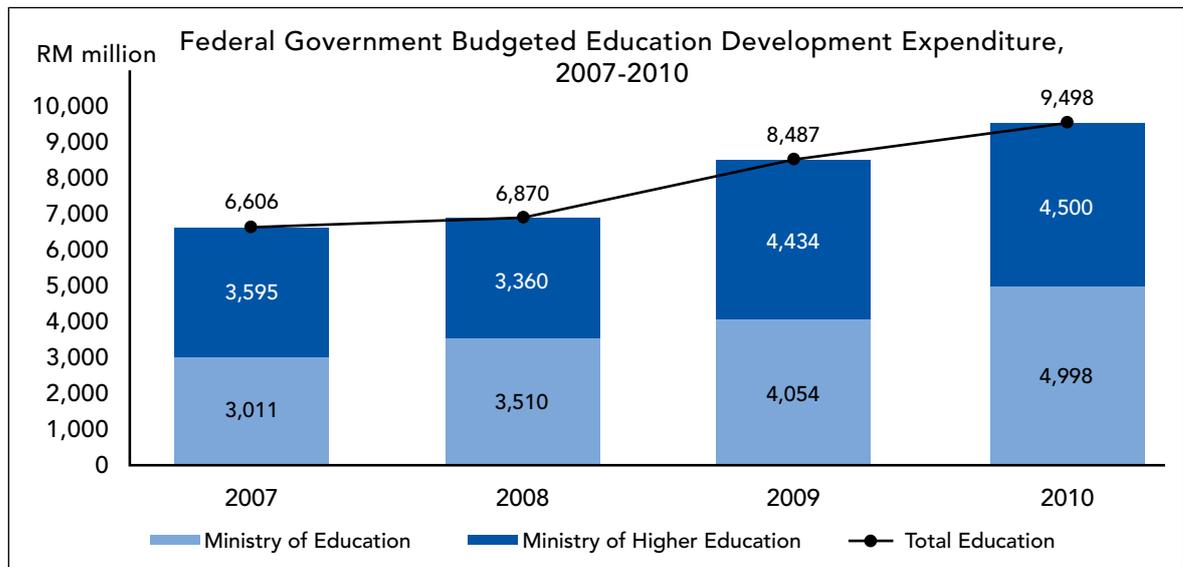
When it comes to developing the SSO industry, the country need not look abroad. Already a major player in the global oil and gas industry, for a long time a key part of the global electronics manufacturing chain and today the global leader in Islamic finance development, the SSO industry should look to tap on these hard earned experiences by developing the “portfolio” services, “vertical” solutions and management capabilities in these specialised sectors. Tapping into such experiences is also consistent with the Government’s focus on specialisation. In addition, these specialised “skills” are difficult to replicate and therefore represent strong defensible segments.

10. Opportunities in the Public Sector

Over the past years, the public sector has and will always remain a dependable source of growth for the ICT industry. Education, security, traffic management, immigration, registration and taxation are but some areas where ICT adoption is key to the Government’s efforts. Today, Malaysians have access to world class travel documents delivered within hours (in some cases within the hour itself). Motor insurance and road tax renewals done from home with the road tax delivered, by courier to one’s doorstep. Come the usual “pay your taxes” rush period, taxpayers can look to hassle-free tax filing through e-filing. First introduced for the 2005 assessment year, the number of users has risen from an initial 180,000 (NST, 2009) to 1.49 million for 2009 assessment year (The Star, 2010).

Another sector with abundant of opportunities is the education sector and the expenditure here consistently ranks among the largest development expenditure item in the national budget, accounting for 14.2% (RM6.6 billion) of total development expenditure in 2008, and rising to 17.8% (RM9.5 billion) in 2010 (Ministry of Finance). The reason being, education covers a very broad spectrum, right from primary and secondary education, technical and vocational education all the way to tertiary education. For example, in the 2010 budget, the Government announced 100,000 netbooks will be provided to university students (MOF, 2009) and the 10th Malaysia Plan has also identified education, in particular higher education, as one of the NKEA.

Chart 8: Federal Government Education Development Expenditure Budget



Source: Federal Treasury of Malaysia, Ministry of Finance

As an added bonus, public sector ICT demand is reliably consistent. Budget cuts come and go but the need to provide consistent services require consistent expenditure. Furthermore, government initiatives are often longer term in nature, and driven by policy imperatives which make them more resilient to changes in economic conditions. Contrast this to the private sector where spending decisions are often dependent on annual financial performance, quarterly performance and return on investment and equity numbers, with ICT budgets usually among the top items to be cut when times are bad.

11. Public-Private Partnerships (PPP), a key thrust for Future Development

In the 10th Malaysia Plan, the Government announced the creation of a RM20 billion “Facilitation Fund”, similar to last year’s RM2 billion Private Finance Initiative (PFI) fund announced in the second stimulus package. Under the PPP (and PFI) structure, the private sector can seek government funding to “jump start” or as its name suggests, “facilitate” projects. In such cases, the Government will provide the necessary funds to enable the project to begin, with the private sector being ultimately responsible for most of the funding. Some examples of PPP (and PFI) projects announced are infrastructure provision in the Tanjung Agas industrial park, a biotechnology cluster in Iskandar Malaysia, upgrading of the traffic infrastructure system around KL Sentral (EPU, 2009) and the HSBB initiative where the government will fund only 21% of the total RM11.3 billion investment bill (TM, 2008). With RM62.7 billion worth of expenditure earmarked to be done under the PPP structure in the 10th Malaysia Plan, the opportunities in the private sector is as abundant as public sector opportunities, if not more. (EPU, 2010)

12. Conclusion

In conclusion, the outlook for the second half of 2010 points to a good year for the ICT industry. The combination of improved foreign and domestic demand will spur greater ICT demand, be it in the areas of hardware, software, manufacturing or services. In addition, the initiatives and programmes of the 10th Malaysian Plan, including identification of the ICT sector as one of the eleven NKEA, will act as growth catalyst to the programmes and initiatives of the plan, when they unfold over the coming years. Last but not least, the country's broadband initiative, if fully realized, will result in new multiplier effects from consumer ICT spending.

While Malaysia's economic fundamentals still remain sound, possible weaknesses in the country's key export markets and coupled with the uncertainties in the European economy could still impact our overall local economy. Also, with ongoing steep competitions coming from the countries in the region, such as China and India, there is an urgent need to move up the value chain now in ensuring that we are still relevant in this race in the future.

In the 2009/2010 PIKOM Strategic report, we ended with a phrase; 'there are always *"Ji-Hui"* in this period of *"Wei-Ji"*. Let me end this year's assessment simply with another Chinese tenet, *"When the direction of the wind changes, some (people) build walls, others make windmills"*. *"Ji-Hui"* is here, are you game enough to take advantage of it? If in bad times, we should seek opportunities in the midst of distress, this time the industry should seek greater opportunities in the midst of opportunity. If in 2009, we were more likely to aim for the low hanging fruit, let 2010 be the year where we aim for the fruits at the top in line with the aspirations of the Government to move the country towards a high-income and high-productivity economy.

13. Appendix

Table 8: Revised Growth Forecast for 2010

Source	Forecast as of	2009(A)	2010(F)	2011(F)
Government of Malaysia	20 May 2010		4.5%-5.5% (5.0%)	N/A
AmResearch	28 April 2010		8.0%	6.0%
CIMB Research	12 May 2010		6.5%	5.5%
Deutsche Bank	3 May 2010		6.5%	N/A
JP Morgan	17 May 2010		7.7%	4.8%
OSK Research	14 May 2010	-1.7%	7.0%	N/A
Rating Agency Malaysia (RAM)	7 May 2010		4.9%	N/A
RHB Research	11 May 2010		6.4%	5.0%
Asian Development Bank	12 May 2010		5.3%	5.0%
MIER	15 April 2010		5.2%	5.0%
World Bank	April 2010		5.7%	5.3%
		Low	5.00%	4.80%
		High	8.00%	6.00%
		Average	6.20%	5.23%

Source: Various

Table 9: Global Economic Forecasts for 2010

Country	2009(A)	1Q2010(A)	2010(F)
United States	-2.4%	2.5%	3.2%
Japan	-5.23%	4.6%	2.1%
China	8.7%	11.9%	10.1%
Germany	-4.9%	1.6%	1.8%
South Korea	0.2%	1.8%	5.3%
Singapore	-1.98%	15.5%	6.5%
Hong Kong	-2.7%	8.2%	5.25%

Source: Bloomberg, 25 May 2010

Table 10: KLCI and Component Index Performance

Index	31 Dec 2008	31 Dec 2010	Growth
KLCI	876.75	1,272.78	+45%
- Technology	13.69	18.06	+32%
- Finance	6,791.71	11,041.13	+63%
- Plantation	4,142.8	4,142.69	-3%
- Construction	164.18	164.34	+1%
- Properties	515.61	780.89	+52%
- Trading / Services	117.91	118.27	+0.3%
- Consumer Products	282.03	282.85	+0.3%
- Industrial Products	2,063.85	2,070.61	+0.3%
- Mining	237.09	291.81	+23%

Source: Bloomberg

Table 11: Global Rankings of Malaysia and comparative economies sub-factors.

Factor	Sub-Factor	Malaysia	Comparative Economies			
			Singapore	Taiwan	China	Thailand
Economic Performance	Domestic Economy	30	22	17	2	35
	International Trade	4	2	10	17	5
	International Investment	22	6	39	20	38
	Employment	18	5	25	1	3
	Prices	10	47	12	31	4
Government Efficiency	Public Finance	15	3	13	6	14
	Fiscal Policy	8	9	3	48	7
	Institutional Framework	7	1	14	2	32
	Business Legislation	19	1	24	46	28
	Societal Framework	27	8	19	31	33
Business Efficiency	Productivity & Efficiency	27	17	5	21	49
	Labour Market	4	1	11	5	2
	Finance	9	4	7	35	18
	Management Practices	1	6	4	46	13
	Attitudes and Values	1	2	5	26	19
Infrastructure	Basic Infrastructure	16	17	21	12	26
	Tech Infrastructure	19	2	5	22	48
	Scientific Infrastructure	27	12	5	10	40
	Health and Environment	34	18	24	54	51
	Education	33	13	23	46	47

Source: World Competitiveness Yearbook (WCY) 2010

Illustration 1: 10th Malaysia Plan 2011-2015), Information and Communications Technology (ICT), page 129 (EPU, 2010).

6) Information and Communications Technology

The Information and Communications Technology (ICT) sector accounted for 9.8% of GDP in 2009. This sector will continue to be a key focus for Malaysia and is expected to gain greater momentum driven by the convergence of industries due to digitalisation. The contribution of the ICT industry to GDP is targeted to increase to 10.2% by 2015. Greater use of ICT will not only support the growth of the sector but also boost productivity and raise the nation's overall competitiveness. However, to achieve growth, Malaysia needs to shift from being an average producer of general ICT products and services, and progress from a net importer to a net exporter. Issues of lack of product acceptability, weak product branding and lack of cross-discipline expertise will be addressed. Key strategies that will be adopted to propel the industry are as follows:



- MSC Malaysia will identify and support the development of niche areas in software and e-solutions, creative multimedia, shared services and outsourcing as well as e-business. FDI strategy will be to attract MNCs to anchor these selected focus areas, with clusters of knowledge-based SMEs around the MNCs. A tiered benefits scheme will be established whereby financial and non-financial benefits will be provided based on the company's needs, size, stage of maturity and criteria such as the ability to catalyse the development of SMEs in priority sectors and induce high spill over effects;
- The Government will aggressively promote the use of ICT in all industries in parallel with the development of the ICT sector. Cloud computing services will be developed to provide SMEs with critical software application for customer relations management, enterprise resource planning, supply-chain management, human resource management, and financial and accounting management. Niche areas for applications development include healthcare, education and financial services especially in Islamic banking;
- In the creative industry that currently contributes about 1.6% to GDP, emphasis will be on creative multimedia, especially animation for simulation, advertising and entertainment, and games development. A National Creative Industry Policy will be formulated and the National Digital Terrestrial Television Broadcasting (DTTB) project will be rolled-out to help spur the expansion of related creative industries. With DTTB technology, more content will be delivered more efficiently; and
- Education and training will be prioritised to meet the human resource requirements in this sector. This will be done through focused collaboration between the industry-academia-government, especially for curriculum development and industrial training.

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CHAPTER 4

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e-Commerce Adoption in Malaysia: Trends, Issues and Opportunities

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1. Executive Summary

This article presents an overview of e-Commerce from 2000-2013, with specific emphasis on the Malaysian e-Commerce environment.

A generally acceptable definition of e-Commerce is that: e-Commerce is the sale or purchase of goods or services, whether between businesses, households, individuals, Governments, and other public or private organizations, conducted over computer-mediated networks. The benefits of e-Commerce include addressing the needs of today's organizations and consumers to reduce costs, while improving the quality of goods and services and their delivery speed, summed up in one word this is clearly 'convenience'.

e-Commerce finds its origins in the 1960-1970's, and after having undergone a substantial boom from the early 1990's until late 1990's, it experienced a substantial industry bust. Since 2000, global e-Commerce spending has gone from a US\$0.27 trillion industry to approximately more than US\$10 trillion today, about 80% of which is attributable to B2B e-Commerce. The USA, followed by Europe, has been and continues to be the market leader in terms of e-Commerce value, with approximately 40% of global market share. Some of the key trends shaping the e-Commerce landscape today are the social aspect of the Internet and its impacts on e-Commerce, technology trends such as Cloud computing, Web 2.0, VoIP, as well as e-tailing and m-Commerce.

With regards to the Malaysian e-Commerce landscape, while the Malaysian legal environment has long been e-Commerce friendly, the financial infrastructure has only in recent years begun to shape up to this task. Generally, it may be said that Malaysia lags behind by about 3 to 5 years in e-Commerce development when compared to industries such as that of the US. However, this gap is getting smaller year by year, through drivers such as e-Tourism and the proliferation of e-Commerce as an SME development vehicle. One of the most well-known examples of Malaysian e-Commerce success is that of AirAsia. AirAsia, a Malaysian born low cost carrier airline which was established in 2001, has managed to leverage e-Commerce as a main distribution channel and reach US\$0.789 billion revenue in 2008. A likely scenario for Malaysian e-Commerce until 2013 is that Malaysian e-Commerce spending will grow to reach US\$73.5 billion by 2013. Some of the potential strategic directions and recommendations to achieve this include the need to enable a more conducive e-Commerce environment through an improved mindset, and better technical infrastructure.

In conclusion, it may be said that the future of e-Commerce seems to be very bright, even more so in the case of Malaysia which is slightly lagging behind and has not yet reached saturation point, which is slowly being approached in the US. However, e-Commerce's future can only remain bright if there is sufficient consumer trust and confidence in the underlying systems. Therefore, the Government and businesses need to work together on an international platform to ensure specific standards are set, to truly level the e-Commerce playing field.

Throughout the composition of this article, a lack of consistently collected official statistics on e-Commerce and its various sub-segments became apparent. It is therefore advised that the Government dedicate more resources to the accurate and unbiased depiction and profiling of their position in the global e-marketplace.

2. Introduction – What is e-Commerce

As part of attaining Malaysia's goal of being a knowledge driven economy, economic growth through ICT enablement is one of the key success factors. e-Commerce is seen to affect economic growth positively through opening up the world as a 'local' market, reachable by even the smallest of businesses, thus leveling the playing field for the competitive advantages each country's economic participants have to offer. e-Commerce itself is enabled by ICT literacy and ICT proliferation, and is thus fully in line with Malaysia's national development goals.

Although there is currently no internationally agreed-upon definition of e-Commerce, for the context of this article, e-Commerce, which stands for electronic commerce, may be defined as the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organizations, conducted over computer-mediated networks. This includes, for example, virtual items, information, and/or the conducting of financial transactions via electronic means, via the Internet or the computer networks that make up the Information Superhighway (I-way).

e-Commerce can be business-to-business (B2B) or business-to-consumer (B2C), but is currently heavily dominated by B2B in terms of revenue split. B2B e-Commerce can be open to all interested parties, including commodity exchange, or limited to specific qualified participants, such as private electronic markets. B2C e-Commerce, on the other hand, is conducted by establishments, such as Amazon.com, with any individual.

2.1. *The Benefits of e-Commerce*

The Internet, and with it, its primary source of revenue creation: e-Commerce, has evolved from being virtually unknown in the mid-1990s, to being a global multi-trillion dollar industry in just over one decade. The proliferation of the Internet has brought the world and thus the world's economic activities closer together, and e-Commerce itself has spurred a variety of innovations and brought many benefits to its users. Generally, e-Commerce offers increased convenience across the board, for all participants. However, it also reduces goods and service costs while improving the quality of the purchasing experience in, for example, allowing for more choice and reduced delivery times. The manifold benefits of e-Commerce can be summarized as related to expanding market reach in allowing for the overcoming of geographical limitations, increased availability (24x7), eliminating intermediaries, lowering transaction cost for buyer and seller, decreasing administrative, marketing and logistics costs, providing a competitive environment to improve the quality of goods and services, increase the convenience of obtaining goods and services, and allowing for a provision of more customized offering as well as a new way of managing relationships. Specific advantages can be clustered around cost, operational, market reach, innovation or other benefits.

Despite these apparent benefits, website set-up and maintenance cost, and the fear of being exposed legally remain significant hurdles for many enterprises, especially SMEs, wishing to engage in e-Commerce. For consumers, IT illiteracy or unfamiliarity as well as fears concerning virtual financial transactions security remain the main impediments to e-Commerce uptake.

3. Global e-Commerce – Past, Present, Future

e-Commerce has undergone a rapid “snowballing” evolution and growth since its inception. e-Commerce finds its origins in the 1960-1970's where it referred to executing commercial transactions electronically through technologies of the time, such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT).

Figure 1: e-Commerce Historical Development



3.1. 1990 – 1999: The Pioneering Years

With the emergence of public use of the Internet in the mid-1990's and the invention of the World Wide Web, HTML and the HTTPS protocol, which allowed for secure transactions, in 1990, a new platform for e-Commerce was born. In 1991, the US National Science Foundation lifted a ban on commercial businesses operating over the Internet, paving the way for e-Commerce. From 1993 to 1999, browsers like Netscape, Mosaic and Internet Explorer made it possible to navigate the World Wide Web with ease and thousands other Internet companies came into being during this period. In 1994 Netscape pioneered an important security protocol called Secure Socket Layer (SSL), the protocol is still in use until today. It involves encrypting data on both transaction ends, thus ensuring that personal information such as names, addresses and credit card numbers could be kept safe over the Internet. Around 1994, third-party services for processing online credit card sales began to appear, and in 1995 Verisign began developing digital ID certificates, that verified the identity of online businesses, later shifting focus to verifying that a website's e-Commerce servers were properly encrypted and secure. Two of the companies attaining tremendous success through e-Commerce during this time are Amazon and e-Bay.

3.2. 2000 – 2005: The Bust-Boom Cycle

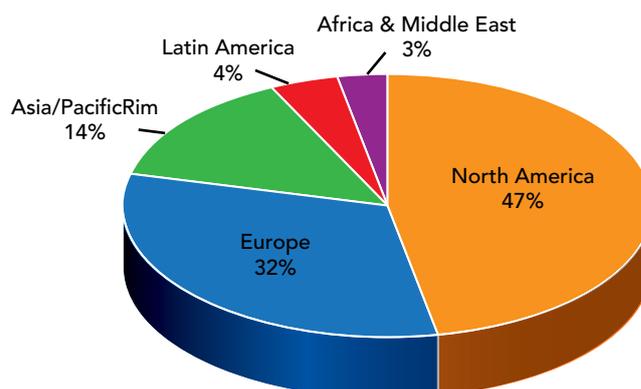
After the initial boom of the 1990's, there followed a so-called 'dot.com Bubble Burst' in 2000, as investors had cashed-in and cashed-out as fast as possible and unbridled enthusiasm had held no stops to speculative investments. In 2000, the stock markets crashed and took much of the value created since 1994 with it. Some companies weathered the storm, some failed completely, and others merged with stronger companies. From then on, it took a few years for companies and investor confidence to recover. When the Organization for Economic Cooperation and Development (OECD) became involved, eventually drafting the Action Plan for e-Commerce, a collaborative model of addressing e-Commerce was being developed. Coordination at a global level continued with the World Trade Organization (WTO) deciding to conduct an extensive review of areas potentially affected by this new technology in 1998. With the dawn of the 21st Century, many traditional 'brick and mortar' enterprises realize the advantages of e-Commerce and began establishing websites or adding e-Commerce applications to their existing web presence.

By the end of 2001, the largest form of e-Commerce, Business-to-Business commerce, had around US\$700 billion in transactions in the United States alone. In 2005, Web 2.0 further changed the landscape of the Internet, by making it more interactive, more social and closer to the people who 'feed it' with their actions. Thus, the requisite high level of technical skill was no longer required to use the ICT applications effectively, changing the demographics of the average Internet user. By the end of 2007, e-Commerce sales accounted for 3.4% of global sales. Meanwhile, the proliferation of the Internet and ICT application for both home and office use enabled the customer base to grow for both B2B and B2C e-Commerce. For example, the increased Internet usage in populous Third World nations such as China, India and Brazil opened up vast potential markets for e-Commerce.

3.3. 2006 – Present: Sustainable Growth

In 2006, the global value of e-Commerce stood at just over US\$6 trillion, with approximately 80% being attributable to B2B commerce. Figure 2 below shows, North America followed by Europe, make up the largest share of global e-Commerce revenue, with about 79% of global e-Commerce revenue. North America has remained the leader in e-Commerce transactions over this period due to its conducive e-Commerce environment, including a well-developed e-Commerce legal infrastructure. However, other regions are fast catching up, with Western Europe experiencing a per annum growth rate of 27% for its e-Commerce activities since 2006.

Figure 2: Frost & Sullivan Estimate of e-Commerce Revenue by Region (2006)



The above depicted distribution of e-Commerce revenues is even more interesting, when considering that the global Internet user statistics (refer to Figure 3) show that majority of Internet users worldwide are located in Asia. This implies a gradual shift of e-Commerce activities shifting towards Asia. Although the ratio of the Internet users who are e-Commerce participants is lower in Asia, the sheer numbers will eventually reach a tipping point where North America loses its top position. In 2009, China for example, boasted that 91.5 million people are already online and this constitute to a penetration of only 9% of the country's population. This number includes about 50 million of China's burgeoning middle class, which is bigger than the American middle class, and is embracing technology. Based on a Mastercard survey conducted in 2008, Asian shoppers' favorite items in descending order include books, art, electronic products, CD/VCD/DVD's, fashion, airline tickets, toys, gifts and groceries.

Figure 3: Internet Users by Region (2009)

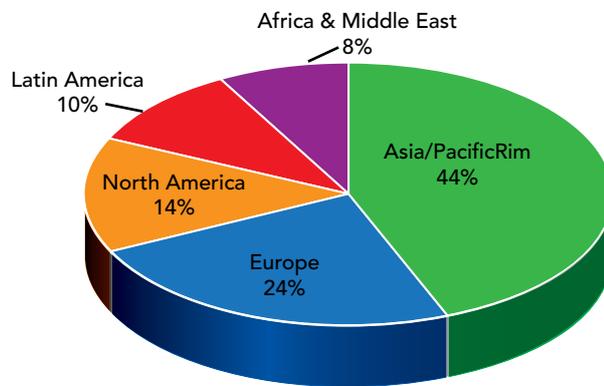
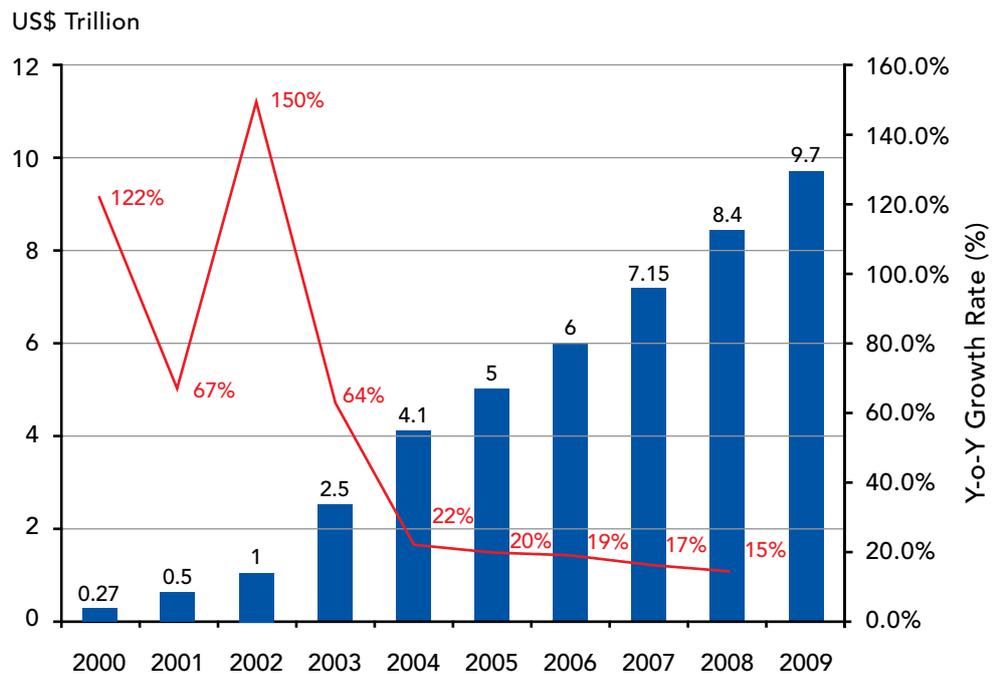


Figure 4: Frost & Sullivan Estimate of e-Commerce Growth from 2000-2009



3.3.1. Key Global e-Commerce Players

Generally, e-Commerce players can be classified into four clusters, by different business model types, different target market bases, different types of services provided, and others. The various types of business models engaged primarily by e-Commerce players today are detailed further in the next section. Generally, they are ad-based versus subscription based. Some of these operate on a subscription basis, while others support themselves through advertised based funding. Some of the companies do not charge for their services, almost half of their revenue stems from advertising, with only a negligible share of revenue originating from payments.

With regards to target markets, these might be B2B, B2C or B2G for example. Most of the companies, which we consider are well-known, are successful also in the B2C segment, although the goods or services they provide can usually be used by businesses. Despite this apparent success of B2C e-Commerce players, B2B commerce is where the real money lies, with approximately 80% of e-Commerce being B2B centric. Some of the establishments which have made it big in B2B e-Commerce are depicted in Figure 5 below. e-Procurement, supply chain management, lower interaction cost, and better customer relationship management are just some of the benefits businesses can gain when leveraging on B2B e-Commerce.

Figure 5: Top B2B e-Commerce Players in 2009



As mentioned above, another way to categorize e-Commerce players is through the type of services they provide. This includes e-tailers, ticketing companies, and similar product and service offering. In 2008, Amazon was by far the leading Internet retailer in the US with a sales volume of US\$19 billion, followed by Staples with US\$8 billion. Amazon is an e-tailing pioneer that started purely with books sales and is today consistently ranked among the top websites due to perceived ease of use and convenience. Office Depot and Staples each have almost 30% of their sales originating from online transactions. Dell and HP are also household names in e-tailing due to their innate e-Commerce connection and unique business approach. Other e-tailers which have done very well are Zappos, Wal-Mart, Target, and Talbots.

Figure 6: Top E-Tailers in 2009



3.3.2. e-Commerce Business Models

As with ordinary commerce, e-Commerce business models form the underlying rationale of how an organization creates, delivers, and captures value, be it of economic, social, or other nature. Most of the traditional e-Commerce business models can be grouped into following categories, subscriptions, and storefront sites. These form the most basic structure for many of the websites today, with many sites also combining several of business models at once.

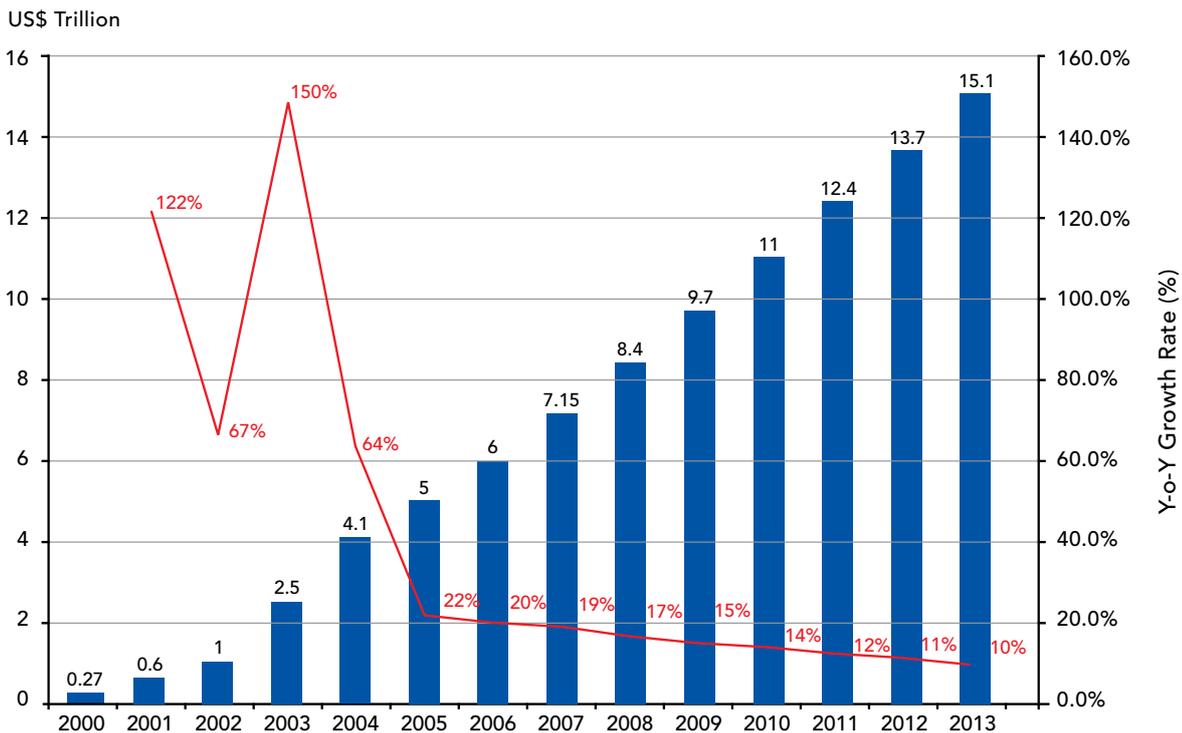
Billboard sites are designed to derive economic benefits through indirect means from either referred sales, reduced cost, or both. Revenue comes from creating awareness of its products or services via the web, with the actual purchase transaction occurring off-line. Advertising sites are sites with programming and content funded by advertising dollars, with consumer viewership measuring value. Popular uses include websites for Network television, radio, and many periodicals and advertising can be in the form of banners, sponsorships, ezine ads, and other promotion methods. Subscription models are well-established, accepted by subscribers and nurtured by publishers. However, subscriptions are not yet as widely accepted by consumers. These sites are often specialized with expert content and timely information. The subscriptions fund the development and maintenance of the site. Storefront sites are websites that offer products for sale in the electronic version of a catalog. This would be the narrow definition of 'true' e-Commerce. These virtual storefronts offer promotions, provide a "shopping cart," and complete the purchase transaction. Some manufacturers are now passing up the intermediary wholesalers and retailers by offering their products directly to consumers. This collapsing of the supply chain is called disintermediation.

In addition to the above mentioned business models, several new market mechanisms or business models have emerged in the e-Commerce market space over the past years, aiming at enabling participants to leverage on new value creation opportunities. e-Commerce business models have undergone a move towards new market structures, such as agent based forward and reverse auctions, store-within-a-store concept, collective buying and others. Consequently, there is today a greater need for e-Commerce participants to be informed about different business models available to them, and how to benefit from offering multiple market mechanisms. A reverse auction, for example, is a type of auction in which several sellers offer their items for bidding, and compete for the price which a buyer will accept. The buyer usually has the option to accept any bid or reject all. Bid-based construction or supply contracts are possible examples of reverse auction. The stores-within-a-store concept is another emerging trend which has been utilised successfully for physical retail outlets, particularly in China, and other Asian countries as well as in Europe. A store-within-a-store concept is fundamentally an agreement in which the owner of a shop lets a part of the shop site to be used by a different company to run another shop. Although not yet common in the e-Commerce marketplace, store-within-a-store holds great potential for e-Commerce applications to become more centralized and thus leveraging on combined strengths, as well as being more convenient for the shopper. The Brazilian B2C portal Extra.com has been championing such a concept for the e-Commerce space successfully, by giving independent space to unrelated suppliers within its home portal. In less than a year, the portal's 13 mini-sites, which allow shoppers to purchase single brand products within the Extra.com portal, make up 40% of the company's sales.

3.4. Global e-Commerce: Trends, Driver and Restraints

The global e-Commerce market has been growing rapidly since 2000, at a CAGR of approximately 51%. While e-Commerce is set to continue at medium to high rates of growth it is slowly stabilizing at a lower range two-digit growth, compared to the previously volatile growth it experienced. As broadband penetration across the world increases, along with more existing Internet users engaging in e-Commerce applications, e-Commerce is expected to grow, as depicted in Figure 7 below.

Figure 7: Frost & Sullivan e-Commerce Forecast until 2013



The forces which fuel e-Commerce today can be split into three major categories: economic forces, marketing and customer interaction forces, and technological forces. To provide a brief overarching snapshot of the general e-Commerce landscape, several sectors continue to dominate e-Commerce growth as their year-on-year virtual sales, compared to their traditional sales channels increase tremendously. These sectors include traveling, health services, car purchases as well as financial and insurance services. As many as 80% of car purchasers already rely on the Internet to research their decisions, it is expected that through the next few years, car purchasing over the Internet will also become more mainstream. Online banking is already widely used globally, with Canadians using it the most worldwide, and almost 52 million Americans using it as well. However, it is expected that online banking services as well as insurance direct selling are going to grow at an accelerated rate in the next 3 to 5 years. Furthermore, health service related Internet usage is already one of the leading global Internet uses. This trend is set to further increase in importance in the next 3 to 5 years. While the aforementioned focus largely on the increase in B2C commerce, B2B commerce is set for tremendous growth as well. Not only China, which has now grown to be the largest B2B e-Commerce contributor in terms of revenue, but also the growing importance of B2B e-Commerce in Germany, UK, France, Eastern European countries and other developing countries will continue to push the overall value of the e-economy up.

The specific major trends expected to drive or restrain e-Commerce until 2013 will be discussed in detail in the section 3.4.1 onwards. They are, in short, the changing e-Commerce user demographics and general increase of Internet users, as well as certain e-Commerce growth sectors such as insurance and automotive, e-tailing, VoIP applications and other technological trends, besides the social networking sites.

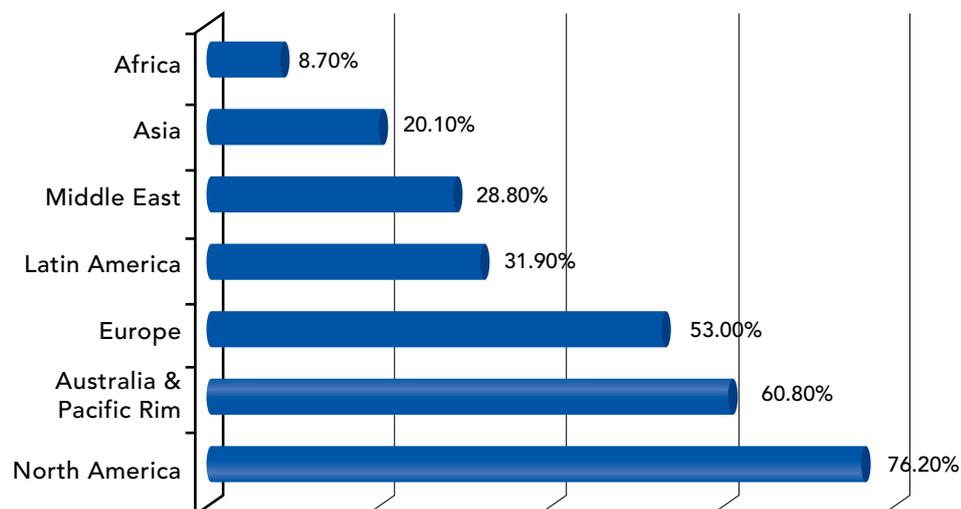
Figure 8: Frost & Sullivan e-Commerce Trend Impact Analysis

Trend	Degree of Impact on e-Commerce from 2010-2013
Changing Internet User Demographics	
e-Tailing	
VoIP Applications	
m-Commerce	
Peer-to-Peer Applications	
User Generated Content in e-Commerce	
Internationalisation of e-Commerce Standards	
e-Commerce Payment Systems	
e-Tourism	
e-Commerce Technology and Security Trends	

3.4.1. Changing Internet User Demographics

According to a study conducted by Plunkett Research, the approximate number of Internet users worldwide was 1.73 billion in late 2009. With the continued proliferation of ICT application usage in more countries, across lower income groups and older demographic segments, this is set to continue rising steadily. Cheaper hardware and broadband connections and the Internet becoming easier to navigate, are just some of the factors which aid in bringing the Internet to more homes. In addition, community centers, libraries, café or similar establishments now often offer free WiFi to its clientele. All this helps to provide for a larger and more demographically diverse potential e-Commerce participant pool.

Figure 9: Internet Penetration by Region (2009)



Source: www.Internetworldstates.com

While teens and tweens continue to dominate the average Internet users' profile, the average age of today's Internet user is 27 years, this assessment is slowly but surely getting stretched in all age directions. The baby boom generation is getting more ICT literate despite age, possibly spurring growth in sectors such as medical goods and services, and even younger children are surfing the net as well. When considering Figures 3 and 9 above, it is clear that, while per capita Internet penetration is still highest in developed nations, the number of actual Internet users has already started being dominated by developing nations, with Asia leading the way. With the flourishing of more affordable Internet access and ICT hardware in populous nations such as China and India, recent studies foresee a massive growth of e-Commerce uptake in the Asian region. If combined, Malaysia, Singapore, Hong Kong, Korea and Australia may possibly challenge the first and second positions the US and Europe currently hold as e-Commerce 'champions'. Other nations in Latin America, Africa and Eastern Europe are not far behind in Internet penetration, thus opening up more possibilities for their e-Commerce participation as well.

3.4.2. Internationalization of e-Commerce Standards

While e-Commerce has many advantages, it also presents concerns that need to be addressed to maintain a safe and conducive international e-Commerce environment. Some of these concerns include privacy issues, legal issues, protection of patent rights, domain name disputes, preservation of trade secrets as well as issues pertaining to the validity and enforcement of agreements made online. The mere fact of the Internet being a global network thus raises significant jurisdictional issues.

History has shown in other enforcement aspects that cross-border collaboration and legal harmonization is the only way to move towards a safer and more efficient e-Commerce environment. Agencies such as the OECD, ITU, and WTO have already tried venturing into this area; unfortunately not a lot of progress has been made with regards to international laws or best practices for Internet and e-Commerce regulations. e-Commerce has yet to find a universally acceptable definition itself. Some examples that can be cited, however, are the ITU's Cybersecurity Guide for Developing Nations, the World Summit in the Information Society, as well as the Payment Card Industries Data Security Standard. The OECD has also made progress, by establishing a conference entitled "Building Trust in the Online Environment: Business-to-Consumer Dispute Resolution". Eventually, the results of such initiatives will avoid or aid in resolving disputes such as the case of Yahoo! and the French ban on Nazi memorabilia sales. Private organizations, such as the New York-based American Arbitration Association (AAA) and some major industry leaders, such as Microsoft, have also been collaborating to develop a new B2B e-Commerce dispute management protocol. It could reasonably be expected that with the involvement of big players such as these, established protocols could move the global e-Commerce community towards greater homogeneity.

While overarching international results may still be outstanding, a lot of national progress has been made. In the US for example, the *Federal Trade Commission Act*, which oversees the use of commercial e-mails, online advertising, and national standards for direct marketing over e-mail and consumer privacy, has been passed. The *CAN-SPAM Act* of 2003 and the *Ryan Haight Online Pharmacy Consumer Protection Act* of 2008, both also in the US, are other such examples. The EU has also taken steps to resolve jurisdictional issues associated with e-Commerce sales, by allowing EU consumers to sue sellers either in their EU country of residence or in the EU country where the seller is physically located. And countries such as Australia have their own *Electronic Transactions Act 1999*, *Broadcasting Services Amendment (On-Line Services) Act 1999*, *Privacy (Private Sector) Bill* and the *Copyright Amendment (Digital Agenda) Bill 1999* to cite a few examples.

South Korea, Singapore, Hong Kong, Philippines and Japan all have legislations centering on Electronic Transactions and Electronic Signatures and Certification Authority. With regards to online entertainment contents, and the fight against illegal downloads, there has been a proliferation of domestic statutes such as the *US Digital Millennium Copyright Act*, and the *2001 EU Copyright Directive*, which aim to implement the *WIPO Treaty*, will continue to aid in channeling the demand for this content through revenue creating channels, thus further contributing to e-Commerce.

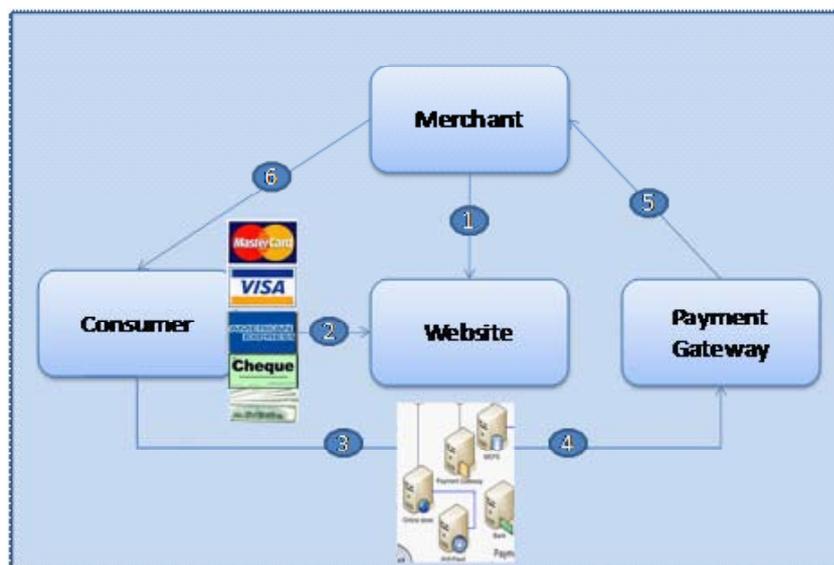
Without the continued emphasis on developing and maintaining a homogenous set of rules for participation applicable to the Internet and e-Commerce, e-Commerce will expose economic participants to an uneven and potentially harmful playing field, thus restraining its growth.

3.4.3. e-Commerce Payment Systems

Generally, an e-Commerce payment system may be described as a system which facilitates the acceptance of electronic payment for online transactions. There are many different payments systems available for online merchants, including traditional credit, debit and charge card as well as newer technologies such as digital-wallets, e-cash, mobile payment and e-checks. Traditional payment methods can also be linked to e-Commerce; these include wire transfers, bank deposits, money orders and Cash on Delivery (COD). Another form of payment system is allowing an intermediary or third party to render payment on your behalf, such as PayPal or WorldPay. This has the added advantage of keeping the user's payment data opaque and thus keeping them safer from fraud.

A generic example of a payment system is detailed below, where transaction 1 is the merchants displaying the goods or services for sale on a web portal. Transaction 2 is the consumer purchasing these items at the merchant site, while transaction 3 is the customer's information being encrypted while being transferred over the Internet, transaction 4 is the online store transmitting the order from the web host to the payment gateway. Transaction 4 is also the payment, via credit card or other means, for example, through an intermediary service such as PayPal, or MEPS or other traditional Banking channels. Transaction 5 represents the merchant's receiving of this payment, which results in transaction 6, the delivery of the goods or services.

Figure 10: Generic Payment Ecosystem



There are various advantages and disadvantages to using one payment system over another; particularly, what buyers look for, versus what sellers are after, can create conflicts of interest. Prepaid options such as e-money and prepaid cards are compared to immediate payments such as online credit transfers and electronic direct debit, as well as to post-paid services such as credit cards. Which system a buyer and seller decide for depends on a multitude of factors, including the general need for both sellers and buyers for security, speed, low transaction cost, and consistency. In addition, sellers need binding and secure methods of payment, as well as a widespread use of the payment option among potential shoppers. Buyers on the other hand look for privacy features, repudiation avenues, ease of use, and widespread use among shops.

Despite many developments in payment options, credit cards are still the preferred way of paying for goods or services bought on the web. While Americans still have the most credit cards per capita, as well as having the highest limits on average, Asia, Europe and countries in other regions are fast catching up. Canadians, for example, are getting more comfortable using their credit cards for Internet purchases. However, fears about fraud and identity theft remain the biggest barriers to shopping online. To overcome such problems, services like PayPal are gaining more popularity. In 2008, PayPal recorded a total value of transactions of US\$60 billion, an increase of 27% over the previous year. This figure also represents 9% of global e-Commerce and 15% of US e-Commerce value. There are currently about 54 online payment services, including the newly established “Google Checkout”, Pro Pay, 2CheckOut, Any Pay, Authorize Net, CCNow, Charge.com, Digital River, Fire Pay, Internet Cash, MerchantEquip, PayQuake, Moneybookers Wirecard, 2Checkout.com, CCNow and Kagi.

An increase in payment options, proliferation of their use as well as the availability, security and ease of use is set to contribute further to the proliferation of e-Commerce.

3.4.4. Public Involvement in Driving e-Commerce

Governments are largely known to support applications and technologies which will provide public benefits. Since e-Commerce is considered one such application, e-Government initiatives and other e-enablement drivers are currently and will continue to be drivers for e-Commerce growth as more-enabled citizens will provide for a bigger potential e-Commerce participants pool.

Traditionally, governments have focused on encouraging e-Commerce development through laws and regulations designed to support or regulate private online business initiatives. One of such examples is the *US Internet Tax Freedom Act*; others include laws on Data Protection and limited liability. However, through leading by example, the impact on e-Commerce can in fact be much bigger. By evolving from being simply an informational service to a more transactional environment, governments function as both consumers and suppliers of e-Commerce and related services, e-Governments not only directly drive e-Commerce activities, but also create indirect drivers through potential outsourcing of non-core functions to the private sector. There can even be competitive advantages gained by that most effectively utilise e-Government operations to assist in driving e-Commerce growth, such as in Singapore where it takes only a few minutes to register a business online. According to UK Statistics, in 2008 for example, 66% of Businesses in the UK used the Internet to interact with public authorities, particularly to obtain information and forms. Some of the public e-Commerce services typically available include informational transactions, issuing Government documents, accepting tax filing and payments, registrar services and others.

As mentioned, e-Government initiatives are one of the most common public drivers for e-Commerce or e-Commerce readiness. As more governments around the world take advantage of the benefits that e-Government brings with it, they will continue to support e-Commerce directly and indirectly. The role of the Government is to improve the e-Commerce ecosystem, which includes infrastructure, regulatory, security and infrastructure issues. One way in which this can be 'pushed forward' is through regional cooperation. As long as countries continue to lag behind in their ICT infrastructure, including restricted domestic ISP competition or restrictive Internet or custom policies, this will present a restraint to e-Commerce and related readiness.

3.4.5. m-Commerce

m-Commerce, or Mobile Commerce, is the process of conducting commerce using a mobile device, for example, a mobile phone, smartphone or PDA. More specifically, it involves the transfer of ownership or rights to use goods and services, initiated and/or completed with the help of mobile access to computer-mediated networks. m-Commerce contributes to e-Commerce as it is a subset of e-Commerce which is being used with increasing frequency and values.

In 2001, total m-Commerce revenues for Western Europe were still less than US\$28.8 million. However, just 3 years later in 2004, the German m-Commerce revenues were US\$351 million, British were US\$266 million and those in France were US\$160 million. Another example is China's m-Commerce market, which stood at US\$163 million in 2006 and was expected to reach US\$953 million by 2010.

m-Commerce is characterized by unique features that provide it with certain advantages against e-Commerce or other conventional forms of commerce. They are: ubiquity, immediacy, localization, pro-active functionality, instant connectivity, and simpler authentication procedures. Specifically ubiquity, or the 'anywhere' feature, allows users to access services wherever and whenever they need to or want to. Immediacy is specifically important for real-time critical services, such as stock broking or auctions. Localization is enabled through the proliferation of GPS technology, and allows service offerings and advertising to be tailored to the current location of the user, such as weather or traffic information. Pro-active functionality includes services like 'opt-in advertising' which can be transmitted via SMS, thus enabling reaching users wherever and whenever the information is needed or becomes available. Due to the SIM's (Subscriber Identity Module) unambiguous identification, further time-consuming authentication procedures often become redundant.

Some of the applications which form part of m-Commerce are mobile browsing, contents or other mobile purchases and delivery, mobile banking and brokerage, mobile ticketing, mobile vouchers, coupons and loyalty cards, location-based services such as traffic updates, and information services. Mobile marketing and advertising is the specific focus of advertisements and marketing tailored to m-Commerce.

The common payment methods used to enable mobile commerce are: charging to the mobile telephone user's bill or deducting from their calling credit, premium-rate calling numbers, registration of a credit card that is linked to a SIM card, and billing a customer's credit card through a secure user interface.

m-Commerce is one of the fastest growing segments of e-Commerce, and is thus set to further drive e-Commerce growth.

3.4.6. e-Commerce Technology Trends

There is currently an industry trend towards open source software. There are open source e-Commerce platforms such as Magento by Varien, osCommerce, ZenCart, CubeCart, VirtueMart, Ubercart, PrestaShop, Spree, AgoraCart, WordPress e-Commerce Plugin, DigiStore and OXID eShop to name a few. The usual features of such platforms include product input, shopping cart, single-page checkout, integration with 3rd party applications, product tagging and others. There are also plenty of premium platforms ranging in prices from a few hundred US dollars, up to thousands of dollars annually. Some of these are Avactis, LiteCommerce, and X-Cart, for example. In addition to these broad system integrators, many webdesign, shopping cart and other more niche feature service providers also vie for the attention of e-Commerce participants. Some of these include VeriSign, McAfee, and goecart. As e-Commerce becomes more main stream, and its customers become more demanding, these services will continue to sprout and grow in importance. The most important technology trend in this area is and will continue to be, however, scalability, reliability, flexibility, integrateability of e-Commerce applications and it is asserted that Cloud computing can address all of these.

While many e-Commerce applications come and go, some become dominant and others attain challenger status, no one technology, platform or standard has yet gotten undivided devotion. But as the dual trend of medium-sized players consolidation, and more new niche market entrants continues, so will the trend of e-Commerce platform and service provider proliferation. This in itself spurs e-Commerce growth through the creation of new layers of revenue earning potential and outsourcing options.

3.4.6.1. Web 2.0

Since the transition to Web 2.0, mentioned earlier in this article, there has not been much groundbreaking technological change impacting e-Commerce. The term Web 2.0 is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centered design, and collaboration on the World Wide Web. A Web 2.0 site allows its users to interact with each other as contributors to the website's content, in contrast to websites where users are limited to the passive viewing of information that is provided to them, as was the case in Web 1.0. Web 2.0 is most applicable to e-tailing, but can apply to any aspect of e-Commerce. e-Commerce participants should continue to assess Web 2.0 technologies and incorporate the functionality that helps them deliver the experience sought by their customer base, and allowing for greater customer feedback. These new technologies help create online brand immersion, increase customer loyalty and drive repeat sales. One example of this is the new approach to metrics measurement, which can be used to measure the amount of time a user spends on a website, as compared to traditional 'number of clicks' measurements. Other examples are the 'add to cart', 'think about' and 'mash up' functions, which all enable the customer to shop in a more effective manner.

3.4.6.2. Cloud Computing

Cloud computing is a somewhat ambiguous concept, but basically describes a model wherein information and applications are stored in unknown, unidentified servers and temporarily accessed from terminals such as laptops, desktops, and other Internet-capable devices. Users access that infrastructure as a service, develop on middleware as a service, and use web applications such as software-as-a-service (SaaS), infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) as well as grid-computing. As more applications in the IT field are making their transition to Cloud computing, e-Commerce will also be affected by this trend. The underlying reason for this is the increased scalability, faster implementation, and cost benefits Cloud computing may offer. One of the aspects to consider for cost is that of peak usage of e-Commerce websites. These would traditionally be higher around key shopping dates, such as Christmas or even Valentine's Day, requiring more computing power, disk storage and bandwidth. Without Cloud computing, the e-Commerce applications would have to be set up in such a way that they can cater to this peak, making them more expensive all year round. With Cloud computing, however, usage is allocated on a need basis, allowing the business to pay for the processing power, storage and bandwidth as needed, thus reducing cost automatically. Cloud computing may also be more flexible in terms of developing new applications or implementing custom applications because the Cloud includes middleware, and users are not limited to one server or even one data center. Cloud computing also promises to be very scalable, and promises to overcome technical fault or maintenance related downtime. While many e-Commerce players are already using some type of Cloud application such as hosted shopping carts, it is expected that by 2014, about 90% of all e-Commerce businesses will be leveraging some form of Cloud computing in their operations.

But the Cloud is not without potential problems. Two of these include choice and custody. Despite Cloud computing's apparent increase in available options, it would almost certainly limit customer's choices through eliminating some potentially better solutions in favor of available solutions or locking users into particular providers. With regards to custody, there may also be problems of who has ultimate custody of data in Cloud computing. The question of where customs data, credit card data, e-Commerce business records, and personal data will be stored, and who has access to this data, if multi-tenant software is used, are some of the security considerations which will impact the interplay of e-Commerce and Cloud Computing.

3.4.7. VoIP Applications

One of the most evident benefits of e-Commerce is the economic efficiency resulting from the reduction in communications costs, low-cost technological infrastructure and the speedier and more economic electronic transactions with suppliers, as well as cheaper customer service alternatives. VoIP is one such example of a technology that has contributed to e-Commerce growth, both directly and indirectly. While VoIP has channeled telecommunication service and hardware revenues away from traditional sales channel towards e-Commerce sales, it has also enabled existing and potential e-Commerce participants to save on a variety of cost, thus indirectly spurring e-Commerce growth as well. Currently, China is the most active country for VoIP and IP Telephony, followed by USA and Japan, but Europe has also become a prime innovator in VoIP services. VoIP globally grew to a US\$20.7 billion industry in 2009, with penetration among US businesses alone reaching almost 50%.

Companies offering VoIP services, such as Google Voice/Talk, Gizmo, Vopium, Ooma, Vonage and Skype, have seen tremendous growth in recent years. Skype started in 2002 and has since then experienced a 60% CAGR of new users to now more than 560 million users worldwide at the end of 2009, making up more than 6% of global international calls, which contribute to e-Commerce when they are not skype-to-skype. Cisco, followed by Avaya and Nortel, continues to be the market leader for VoIP hardware, while Skype leads the market in terms of service provision, beating out AT&T and Verizon. In order to stay on top of this rising trend, telecommunications service providers such as Unified Communications and Telepresence are currently preparing to move online. As VoIP applications become more commonplace and find more users, this growth trend is set to continue and strengthen as more enterprises, such as what MSN and Yahoo! have already done, jump on the bandwagon, and more businesses also take advantage of this service for their telecommunication needs. Companies continue to realize cost savings, particularly for video conferencing, amid rising energy costs and the demands to make working cheaper for companies and employees. Global VoIP revenue was estimated to have grown at a rate of 20.1% in 2009, which was an even higher growth rate than that of e-Commerce itself. Common concerns for using VoIP, that may act as a restraint if not resolved, remain to be security concerns, reliability/quality-of-service concerns as well as cost considerations.

3.4.8. Online Retail: e-tailing

Online retail (e-tail or e-tailing) is the resale without transformation of new and used goods and products to individuals and the general public for household use. e-tailers are retailers who use the Internet, whether they be email-based or web-based, for any or all aspects of sales, that is negotiation, confirmation, authorisation and conclusion of sale of tangible, physical goods. As a place for direct retail shopping, with its 24-hour availability, a global reach, the ability to interact and provide custom information and ordering, it continues to gain in importance. In 2009, it was reported that e-tailing was growing faster than any other form of merchandising. According to IBISWorld and Forrester Research, while physical retail outlets worldwide registered a decline in sales of -1.8% in 2008 and -7.2% in 2009, e-tailors on the other hand grew by 4.3% worldwide in 2009 compared to 6.4% growth in the previous years.

The trends most likely to influence e-tailing growth are the continued trend of traditional retailers going online or existing players expanding their e-tailing services. Online sales are expected to reach 12% of the total retail market by 2012, up from approximately 6% in 2010. Companies which have announced recently that they are undertaking a major revamp of their web-presence to better leverage on e-tailing opportunities and further cater to budget-conscious buyers include Levi Strauss, Procter & Gamble, Mattel and Columbia Sportswear. Direct sales by consumer-brand manufacturers are one of the fastest-growing areas of online retail, increasing almost 13% in 2009 to US\$487.6 million. One of the pull factors of establishing an e-tail presence is also the much lower advertising and customer acquisition cost, with only US\$4.90 to attract existing customers to shop online, whereas new customer acquisition costs US\$42 per customer. While this trend has been largely driven by US retailers going online in the past, it is expected that more European and Asian companies will drive growth in this area for the next years. Unlike the US where e-tailing is dominated by a few select companies, whereas the European e-tailing industry is more fragmented with significant scope for establishing online presences and market consolidation. This expectation is further supported by the growth decline mentioned above which has been seen in the US e-tail sales, as compared to e-tail sales growth in Europe, with 13% in Germany, in 2009. Furthermore, B2C e-tailing activities in Eastern Europe continue to grow at a much faster rate than in Western Europe. In the US, additional e-tailing growth may come from previously underserved populations like senior citizens and the Hispanic population.

Since the United States however still holds the top spot of global e-tailing revenue, its e-tailing sales figures and e-tailing as percentage of overall retail sales since 2000 are shown below. It is to be noted that the data does not include travel, ticketing, and financial services, which is estimated to bring the percentage of e-tailing to overall retail to approximately 6 to 8%.

Table 1: Frost & Sullivan USA e-tailing Growth

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
US e-tail Value (US\$ billion)	-	37.7	55.2	73	90	108	131	175	204	235
e-tail as percentage of Total US Retail	0.90%	1.1%	1.4%	1.7%	2%	2.4%	2.7%	3.2%	3.3%	3.6%

In 2009, over 875 million consumers shopped online, which represents a 40% increase in just two years. The most popular and purchased items are, not in a ranked order: Clothing/Accessories (such as jewelry)/Shoes; Electronic Equipment (including PCs, consumer electronics); Cars; Tickets (including event and airline tickets); Toys and baby products; Home furnishings; Sporting goods; CDs / DVDs / Games; Office supplies and Books.

The top five Internet retailers by revenue are Amazon, Dell, Staples, Office Depot and Hewlett Packard, which are all based out of the US. In 2008, Amazon alone reportedly attracted about 615 million customers, and grew by almost 30% in 2009 to approximately US\$19.3 billion in value. A company which has also contributed much to the process of e-Commerce development is Dell. Dell's key success factor is that its website enables customers to customize their purchases completely based on their budget and preferences. It is reported that approximately half of Dell's sales stem from its website, while 100% of Amazon sales are online. However, online still accounts for a small percentage of sales. On average, online sales account for only 6.6% of total sales for the top 100 retailers in the world in 2010.

Figure 11: Retailing Business Models

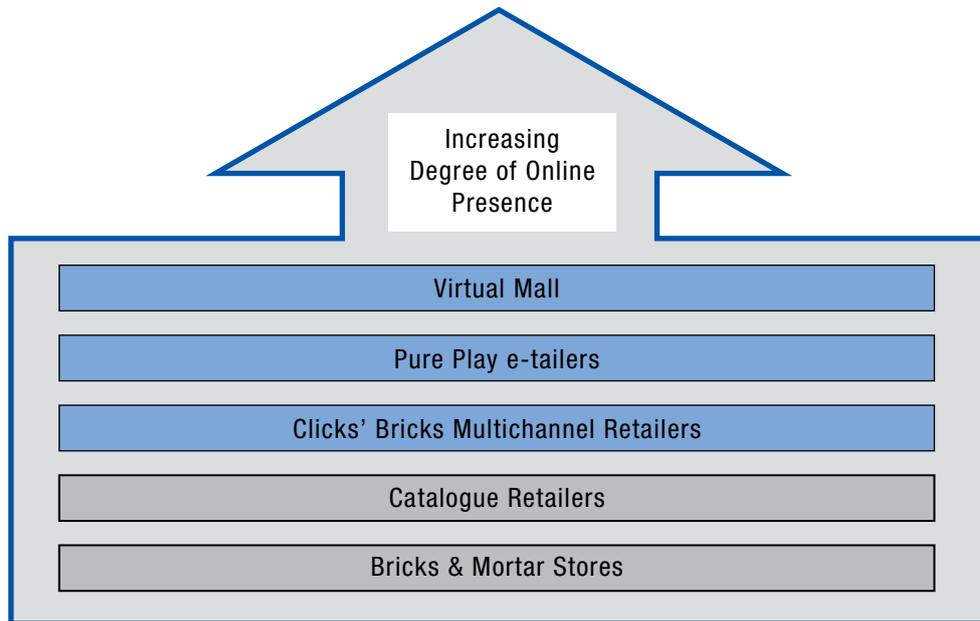


Figure 11 above depicts the various types of retailing business models there are. Only the top three types of retailing, shaded blue, are considered e-tailing activities. Examples for pure play e-tailers include Amazon, whereas Clicks'n Bricks includes many more companies such as HP, Staples, Home Depot to cite a few. Amazon was a pioneer in the e-tailing field, and has continued to profit through expanding its service offering and staying dynamic and responsive. Amazon has, for example, established specialty stores, expanded editorial content through partnerships with experts, and expanded its offerings beyond books since 2002. Compared to this, companies such as Lands'End, a traditional mail-order company, moved online early with the emergence of e-Commerce. In 1995, it offered 100 products online and in 2002 it already offered its entire product catalogue online. Lands'End was successful because of its pre-established logistics system, through offering special discounts for online shopping and was also able to expand its presence into Germany, the UK and Japan through e-Commerce. Two examples of traditionally well-established brick and mortar stores which have not done as well as expected in the e-Commerce realm are Walmart and Sears. Another approach to e-tailing was taken by Toys'R'us, which right at the beginning realized that it did not have the skills to be an e-tailer, and thus partnered with Amazon to channel its goods directly to consumers.

3.4.9. Re-Directing Peer-To-Peer Traffic

What started with Napster in 1999, today continues with uTorrent, FasTrack, Gnutella, BitComet, LimeWire and Kazaa. More than 60% of all Internet traffic today stems from Peer-to-Peer file sharing applications. And according to the International Federation of the Phonographic Industry, 95% of all downloads today are illegal. While such an issue would seem to primarily affect only Internet traffic and not e-Commerce, the fact remains that due to the illegal nature of these downloads, and the subsequent loss of revenue by the actual owners of these products, more ways to combat this rising trend are being devised. The P2P networks pose a grave threat to the established distribution model for digital Intellectual Property. An estimate of how big this industry is today in the USA alone can be garnered by looking at the Recording Industry Association of America (RIAA), which represents about 85% of all legitimate sound recordings produced and sold in the United States. The total retail value of recordings sold by members of the RIAA is reported to be US\$10.4 billion at the end of 2007, reflecting a decline from a high of US\$14.6 billion in 1999. While there are conflicting reports of how much illegal file sharing has actually cost the industry, the Institute for Policy Innovation's study in 2007 indicated that as a consequence of global and U.S.-based piracy of sound recordings, the US economy loses US\$12.5 billion in total output annually, including corporate revenues, taxes, employee wage and related measures of economic performance.

One way to combat this is through entering agreements for legalized distribution of such content at very minimal fees sometimes with advertising as main revenue generator, which in turn contributes to e-Commerce. The new 'Digital Retail' business models largely center on either subscription or streaming, some of which will be highlighted in the hereafter. Taking the music industry for an example, according to the IFPI's Digital Music Report global digital revenues grew by an estimated 12% in 2009, totaling US\$4.2 billion in revenues. Digital channels now account for 27% of music sales, up from 21% in 2008. For the movie industry, Warner Brothers has also successfully implemented a pay per download movie service, which even allows for customized DVD creation. With regards to subscription services, Vodafone has been very successful in Europe where more than 450,000 subscribers have signed up to its music service, largely due to its service being "DRM –free", meaning that it can be transferred across devices. With regards to streaming services, it was found that even though users of streaming services are not necessarily buying more music, the industry benefits by learning more about fans' tastes and is thus able to sell add-services such as merchandise or concert tickets. Spotify, Lala, Pandora, Groove Shark and MySpace are some of the most successful services. While MySpace is an ad-supported joint music venture, with equity stakes from major labels, Spotify allows users to choose if they want to receive the service for free with advertisements, or paid without advertisements.

What is important in the long run to make these strategies successful is the maintenance of user convenience and realistic pricing. In addition to these innovative business models, new enabling infrastructure such as mobile broadband is set to further drive demand, thus increasing the importance for e-Commerce versus traditional means of distributing such content.

3.4.10. User Generated Content in e-Commerce: Social Commerce

Social Media is a subset of electronic commerce that involves using online media that supports social interaction and user contributions, to assist in the online buying and selling of products and services. User generated content includes social networking sites such as Facebook, video aggregators such as YouTube or knowledge sharing sites such as Wikipedia amongst others. There are several ways through which user generated content already influences e-Commerce, including user reviews, C2C commerce, and targeted/social advertising and e-Commerce friendly applications including e-notifications, RSVP systems, unique hyperlinks, photo albums, message books, and registry systems, to name a few. This integration of everyday people with commerce has been made possible primarily by Web 2.0, discussed earlier in this chapter. Statistics from Pingdom, a social media monitoring site, indicates that males and females use social media and networking sites almost equally, at 47% for males and 53% for females) and that the average age of a Facebook user is 37.

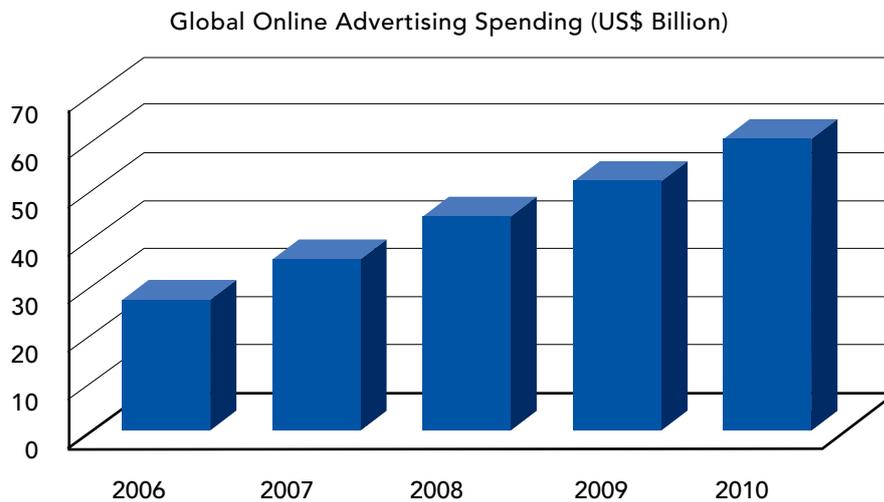
The overwhelming success of Wikipedia has shown that people are now looking for authoritative information generated by other users online. In line with this sentiment, companies are beginning to realize that customer generated content about specific products or services are a major influence for other potential customers. Websites allowing for user reviews or user generated content features include Google Maps, e-Bay, Amazon, PetCo and many others. PetCo in particular, tracked a decline of product returns by 20% for products which had been reviewed by other customers, and this rate declined with more reviews. Another example of this is Facebook's 'Like' application, which is now being expanded to a multitude of popular sites across the Internet, allowing users to approve of anything they see on the web with one click and having this action being published on their Facebook feed. Social networking sites such as MySpace, Facebook, Twitter, Orkut, Hi5 and many others have become favorite social networking media in a short time. These mediums not only spur more online activity of Internet users, but also open up new possibilities for e-Commerce ventures. C2C business models focus on the use of social networking mediums that facilitate the exchange of data directly between individuals over the Internet, thus also enabling e-Commerce channels. For example, by establishing virtual stores on blogs and selling items on blogspots, Facebook, TagWorld or Craigslist. The other way is by utilising social networking media for advertising purposes, when established e-Commerce or non-e-Commerce businesses establish a presence or advertise on social media or networking websites. Posting product videos on YouTube, conversing with customers through Twitter or Facebook, which has a monthly visitor count of 500 million, or performing any of the numerous functions available to users on the many other social media web services, are just some of the examples. Social media strategies are also not just for consumer-focused companies anymore, with many of the networking sites finding their way into the B2B realm. In the US, for example, Waste Management service providers have set up a web presence for educational and engagement purposes, because they believe that people are talking about companies whether they are aware of it or not, thus establishing a web presence allows the companies to partake in these conversations.

These are just some of the ways of how social media and networking tools is already and can continue to positively influence e-Commerce growth. Nonetheless, a recent study by Hitwise found that in 2009, less than 5% of retail traffic was actually induced by social networks. This is compared to nearly 31% traffic pushed from search engines and 23% pushed from paid traffic. However, with the continued proliferation of blogs, video logs, Twitters, and Diggs this is set to steadily increase if utilised correctly. Particularly advertising is an area kept under close watch when it comes to social commerce; this is discussed in the next section.

3.4.11. Online Advertising Spending

Tying up with the previous section, online advertising and the new channels continue to be a major e-Commerce contributor, with many business models traditionally centered on advertising revenues. According to the Interactive Advertising Bureau, spending on online advertising hit around US\$60 billion in 2010.

Figure 12: Global Online Advertising Spending



Source: Zenith Optimedia

Table 2: Global Online Advertising Share of Overall Global Advertising Spending

Year	2006	2007	2008	2009	2010
Share of Total Global Advertising Spending	6.40%	8.10%	9.40%	10.40%	11.50%

Source: iab.com

More e-Commerce hubs are beginning to push advertising budgets into the social space, as social marketing shows tremendous potential for ad recall, brand awareness and intent to purchase. Ads in the social space appear to be more effective than other ads, perhaps due to their reliance on past clicks and personal preferences, which allow them to be targeted. Google's AdSense, for example, is an ad serving application in which website owners can enroll in this programme to enable text, image, and video advertisements on their websites. These advertisements are administered by Google and generate revenue on either a per-click or per-impression basis. ROI studies still have inconclusive results as to the performance of online advertising versus traditional advertising. Consumers have limited social bandwidth, and people are already starting to become social-saturated, so marketers need to be more creative to differentiate themselves in this new advertising landscape. The key is to create a web presence which fits within the companies branding, and at the same time tracks customers and listens to them.

3.4.12.e-Enabled Tourism

The Internet is revolutionizing the distribution of tourism information and sales channels. It offers the potential to open up bigger markets, as well as providing for communication tools between tourism suppliers, intermediaries, and end-consumers. The global tourism industry is one of the biggest sectors in the world, according to the World Travel & Tourism Council (WTTC). In 2009, global travel and tourism industry generated receipts of approximately US\$1.87 trillion in direct global revenues, which represents approximately 3.2% of total global GDP. An estimate of the total effect of travel and tourism, including both direct and indirect revenues, shows that the total impact of the industry on global GDP to be at US\$5.47 trillion or 9.4% of global GDP for 2009. The industry employed about 77 million people on a direct basis and 200 million people indirectly worldwide. It is set to continue growth at approximately 3.6% per annum, with non-e related trends such as 'Open Sky Agreements' further fostering growth. The US accounted for US\$1.64 trillion in direct plus indirect travel expenditures in 2009, followed by Japan at US\$551 billion and China at US\$526 billion.

While specific numbers of traditional tourism retail versus e-enabled tourism are not easy to come by, there are indications that in 2002 the US online travel industry already represented 14.4% of the total US travel industry, with US\$27 billion in revenues. In 2004, only approximately 6% of all US travel tickets were paper-based. And in 2007, it was estimated that 40 million US households would have booked travel online, creating a value of US\$86 billion on airline tickets, lodging, cars, intercity rail, cruises, and packages. According to Plunkett Research, in 2009 total online travel sales in the US stood at US\$92.6 billion. It is expected that the tourism industry will over the next years overtake traditional sales by virtual sales, as planning travel online becomes the norm.

The concept of e-Commerce extends beyond pure commerce, into communication, promotion and advertising, customer service, statistics, usage patterns, the social and cultural impact of e-Commerce as well as the emerging trend of social networking media as an impactor of e-Commerce. For e-Commerce to flourish it needs to be enabled through a proper infrastructure and environment. The infrastructure needs to enable communication, payment, and distribution and delivery, whereas the environment needs to provide an appropriate socioeconomic, cultural, and legal setting. For example if e-Commerce achieved or could come close to the acceptance currently accorded to over-the-counter transactions. The continued growth of e-Commerce globally will thus be the result of the positive confluence of these two sets of factors.

4. e-Commerce in Malaysia

Malaysia started accepting e-Commerce systems early, along with other developed nations. e-banking facilities were introduced in Malaysia in 1981 with ATMs, with tele-banking services being introduced in early 1990's. In the late 1990's, PC banking or desktop banking using proprietary software, was also already popular among corporate customers. On June 1, 2000, Bank Negara Malaysia formally allowed local commercial banks to offer Internet banking services. In June 2000, Maybank introduced the country's first ever Internet-supported banking services.

e-Commerce had taken a hold on Asia with total e-Commerce spending in the Asia Pacific estimated at US\$39.4 billion in 2000 alone. However, the e-Commerce bubble in Malaysia deflated in 2000, as it did in the rest of the world. Companies whose business plans relied completely on online operations have found it difficult to survive, especially in the B2C area. For the most part, B2C was abandoned as a near-term source of profits, and resources were shifted to other areas. Some large firms went after market share by acquiring ailing dotcoms, B2B portals and application service providers (ASPs). Companies based in traditional "brick and mortar" industries also began using the Internet to extend market presence.

Between 2005 and 2008 specifically, there was a marked increase in the number of payment service providers and the variety of payment channels available, from other banks such as Hong Leong Bank, HSBC Bank, and RHB Bank jumping on the bandwagon. During this same period, the Malaysian Government also started offering e-payment services and other e-Government services to the public. The uptake of such services, however, was slow, as the country's Internet penetration at this point was low. In 2003, only 97 out of 1000 Malaysians regularly browsed the Internet. But with the help of Government initiatives, this number grew fast to 353 in every 1000 Malaysians in 2008, displaying a CAGR of 20% from 2002 to 2007. Enabling infrastructure, the enhancement of ICT literacy and skills, the rise in number of Internet users, and supportive legal policy are some of the factors cited to have helped e-Commerce to receive increased acceptance among Malaysians. Malaysia also adopted measures to develop a computer-mediated environment for its retail sector. Thus, both the conventional retail and e-Commerce sectors were able to slowly develop side-by-side. In fact, Malaysian retailers adopted e-Commerce applications as a way to strengthen their marketing strategies, through reduced transaction costs along with increase in overall productivity. In 2007 for example, online tourism generated revenue and associated online sales contributed 12.9% of the national GDP, largely due to the help of Government-backed Tourism Malaysia campaigns. In 2008, Malaysian banks collectively recorded a volume of 20 million transactions on the low value, personal account segment. Common e-banking services like inquiries, bill payments, fund transfers, credit card payments, insurance, share investing, are more and more operated electronically.

In 2004, the number of Malaysian Internet subscribers was 2.9 million, in 2005 it increased to 3.5 million, and in 2006, the number was close to 5 million. The National Broadband Initiative aims to have a 50% household broadband penetration rate by the end of 2010. To achieve this, the Government has been implementing for example the Universal Service Provision initiative and the High Speed Broadband Project (HSBB). On a more regional level, several e-Commerce advocacy and working groups aim to promote ICT related trade and investment among ASEAN members by fostering pro-business policies and establishing a transparent and non-discriminatory regulatory environment in member countries.

4.1 Current State of e-Commerce in Malaysia

Malaysia was one of the pioneers amongst Asian countries to establish a new ministry, to spearhead and promote the growth of Information and Communication Technology (ICT) with the support of several agencies, including the MIMOS, MDeC and MCMC. These agencies have continued to contribute to e-Commerce by developing masterplans, agendas and fostering research into what is needed to drive e-Commerce in Malaysia further. In lieu with the importance of e-Commerce, the Malaysian Government has allocated RM12.9 billion for the Ninth Malaysia Plan (2006-2010). The key focus points of the Malaysian e-Commerce masterplan are to boost confidence in e-Commerce, prepare a regulatory framework, build a critical mass of Internet users and introduce an electronic payment system.

Although e-Commerce has been around in Malaysia since the mid-nineties, its ecosystem is still far behind those in countries like Hong Kong and Korea. A recent McKinsey survey indicated that about 10% of Malaysian Internet users have purchased products or services through the Internet during the past 3 months. The most popular items were airline tickets, books and music. About 74% of Malaysian Internet users express varying degrees of concern about security while on the Net, including identity thefts, spam, viruses, worms or Trojans. However, 25.7% of users did not express concern at all. Recent B2C surveys also indicate that the acceptance of e-Commerce in Malaysia is relatively high, with 20% of respondents already using e-Commerce facilities at least twice a month and 38% of respondents indicating their willingness to shop online in the near future. According to a recent Nielsen Company Survey, in 2008, 41% of Malaysian Internet users used the Internet for Airline or Ticket reservation, while 24% used it for Event Ticket reservation, 22% for Tours or Hotel reservation, 21% for Computer and Hardware sales and 18% for Book purchases. The average festive season e-Commerce spending per person in Malaysia in 2009 was RM730.

Only 42% of respondents indicated apprehension or lack of interest in using online payment methods. What has been found to contribute the most to such apprehension in the Malaysian case are security concerns, a preference for personal contact for banking, the limited amount or complexity of services available online.

The current industry outlook for the Malaysian e-Commerce sector is detailed below. Due to a limitation of timely official statistics, some of the figures are based on estimates or are from less recent years.

Figure 13: Frost & Sullivan e-Commerce Spending Analysis in Malaysia (2006)

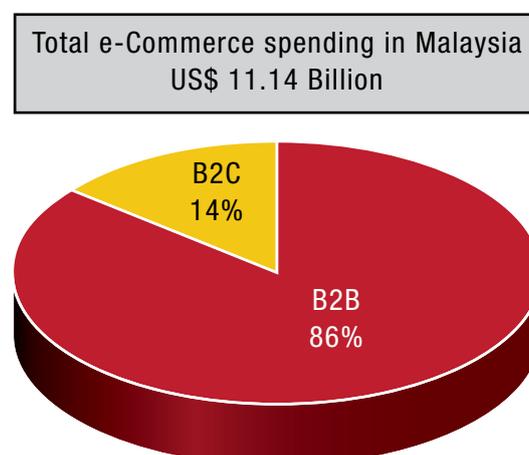
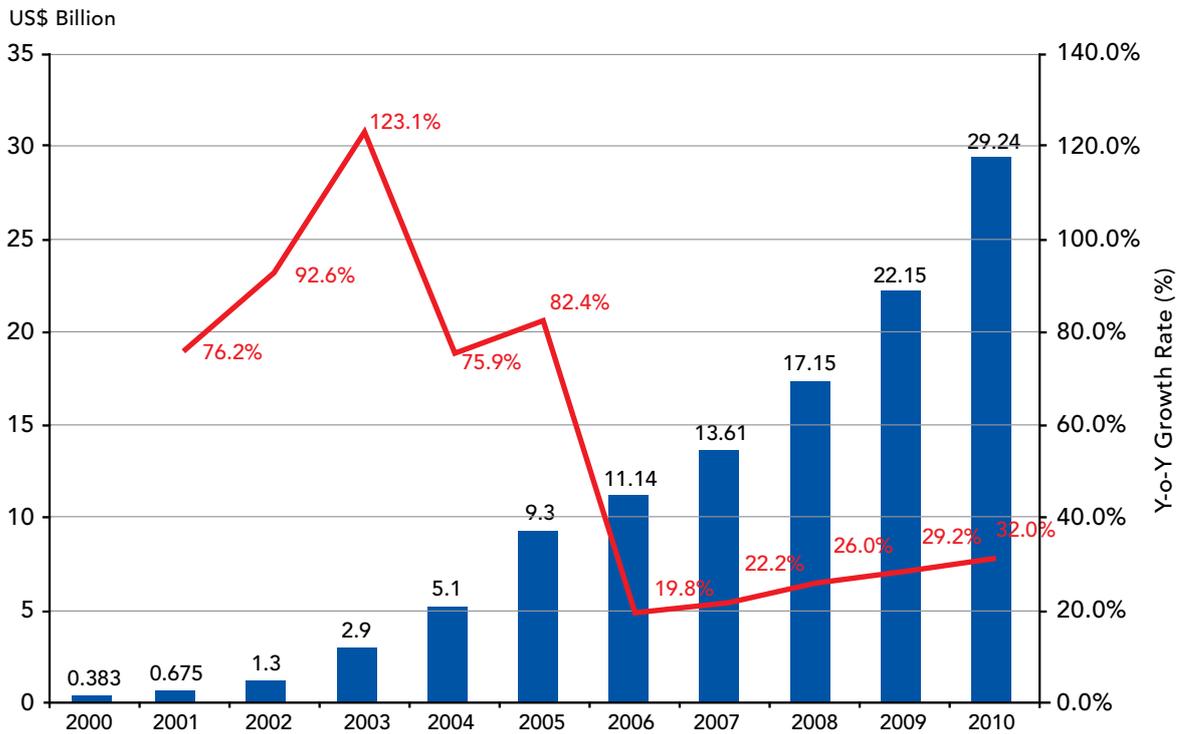


Figure 14: Frost & Sullivan E-commerce Spending Analysis in Malaysia (2000-2010)



Malaysian e-Commerce spending has displayed an average growth rate of 24.26% growth from 2006 to 2010. Forecasts of this trend will be detailed in section 4.4.

Figure 15: Frost & Sullivan e-Commerce Trend Impact Analysis

Trend	Degree of Impact on e-Commerce from 2010-2013
e-Government	1/4
Regulatory Environment	1/2
Financial Environment	1/2
Security Concerns	1/2
Broadband Infrastructure	1/2
Cultural Preferences	1/2
Logistical and Cross-border Challenges	1/2
e-Tourism	1
e-enabled SMEs	1

4.1.1. Key e-Commerce Players in Malaysia

The Malaysian private sector is also catching on and leveraging on the e-Commerce trend with many cinema companies such as Golden Screen Cinemas, book retailers such as MPH, online recruitment services such as Jobstreet, auction sites such as Lelong, participating successfully in e-Commerce.

Figure 16: Malaysian Key e-Commerce Players



Blooming.com.my, a florist delivery service, has already been engaged in e-Commerce activities since they first reached Malaysian shores in the mid 1990's for example. MPH, a popular Malaysian bookstore, has also been doing great on the e-Commerce front since 2004. Lelong.com.my, a Malaysian homegrown e-Bay, was established in 1999 and for the first five years did not charge any fees for its services, instead relying on its own investments and advertisement sales to stay afloat. Another example is Royal Selangor, a Malaysian pewter manufacturer and retailer, the largest of its type in the world. Royal Selangor started exporting in the 1970's and was also one of the first Malaysian companies to go online in 1996. Today, 80% of its online sales originate from the US and Britain. AirAsia, one of the most successful Malaysian e-Commerce examples, is described in detail in the case study of section 4.3.

While the above represent the early adopters, further developments have already occurred in the Malaysian e-Commerce. Some of these include the establishment of Internet hubs focusing on driving growth while fostering collaboration in specific industries, such as Tradenex.com, formed by a consortium of Malaysian manufacturers, or oilpalmworld.com, an initiative backed by various palm oil industry associations, government agencies and commercial banks. Another example is the State Government of Sarawak's initiative, www.right.sarawak.gov.my/Rightmart, a website aimed at promoting locally manufactured handicraft in the country as well as globally.

Some of the local e-Commerce application players which have been successful are N2N Connect, a e-Commerce solution provider for the financial and security sector, as well as e-Globalfocus, a company specializing in web development and content management. iTransact, another provider, offers e-payment solutions, while Ivanex develops software for financial institutions.

These only represent the 'tip of the Malaysian e-Commerce activity iceberg', but they do also reveal an underlying problem. While Malaysia has been able to produce a few successful e-Commerce ventures, the majority of its businesses continue to struggle with establishing a successful online presence. Reasons for this will be discussed in further detail later in this article.

4.2. Malaysian e-Commerce: Trends, Drivers and Restraints

While many global drivers and restraints discussed in section 3 of this article generally also apply to Malaysia, there are specific drivers and restraints which impact Malaysian e-Commerce uniquely or more so than those identified for the global marketplace. These will be identified in the following section.

Generally it may be said that Malaysia suffers particularly under a lack of e-Commerce infrastructure, particularly Internet connectivity, and policy. Furthermore, lack of “development-oriented” e-Commerce sites and Malaysian centric online content also adds to the problem. Difficulty in obtaining merchant accounts, difficulty in finding and retaining skilled, technology-savvy employees, lack of appropriate business knowledge and technical skills, delivery and stocking problems which lead to dissatisfied customers, contribute to the hurdles of setting up e-Commerce business.

From a perception angle, a lack of belief in e-Commerce success at the leadership level and thus low priority in management direction, and the absence of a peer group to share experiences with also pose problems. High incidences of fraud, along with a general customer preference for physical dealings have also been identified as a restraint to e-Commerce growth in Malaysia.

4.2.1. e-Government in Malaysia

While it is generally agreed that the private sector should take the lead role in the development and use of e-Commerce, the Government plays an instrumental role in encouraging e-Commerce growth through concrete practicable measures such as creating a favorable policy environment for e-Commerce, becoming a leading-edge user of e-Commerce and its applications in its operations, and being a provider to citizens of e-Government services to encourage widespread e-Commerce use.

To fulfill the Government's role as an e-Commerce enabler, the Malaysian e-Government steering committee, MAMPU and MDeC were entrusted with spearheading the e-Government initiative in Malaysia in 1997. They developed 7 flagship applications or initiatives as of 2009, namely the General Office Environment, e-Procurement, Project Monitoring System, Human Resource Management Information System, Electronic Services, Electronic Labor exchange, e-land and e-syariah (source: Mampu.gov.my). The Malaysian Government also launched MyEG in 2000, to offer e-Government services to the public. MyEG began by developing online Government transactional services for the Malaysian community and it focuses on delivering improvements in the Government internal operations and in the delivery of services to the consumers.

Oftentimes the e-Commerce initiatives by governments are a barometer indicating whether or not the infrastructure supports e-Commerce use by private firms. This means that if a government is unable to engage in e-procurement, secure records online, or have customs fees remitted electronically, then the private sector will also have difficulties in e-Commerce uptake. Demonstrating how successful e-Commerce usage for the Malaysian Government has been, its e-procurement, or e-perolehan had a value of RM6 billion in 2008. Furthermore, in 2010 the Malaysian Government will first allow for an e-census to be carried out, to make the experience more convenient for citizens.

4.2.2. The Regulatory Environment for e-Commerce in Malaysia

Malaysia established an Internet Banking Task Force and the Malaysian Cyber Security Agency early on, in light of increasing security risks to boost consumer confidence in using e-Commerce. Malaysian e-Commerce transactions are legally recognized as contractual transactions by virtue of the *e-Commerce Act 2006*. While the *Sale of Goods Act 1957* and the *Contracts Act 1950* prescribe remedies in the event of disputes, the *Consumer Protection Act 1999* has yet to include electronic transactions in its scope. The impending passage of the Personal Data Protection Act, aimed at providing measures for the security, privacy and handling of personal information, will regulate the collection, possession, processing and use of personal data. Some of the national laws which have been passed specifically for e-Commerce are the *Communications and Multimedia Act 1998*, *Digital Signature Act 1997*, *Computer Crimes Act 1997*, *Payment System Act 2003* and the *Telemedicine Act 1997*. With regards to banking, The Malaysian Central Bank also mandated a shift to the Europay Mastercard-Visa standard for credit cards in 2005, and implemented minimum risk management requirements for all forms of electronic banking, including 'two-factor authorisation'. On a broader perspective, Malaysia is participating in Asia Pacific Economic Cooperation's (APEC) to contribute in the efforts of introducing e-Commerce laws, policies and regulations to facilitate e-Commerce transactions internationally through the provision of guidelines for traders to systematically utilise e-Commerce and in tandem ensure protection for e-Commerce users.

All these initiatives serve to create a better e-Commerce ecosystem in Malaysia, since one of the frequently cited barriers to e-Commerce adoption is security concerns. If the relevant Malaysian organisations continue to focus their efforts on bringing the Malaysian regulatory environment for e-Commerce on par with those of the US or other more developed e-Commerce destinations, then this would greatly aid Malaysian e-Commerce industry growth.

4.2.3. The Financial Environment for e-Commerce in Malaysia

The development of a nation's payment system is of utmost importance due to its relevance for national monetary policy, financial stability, and the overall economy. Generally, the Malaysian Payment system is made up of four sub-sectors: RENTAS, the real time electronic transfer of funds and securities; SPICK, the national image based check settlement system; ATM's and other retail payment networks; and Clearing Houses.

As in the international financial system, Malaysian customers have a plethora of payment option choices at their disposal. Cheques have traditionally been the most popular payment method in Malaysia, making up 93% of non-cash retail payments in 2007. This has declined slightly since 2003, where they made up 98%. While only 7% of Malaysian retail payments were e-Commerce payments in 2007, the number of such payments per capita has increased substantially from 2003 to 2007, from 13.8 to 32.5 transactions (details are shown in tables 3 and 4 below). Some of the possible reasons for this are the cost-savings which can be realized through non-cash payments, the increased safety through using e-Commerce, in terms of reduced risk of theft, robbery and human error. There has also been widespread increased confidence in e-Commerce applications, as compared to when this technology first emerged.

According to a study conducted by professors at the University of Malaya, in 2005, 53% of e-banking users were female, and 40% were aged between 26-35 years old. 60% of e-banking users were Chinese, and 20% were Malay, with almost half of all Internet users having at least a first tertiary degree.

In 2008, an AC Nielsen Survey indicated that for those using e-Commerce, the most frequent methods of payment were credit cards with 77%, followed by money transfers with 38%, Cash on delivery with 18%, PayPal with 15% and pre-paid credit cards with 11%.

Table 3: Most widely used e-payment instruments in Malaysia by volume of transaction (per capita)

	2003	2007
e-Money (card/network based)	7.6	22.3
Credit cards	5.8	8.7
Internet banking	0.3	1.5
Interbank Giro (IBG)	0.1	1.0
Debit cards	0.1	0.3
Charge cards	0.3	0.2
Mobile banking	-	0.1

Table 4: Most widely used e-payment instruments in Malaysia by value of transaction (MYR)

	2003	2007
Interbank Giro (IBG)	249	2,439
Credit cards	1,159	2,047
Internet banking	403	1,765
Charge cards	74.9	81.7
e-Money (card/network based)	22.4	59.0
Debit cards	3.5	42.9
Mobile banking	-	0.7

With regards to credit cards specifically, being the most established form of electronic payment, and increasing consumer demand for easy credit, has aided greatly in increasing both the value and volume of transaction. For Inter-Bank Giro, the increase in value of transaction may be attributed to more banks having joined the system, as well as aggressive marketing to corporate clients, and the uptake of IBG facilities in the public sector. Despite these promising numbers, Malaysian e-Commerce participants face impediments with easily accessible online payment systems. According to industry experts, it is rather difficult for an e-Commerce merchant to apply for a credit card transaction service to include in their website, as Malaysian financial institutions are risk adverse and thus focus on approving sites that are established, which is a serious stumbling block for upstarts. Furthermore, the Malaysian credit card facilities are still immature by comparison, often forcing merchants to utilise foreign card companies, thus increasing inefficiency due to having to convert transactions to US\$. Further restrictions are the limitations of foreign transfers or withdrawals from online payment systems, such as PayPal until 2009. PayPal first allowed for transactions in RM as well as withdrawals from PayPal accounts to Malaysian Bank Accounts in October 2009, representing a huge step in the right direction towards a better e-Commerce environment in Malaysia.

Leveraging on country specific factors, such as the lower credit card ownership rate in Malaysia when compared to more developed e-Commerce countries, as well as preferred alternative ways of payment, such as Cash on Delivery (COD) can aid e-Commerce players in succeeding in Malaysia. For example, the high proliferation of mobile phone ownership, allows payment systems relying on mobile infrastructure to be more successful in Malaysia compared to more developed e-Commerce nations.

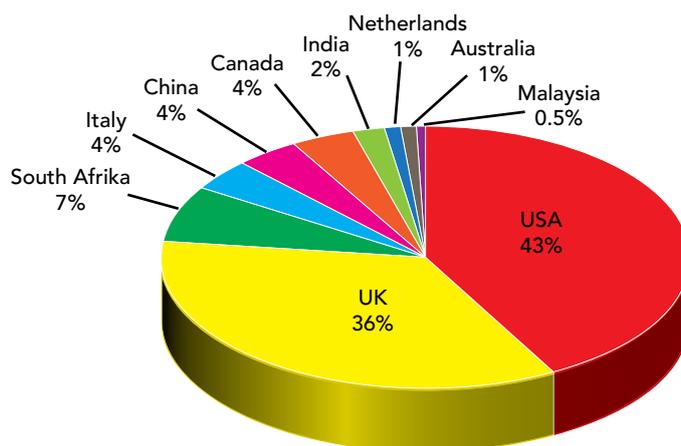
4.2.4. Security Concerns

Security is one of the most addressed issues in implementing trust mechanisms because the main concern about e-Commerce is whether it is safe to conduct online transactions so as to protect businesses from fatal blow to business. e-Commerce transactions can potentially lead to security threats, crime, loss or misappropriation of sensitive business information, information losses, theft of data or trade secrets, harm to corporate or brand name reputation, and/or loss of privacy.

Approximately 70% of Malaysian businesses in 2000 believed that security was the most important barrier to e-Commerce development. Therefore, relevant agencies have to play a bigger role in enforcing applicable regulations and ensuring and convincing the Malaysians public and business that it is safe to conduct business online.

In March 2010, Malaysia was number 10 in the global top 10 countries by cyber attack volume and phishing scams. Generally, Malaysian businesses see fraud cases, but they maintain it is still a small enough issue to be handled easily. Industry participants advise that e-Commerce merchants should always be careful when dealing with suspicious orders. Despite preceding efforts in this area, the Government must continue to take a lead in this, passing further and more stringent laws and ensure more enforcement to act as deterrent.

Figure 17: Share of Global Cyber-attack Volume by Country



4.2.5. The Malaysian Broadband Infrastructure

One of the main impediments for e-Commerce in Malaysia has traditionally been the sub-developed nation standard Internet environment. Factors contributing to this are the high cost and previously limited number of ISPs. While the household Internet penetration was 81.4% in 2006, the household broadband penetration was merely 17.1%. This suggests the continued prevalence of dial-up as a more popular mode of accessing the Internet, which does not lend itself to e-Commerce applications conductively. Furthermore, in 2003, only 97 out of 1000 Malaysian's regularly browsed the Internet. Traditionally, the high price structure of broadband connectivity services, dominated by a single service provider, along with limited reach, particularly in rural areas, appear to be primarily at fault for the low uptake of broadband services. Average broadband pricing for residential use ranges from RM66 (512kbps) to RM88 (1.0Mbps), while that for commercial use ranges between RM418 and RM618 for a 1.0Mbps connection speed. However, Broadband access is critical for the growth of e-Commerce here. If an online retail store is set up, too much data including pictures will be displayed to make the site appealing. When Internet users rely on dial-up, this data will take too long to load, making it less convenient to shop online. And apparently, Malaysian websites hosted locally are already at least 70% slower than other websites around the world.

In December 2009 however, there were a total of 91,188 Malaysian Internet domain names registered. And moves have been made towards liberalising the ISP market and reducing broadband subscription prices through subsidies. In Q4 2009, total broadband subscribers have reached 2.62 million. There has also been a proliferation of public access points or Internet cafes. If such initiatives and trends continue, Malaysian e-Commerce is on the right track to a healthy future.

4.2.6. Logistical and Cross-Border Challenges

There are also a number of logistical challenges in place which further hamper Malaysian e-Commerce. For example, products are taxed, unlike in Hong Kong or Singapore, putting local e-Commerce traders at a disadvantage. There are also high delivery fees and lengthy delivery times due to the underdeveloped Malaysian postal and other delivery infrastructure, when not considering providers such as DHL or other courier services. Who has not heard of items being lost in the mail? Malaysian shoppers are thus at a disadvantage, since international sellers may not be interested in mailing items to countries such as Malaysia, due to infrastructure challenges. An emerging trend supporting this is the use of ubiquitous corner stores or other central delivery and pick-up points rather than opting for the more common in western countries system of home delivery.

Most local e-Commerce merchants do not know their logistics capacity well, and thus cause delays in delivery and as a result perhaps dissatisfied customers.

While e-Commerce is on the rise worldwide, there is still no authoritative body to govern cross-border online transactions, especially relating to consumer protection. When consumers buy goods, for instance, from a US-based company like Amazon.com via the Internet, such online transactions are international and Malaysian laws like the *Consumer Protection Act* do not necessarily have jurisdiction. Situations like these, call for more action in developing regional and global standards to increase consumer confidence and willingness to participate in e-Commerce.

4.2.7. Cultural Preferences

Apart from the infrastructural issues as elaborated above, social factors appear to be at play as well. It appears that a majority of Malaysians are still uncomfortable about shopping online.

Malaysians tend to be 'followers' rather than 'pioneers' or 'first-movers'. The culture here is to 'play it safe', letting the others to test the waters first and would only follow or move to kick start a new type of business, if the latter were to succeed. Many of the Malaysian businesses see e-Commerce as an experiment rather than an investment. In addition to this conservative seller attitude, buyers also grapple with cultural impediments to e-Commerce. Malaysians generally seem to shy away from buying products online because they think it isn't safe. Part of this concern stems from security concerns, but other reasons include a cultural preference to see or hold the product in one's hand. The business environment is rather different in Malaysia, when compared to most western nations. Here, many stores are generally located near a buyer's residence, and shops' and restaurants' business hours extend through a distinctively longer period compared to those found in western countries. As such, the aspect of convenience is less valid for many Malaysian consumers. The challenge then is to get the public past their fears, and build a culture where people are comfortable and confident in buying and selling products online. In 2008, 3% of the total retail sales in the United States came from e-Commerce. This would amount to more than RM1 billion for the Malaysian equivalent. However, in 2008 the entire Malaysian retail economy only stood at RM59.5 billion. Malaysia needs more players to create a larger community of buyers and sellers, in turn adding to the comfort level of shopping online.

However, it is not all bleak. People that already shop online are citing time savings, avoiding crowds and access to a wider range of products as the main reasons for avoiding the brick-and-mortar shops. Almost half of Malaysian online shoppers prefer buying from online overseas merchants, citing product availability and choice, the offer of well-known brands and a more appealing website experience as the top reasons for doing so. Yet, this choice holds its own disadvantages in store. High delivery fees, lengthy delivery times and lack of contact during a dispute were cited as the major disadvantages to shopping on overseas websites. These were discussed in the previous section.

4.2.8. e-Tourism

In 2009, there were approximately 23.6 million tourist arrivals in Malaysia, with a sector revenue of RM53.3 billion. This stood at RM38.2 billion in 2006, contributing 6.7% of nominal GDP.

Tourism is also listed as one of the National Key Economic Areas. This is reflected in the annual development allocation for this industry, which has been increasing 60% over the years from RM605.5 million in the 7th Malaysian Plan to RM1009.0 million in the 8th Malaysian Plan period, and RM1367.0 million in the 9th Malaysia Plan. A study by Mohammad Nurul Huda Mazumder et al in 2009 showed that the average tourism output multiplier illustrates that every Ringgit increase in the tourist expenditure would generate 1.42 Ringgit. And, according to a study commissioned by Khazanah Nasional, the Malaysian aviation sector has a multiplier effect of 12 on the national economy.

Since Tourism contributes a very substantial share of GDP to Malaysia's economy, and travel-related e-Commerce has been and continues to be growing, a natural potential driver for Malaysia's e-Commerce is e-Tourism. Travel is a category extremely suited to the Internet due to the latter's ability to provide efficient access to an extremely wide range of comparable information. Whilst certain areas of the travel industry were initially slow to utilise the benefits of the Internet, it is now

one of the undoubted success stories of online business, playing an integral part in the arrangements and experience of today's traveler. According to a recent Nielsen Company Survey, in 2008, 41% of Malaysian Internet users used the Internet for Airline or Ticket reservation, while 22% used it for Tours or Hotel reservation.

To further emphasize on this, UNCTAD, a body of the UN, launched the e-Tourism Initiative as part of UNCTAD's task force on sustainable tourism for development, particularly for developing countries. The Initiative focuses on the development and implementation of ICT-based tools that will help communities tap the international market by strengthening and including local institutional and human capacities in the global market and promoting local involvement and ownership via e-Commerce applications. National Government tourism websites or portals could help to offer a wide range of tourism products and services like airlines, hotels, restaurants, camp-sites, tours, activity centers, concerts, festivities, shopping and many more with choicest of assortments of services.

In line with this initiative, Malaysia has already established its tourism website at www.tourism.gov.my. The website received approximately 12.3 million hits a month in 2009, and has been described as a model of e-Tourism by the UNCTAD. Further enabling Malaysian SME's and communities to reap the benefits of being visible to any potential tourist, abroad as well as domestically, will help to increase the share of Malaysia's e-Tourism revenue, as e-enabled tourism generally allows Malaysian tourism participants to reach bigger as well as niche markets, and introduce centralized convenient services.

4.2.9. Enabling SMEs Through e-Commerce

SME's make up about 99% of Malaysian companies. With a majority in numbers but often little means, SME's can benefit greatly from e-Commerce through increased efficiency, opening of a wider market without establishing a physical presence, fees and administrative cost reduction, enhanced security means and more flexibility through wider payment options. With 15.8 million Internet users and e-Commerce expected to grow at a compound annual growth rate of over 28% from 2006-2010, Malaysia has a tremendous potential.

However, the adoption and implementation of e-Commerce has not been widely embraced by Malaysian Small and Medium Enterprises. While the manufacturing sector is generally seen to be more active in adopting e-Commerce than the service industry, Malaysian SMEs in general have a low uptake of this technology. According to a Frost & Sullivan study in 2009, 47% of Malaysian SMEs by their own admission were ready to embrace e-Commerce within the next 2 years. 70% of SME's believed that e-Commerce could be a possible solution to overcome the challenges they faced because of the 2009 financial crisis, but only about 10-11% of these SMEs were already conducting e-Commerce activities. According to latest official statistics available, 82% of SMEs only use computers for office work such as billing and invoicing, while 94% have no e-Commerce exposure and about 53% of SMEs own a corporate website with no e-Commerce capabilities.

The biggest impediments to international e-Commerce adoption appear to be a shortage of working capital, including granting credit facilities, the slow collection of payments from abroad, the difficulty in enforcing contracts abroad and the uncertainty of dispute settlement options. Furthermore, a lack of ability to identify foreign business opportunities, and locating or analysing potential foreign target markets, as well as the IT skills of the SMEs staff, were also cited as reasons.

The biggest impediments to domestic e-Commerce adoption appear to be a lack of understanding of e-Commerce benefits and a refusal to leave the comfort zone. SME entrepreneurs are often not aware of the benefits e-Commerce has to offer them, as they are generally not very IT savvy and are reluctant to leave the comfort zone in pursuing the traditional and established methods they have always used. This barrier includes limited knowledge of business models and e-Commerce technologies. Furthermore, the misconception of a high maintenance cost for establishing and maintaining a virtual presence. Malaysian SME entrepreneurs generally think ICT related investments are expensive, and fail to see that, if done the right way, it not only isn't expensive, but also saves them money. With regards to financial transactions, e-Commerce offers reduced payment clearing time for IBG transactions or checks, particularly when dealing with customers located in other geographies domestically or internationally. SMEs have less means to employ a large staff base, and are thus aided by being able to conduct financial transactions from the comfort of their office, instead of dispatching employees. The reduced need to hold cash also reduces risks of losing said money and thus reduces insurance costs. With a move from traditional means of payment to less tangible forms, consumer confidence in such payment options has to be maintained in order for SME's to maintain their customer base. A decreased risk of fraud, theft and robbery with continuously improving security measures in e-Commerce applications, has aided to maintain this confidence and will continue to do so.

e-Commerce provides opportunities to participate on a global scale without extending an SME's physical infrastructure, which is often not financially viable for their limited means. Other impediments which have been identified are the lack of trust and confidence in e-Commerce facility, stemming from security, legal, and liability concerns. The ideal situation for e-Commerce in Malaysia to flourish is to approximate the trust accorded to over-the-counter transactions. This can naturally only occur with exposure and hands-on experience. Other barriers include a shortage of working capital to finance exports, problems in identifying foreign business opportunities, limited information to locate potential markets and focus advertising efforts, the inability to grant credit facilities to foreign customers or general inability to deal with e-payment systems.

Due to the market pressures Malaysia SMEs have been exposed to due to the recent financial crisis, they now seem more eager to leverage on the power of the Internet as a new strategy for driving business growth. The economic downturn has turned up the pressure on Malaysian SMEs to find new customers for their products and services amid declining sales and financial constraints. Extending their marketing and advertising reach by venturing into cyberspace, without much added cost, is a logical move.

The Government has aided SMEs in this regard, with introduction of the SME Business Stimulus Package in December 2009, allowing the first 100 SMEs to register for entry-level websites for free, while the rest pay RM200 each. The package is the result of a partnership between the Ministry of International Trade and Industry, Google and two local universities, the Multimedia University and Universiti Tunku Abdul Rahman. Its aim is to connect Malaysian SMEs to millions of Internet users at home and abroad. The package offers free hosting on Blogger.com and five static HTML pages, including the homepage, a products/services gallery, a business location page with map, an "About Us" page, and a "Contact Us" page with form. The package makes it easy for Malaysian SMEs to create a simple website and use it as a sales channel in conjunction with a free trial of Google AdWords.

In January 2010, the Malaysian Government, through SME Corp, further took steps to e-enable Malaysian SMEs, through signed a Memorandum of Understanding with eBay and PayPal entitled, "Empowering Businesses Online with eBay and PayPal". The initiative aims to help Malaysian SMEs leverage on the global business opportunities that e-Commerce brings, through equipping SMEs with knowledge needed to market their products internationally and gain a competitive advantage. The initiative would provide educational courses for SMEs in Malaysia in the form of workshops or phone consultation programmes that are conducted by certified eBay Education Specialists in Malaysia. To encourage SMEs to start selling on eBay, there will be a waiver of insertion fees for the first 100 eBay listings and selected features, as well as up to 25% discount on fees for the first 100 payments received via PayPal.

4.3. Case in Point: Airasia - An e-Commerce Success Story

Malaysia has managed to home-grow several very successful e-Commerce based businesses, as mentioned in section 4.1.1 above. From the various companies highlighted, AirAsia is deemed as one of the most successful case studies, with more than 80% of sales generated through online channel. To understand the strategies and challenges faced, in some successful cases, we interviewed two key people behind the scene who are actively involved in strategy formulation and implementation of e-Commerce platform for AirAsia, namely Mr. Lau Kin Choy and Mr. Alvin Loh from the Innovation, Commercial and Technology Department.

With the tagline 'Now Everyone Can Fly', AirAsia is the leading low-cost carrier in Asia, with 130 routes covering more than 70 destinations in more than 20 countries. Within the span of 9 years since its establishment in 2001, AirAsia has grown its fleet from just 2 aircraft to 83, and a revenue of RM3.18 billion and net profit of RM549 million in 2009. Approximately 80% of sales are attributed to e-Commerce channels, including AirAsia's website and mobile platform. AirAsia's website, www.airasia.com is one of the top e-Commerce sites in Asia, accessed by visitors from more than 200 countries worldwide, and registering a record 300 Million hits in November 2009.

Since its humble beginnings in 2001, AirAsia's key differentiating strategy has been its low-cost carrier aspect, to reach mass and underserved niche markets. With this in mind AirAsia has leveraged on its IT platform to achieve greater cost efficiencies. Combining its 'low-cost' strategy and IT as a platform, AirAsia early on engaged in promotional sales, including giving away free tickets. Enticing security weary potential customers with free or very low priced seats allowed AirAsia to overcome initially encountered inertia and gain the consumers' trust. Summing it up in a statement, "at that time prices, had to be low enough to make taking the risk of using your credit card online with a little known company worth it". The customers gained through this strategy, were then more easily retained based on their favorable experiences with AirAsia and its innovative e-Commerce applications. However, AirAsia notes that one of the top impediments for e-Commerce in Asia remains the trust factor due to financial fraud and the culturally influenced aversion to intangible and time-delayed obtaining of goods or services. AirAsia thus takes its responsibility to deal carefully with sensitive data very seriously, and until today there has been no incident in this area such as hackers. AirAsia maintains compliance to all international security standards. The key differentiator for AirAsia's website is the website's user friendliness, ease of use and provision of different payment channels and currencies. In the beginning, one of the most severe challenges AirAsia faced was less of the customer's e-readiness, and more of the payment gateway provider's e-readiness. At that time, bigger financial institutions in Malaysia did not find AirAsia credible or its churn rate substantial enough to warrant the integration with their often bureaucratic and cumbersome legacy systems. Alliance Bank was AirAsia's first partner for credit card payment in this respect. Over time, AirAsia managed to expand and maintain multiple payment gateways and platforms, in turn, increasing its customer base.

AirAsia exemplifies innovativeness in every aspect of its operations, and has enjoyed success also through innovative extension of its brand from mere airline to telecommunication service provider, hotel operator, and airline related merchandise retailer. Apart from these brand vertical extensions, AirAsia has also grown horizontally, by launching the unique AirAsia X, and establishing strategic joint ventures in Thailand and Indonesia. Because entry barriers to e-Commerce are low, e-Commerce newbie's have to find ways to differentiate themselves, bringing something new to the table that others are not offering or cannot provide, or anyone else can easily come in and take over your market. In the words of Tony Fernandez, AirAsia's CEO: "What does the market want? Nine times out of 10, when you go for what the market wants, it's something that's different. That's why invariably everything we have done is kind of blue ocean [companies, rather than competing with existing players, should venture to find new markets for themselves], as we weren't the first to invent low-cost travel, but we've taken it to a new level by taking it, adapting it, and making it better for our part of the world."

Despite AirAsia's penchant for achieving lower costs by outsourcing non-key business processes, AirAsia maintains that for some aspects, it pays to be in control and thus focused its resources on key business processes such as product development, marketing business strategy. Taking this as a guiding principle approximately 50% of operations are outsourced and 50% are internally managed. While the reservation system used by AirAsia is thus the standard reservation system used across the industry, the marketing and creative aspects are all customized according to AirAsia's requirements. Obvious benefits of this strategy are the ability of a short response and turnaround time. This was demonstrated in the past, where AirAsia managed to quickly respond with promotions for Bali and Thailand within hours of the bombings or political unrests respectively, or even the volcanic ash cloud in April 2010. Real-time market driven responses such as these, help in stabilizing or buffering effects, particularly for the tourism industry in affected countries.

In line with this general 'differentiating strategy', AirAsia has slowly been phasing out traditional media channels for advertising, instead focusing more on social networking, 'below the line' and viral marketing e-Commerce aspects, thus differentiating it from incumbents. Starting around 2008, AirAsia maintains a strong presence and reachability via its corporate Blog, Twitter page, Facebook page, Flickr page, YouTube channel, via e-mail and even SMS. This strategy is driven at top level as most of AirAsia's senior management tweet. AirAsia's Facebook fanpage has more than 200,000 fans, who receive real-time information updates on flight operations and local airport conditions, are entitled to exclusive low fare deals, like the exclusive April 2009 20% fare discount for Facebook fans. The value created through such channels is really priceless for AirAsia, as it has allowed AirAsia to customize marketing, in understanding the differences between the markets and demographic segments in the markets AirAsia operates. In fact, in their view customers, bar the older customer segment, are more responsive to more than just traditional marketing. However AirAsia realizes that "Malaysian customers are very different to other markets, for instance, while Malaysian customers are very price sensitive and price driven, customers from Australia and the UK will look for more ancillary services", partly due to the exchange rate advantages, and thus generally have a higher ARPU. The AirAsia CRM team also splits its markets into demographic segments, for example business flyers, frequent flyers, students and senior citizens. Through data collection and smart website features, AirAsia is thus better able to tailor marketing activities specifically to the segments most likely to be receptive to certain product and service offerings. But social networking platforms also have negative aspects. Not only do they need a big commitment, but also huge resources to manage 24/7 or it may backfire. In doing so, transparency is crucial. Learning through feedback instead of hiding from it, is a plain necessity for companies that want to be seen as 'in touch' with their customers.

With regards to e-readiness, AirAsia has no major challenges in Malaysian customer e-readiness". This is mainly attributed to the extensive governments support through initiatives to improve e-readiness among Malaysian including increasing PC penetrations, improve broadband penetration etc. Indonesian customers for instance seem to be the savviest when it comes to m-commerce applications over traditional e-Commerce access through PC's Malaysian customers have also been very progressive in this area. However compared to western countries, the potential customers are less IT savvy compared to their Asian counterpart. For instance while the Asian counterpart have been using m-commerce for the last few years the in western countries this has yet to be a common scenario. Potential reason for this scenario is due to the sensitivity to privacy culture among western consumers. To accommodate to this needs AirAsia is seriously looking into the privacy clause on their ecommerce platform. High degree of security is put in place to ensure customers are protected.

While AirAsia has faced challenges in channeling more traffic to its website in the beginning of 2002, today however during peak hours consumers may encounter a slow response time, due to the overwhelming response to promotional campaigns. AirAsia has also managed to increase ancillary income from MYR2 in 2001 per passenger to MYR27 in 2009, and is planning to further increase it to MYR60. For its stellar performance in rising from scratch to be one of Asia's most well known companies in less than a decade, AirAsia.com has been awarded much recognition for its manifold achievements. Some of the honours include, the World's Best Low Cost Airline, Airline of the Year, Leadership Awards, Brand Icon Award, Airline Human Capital Development Strategy Award, PIKOM ICT Organization Excellence Award, Malaysia's 30 Most Valuable Brands, Top CEO brand, 3rd Best Corporate Brand in Malaysia, to cite a few.

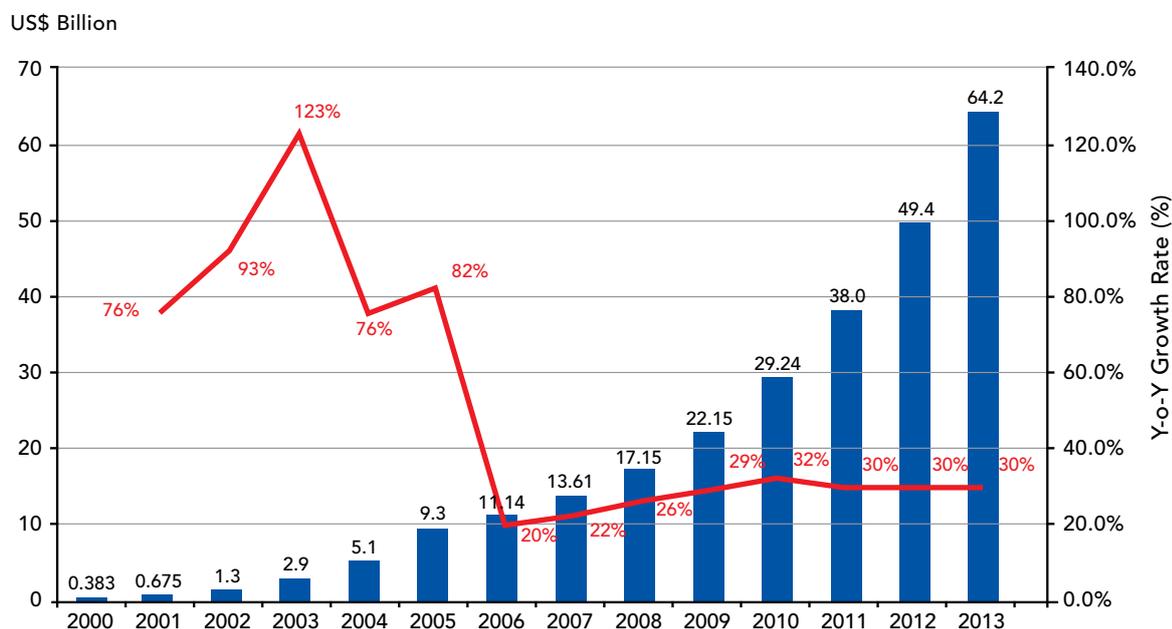
For its future development, AirAsia is planning to strengthen its ecommerce platform through more innovative product and services. In a recent development, AirAsia plans to launch its new website at the end of June 2010. The website would allow AirAsia to better interact with customers, and improve customer service through features such as personalized greetings, smart histories of past purchases or preferences to cite a few. With the recent trend of having smart phones as a lifestyle mobile application reach its full potential, reaching out to more potential customers through mobile platform is also high on AirAsia's agenda. Leveraging on this trend AirAsia is working together with big names such Apple to provide mobile applications for iPhone and other type of smart phone such as HTC, Blackberry just to name a few. M-commerce applications are the 'next big thing' for AirAsia. M-commerce platform was earlier launched in 2008, however in Q4 2010 there will be major additions to mobile applications and AirAsia will focus on replicating most of the services available on airasia.com, such as baggage and food related value added services. Self-check in and online self-help features are also big on AirAsia's agenda, particularly to be able to maintain low costs through reaping all the benefits an interactive e-Commerce environment has to offer.

With e-Commerce as an enabler to an innovative business strategy, AirAsia has managed to not only maintain its market share in the airlines industry, but it has also grown in terms of its business portfolio to include hotel and entertainment, financial services and others. AirAsia is currently one the most respectable company not only in Asia but globally.

4.4. The Way Forward for e-Commerce in Malaysia

While the global e-Commerce market has been displaying up to triple-digit growth over the last few years, it is slowly starting to cool down to more reasonable growth rates in established e-Commerce economies such as the USA. However, e-Commerce in Malaysia has taken its own path. Lagging behind between 3-5 years in development, the era of tremendous growth has yet to come, with more e-enabled potential customers and a more developed local e-Commerce marketplace. Generally, it may be said that e-Commerce is expected to grow as shown in the forecast below. While the growth from 2000 to 2005 was rather volatile, it has since been growing more steadily. From 2006 to 2010, the Malaysian e-Commerce spending tripled in size, standing today at an estimated RM30 billion. This is again expected to double until 2013, amid a stabilizing growth rate.

Figure 18: Frost & Sullivan Malaysian e-Commerce Forecast



While the Malaysian Government has already played an important role in ensuring the thriving of e-Commerce in Malaysia through ensuring more safety through regulations, as well as through encouraging broadband penetration, it has to continue to oversee developments of the market. It is thus the responsibility of the Government and the current and future e-Commerce participants in Malaysia to continue creating an environment conducive to the development of e-Commerce through setting up of safer payment methods, making e-Commerce applications more accessible and convenient through mobile banking and leveling the playing field between services available through conventional means versus e-Commerce.

Some of the measures which could be taken or implemented to further aid in the proliferation of e-Commerce in Malaysia include the following:

- Overcoming some of the aforementioned barriers to e-Commerce adoptions, particularly of Malaysian consumers and SMEs, could partly be achieved through awareness programmes. Naturally, the Government needs to provide a leadership role by using e-Commerce in its own operations, which Malaysia has started doing since 2007. Further leveraging on e-Government applications, such as e-procurement and various Government services which can be rendered through the Internet, as can be seen in Singapore. Consumer Protection Act 1999 to be applicable for online transactions to further create a secure environment, in turn inspiring a feeling of safety for potential shoppers who are currently reluctant to use e-Commerce due to safety concerns.
- In the long term, steps should be taken to make the Ringgit a CLS eligible currency. The first moves towards this have already been accomplished with the de-pegging of the Ringgit, greater liberalisation of the financial sector, and closer ties to world-class e-payment players such as PayPal.
- Consumer Guidelines or a consumer code in line with the UNCITRAL model should be drafted.
- A greater emphasis should be put on laws being applicable to both online and offline transactions equally .
- An assessment of the applicability and flexibility of the Malaysian legal system with regards to cross border issues .
- Revisit Income Tax, Stamp Duty and Excise Duty Acts to make them more applicable to today's e-Commerce environment and avoid putting Malaysian e-Commerce participants at a disadvantage. While e-Commerce transactions are presently not covered by local tax laws, the Ministry of Finance and the Inland Revenue Board are reportedly considering the introduction of new legislation to tax online transactions. If this becomes a reality, it may further act to deter SMEs and individual merchants from setting up e-Commerce facilities as they are at a comparative disadvantage from countries such as Hong Kong and Singapore.
- Continue focusing on improving Broadband and High Speed Broadband uptake on a consistent level across Malaysia.
- Encourage SMEs through tax breaks and subsidies, provision of specialized training, technology transfers, provision of affordable and secure hosting solutions, and easy template based websites are some of the tools which could be considered to increase Malaysian e-Commerce participation.

5. Conclusion

e-Commerce is likely to be one of the most influential forces shaping life and how we do business in the coming decades. As Internet usage and ICT literacy increases, this effect will continue to expand and increase in importance.

Benefits of e-Commerce adoption include improved customer service, better inventory control, lower marketing and distribution costs, reduced cycle time, increased market reach, and reduced operation costs. Other benefits include global connectivity, high accessibility, scalability, interoperability, and interactivity.

The future of e-Commerce thus appears very bright. This is the case even more so in the case of Malaysia which slightly lags behind countries which are slowly reaching their e-Commerce participant saturation point. This can, however, only remain so if consumer trust and confidence are maintained.

Governments and businesses need to work together on an international platform to ensure specific standards are set, which will assist the electronic traders to meet their responsibilities more systematically. The Malaysian Government needs to provide a baseline for international consumer protection to ensure effectiveness of industry self-regulation and thus strengthen consumer confidence. Industry's expertise and knowledge of commerce, and its ability to take that information and translate it into procedures for operating in the digital world at the same pace as the underlying technology evolves, will allow it to implement the necessary codes of conduct. International initiatives seeking to build international consensus on core protection for the electronic consumers, like those by Europe, the United States, and APAC offer a response to how e-Commerce may be monitored in order to provide appropriate protection and legal certainty to individuals and businesses globally. Yet, many nations have not translated these into actionable domestic laws. Therefore, there is an even greater need for online traders to be accountable and responsible to consumers.

e-Commerce has come a long way to revolutionize the way we do business and live our lives today, and it will undoubtedly continue to shape and influence the world we live in, and how we live in it. Both businesses and Governments have had and will continue to play a role in international consumer protection in the online marketplace, which can be global and borderless.

6. Glossary

B2B – Stands for Business to Business. It refers to e-Commerce activities between businesses, such as between a manufacturer, wholesalers, or retailers.

B2C - Stands for Business to Customer/Consumer. It refers to e-Commerce activities of businesses serving end consumers with products and/or services.

B2G - Stands for Business to Government. It refers to e-Commerce activities, between businesses and Government institutions.

Brick and Mortar – Refers to a company that possesses a building or store for operations.

C2C - Stands for Customer/Consumer- to-Customer/Consumer. It refers to e-Commerce activities of individuals serving other individuals or consumers with products and/or services.

Clicks'n Bricks – Refers to a business model by which a company integrates both offline (bricks) and online (clicks) presences. It is also known as click-and-mortar or clicks-and-bricks, as well as bricks, clicks and flips, flips referring to catalogues.

Cloud computing – Although this is an ambiguous concept, it basically describes a model wherein information and applications are stored in unknown, unidentified servers and temporarily accessed from terminals such as laptops, desktops, and other Internet-capable devices.

Digital wallet/e-wallet – Is an application which allows users to make electronic commerce transactions quickly and securely through software and information component which provide security and encryption for personal information and for the actual transaction. Typically, digital wallets are stored on the client side and are easily self-maintained and fully compatible with most e-Commerce Web sites.

e-Cash – Stands for Electronic Cash. It refers to money which is exchanged only electronically. Typically, this involves the use of computer networks, the Internet and digital stored value systems. Electronic Funds Transfer (EFT) and direct deposits are all examples of electronic money.

e-Check – An e-check is a payment that can be made directly from someone's bank account. Just like a regular check, it usually takes between 3 and 5 business days for an e-check to clear and the money to appear in the recipient's account. An e-check is like writing a normal check, but more secure.

e-Commerce – Stands for Electronic Commerce. It refers to commercial transactions being conducted via electronic means, such as the sale or purchase of goods or services, whether between businesses, households, individuals, Governments, and other public or private organizations, conducted over computer-mediated networks.

e-Commerce 2.0 – e-Commerce which relies on Web 2.0 for commerce to be more interactive and socially integrated.

e-Commerce Platform – A virtual platform, or software, which provides for easy setting up, running and managing an online store quickly, easily and cost-effectively. e-Commerce platforms offer a variety of services including shopping carts, product listing and search features, website design and layout features, newsletter manager, discount coupons, quantity discounts, gift certificates and so forth.

e-Government – Stands for Electronic Government. It refers to the use of technology to enhance the access to and delivery of Government services to benefit citizens, business partners and employees.

e-tailing – Stands for Electronic Retail. It describes retail activities which are conducted online. Retailing is the resale without transformation of new/used goods to the general public for household use.

e-Tourism – Stands for Electronic Tourism. Refers to IT enabled tourism which enables direct booking, easy payment for end-users, B2B trading for product providers, travel agents and resellers.

Electronic Data Interchange (EDI) – Is the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents from one computer system to another.

Electronic Funds Transfer (EFT) - Refers to the computer-based systems used to perform financial transactions electronically. Includes any transfer of funds initiated through an electronic terminal, including credit card, ATM, and point-of-sale transactions. The most widely used is Direct Deposit.

HTML – Stands for HyperText Markup Language. It is the predominant markup language for web pages today. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes, and other items. It allows images and objects to be embedded and can be used to create interactive forms.

HTTPS – Stands for Hypertext Transfer Protocol Secure. It is a combination of the Hypertext Transfer Protocol with the SSL/TLS protocol to provide encryption and secure identification of the server. HTTPS connections are often used for payment transactions on the World Wide Web and for sensitive transactions in corporate information systems.

m-Commerce – Stands for Mobile Commerce. It describes commerce activities carried on over mobile devices such as mobile phones, smartphones or PDAs.

Merchant Account – An account provided by an acquirer (merchant bank) for the merchants to accept and process credit cards for payment of goods and services.

MEPS – Stands for Malaysia Electronic Payment System. It refers to Malaysia's only interbank network service provider. MEPS is owned by a consortium of local financial institutions.

Online Payment – A financial transaction conducted through the online media.

Open source - Describes practices in production and development that promote access to the end product's source materials. With regards to e-Commerce, it usually describes open-source software (OSS), which is computer software that is available in source code form for which the source code and certain other rights normally reserved for copyright holders are provided under a software license that permits users to study, change, and improve the software.

Payment Gateway – It is an e-Commerce application service provider service that authorises payments for e-businesses, online retailers, bricks and clicks, or traditional brick and mortar. It is the equivalent of a physical point of sale terminal located in most retail outlets.

Secure Sockets Layer (SSL) – An established industry standard that encrypts the channel between a Web browser and Web server to ensure the privacy and reliability of data transmitted over this channel.

S-commerce – Refers to a subset of electronic commerce that involves using social media, online media that supports social interaction and user contributions, to assist in the online buying and selling of products and services.

Virtual Mall – Refers to Internet site that mimics a department store or shopping center, enabling customers to access a variety of retailers using a shared site or site links; also called on-line mall.

VoIP – Stands for Voice over Internet Protocol. It is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks.

Web 2.0 – Stands for the newly reorganized form of the Internet which emerged in the mid 1990's. The term Web 2.0 is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centered design, and collaboration on the World Wide Web.

7. Methodology

The methodology used in this article to assess past, present and future e-Commerce and sub-segment data is as follows:

Based on secondary resources as well as Frost & Sullivan internal data where applicable, data for 2000 to 2009 was compiled. Based on this data, a CAGR was obtained, which served as a baseline guide for the forecasts until 2013. These numbers were then adjusted by the impact of various drivers and restraints affecting e-Commerce usage or revenues as detailed in the report occurring between 2010 and 2013.

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CHAPTER 5

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Malaysian C2C Auction e-Commerce Sites: A Case Study on eBay and Lelong.com.my

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Abstract

This paper describes Malaysian C2C (consumer to consumer) online auction sites and the top auction sites in Malaysia; lelong.com.my and eBay. Based on the examination of these two sites, this paper proposes four critical success factors; security, transaction costs, online market volume and website performance.

1. Introduction

e-Commerce involves the exchange of products, services or information electronically. It is estimated that in the US, e-Commerce retail sales have reached \$204 billion. From 2000 to 2009, Internet usage has grown 400% and that in 2009, there are currently 1.8 billion Internet users worldwide (Group, 2010). It is expected that Internet usage will continue to grow and will contribute to the growth of e-Commerce.

An important element of e-Commerce transaction is C2C (consumer to consumer) where consumers exchange goods and services directly with other consumers. Online auction sites have become one of the most popular methods of transaction in C2C. It is estimated that in 2007, there were \$109 billion worth of goods that were sold online and that a quarter of that come from online auctions (eBay, 2005; U.S. Census Bureau, 2006).

The benefits of online auctions for sellers include a global market, expedition of product sales, and low cost of sales (Becherer & Halstead, 2004). Other reasons given by Becherer and Halstead are that sellers might want to sell huge volumes of their stocks, to determine the market valuation of their products and to connect with customers.

For buyers, online auctions represent prospects of finding rare items, and possibility of finding good deals (Turban & King, 2008). In Malaysia, the top auction C2C sites are lelong.com.my and eBay ("Alexa page rank," 2010).

In this Chapter, the focus will be on examining and describing the critical success factors of C2C for online auction sites in Malaysia. The first section will explain the online auction; the second part a brief case descriptions of eBay.com.my and lelong.com.my will be provided and in the last section, the critical success factor will be presented.

2. Online Auctions Sites

This section describes online auction in detail. Online auction is a type of dynamic pricing mechanism that allows direct interaction between buyers and sellers. A seller can place items for buyers to make bids or buyers can ask for bids for items that they want. Due to the competitive nature, this allows buyers or sellers to pick the best bid. There are basically three types of online auction; namely business to business (B2B), business to consumer (B2C) and C2C. It is said that C2C is the most popular type (Becherer & Halstead, 2004).

There are different ways of looking at an auction. To understand auction, one can look at whether the price of the bid is moving upwards or downwards, information about other bids or the number of buyer and seller participants.

The most common is the English auction where bidders publicly announced their bids until the highest bid is achieved. The winner is the one who has the highest bid. This type of auction is also called the ascending price auction because of the increasing price of the bids. If there are multiple items for sale using the English auction, then it is called the Yankee auction. In Yankee auction, like the English auction, the winning bid is also the highest bid. The difference from the English auction is that bidders bid for multiple items. If there are still items left after the highest bidder has taken the items, the remaining items will be allocated to the second highest bidder, and so on. The winning bidders will pay the lowest price bid that wins the items. The advantage of the English auction for sellers is that buyers compete with each other and might raise the bidding price beyond the value of what they have set out initially to pay for.

On the opposite end is the descending price auction where the prices starts high and then keep dropping until a bidder accepts the price. If there are still some items left for sale, the prices will continue to drop until a second bidder accepts that price. This type of auction is also called the Dutch and is promoted by lelong.com.my. Dutch auction tended to be favoured by sellers who have many identical items for sale. The advantage to the seller is that the bidder will not let the prices drop too low; otherwise, the items will be picked up by another bidder.

Other common types of auction are sealed-bid auctions, sealed double auction and open auction (Beam & Segev, 1998). In sealed bid auction, bidders tender their bids without knowing other conditions and information about other submitted bids. In sealed double auction, buyers and sellers submit their bids and conditions at the same time without knowing each other's bid. The auctioneer will then match the buyers with the sellers that have similar conditions and bids. In an open bid, bidders have information about the conditions on other bidders.

According to Turban, there are four types of participant configurations. In the "one buyer - one seller" configuration, the auction price is largely determined by the bargaining power of the buyer and seller. Turban states that this configuration is popular in B2B.

In the "one seller – many prospective buyers", the seller offers one product to many possible buyers. This is also known as a forward auction and is popular among C2C sites such as eBay and lelong.com.my.

In the "one buyer – many prospective sellers", the buyer requests bids from as many possible sellers before concluding a purchase. This type of auction is known as reverse auction, because the buyers seek bids that are the lowest rather than the highest price. This type of bids are popular amongst B2B and G2B (Government to business) e-Commerce. Some C2C auctions do cater for reverse auction. For example, eBay allows any buyer to leave a request for bid, and sellers who are able to meet that specifications contact the buyer.

In the last configuration of "many buyers – many prospective sellers", sellers are matched with buyers based on the quantities and interaction between the two sides. A typical example would be the stock market. B2B tend to favour this type of auction.

Two important concepts for auction are reserve price and minimum bid. A minimum bid is the starting price in which the bidding will start. The reserve price is the minimum amount of price that the seller will accept. For example in the English auction, if the bid does not go higher than the reserve price, then the sellers can remove the item from sale. The lower the starting price the more bidders are willing to bid and the higher the chances that the transaction will proceed (Bland, Black, & Lawrimore, 2005). This empirical study has also shown that having a reserve price reduces the number of bidders. Some transactions may not even proceed due to the perception that items with reserve price is riskier than those without (Reiley, Bryan, Prasad, & Reeves, 2007).

Many consumer goods can be sold through online auction. For example, in eBay, one can look for real estates, toys, stamps, musical instruments and kitchen sinks. The popularity of online auction is due to its low cost entry and huge marketplace. In the next two sections, this article will describe two of the largest online auction in Malaysia, which is eBay and lelong.com.my.

3. About eBay

In September 1995, Pierre Omidyar in his spare time created a web site called AuctionWeb to bring online auction as a mechanism for buyers and sellers to transact in the online marketplace. After only a year, and due to the success of his web site, Omidyar had to resign from his Web programming job at General Magic to work full time on the site. The company was renamed eBay and within four years, there were 10 million registered users and a total transactions of \$2.8 billion annually (Bunnell, 2000). In 2004, eBay created local versions of its website in many different regions of the world including Malaysia. Today, eBay has about 90 million active users worldwide and a gross merchandise volume of \$60 billion annually. It can be considered as one of the largest Internet e-Commerce, and one of the largest marketplaces in the world (Reiley, et al., 2007).

Currently, eBay has three major businesses; eBay marketplace, PayPal and Skype. Both PayPal and Skype were acquired in 2003 and 2005, respectively. This article will focus on the largest eBay business, namely the eBay marketplace. Although in eBay marketplace sellers can elect to sell based on a fixed price, this article will focus on the largest component which is the online auction.

The main source of eBay's income is from the listing fee and "final value fee" (commission) from completed sales. The amount of listing fee paid by the seller depends on the amount of attention that the seller wants. A basic "insertion fee" (listing fee) is paid upfront but a higher amount if the product is listed among the "featured auction" in a specific product category and an even higher fee if the product is listed on the "Featured Items" in the eBay homepage. A further charge ("listing upgrades fee") is also incurred, if the seller wants additional prominence for the product listing, for example, subtitle, extra pictures, boldface fonts or highlighting. At the current time of writing, the amount of commission for C2C products is 9.0% of sale price or maximum charge of USD\$50.00. The other source of income, advertising revenues comprise only a small proportion of net revenue comprising about 15% of net revenues (Wolverton, 2001).

To sell or buy from eBay, the e-trader needs to create and verify an account stating whether payment can be made through credit or debit cards. Buyers have protection from eBay through their PayPal Buyer Protection of up to RM650, in cases where they do not receive the items once payment has been made.

Another form of protection for buyers, are through “member feedback rating” where buyers and sellers rate each other on their transactions with each other. Members can leave a positive or negative feedback within 90 days after their transactions. A point is awarded for positive comments, zero for neutral and negative for adverse comments. If the seller receives more than ten comments, a star icon is given to the seller.

4. About lelong.com.my

Lelong.com.my was started by K.S. Wei and Richard Tan, who founded Interbase Resources in 1999. Currently, it has become one of the top C2C auction sites in Malaysia. The website layout and principle is similar to eBay. However, there are major differences between eBay and lelong.com.my.

The main revenue from lelong.com.my is derived from fees from membership and transactions. The fee charged depends on the type of auction used. A standard auction, like the one described in the eBay section above with a reserve price, costs about RM2. There is a fixed price fee to be paid to lelong.com.my for most auction types, except for Dutch auction, where a percentage of the final amount or up to a maximum of RM128 is charged. Similar to eBay, there is an additional charge for posting in the “Feature Front page”, “Featured in Category” and additional upload of more than one picture.

To sell or buy from lelong.com.my, e-traders needs to create and verify their emails and mobile phones. These anonymous members can still buy or sell through their accounts. Lelong.com.my does not authenticate their information other than making sure their handphones and e-mails are working. To encourage members to upgrade, there are certain restrictions on these members. For example, these members are only allowed to post or bid for five items at one time and not allowed to upload their product pictures.

To be a verified member, lelong.com.my requires members to upload a copy of their MyKads (Malaysian identity cards) and make a payment of RM10. A verified member has additional benefits, such as priority customer support, more auction types and a special icon that appears next to the member's name.

Lelong.com.my also provides escrow services; called Safetrade. An escrow service is where a neutral third party holds the cash payment and will not release the cash to the seller until the buyer receives the goods and acknowledges that it is in good condition.

Buyer and seller protection are similar to eBay. There is also a “feedback profile” of member. Lelong.com.my provides more detail than eBay by giving the breakdown of the number of buyers and sellers, who gave positive, neutral and negative feedback and how many of those that gave feedback gave positive, negative or neutral feedbacks to other members. However unlike eBay, lelong.com.my does not offer any cash protection.

On the whole, although it may appear that eBay and lelong.com.my are similar, there are important differences between the two. Lelong.com.my is more focused on the local context with multilingual website offering of Chinese and Malay, escrow service, and verification of the identity card; eBay has more of an international setting.

5. Critical Success Factors for Online Auction

The critical success factors for online auction are security, transaction costs, online market volume, and website performance. This chapter will then describe in detail about each of those factors.

5.1 Security

Security is important, given the lack of a well-established legal infrastructure in Malaysia to protect online transactions. One of the biggest problems facing e-auction is fraud (Festa, 1998).

Risks to sellers are purchases from buyers using stolen credit card numbers, identity theft, or buyers, who place winning bids but never went through to actually buying the items. Other risks include, buyers claiming that they did not receive the item or that it was damaged and that they want a refund. If the item has been returned, it might have been swapped with a similar non-working one. Buyers may use bid shielding. Phantom bidders are used to bid high prices to scare off potential bidders and then, disappear. The collaborators of the phantom bidders get the items at the lower bid.

Risks to buyers include sellers that do not deliver the purchased items which constitute about 36.5% of complaints (Gregg & Scott, 2008). Other risks to buyers are that sellers provide misleading information about their products and sale of stolen items. Sellers may use shilling to artificially increase price of the bids. Some sellers have been reported to charge additional hidden costs to the item after the auction is over (Gregg & Scott, 2008).

As described earlier, both eBay and lelong.com.my do have some form of user identification verification. In eBay, members have to be verified using credit card. In lelong.com.my normal members have limited verification. Their mobile phones and emails are checked to determine whether the information provided exists. The verified member on the other hand will have their MyKad uploaded to the system.

Although eBay and lelong.com.my do have feedback ratings on buyers and sellers, these can be circumvented. Fraudsters can conduct fake transactions among alternate user names and giving themselves high ratings. Furthermore, a buyer or seller can rate an ungrounded positive rating, to encourage the other transaction party to reciprocate with a positive rating (Masclat & Pénard, 2008). Likewise, a buyer or a seller may not rate a negative rating because an "unjustified" negative rating might be retaliated in return. Nevertheless, most buyers and sellers still put importance on the feedback ratings more than even the information of the items that is placed for auction (Hortaçsu, Martínez-Jerez, & Douglas, 2009).

Lelong.com.my provides statistics on how much the raters rate other members, so as to give an indication about their activities. Escrow services that are provided do allow some form of protection but these tend to be only worthwhile for expensive items. An advantage of eBay over lelong.com.my, is the buyer protection mentioned earlier in which eBay provides for up to RM650.

5.2 Transaction Cost

Research (Ou & Davison, 2009) in other countries such as China has shown that transaction fee is one of the main determinant of a C2C auction site success. In China, TaoBao has exceeded eBay (China)'s market share by its free-of-charge business model. In Malaysia, mudah.my has now won the market share of C2C traffic from eBay and lelong.com.my by offering free-of-charge for buyers and sellers ("Alexa page rank," 2010).

Mudah.my is a joint-venture between Singapore Press Holdings Limited and Schibsted ASA. Singapore Press Holdings Limited (SPH) is the biggest media organisation in Singapore. It publishes many newspapers such as The Straits Times and The Sunday Times, and operates several television networks such as Channel 5, Channel 8 and Channel U. Schibsted ASA is one of the biggest online classified advertising companies in Europe.

Mudah.my offers an online classified service where sellers can sell items or services for a fixed or negotiable price. There is no security feature for buyers or sellers and there is no feedback rating. To verify the items, buyers generally arrange to meet with the sellers face to face. Mudah.my business model is to offer a simple online classified advertisement with no costs to sellers and buyers by earning money through advertisements. It is unclear how long mudah.my is able to sustain its business model because there have been a reduction in advertisement revenue (Chen, 2003) and increased competition from other websites.

5.3 Online Market Volume

If there is no one to trade with, then the C2C site will not be successful. For example, in the initial stages, Yahoo auction was able to attract sellers because of its free service but it was not able to attract sufficient buyer volume. Due to decreasing revenues, Yahoo instituted fees on sellers. This drives further the existing sellers away and brought about the decline of its auction business.

An important aspect of online market volume is marketing. eBay spends an average of 15% of its revenue (about \$870 million) on advertisements (Sterling, 2007) to build its brand name. Buyers and sellers would transact if they are able to trust the brand name behind the e-Commerce site. Buyers have a perception that purchasing from e-Commerce website is riskier than a physical retail store. Thus, a way to reduce risk is through being a well-known brand (Becherer & Halstead, 2004).

5.4 Website Performance

There have been a number of researches on website performance and their effect on the buyers and sellers.

In China, a local C2C auction site was able to take market share over eBay because it offers an integrated Internet messaging, indicators of sellers' online status and opportunities to contact the sellers immediate when they are online (Ou & Davison, 2009). This is in contrast to eBay, where these services are not in built into the website.

Research on C2C has also shown that personalizing contents and services for users with different needs is also one of the critical success factors (Wu, Tao, & Wang, 2007). For some buyers, Wu also found they place a higher importance on the item's condition (whether it is new or the degree of being worn out) than the usefulness of the product itself. That paper recommends that web sites have a customized recommendation system that tries to discover members' purchase preferences.

Other research has indicated that "the C2C auction website content, user friendliness (a combined measure of C2C auction format and ease of use), timeliness, security, transactions, and product varieties are positively related to the website performance for the auction buyers" (Rauniar, Rawski, Crumbly, & Simms, 2009). Raunier et al. suggested that auction websites that add value to the buyer's purchasing experience, will affect the buyer's recommendation and that eBay acquired half of its customers through referrals.

6. Conclusion

Online auction seems to be a perfect fit for the web. Buyers and sellers can be charged when they transact and at the same time, can sell advertising on the auction site. Advertisers would pay a premium because they can target their advertisements based on the search engine results. However, things are not that simple. Fraud is a main problem in the auction sites. It was reported that online auction make up about 45% of all frauds reported to the Internet Crime Complaint Center (IC3, 2004). The majority of the fraud are from non-delivery of the item once it is paid (36.5% of complaints) and misrepresentation fraud (30.3% of complaints) (Gregg & Scott, 2008). In addition, transaction costs and website complexity might scare off some buyers and sellers. Despite these reasons, online auction in Malaysia still capture a large proportion of online C2C traffic and will remain so in the foreseeable future.

To be successful, online auction needs to prove that they are able to protect buyers and sellers alike, attract sufficient market volume and value-add to the experience of buying and selling. At the same time, online auction sites need to reduce transaction fees and remain profitable. A tough ask, but eBay and lelong.com.my have survived and both will continue to evolve as the environment changes.

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CHAPTER 6

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e-Payment in Malaysian Public Services: A Model Framework for Evaluation

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Abstract

As promulgated in the Gartner Model, the formulation and implementation of e-payment services within the context of e-Government programme in Malaysia has progressed from web presence to online transaction. This development is still short of the next stage of transformation, which in contemporary sense demands e-Governance processes in the form of citizenry participation as an integral component from onset of strategic planning to the execution level. Nonetheless, this study examined 113 randomly selected Government agency websites in Malaysia on information currency, interactivity, communication and online services. These websites are part of the 278 e-payment services offered by Malaysian e-Government sites. Besides investigation simple frequency distribution, the study also benchmarked the performance of each e-public service against a backdrop of absolute criteria or comparing it against the best performing site. The overall findings revealed that over the years, more services are provided online by Government agencies. Indeed, in terms of quantity, the number of websites providing e-public services increased drastically over the past year. However, the quality of services provided still becomes a big challenge to the service providers.

Keywords : Multimedia Super Corridor (MSC) Malaysia, e-Government, e-governance; Gartner Model; e-payment.

1. Introduction

The advent of the Internet is poised to start a new revolution, as did the steam engine, electricity and telephone in the last century (Mathew, 2004). The Internet has opened new possibilities for the Government and its citizenry, just as it has for the businesses. The emergence of e-business, e-organization and k-economy and the corollary, e-Government, is predicted to change social governance dramatically, if not, radically (Tapscott, 1996; Castells, 1997). Over the past decade many governments have conceived and implemented programmes intended to launch the governments into the digital realm (UNDP, 2009). It is considered as an historical and technological inevitability with many implications for the government, the governance and the governed (Maniam & Ramachandran, 2009; Maniam et al., 2010). While many see the power of Information and Communication Technology (ICT), especially the Internet, to improve, extend and diversify public service delivery systems, others view it more broadly to include the governance dimensions. The optimists view ICT and particularly the Internet as the panacea for the ailing spirit of democracy all over the world. ICT, it is argued, will rekindle the political consciousness of the citizenry and draw the apathetic masses back into the mainstream of political debate and discourse (Chadwick, 2001). The years of declining social capital and the politics-citizen disconnection can be mended, and in fact, reversed. Other scholars, while recognizing the potential for democratic reinvigoration, are more circumscribed in their assessment of role of ICT in the re-awakening of the political consciousness (Hague & Loader, 2001).

The Malaysian Government has envisioned a technologically advanced society and implicitly, becoming a technologically-enabled government by 2020. The move towards a digital government is progressing slowly along the Government-to-Government route (G2G) and also along the Government-to-Citizen path (G2C). Alongside with the launching of the Multimedia Super Corridor (MSC) in 1996, the Government has lined up several flagships e-Government projects namely, the Project Management System, Human Resource Management Information System, e-Procurement and General Office Environment intended to transform the government from the paper-based, un-integrated islands of agencies and departments to an integrated and networked government. The public sector ICT vision aims to provide more efficient services by leveraging on the multimedia

capabilities of the ICT to facilitate resource sharing between government agencies and to become a citizen centric entity in its service delivery (Malaysian Administrative Modernisation and Manpower Planning Unit (MAMPU). Despite the growth of websites and their profound implications for the Government, there have been few studies of the e-Government revolution. It is not clear how the e-Government revolution has progressed and what kinds of information and services are online. Much less is known about the pace and the depth of e-Government implementation in Malaysia. The publicly available information is policy oriented and says little about the progress and, more importantly, about the pilot project outcomes, which will inform the eventual rollout of the e-Government programmes (Hazman et al., 2006).

Therefore, this paper attempts to evaluate to what extent the e-public services in the country are meeting the expectations of businesses and the society. The objective of this study is to examine both the quantity and quality of e-Government services, provided by the Government agencies and departments. Specially, the paper evaluates the attributes of these websites (currency of data, range of online services, the extent of interactivity, responsiveness and general orientation of the Government websites) and more importantly the extent of e-payment services provided.

2. Stages of e-Government: Gartner Model Framework

E-Government means different things to different people. Some define e-Government as a government kiosk, citing the examples of recruitment and job information, application for Social Security benefits using a web site, or creating shared databases for multiple agencies. Others see e-Government more generally as automating the delivery of government services. While perceptions of e-Government vary widely, some common themes can be identified that capture its evolutionary nature.

E-Government involves using information technology, and especially the Internet, to improve the delivery of government services to citizens, businesses, and other government agencies. It has the potential to directly connect the government with its citizens in a manner that opens new opportunities, while also raising new challenges. E-Government could enable citizens to interact and receive services from all three tiers of the government administration 24 hours a day, seven days a week. Some observers of e-Government initiatives suggest service delivery could become more convenient, dependable, and less costly. The Gartner Group describes e-Government as “the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet, and new media. The Gartner Group summarized e-Government progress based on the following stages:

Stage I: Presence

Presence is the first stage of development. It is the establishment of a placeholder for effective dissemination of information. It represents the simplest and least expensive entrance into e-Government, but it also offers the fewest options for the citizens. A typical example is a basic Web site that lists cursory information about an agency, such as hours of operation, mailing address, and/or phone numbers, but has no interactive capabilities. It is a passive presentation of general information. Some observers refer to these sites as ‘brochureware,’ suggesting they are the electronic equivalent of a paper brochure.

Stage II: Interaction

The second stage is interaction. Although interactive Web-based initiatives offer enhanced capabilities, efforts in this group are still limited in their ability to streamline and automate administrative functions. Interactions are relatively simple and generally revolve around provision of information. These initiatives are designed to help the customer avoid a trip to an office or make a phone call, by making commonly requested information and forms available around the clock. These resources may include instructions for obtaining services, downloadable forms to be printed and mailed back to an agency, or perhaps e-mail contact to respond to simple questions.

Stage III: Transaction

The third stage in the evolution of e-Government initiatives is the handling of transactions. These initiatives are more complicated than providing simple information. They embody the activities popularly associated with e-Government, enabling clients to complete entire tasks electronically at any time of the day or night. These initiatives effectively create self-service operations for tasks, such as license renewals, payment of taxes and fees, and submission of bids for procurement contracts. Although the level of interactivity is of a higher magnitude than the Stage II initiatives, the activities still involve a flow of information that is primarily one-way (either to the government or to the client, depending on the activity).

Stage IV: Transformation

The highest order of evolution for e-Government initiatives is transformation. Initiatives at this level utilize the full capabilities of the technology to transform how government functions are conceived, organized, and executed. Such initiatives would have the robust customer relationship management capabilities required to handle a full range of questions, problems and needs. Currently, there are very few examples of this initiative, partly due to administrative, technical, and fiscal constraints. When implemented, these initiatives will help to facilitate the seamless flow of information and collaborative decision making between federal, state, local, public, and private partners. In other words, transformative e-Government initiatives often seek to remove the organizational barriers that promote agency-centric solutions and, instead, promote customer-centric solutions. Some advocates suggest that, at its most advanced level, e-Government could potentially reorganize, consolidate and even eliminate existing agencies, turning them into virtual agencies.

Businesses and citizens have always hoped to have a responsive and quality civil service which, unfortunately due to bureaucracies, is traditionally hard to come. The Special Task Force to Facilitate Business, popularly known as PEMUDAH, has reported that, as of 17 December 2009, a total of 278 e-Payment services offered by 118 government agencies, compared to just over a year ago, where only a total of 148 public services offered by 89 government agencies were using e-payment facilities. In others, the citizens have a choice of paying bills by direct debit or credit card via the web portal based services provided by the agencies concerned. However, members of the public who are not ready to make payments using online and interactive virtual modes, can still resort to conventional modes of payment, either at its own counters or the post offices, banks, or kiosks strategically placed at high traffic area such as the shopping malls. Judging from the results achieved within a year, from 2008 to 2009, PEMUDAH has accomplished much by increasing the number of services by 87.8 % and the number of government agencies by 32.6%.

The e-Public Services list 2009 showed that a total of 118 Government and Government-linked agencies are involved in the provision of e-services. Of this, as shown in Table 1 below, 83 are from the Federal Government; 14 local authorities comprising of Kuala Lumpur City Hall, Petaling Jaya City Council and Shah Alam City Council, two district councils and eight municipal council and

Putrajaya Corporation; six State Secretaries; 11 universities; and four Government-linked companies. It can be seen from the list that, a wide range of government institutions at federal, state and local levels, as well as those privatized government institutions, are continually engaging themselves in improving the provision of civil service in the country under the e-Government activities (PEMUDAH, 2008; PEMUDAH, 2009).

“Foreseeing the Internet Age in improving the performance of governments, the Malaysian Government in 1997 adopted a bold vision of effecting dramatic, sweeping changes through e-Government.” (Rais and Khalid, 2003). Thus, in an effort to improve the quality of the civil service, the e-Government flagship applications, comprising Generic Office Environment (GOE), Electronic Procurement (EP), Project Management System (PMS), Human Resource Management Information System (HRMIS), Electronic Labour Exchange (ELX), e-Syariah, e-Services (ES) and e-Land (EL) were initiated. Since its launch, the projects have gone through various stages of development at all three tiers of government - federal, state and local. Among these projects, the e-Services project is considered central and foundational for the successful implementation of other e-Government flagship applications. It is basically aimed at enabling direct, online and real transactions between the public, the Government and the service providers. As acknowledged, e-Services comprise many aspects such as e-mail communications, dissemination of key information via web-based or portal-based system, online registration for soliciting a public service, downloading of forms, posting a complaint or query, performing a transaction, e-payment services become an integral component of e-Services whenever payment is involved.

Perhaps, most government agencies that are participating in the e-Government programme would have achieved the first two components of Gartner model – maintaining a web presence and being interactive. Achieving these two components is not difficult, if adequate allocation and administrative capacity, as well as commitments and discipline, on the part of implementers, are in place. Moreover, developing the requisite ICT infrastructure for ensuring web presence and interactions do not require much technological sophistication, which over the years, has evolved into a simpler task. Even novice or fresh entrants in the job market are nowadays able to provide such services. However, reaching the third stage in the Gartner model is the real challenge. This stage, among many other provisions, involves element of e-payment. It entails monetary payment for the services solicited as well as refund processes and procedures, if overpaid.

As acknowledged, e-payment links the customers on the one hand and service providers and paying institutions on the other hand. Technological sophistications and demands, as well as customers' and service providers' expectations are high. In other words, the e-payment system must be trustworthy, totally error-free, and must avoid any administrative, logistic and legal encumbrances. In case of any unexpected eventualities, the processes and procedures must be simple and straightforward for customers. Otherwise, the successful implementation of e-payment system will turn into a white elephant. In the case of e-Government, it would be sheer waste of public funds and tax payers' money. Having gone through more than a decade experience, the level of comfort in the introduction and adoption of ICT-driven activities such as e-Commerce and e-banking involving either private or public sector or both in an integrated manner should presumably have risen to higher level of comfort and familiarity of technology. At least in the private sector, transactions the country has reached some level of trust, familiarity, technological capability and maturity, given the prolific growth rate registered in the uptake usage of Internet and mobile banking (Ebrahim and Irani, 2005). In the similar vein, when the Government introduce e-payment modes the expectations of citizens are very high (Donnelly and McGuirk, 2003; Nair and Kuppasamy, 2005).

The participation or involvement of the private sector in any Government endeavours these days is imperative to help the nation to remain competitive (Sarji, 1993; John et al, 2005). The pressure to improve the delivery of public services, in terms of cost reduction, timeliness, being citizen-focussed, keeping a high degree of professionalism, unquestionable integrity, high performance work culture, free from corrupt practices, accountability, responsibility and transparency on mismanagement and abuse of power, is heightening (Sarji, 1993; Najib, 2005; Lim, 2009). The old maxim, "The Government knows best" is now history. In fact, the citizens and business community's demand for improved civil service has taken a drastic twist with the advent of the Internet and provision of online services, which significantly transformed the communication, networking and participation at anytime and anywhere (Szeremeta, 2005; Ives, 2006; Moshin and Raha, 2007). Such provisions inherently enhance transparency, delivery of social services and knowledge creation (Szeremeta, 2005). However, in essence, the citizens expect a top-notch service level and quality when public services are increasingly is delivered through new media or new technology (Szeremeta, 2005). However, it must be acknowledged that ICT can only make Government operations more efficient through increasing operations speed, precision, outreach and networking capacity, but does not guarantee a stable state or human development (Nair and Kuppasamy, 2005; Szeremeta, 2005).

What is more crucial is governance and how society is organized. As Szeremeta has succinctly put it, "if citizens do not demand it (e- services), the social institutions of democracy and the market would not change to accommodate a new division of public power and resources or a new framework for the operation of the markets". In this regard, well informed public and wider citizenry participation in the decision making processes, ingrained with civic rights, freedom, accessibility and openness in the public sphere are more important elements in assessing what people really want (Abdul Rahim and John, 2000; Szeremeta, 2005).

Therefore, in the case of provision of e-payment services in the public services, what each citizen looks for, is a pertinent question to be addressed. Going back to the Garner model, most can only access the first three elements – presence, interactions and transactions. Assessing transformations is an issue about "good governance", which bureaucrats like Szeremeta argue that ICT cannot fulfil the gap unless there is an explicit strategic commitment (vision/ strategy/ programme) and institutional or organizational innovation taking root in the process. Acknowledging the complexities, the exercise confined its assessment on e-payment services only to the first three elements of Gartner model. Probes with regard to transformation component are excluded. It requires an "outcome based" research approach involving collation and analysis of information from all quarters, in particular, the service providers, their consumers and representatives from both the industry and academia. It may involve a number of primary probes and surveys, which can be costly and time-consuming. Moreover, the formulation of e-Government programme in the country from the onset did not incorporate the element of "governance" in its formulation and implementation process; rather researchers and academia perceived it as technology or infrastructure-focused, as opposed to being people centric (Maniam & Hazman, 2006). A lesson to be learnt from here is never to allow the research be directed to what it is never intended for. "Mechanisms for participation have to correspond to the realities of the people who are meant to be included in the process. This means that we have to take into consideration the variety of circumstances and contexts within which people live, and make assumptions about their ability to access information and provide feedback" (Esterhuysen, 2005).

The common saying is that “first impression is the lasting impression”. Though it is an old adage, this is quite applicable, even in the case of website or portal development based businesses. If the website does not look professional and if it does not function in an efficient and effective way, as well as being attractive, potential clients may be lost forever. Some of the key elements are considered important in the development of website include:-

- The URL must be short, simple and intuitive;
- Homepages must be easily downloaded so that the users do not wait long to download items;
- The content of pages should be readable, clear in terms of font-size and colour for text and images, and easily comprehensible;
- Some users, being novice or early adopters or less technology savvy, will not appreciate sophisticated computer stuff, such as downloading a software or even scrolling down or clicking a button to go to the link or follow-up sites. Therefore, keep the web design simple and sweet;
- The most important thing in a website is the unique selling point to make the users realize that the site is useful to them and from onset, should be stated on the homepage itself;
- The site should be interactive and should provide the requisite prompt and motivate web browsers to participate it from the outset. It should be linked to “key action points (KAP)”;
- The site should also able to create a desire for more or wanting to visit it again by ensuring adequate depth in the contents;
- Providing immediate contact details such as e-mail addresses and telephone numbers on the homepage will give the site an open feel and add a personal touch, thus increasing user confidence and trust in using the site;
- Providing the credentials is a useful way to build trust in the user;
- The Statement from the management is viewed as important, especially since it provides an opportunity for the surfer to see the business vision and values of the company;
- It is also considered unprofessional, indeed can cause irritation, when users are forced to subscribe or register on the home page. When users do not appreciate such terms, it may turn them away. Therefore, it is crucial for web hosts or developers to take cognizance of ethics involved in user registration;
- Easy navigation is critical. Direct access to various contents and facilities around the website; returning to home page from any page; internal search engine providing fast and efficient access to the content; natural progression in the internal links; avoidance of broken links; graphics accommodated with additional text links to increase the ease of comprehension, visibility and consistency in the navigational links and avoiding use of frames in the web page presentation;
- The content presented on the site should be easy to locate, and the copywriting should be of the highest quality and properly proof-read. Users are generally interested in contents, not the fanciful animations and graphics;

- Information published on the Web should reflect:
 - o *Authority*: Who is responsible for the pages, what are their qualifications and associations, and can this information be verified?
 - o *Currency*: Are the dates when the site was created and last updated clear?
 - o *Coverage*: What is the focus of the site? Are there clear headings to illustrate an outline of the content?
 - o *Objectivity*: Are biases, if any, clearly stated? Are affiliations clear?
 - o *Accuracy*: Are sources of information and factual data clearly listed, and available for cross checking?
- Websites should be as interactive as possible by presenting the contents using text, graphics and animations;
- Graphics, animations and sound when used to provide content should add value to the website rather than reduce performance;
- Providing independent comments about how trustworthy the website is will build trust in the users;
- Contents should be broken up into easily digestible amounts;
- All contents published should be recent and up-to-date;
- Making the site's content available in multiple languages will make the information accessible to a wider audience;
- The site should at best accommodate those with visual and audio disabilities;
- It is important to supply details on terms and conditions on how goods and services are to be delivered and returned, if necessary;
- Information on mode of payment;
- Frequently asked questions provide a site with the ability to quickly introduce a site's content to an unfamiliar user quickly;
- The website should provide a means to engage in a discussion with the business;
- Internet surfers usually search for websites by typing keywords into the search box in search engines and good websites will have such common words;
- On-line banner advertising is a useful promotional tool and there are many services that charge per number of users directed to the site;
- Recommend a friend's facility is essential to promoting a website, as friends or associates may have a similar interest in the site;
- Getting other websites to link to your site can substantially increase the flow of traffic into your site;
- Affiliates' sites may help to boost the ranking of a website with some of the search engines.

3. Research Methodology & Analysis

A total of 113 Government websites which provide e-payments services was randomly selected from the list of 278 e-payment services offered by the Government, as at 17 December 2009 (PEMUDAH, 2009).

Attempts were made to study:

- Web Attributes
 - o Web language
 - o Frequently asked questions
 - o Search facilities
 - o Date of last up-dating
 - o Lag between current data and update
- Web Master Attributes
 - o Web master identified
 - o Web master's e-mails
- E-mails
 - o E-mails for general inquiries
 - o E-mails of key staff
 - o E-mail sent: date and time
 - o E-mail received: data and time
 - o Reaction time in days
- Hyperlinks
 - o Hyperlinks to other websites
- Visitor records
 - o Visitor counter
- Advertisements
 - o On-line ads at the site
- Policy on privacy & indemnity
 - o Statement on policy and indemnity
- Corporate information
 - o Laws and regulations
 - o Circulars
 - o Newsletters / journals
 - o Data / calendar of activities
 - o Organizational structure
 - o Office holder information

- Online Services
 - o Online service provision
 - o Provisional forms and instructional guides
 - o Checking status of offline applications
 - o Complete online services from application to services delivery
 - o Partial online services
 - o Online payments
 - o Mode of payments stated
- Public Participation
 - o Chat rooms
 - o Forums

The sites were analysed in two sections:(a) the attributes of the websites in terms of language used, accuracy of information, updates of the websites and (b) the mode and extent of the provided e-payment services.

Analyses carried out were based on:

- (a) the simple frequency count, used to obtain the proportion or percentage distribution;
- (b) Binomial score. As statistically acknowledged, the binomial probability typically deals with the probability of several successive decisions, each of which has two possible outcomes (www.wikipedia.org, 2010).

In this context, the two possible outcomes are Success or Failure. For simplicity, we shall assign "Success" with code "1" and for "Failure" code "0". That is, responses obtained for each probe were converted to Binomial score. For example, if the website indicates "provided" for FAQ, then it will be coded as "1" and if the answer is "not provided", then the code will be "0". Similar coding was done to other dichotomy in responses. However, four questions have multiple responses, which using an appropriate criterion or cut-off point, the responses were converted into Binomial type, as shown in the Table 1 below.

Table 1: Variable Coding (success or failure)

CATEGORY	VARIABLE STUDIED	"SUCCESS" (assign code "1")	"FAILURE" (assign code "0")
Language options	Web language options	Any two or more languages including Malay coded as "1"	Only one language stated coded as "0"
Date of last posting	Lag between current date and last update	Less than 1 month coded as "1"	More than 1 month coded as "0"
Overall attractiveness of the site	Colour	Very light pastel or light pastel colours coded as "1"	Very strong /radiant or strong radiant colours coded as "0"
Fonts type	Readability	Easily readable/fairly easily readable coded as "1"	Fairly unreadable/ unreadable font coded as "0"
Website navigation	Ease of navigation	Easy to navigate or moderately easy to navigate coded as "1"	Fairly difficult to navigate or difficult to navigate coded as "0"

As such, for each website evaluated, the total scores netted will be in the range:

$$0 \leq x_i \leq n \text{ where,}$$

“n” represents the total number of variables probed. A website will secure a zero rating when all responses are coded as “0”, although this is unlikely to occur. If a website secures code “1” for all categories of probes, then total score will be “n” and in such a case, the services offered is considered the best.

In the example considered in this exercise, the total number of criteria used in the probe is 42, which determines the value of n. With such a methodological procedure, two types of analysis is proposed, one is **absolute ranking** and the other is **relative ranking**. In the case of absolute ranking, the score secured by each e-payment services is measured against the total score, that is, value of “n” which is equal to 42, as mentioned above. This can be expressed in terms of % age. Analogous to school examination grading system, the level of performance of each e-payment services can be assessed using the following criteria (Table 2).

Table 2: Absolute Ranking Assessment Criteria

Score Range (x)	Level of Performance
$x \geq 80$	Distinction
$70 \leq x < 80$	Strong credit
$50 \leq x < 70$	Credit
$25 \leq x < 50$	Pass
$x < 25$	Fail

In the case of relative ranking, the performance of each web-based e-payment service can be assessed by comparing it against the best performing site. This procedure requires ranking of e-payment services offered, from the best performing to the least performing sites, which in turn, can be used to assign scores using Minges Methodology , as outlined below:-

$$y = \left\{ \frac{x_i}{\max \{x_i\}} \right\} \%$$

3.1 Frequency Distribution

Table 3 shows the summary of the e-Government websites analysed. As can be observed from the table, out of 18 attributes analysed, 14 attributes indicated success i.e. the sites have provided the relevant information and facilities to ease the navigation and use of these websites. Table 4 shows that majority of the sites provide online services, either fully or partially (103 agencies or 91.2 %). Table 5 shows the types of online services provided by these agencies. As shown in Table 5, most of the sites are providing forms while very few provides complete online services (44 agencies or 38.9 %). In terms of payment mode, most of these sites allow only online payments through the local banks and not other international financial institutions.

Table 3: Attributes of e-Government websites

No	Items	Success		Failure	
		Number	Percentage	Number	Percentage
1	Web language options	29	25.7	75	66.4
2	Frequently asked questions	90	79.6	23	20.4
3	Search facilities	99	87.6	14	12.4
4	Date of last updating	85	75.2	28	24.8
5	Lag between current data and update	101	89.4	12	10.6
6	Webmaster identified	37	32.7	76	67.3
7	Emails of webmaster	52	46.0	61	54.0
8	Email for general inquiries	88	77.9	25	22.1
9	Emails of staff or key staff	74	65.5	39	34.5
10	Cross-link to other relevant sites	108	95.6	5	4.4
11	Visitor counter	83	73.5	30	26.5
12	Advertisements at the site	84	74.3	29	25.7
13	Statement of policy on privacy and security	87	77.0	25	22.1
14	Laws and regulations	102	90.3	11	9.7
15	Circulars	52	46.0	61	54.0
16	Newsletter/journals	112	99.1	1	0.9
17	Organizational structure	105	92.9	8	7.1
18	Office holder information	110	97.3	3	2.7
TOTAL		113 agencies (100 %)			

Table 4: Online service provision

Online Service	Frequency	Percentage
Yes	103	91.2
No	10	8.8
Total	113	100

Table 5: Types of online services

No	Types of online services	YES (percentage)	NO (percentage)
1	Provision of forms and instructional guidelines	108 (95.6)	5 (4.4)
2	Merely checking of status of offline applications	112 (99.1)	1 (0.9)
3	Complete online services	44 (38.9)	69 (61.1)
4	Partial online services	71 (62.8)	42 (37.2)
5	Online payments	51 (45.1)	62 (54.9)
6	Mode of payments listed	32 (28.3)	81 (71.7)
7	Can the customer pay by any local banks?	46 (40.7)	67 (59.3)
8	Can the customers pay by any international banks?	21 (18.6)	92 (81.4)
9	Can they pay through other modes?	25 (22.1)	88 (77.9)
10	Refund of payment via online is available	1 (0.9)	112 (99.1)
11	If yes, is the duration stated in the websites?	1 (0.9)	112 (99.1)
TOTAL		113 agencies (100 %)	

3.2 Absolute and Relative Benchmarking

Top-14 e-Payment Services

The ranking procedure allowed identifying the top-14 e-payment services, as follows:-

Table 6: Top e-Payment Services

No	Score	Institution
1	33	Ministry of Education
2	33	Selayang Municipal Council
3	32	Property Management Division (JPM)
4	32	Ministry of Information
5	32	Malaysian Palm Oil Board (MPOB)
6	32	Kajang Municipal Council
7	31	Department of Irrigation and Drainage
8	31	Shah Alam City Council
9	31	Sepang Municipal Council
10	30	Department of Workplace Safety and Health
11	30	Department of Director General of Land and Mines
12	30	Ministry of Finance
13	30	Social Security Organization (SOCSO)
14	30	Labuan Municipal

3.3 Absolute Ranking

The absolute ranking analysis showed that no e-payment services secured distinction. Most of the e-payment websites or 66.4 % of the total e-payment services investigated fell under the credit category. Only a total of 14 or 12.4 % of the total e-payment web sites secured strong credit standing. It is also surprising to note that one e-payment web site utterly failed to meet the criteria set for best performance.

Table 7: Absolute Ranking

Absolute Ranking Category	Number	%
A : Distinction (80 and above)	32	28.3
B : Strong Credit (70 to less than 80)	28	24.8
C : Credit (50 to less than 70)	46	40.7
D : Pass (25 to less than 50)	6	5.3
E : Fail (less than 25)	1	0.9
Total	113	100.0

3.4 Relative Ranking

However, relative ranking results showed that 32 e-payment websites or 28.3 % investigated secured distinction. However, most of them, that is, 46 or 40.7 % still fell under the credit category.

Table 8: Relative Ranking

Absolute Ranking Category	Number	%
A : Distinction (80 and above)	0	0.0
B : Strong Credit (70 to less than 80)	14	12.4
C : Credit (50 to less than 70)	75	66.4
D : Pass (25 to less than 50)	23	20.4
E : Fail (less than 25)	1	0.9
Total	113	100.0

Of the 42 variables considered in the analysis, 12 of them are construed as providing direct measures on e-payment transactions, namely:-

- Online service provision
- Provision of forms and instructional guidelines
- Merely checking of status of offline applications
- Complete online services
- Partial online services
- Online payments
- Mode of payments listed
- Whether the customer can pay using any local banks
- Whether the customers can pay using any international banks
- Whether they can pay through other modes
- Availability of online refund
- If yes, is the duration stated in the websites

An absolute ranking analysis was carried to determine which of the e-public services are truly providing e-payment services. The findings are shown in the Table 9.

Table 9: Absolute Ranking

Absolute Ranking Category	Number	%
A : Distinction (80 and above)	9	8.0
B : Strong Credit (70 to less than 80)	12	10.6
C : Credit (50 to less than 70)	34	30.1
D : Pass (25 to less than 50)	54	47.8
E : Fail (less than 25)	4	3.5
Total	113	100.0

The result showed that only 9 websites or 8% of the total websites investigated secured distinction, implying compliance to full-fledged e-payment services. The nine e-payment websites that showed exemplary performance in e-payment services are listed below (Table 10):-

Table 10: Exemplary performance in e-Payment

No	Institution
1	Istana Budaya
2	Board of Quantity Surveyors Malaysia
3	Selayang Municipal Council
4	Property Management Division (JPM)
5	Inland Revenue Board Malaysia (IRB)
6	Open University Malaysia (OUM)
7	Kuala Lumpur City Hall
8	Tenaga Nasional Berhad
9	Companies Commission of Malaysia (SSM)

4. Discussion & Conclusion

The implementation of e-Government in Malaysia has gone on to Stage 3, where complete transactions can be done online and it is known as e-payment services. The overall findings show that the government agencies are sensitive to the needs of the users and thrives to provide quality services online. This can be observed from Table 3, where 14 out of 18 attributes have user friendly and ease-to-use characteristics.

In terms of online services, most of the government agencies, as observed in Table 5, only provide partial online services. They provide online forms and checking of application status only. A handful of agencies provide complete online services i.e. from downloading to submission of forms online and online payment. Also, most of the agencies still rely on local banks and have no link with international financial institutions for overseas payment transactions.

Overall, while the number of websites and agencies providing online services has increased, the quality and extent of services, especially e-payment, is still very much at the infancy stage. The Malaysian e-Government, as judged by the features and facilities provided in the websites, is still very much in the early stages or phases of e-Government development, contrary to much higher placing in other surveys. The websites are very much focused on the agency's need to broadcast information relevant to the public. A user-orientation is not evident as a general feature. This partly explains why the e-Government uptake is still low among Malaysians. There is a serious issue of information paucity and information staleness. Outdated information has become a common caricature of Government websites, where the utility of information in these websites is still seriously in doubt. The responsiveness of the agency to, for example, an email inquiry, is dismal and disturbing. The agency websites have not actively sought to interact and involve their respective constituencies.

In summary, the evolving e-Government requires greater user centricity to propel e-Government to challenge the conventional services delivery, as envisaged in the Public Sector ICT Plan. The increasing info-structural facilities will not see a corresponding rise in e-Government uptake unless the agencies aggressively move beyond the broadcasting stage to interaction and even online transaction. To achieve this, the agencies must become more user-centric in the planning and put in more efforts on the internal front to develop greater e-Government readiness. The public expectation is rising faster than the agencies' ability to reengineer and transform themselves. The evolution of e-Government in Malaysia is not moving in tandem with the expectation of the public. Websites appear to move faster but the back office has yet to undergo major changes in mindset of the people to allow rapid and seamless integration of services across different platforms and agencies. The dream of fully developed e-Government services is still a long way to go, unless there are strong citizenry participation at all levels involving all segments of society, irrespective of cultural and political ties.

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CHAPTER 7

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What is Branding in e-Commerce Context?

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1. Branding and Trade Mark

Branding is nothing new. It began many centuries before the term acquired its modern usage. The Greeks and Romans and others before them used signs, pictures, written words to advertise and sell their goods (Room, 1998).

However, the use of brands has developed considerably, especially in the past two centuries. The Industrial Revolution, which enabled goods to be mass-produced, has tremendous effect on the rapid growth and importance of branding. In both America and Europe, the rapid increase in population, expansion of the railways and construction of new factories brought with them, a keen public demand for a whole new range of products. The sudden increase in the variety and quantity of mass-produced products resulted in the need to distinguish one product from the others. The need to choose a memorable, pronounceable, and in many instances, directly or indirectly descriptive names or trade marks became the more important. This explained the rationale for the original function of brand as an indication of the origin of the goods.

In defining 'brand', the renowned marketing guru Kotler emphasises the importance of brand as a source indicator as well: "A brand is a name, term, sign, symbol, design or combination of these which is used to identify the goods or services of one seller or groups of sellers and to differentiate them from those of competitors." (Kotler, Armstrong, Saunders & Wong, 2002).

Brand and trade mark are not separable. In fact brand advertising presupposes trade marks as trade marks are the tools which enable a producer to readily identify his brand to the consumer. One of the famous jurists and judges of America, Richard Posner, justifies the protection of trade mark on its ability to lower the *search cost* by providing consumers with valuable information about brands and encourage quality control. By search cost it means the time and cost spent in searching to get the right goods with the right quality. To give an illustration: goods X and Y may have the same chemical formula. But this may not make them of equal quality to the most rational consumer. The simple reason is that the consumer may not be interested in the formula as such but in the actual product as manufactured and marketed. The consumer is therefore more willing to pay a premium for greater assurance that the product will be manufactured to the specification of the formula (Lander & Posner, 2003).

It is common knowledge these days, that besides conveying source information, a brand helps to sell the goods. As long ago as in 1927, Frank Schechter postulated that a trade mark's main function was not to designate source but to create and retain custom. In other words, "the mark sells the goods". From that, Schechter concluded that the action against the dilution of a trade mark, and the aim to preserve the selling power of the mark, was the only rational basis of trade mark protection (Schechter, 1926-1927). It is undeniably true that in the past decades, Schechter's views have gained more acceptance (Singapore Trade Marks Act).

And from our experience, we would agree that a trade mark is no longer a simple indicator of origin. In almost all cases, a trade mark or brand is a means of identification and communication of all sorts of rational information and irrational images. To give an illustration, "Nike" is no longer denoting a type of shoes or sneaker alone. It is much more than that. As we know, Nike employed, among others, advertising and celebrity endorsements to transform sneakers into "high-priced fashion goods" (Evans & Wurster, 2000). A senior executive in Coca-Cola is said to have declared that the company could survive the loss of all its plants, capital, staff, and access to raw materials, provided that it kept possession of the Coca-Cola logo (Evans & Wurster, 2000).

2. Branding in a Digital World: Some Preliminary Thoughts

Has the concept of branding changed because of the advent of the digitised age? And how should we do branding in a digitised context?

Marketing strategist, Al Ries thinks that building a brand on the Internet cannot be done by using the traditional brand-building strategies. “On the Internet, you should start the brand-building process by forgetting everything you have learned in the past and asking yourself two questions:

1. What works on Internet?
2. What doesn't work on the Internet?” (Ries & Ries, 2000)

Al Ries takes the view that the Internet is the Internet. It has unique new needs and requirements. It is the business. It is not merely another medium. I understand Al Ries to mean that to be able to survive in an Internet environment or to succeed in an e-Commerce, one has to think about a whole new business model and strategy more than anything else. He uses the example of Barnes & Noble versus Amazon.com. Barnes & Noble may be selling its books over the Internet but it has lost the Internet book war. “If the Internet is a business, putting your name on both your physical store and your website is a serious error”. Al Ries cautions that we should not treat Internet as another medium for selling one's physical products. “If the Internet is going to be a business, then you must start from scratch. You must develop a totally new strategy, a totally new way of doing business, and (most important of all) a totally new name” (Ries & Ries, 2000).

Al Ries may be right. But I suspect not many of us are doing a new business on the Internet. We are probably doing what Barnes and Nobles does i.e. try to sell our physical products over the Net rather than starting a whole new venture like Amazon.com. The principal reason for this state of affairs may be because most Malaysian companies are still dealing with tangible goods.

Nevertheless, Al Ries does not think that the Internet will change the role of the brand name. In fact, he thinks that in the Internet Age, the brand name is much more important than in a “positioning age” (i.e. the 80s) (Ries & Ries, 2000). He reasons: “In pre-Internet days, a brand always had a visual component. While the name was the most important element, the visual also influenced the brand's purchase. The shape of a Coca-Cola bottle, the colors on a box of Kodak film, the typography of an Intel logotype, the look and location of a McDonald's restaurant. The Internet wipes out the visual. To tap into a website, you type in a word. No pictures, no colours, no typography, no look, no location.”

3. Branding in a Digital World: The Good Practices

Here lies the principal difference between e-Commerce and traditional brick- and-mortar business. In an electronic shopping environment, there is no opportunity for physical inspection or touching and feeling of the goods offered for sale over the Net. There is marked reduction in, or complete absence of, physical interaction between the potential purchasers and the product or service providers. In a context whereby the qualities and benefits of the products or services are going to be imparted or captured in a way that can be communicated over the Internet, the brand name may become the determining factor in influencing purchasing choices. As one author puts it, “in a crowded Internet marketplace, the role of the brand has reasserted itself. A unique brand name has an important role to play as a keyword in the search process” (Rowley, Online Branding).

3.1 The Number One Rule: Brand Name Must not be a Common Name

According to a director of Interbrand UK, the brand name is arguably the most important element of the branding mix, but “not all names have been developed to travel” (Hart & Murphy, 1998). In fact, she coined the term “the brand name spectrum” to describe the various types of names. At one end of the spectrum is the “descriptive name” and at the end of the spectrum is the “freestanding name”. Descriptive name, as its name suggests, is descriptive of the services and goods, and it is the least desirable to function as a brand. Freestanding marks, such as KODAK and EXXON, are totally meaningless and they are the strongest marks. In between these two extremes are the “associative name” – name which is suggestive of descriptive of the goods or services to which it will be applied.

As a starting point, if possible an e-brand should consist of a freestanding or invented name or word. There is a legal basis for this advice as well. In fact, the Malaysian Trade Marks Act 1976 and many trade mark legislations of the world, clearly prohibit the registration of trade mark which is descriptive in nature. Thus, whether creating an e-brand or any traditional brand, one should try to avoid generic or descriptive words. Asians, individuals and companies alike, tend, when developing new brand names, to seek descriptive or auspicious words or names as their brand names, without knowing that this is the taboo of trade mark law.

The criteria of strong brand name must be:-

- Distinctive – it should distinguish the product or service concerned.
- Appropriate – it should support the market positioning of the new product or service – or at least should not conflict with this.
- Appealing – it should help to stimulate interest in the new product or service and motivate trial.
- Linguistically acceptable – it should be free from inappropriate meanings in all the countries where it will be used. This is particularly important since the Internet is of global reach.
- Legally protectable – it should be available for use, register and protect in all countries of interest.

3.2 Trade Mark Clearance Search

Before investing in a trade mark or brand, it is crucial to do a clearance search. A conventional trade mark search involves getting the trade mark lawyers to conduct a detailed legal availability searches in the trade mark offices of the countries of interest. However, in an e-Commerce context, this is complicated by the fact that the Internet is accessible everywhere in the world. Thus, potentially the scope of searches is worldwide. This is not feasible as the cost can be prohibitive and it may be too time-consuming. The next best alternative is to ensure that there will be no legal impediment in the most critical markets. To determine whether a proposed mark or brand is available in a country, your trade mark legal advisor will conduct a search of the records kept at the trade mark offices to ascertain whether there are identical or confusing similar marks filed or registered by third parties. As a rule of thumb, if the goods or services are identical and the marks are identical or very similar, your trade mark counsel will in all probability reject the proposed mark or brand. On the other hand, where the goods or services are completely unrelated and the marks are distinguishable, your counsel will generally approve the mark.

In short, trade mark clearance search is an indispensable part of the brand name development process. The cost and complexity of a multi-country search programme can be high and therefore it is sensible to undertake the searches on a sequential basis, with the searches to be conducted first on the priority countries.

3.3 Protection of Brand Name through Legal Avenues

Under all common law jurisdictions which includes Malaysia, rights in an unregistered trade mark are recognised under the legal principle of passing off. Courts have long ruled that nobody has the right to represent his goods (or services) as the goods (or services) of someone else. The essence of the principle of passing off is not to grant an automatic monopoly over a brand or a mark but to protect the goodwill generated by the use of a brand or a mark in the course of the business of a trader.

In order for the brand owner to succeed in a passing off claim against the infringer, the brand owner is obliged to show that it has used the brand or mark in Malaysia. In this connection, the case of *Abercrombie & Fitch Co. & Anor v. Fashion Factory Outlet KL Sdn Bhd & Ors* (4 MLJ 127, 2008; 7 CLJ 413, 2008) has clearly established that sale of goods bearing a trade mark over the Internet or via a website is recognised as a use of the trade mark.

However, passing off actions are tedious and complex. A heavy burden is placed on the brand owner to prove that his mark does enjoy the requisite level of reputation and goodwill. Therefore, it is always advisable for brand owners to obtain proper trade mark registration.

3.4 Registration of Trade Mark

A trade mark registration is a statutory recognition granted by the Trade Marks Act, 1976, giving the registered proprietor the exclusive right to use the trade mark in relation to those goods or services registered.

Apart from the exclusive right to use the trade mark, registering a trade mark also brings the following benefits:-

- (1) easier enforcement;
- (2) use is not prerequisite (but may be cancelled for non-use within 3 years from the date of registration);
- (3) cost effective; and

In terms of enforcement of a registered trade mark, once a person has obtained a trade mark registration, he can rely on the cause of action of infringement of trade mark to stop the flow of imitation products. There is no need to prove goodwill subsisting in the mark. Further, a trade mark registration may afford its owner the right to claim for summary judgment. Summary judgment is granted in cases where the claims are clear cut and there is no need to go for a costly and lengthy full trial.

4. Building an Online Brand – Some Factors to Consider

Besides choosing to stay as near as possible to the “freestanding” end of the brand name spectrum in selecting and subsequently registering it as a registered trade mark, brand managers need to take into account the following factors in building an on-line brand:-

- (i) the consistency of the on-line and off-line brands;
- (ii) brand objectives and message; and
- (iii) building the interaction between the brand and its customers.

4.1 Consistency in Brand Image

In a case where a company has an off-line brand and decides to embark on an online branding initiative (which is the position for most Malaysian companies), it is imperative to maintain a consistent brand image for both fronts. The brand manager needs to identify the core brand image and values communicated offline and ensure that they are consistent with those provided online. The values adopted or embraced by the offline channels should be echoed in online channels. For instance, the offline channels which promote the value of friendliness of staff, relaxed atmosphere, or provide helpful signage, informative help desk, attractive displays and environment should be reflected online, perhaps through friendly tone of voice, simple and uncluttered site design, easy navigation and helpful email contact particulars (Rowley, Online Branding).

4.2 Brand Objectives and Message

Before embarking on the selection process of a brand name, a company needs to ask itself what it intends its mark to develop into. Alternatively, the company may ask what is it that the company wants the brand to do for it. In other words, it needs to set the objectives for its brand. For instance, company may wish to build up its X brand as the most recognised and respected brand in the world for a particular product or service.

In the context of an online branding, some possible objectives may include the following:

- (a) to raise awareness of online and offline services;
- (b) to encourage a higher level of use;
- (c) to enhance the effectiveness of communication between users and the library;
- (d) to encourage more frequent visits to the Website;
- (e) to encourage users to use a wide range of online services;
- (f) to get people to remember the brand mark; and
- (g) to change people’s attitude to the brand (Rowley, Online Branding).

Besides that, a brand name should be selected on its ability to convey or portray a theme or message which the company wishes to communicate to its ultimate customers. This theme or message may represent the personality or core values of the company.

5. Building Interaction between the On-line Brand and its Customers

In online branding, the customer's interactive experience with the brand assumes great importance. As we have said earlier, in an online environment, there is not much opportunity for inspection of the physical product. The experience a consumer has with an online brand is essentially the online process itself. According to a regional brand expert, "each online involvement requires the visitor (potential customer) to actively seek out the brand site. The motivation of the visit reveals the importance of both traditional as well as online media in advertising the presence of online brand sites. But regardless of the motivation, the quality of the involvement, which is fundamental to the brand building effort, has to be positive" (Temporal and Lee, 2001). In fact, this interactive process constitutes one of the distinguishing differences between online and conventional branding. It is a well-known fact that the Internet is the only mass-communication medium that allows for interactivity. Al Ries boldly declares: "[o]n the Internet a brand lives or dies in an interactive era. In the long run, interactivity will define what works on the Internet and what doesn't work. The secret to branding on the Internet is your ability to present your brand in such a way that your customers and prospect can interact with your message" (Ries & Ries, 2000). Al Ries is totally skeptical about transferring the traditional marketing strategy onto the Internet. He is doubtful whether traditional advertisement in the Internet will work at all. "With the Internet, your prospects have total control of what they see, read and hear. Is there any reason to doubt that they won't turn off your advertising message as soon as it starts?"

He further states that "what works in one medium won't necessary work in another." His advice again is to build a new brand designed specifically of the new medium of Internet."

Again, Al Ries may be right here but his advice may not be heeded by local entrepreneurs simply because it is too time-consuming and costly to build up a new brand, not to mention a new business on the Internet. Having said that, local entrepreneurs should take heed of his advice to ensure that their websites contain the crucial element of interactivity. Interactivity in an e-Commerce context may encompass the following:-

- (i) the ability for the customer to type in his instructions and have the site deliver the information he requested in the form he requested it (Ries & Ries, 2000);
- (ii) the ability of the site to furnish additional information based on the customer's original query;
- (iii) the ability to add the customer's own information to the site;
- (iv) the ability of a site to handle complex pricing situations almost instantaneously;
- (v) the ability of the site to perform a variety of tests;
- (vi) the ability of the site to conduct auctions of all types; and
- (vii) the ability of the site to diagnose a situation and suggest remedies.

The online brand owners should also seize upon another unique feature of the interactive nature of the Internet to enhance its business and build up its brand – the ability to elicit and retrieve valuable consumer feedback on a global scale from the Internet. Further, online brand owners may devise and conduct online surveys to better classify their customer base and understand their customers' preferences and needs. Product variety and customisation may present itself as the cutting edge strategy over the traditional brick-and-mortar business model.

The moderns and the post-moderns (who constitute the bulk of the Netizens) are an impatient lot. They want instant gratification and will not spend too much time looking for or experimenting with a website. They are also quick in recognising good websites and are willing to patronize these websites for benefits and convenience which they could not find elsewhere. Any online brand owner who has a digital presence must strive to offer real time value on the Internet as part of their branding activities. Otherwise they will definitely lose the opportunity to interact and develop strong online brand relationships with their prospective customers (Temporal & Lee, 2001).

Needless to say customers nowadays have greater controls over marketing information on the Internet. Customers no longer wait for information to be served but rather explore the Internet to meet their demand. As such, it is imperative that brand owners should design user-friendly layout for their e-Commerce sites. These sites should be flexible enough to cater for the different needs of their prospective customers.

6. The Law of Singularity: Be No. 1 or Be Nothing

According to Al Ries, one of the biggest differences between branding on the Internet and branding in the physical world is that in the physical world, there is always room for a number two brand (Ries & Ries, 2000). For instance, Coca Cola and Pepsi Cola, Exxon and Shell, Nike and Adidas, Hertz and Avis continue to occupy the number one and number two spots respectively for many years. On the Internet however, the Law of Singularity applies and second place is as good as none.

Looking at the Internet search business, it is no doubt that Google is the number one company with more than 66% market share. When compared to the 14.5% market share secured by Yahoo!, there is no doubt that Google has dominated this market segment with a huge lead. One may ask why then Yahoo!, and for that matter Microsoft's Bing, still exists? A plausible answer is because these companies still aim to increase their market shares by controlling key niches which Google has failed to capture.

For example, Yahoo! News is still the most visited news website. Microsoft's Bing search is acting as an intelligent intermediary for shopping, travel reservations, health advice, and local information. These are niches that Google may not be able to fully dominate.

The lesson to learn from the above scenario is that if you are not the leading brand in a particular sector, you can always narrow the focus and find a niche market for yourself.

Coming back to the Malaysian e-market scene, it is believed that there is no single dominant brand on the Internet now. This may be due to the following reasons. First, Malaysia is one of the countries, which is strictest in its online monetary transfer policy. Second, the current broadband penetration rate is still very low, standing at a mere 36.1% of the total population. Nevertheless, in the recent years, the Government has carried out many efforts in raising broadband penetration rate. Further, ever since Bank Negara has eased its control policy, the local e-Commerce sector is slowly growing. Since the e-market is still growing and there is no single dominant brand, this augurs well for all players in the e-market since it simply means that there is a huge potential for growth.

We are, however, not oblivious to the fact that there are several online business sectors that have seen huge competition. For example, online auctioning business is highly competitive with eBay, Lelong.com.my and Mudah vying for the dominant position. The players must equip themselves to be more creative and competitive to capture bigger a market share by among others, formulating and implementing a suitable and effective branding strategy, taking into consideration the peculiarity of the cyberspace which has been outlined above. As companies which occupy the second spot in their respective market shares may find themselves to be worse off as time goes by. Principally, this is due to the diminishing opportunities as the number one leader consolidates its position.

One of the success stories of a creative approach is that of Yahoo! which has seized the opportunity to convert their business model from merely offering search facility to selling products to creating a unique experience with the brand. Besides providing the core service of search facilities, it has decided to become a “full service centre” providing a whole range of advices in relation to shopping, auction, travel and the like. The conversion of selling of products and/or services into service *experiences* is akin to the value added services one received from a brick-and-mortar shop. There is no doubt that this approach will further enhance the brand value by projecting itself to be customer oriented.

7. Brand Protection in the Internet

To have a wonderful brand creation and promotion strategy without the attendant ingredient of brand protection is defeatist in nature. Once a brand thrives and earns a certain degree of recognition among a huge group of target audience, the brand owner must be prepared for brand-abuse or other kinds of unlawful exploitation by unscrupulous traders. In the cyberspace, dishonest traders are always waiting to misappropriate or even hijack the successful brands for their own gains. One of the common examples of such misappropriation is by diverting clientele from the legitimate websites to the counterfeiting websites. The end result is not merely monetary losses but also the unquantifiable and more injurious loss of goodwill, trust and consumer confidence. If these nefarious activities of piracy, counterfeiting, deceit and fraudulent brand-jacking are not nipped at the bud, e-Commerce traders may find their painstakingly built-up brand image greatly tarnished.

7.1 Different Types of Brand Abuses

The advancement in Information Technology such as the convergence of networked communication mediums, broadband and wireless technologies and multipurpose consumer devices has not only created many opportunities and facilities for the society at large and the IT community in particular, it has also facilitated new, unscrupulous business tactics and provided a haven for criminals to perpetrate fraud, deliberately attack and thereby causing tremendous damage on brand owners. With the global reach of the Internet, the scope of damage is no longer restricted to a particular locality but is world-wide in scale.

According to the statistics released by the Malaysia Computer Emergency Response Team (MyCERT), there were a total of 3564 (www.mycert.com.my) incidents related to “denial of service” attack, system intrusion, fraud and forgery related criminal activities. The first 5 months of the year 2010 have already witnessed a total of 2536 cases of criminal activities reported to MyCERT. Undoubtedly, these figures will keep on rising in tandem with the growth of e-Commerce activities in Malaysia.

Apart from the common brand-jacking activities, infringers today are employing different approaches such as cybersquatting, typo-piracy, search engine manipulation, adware, misspelled links and unsolicited email (phishing) to divert potential customers from the real brand owner website. Since these activities are automatically generated by the computer without the need of the infringer's involvement, a single infringer would be able to target an extremely large pool of people. The consequent financial losses and damage to the real brand owners can be colossal.

7.2 Online Monitoring

An expert in cyber surveillance once remarked, "companies operating without intelligence are lying blind – missing opportunities and flirting with potential disaster... Implementation of an effective online monitoring program is the first step to gain control of your brand and capture revenue" (Murray, 2004).

In order to weed out these infringing activities, the brand owner may either wait for stakeholders, such as customers to report incidents of misuse. Alternatively he may scout the Internet to collect information on a proactive basis. The first option may incur less work in the short term but it is not the most effective approach as early detection is crucial to combat brand abuse (Murray, 2004). Therefore, ideally a proactive approach should be adopted as it maximises the chances of nipping abuse in the bud.

Having said that, it does not make sense to spend an extremely high budget to police the Internet, which is technically impossible. As such, the first step is to determine the issues to be addressed and decide where to focus the online monitoring efforts. There are many activities affecting one's brand occurring on the Net. The commonest of them are cybersquatting; domain name misuse such as adoption of a confusingly similar trade mark or name; misrepresentation of brand or logo; piracy; offering of counterfeit goods or services on the Net or diversion of customers. A company may need to prioritise the activities to be weeded and apportion the efforts accordingly. Some companies start with cybersquatting, then work their way through other customer diversion issues. Other companies mobilise all possible resources to combat counterfeiting, focusing primarily on distribution outlets such as auction and e-Commerce sites, allowing other brand issues to wait. However, it is our view that any instances involving misuse of trade mark and trade name should be given top priority. Otherwise, the goodwill and value associated with the brand may be greatly tarnished or quickly diminished over time. Statistics show that companies that implement an effective monitoring program have also gained a competitive advantage over their competitors and at the same time, the proactive approach improves customer loyalty and revenue (Murray, 2004).

7.3 **The Importance of Registration of Trade Mark**

Malaysia adopts the “first to use” principle in determining the proprietorship of a trade mark. Thus any foreign trade mark which is not used in Malaysia is under the threat of being “appropriated” (or “misappropriated”) by a local trader. The case of *Lim Yew Sing v. Hummel International Sports & Leisure A/S* (3 MLJ7, 1996) illustrates this principle. In this case, the Malaysian Court of Appeal held that there is nothing unlawful under the Malaysian Trade Mark regime for a Malaysian trader to become the registered proprietor of a foreign mark used for similar goods provided that the foreign mark has not been used at all in Malaysia. To simplify, “use” in this context refers to the selling or making available of the goods bearing the mark. Thus it is strongly recommended that foreign trade mark owners should quickly register their trade marks in Malaysia to prevent them from being ‘taken’ by a local trader. The cost of registering a trade mark is insignificant compared to the cost of litigation in attempting to wrest back the trade mark from a local trade mark trafficker.

7.4 **Domain Name Dispute**

Further, it is advisable to register any intended domain name as soon as practicable to prevent it being hijacked by unscrupulous trader. In fact, cybersquatting or domain name dispute is a big issue threatening a lot of companies which have not extended their businesses online, or are not running effective monitoring programmes. A quick search on the Kuala Lumpur Regional Centre for Arbitration (KLRC) website showed that KLRC has handled many cybersquatting cases involving some of the world’s famous brands including: Volkswagen Group, Hugo Boss AG, Apple Inc, Nikon (Malaysia) Sdn Bhd, Budget Rent A Car System Inc, Google Inc, Lego Juris A/S, Sime Darby Berhad and FlyFirefly Sdn Bhd. Interestingly, the relevant decisions revealed that the same Malaysian entity has registered both apple.com.my and boss.com.my.

Various enforcement approaches require the brand owner to possess a valid trade mark registration. For example, any complaints made with the Ministry of Domestic Trade, Co-operatives and Consumerism or the Communication and Multimedia Commission in relation to online fraud or related criminal activities will require the brand owner to show that it has properly acquired the rights to the brand or mark. This underscored the importance of securing trade mark registration as expeditiously as possible.

8. Conclusion

e-Commerce is gaining pace in Malaysia. Many companies understand the urgent need to go online and thereby, extending their brands onto the Internet. But in order to excel in cyberspace, brand owners may need to discard their experiences in branding in a brick-and-mortar environment. Instead, they should be prepared for a totally new and different experience on the Internet. A new business model and strategy may be required. Experts have cautioned that it may not be wise to treat the Internet as merely another medium to promote the physical goods or existing services of a trader.

Branding as a marketing tool is definitely relevant in the cyberspace. However, given the lack of physical interaction between the potential customers and the product over the Internet, a whole new set of rules apply to online branding. The key-words are “interactivity” and “experience”. Besides the social and technological aspects, one of the important elements of e-branding is the legal perspective. A good brand presupposes a good trade mark. Therefore, some knowledge of trade mark law and legal protection of name and logo are indispensable. The rule of thumb is to seek registration of trade mark and domain name as soon as possible to prevent trade mark trafficking and cybersquatting. Constant monitoring of potential abuse of brand over the Internet is also an important element of an effective branding exercise.

Online environments are challenging not only because of its size and reach but also because of its interactivity. Brand owners must capitalize on this unique feature of interactivity in building an online brand. At the risk of unnecessary repetition, they must first understand the needs of the users and be flexible and creative in responding to them. Ultimately, it is the Internet users who helped to build up Google’s worldwide dominant position, and not because of Google, Inc.’s efforts *per se*, however creative and farsighted they may be.

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CHAPTER 8

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Symantec Asia Pacific and Japan (APJ) Internet Security Threat Report XV

Symantec Corporation (Malaysia) Sdn Bhd
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About Symantec

Symantec is a global leader in providing security, storage, and systems management solutions to help consumers and organizations secure and manage their information-driven world. Our software and services protect against more risks at more points, more completely and efficiently, enabling confidence wherever information is used or stored.

An important note about these statistics

The statistics discussed in this document are based on attacks against an extensive sample of Symantec customers. The attack activity was detected by the Symantec™ Global Intelligence Network, which includes Symantec Managed Security Services and Symantec DeepSight™ Threat Management System, both of which use automated systems to map the IP address of the attacking system to identify where it is located. However, because attackers frequently use compromised systems situated around the world to launch attacks remotely, the location of the attacking system may differ from the location of the attacker.

Introduction

Symantec has established some of the most comprehensive sources of Internet threat data in the world through the Symantec Global Intelligence Network. More than 240,000 sensors in over 200 countries and territories monitor attack activity through a combination of Symantec products and services such as Symantec DeepSight Threat Management System, Symantec Managed Security Services and Norton™ consumer products, as well as additional third-party data sources.

Symantec also gathers malicious code intelligence from more than 133 million client, server, and gateway systems that have deployed its antivirus products. Additionally, Symantec's distributed honeypot network collects data from around the globe, capturing previously unseen threats and attacks and providing valuable insight into attacker methods.

Spam and phishing data is captured through a variety of sources including: the Symantec Probe Network, a system of more than 5 million decoy accounts; MessageLabs Intelligence, a respected source of data and analysis for messaging security issues, trends and statistics; and other Symantec technologies. Data is collected in more than 86 countries. Over 8 billion email messages, as well as over 1 billion Web requests, are processed per day across 16 data centers. Symantec also gathers phishing information through an extensive antifraud community of enterprises, security vendors and more than 50 million consumers.

These resources give Symantec's analysts unparalleled sources of data with which to identify, analyze, and provide informed commentary on emerging trends in attacks, malicious code activity, phishing, and spam. The result is the Symantec *Internet Security Threat Report*, which gives enterprises and consumers the essential information to effectively secure their systems now and into the future.

In addition to gathering Internet-wide attack data for the Symantec *Global Internet Security Threat Report*, Symantec also gathers and analyzes attack data that is detected by sensors deployed in specific regions. This regional data sheet will discuss notable aspects of malicious activity Symantec has observed in the Asia-Pacific/Japan (APJ) region for 2009. This is designed to provide a balanced view of the trends in the threat activity landscape that Symantec has observed in the APJ region in comparison to global activity.

Highlights

Threat Activity Trends Highlights

- Globally in 2009, United States ranked first for overall malicious activity as measured by Symantec, with 19 percent of the total, while China ranked second worldwide, with 8 percent. In APJ, China ranked first for malicious activity in 2009, with 32 percent of the regional total, which is down from 41 percent in 2008. The United States and China are always likely to rank highly due to population size, number of computer users, and high broadband penetration. China has the most broadband subscribers in the world (significantly more than anywhere else in the APJ region) and malicious activity tends to increase in relation to growth in broadband infrastructure.
- The United States ranked first for originating attacks detected by APJ-based sensors in 2009, accounting for 26 percent of all detected attacks, down from 28 percent in 2008. Globally, the United States also ranked first in 2009 for originating attacks against global targets in 2009, with 23 percent of the worldwide total.
- The most common Web-based attack against users in APJ in 2009 was associated with the MSIE ADODB.Stream Object File Installation Weakness vulnerability, which accounted for 23 percent of the regional total. In 2008, the most common Web-based attack against users in APJ in 2008 was associated with the Adobe® SWF Remote Code Executable Vulnerability, which accounted for 32 percent of the regional total at that time.
- The United States again ranked first for Web-based attacks globally in 2009, accounting for 34 percent of the worldwide total. China ranked second globally in 2009, with 7 percent, which is a decrease from 13 percent in 2008. In the APJ region, although China ranked first for Web-based attacks in 2009, its 37 percent total for this reporting period is a significant decrease from 2008, when it accounted for 79 percent of the total for the APJ region.
- In 2009, Symantec observed an average of 10,440 active bots per day in the APJ region. This is an 11 percent decrease from 2008, when Symantec observed an average of 11,683 active bot-infected computers per day in the region.
- Globally in 2009, China ranked second for bot-infected computers, with 11 percent of the worldwide total. In APJ during this period, China ranked first for bot-infected computers, with 41 percent of the regional total, which represents a double-digit decrease from its 58 percent total in 2008.
- Taipei was the top city in the APJ region for bot-infected computers in 2009, with 19 percent of the total. This is more than double its 9 percent total in 2008, when it also ranked first in the region for bot-infected computers. Taipei also ranked first globally in 2009, accounting for 5 percent of all botinfected computers observed.
- In 2009, Symantec identified 7,402 distinct bot command-and-control servers in the APJ region, of which 36 percent were controlled through IRC channels and 64 percent through HTTP. In 2008, Symantec identified 3,567 distinct bot command-and-control servers in APJ, of which 30 percent were operated through IRC channels and 70 percent through HTTP .
- Globally in 2009, the United States had the most bot command-and-control servers, with 34 percent of the worldwide total observed by Symantec. In the APJ region in 2009, China ranked first for bot command-and-control servers, with 27 percent of the regional total—a slight increase from 24 percent in 2008. As with malicious activity in general, this percentage is most likely due to China being the world's most populous country and that it continues to enjoy high broadband penetration growth rates.

Phishing and Spam Trends Highlights

- In 2009, South Korea hosted the highest percentage of phishing URLs, with 43 percent of the total. This is a substantial increase from 29 percent in 2008, when South Korea ranked second behind China, which decreased to 12 percent in 2009 from 35 percent previously. Of the phishing URLs identified in South Korea in 2009, 91 percent targeted the financial services sector.
- In 2009, 21 percent of all spam detected worldwide originated in the APJ region. Within the region in 2009, India ranked first for originating spam, with 21 percent of the regional total. In 2008, China ranked first, with 22 percent of the regional total. Globally in 2009, India accounted for 4 percent of spam detected and ranked third.

Threat Activity Trends

This section will discuss the following metrics:

- Malicious activity
- Originating attacks
- Web-based attacks by type
- Web-based attacks by region
- Bot-infected computers
- Bot-infected computers by region

Malicious Activity

This metric will assess where the highest amount of malicious activity took place or originated in the APJ region in 2009. To determine this, Symantec has compiled geographical data on numerous malicious activities, including malicious code reports, spam zombies, phishing website hosts, bot-infected computers, and originating attacks. The rankings are determined by calculating the average of the proportion of these malicious activities that originated in each location.

Globally in 2009, United States had the most overall malicious activity as measured by Symantec, with 19 percent of the worldwide total; China ranked second globally, with 8 percent. In APJ, China ranked first for malicious activity in 2009, accounting for 32 percent of the total, down from 41 percent in 2008 (table 1). On a per-category basis within the APJ region, China ranked first in bot-infected computers and originating attacks, while ranking second in malicious code, spam zombies, and phishing hosts.

China is likely to continue to rank first in malicious activity simply because malicious activity tends to increase in relation to growth in broadband infrastructure and China has the most broadband subscribers in the world (and, it should be noted, significantly more than anywhere else in the APJ region)¹. Malicious activity usually affects computers that are connected to high-speed broadband Internet because these connections make attractive targets for attackers. This is because broadband connections typically provide larger bandwidth capacities than other connection types, faster speeds, the potential of constantly connected systems, and more stable connections. Moreover, new or inexperienced users may be unaccustomed to, or unaware of, the increased risk of exposure to malicious attacks from such robust connections and unknowingly allowing inroads for attack.

¹ <http://www.point-topic.com>

The decrease in China's percentage share of malicious activity in 2009 can be explained by the increase in malicious code activity and spam zombies in India during this reporting period. This is because activity in these categories increased in India during this reporting period, as it rose to first rank in both, up from second in 2008. There was also a decrease in spam zombies in China in 2009. Spam zombies in China are expected to decline further in 2010 because of an enhanced domain registration procedure introduced by the China Internet Network Information Center (CNIC) in December 2009². Early observations indicate that the daily volume of spam originating from .cn domains fluctuated around 20 percent after the changes were implemented, down from an average of around 40 percent prior to the changes. This could also affect the number of phishing UR Ls being hosted in China in the future.

Table 1. Malicious activity, APJ

APJ Rank		Global Rank 2009	Region	Percentage		2009 Activity Rank				
2009	2008			2009	2008	Malicious Code	Spam Zombies	Phishing Hosts	Bots	Attack Origin
1	1	2	China	32%	41%	2	2	2	1	1
2	3	5	India	15%	10%	1	1	6	5	6
3	2	14	South Korea	11%	11%	8	4	1	4	3
4	4	11	Taiwan	11%	8%	7	6	3	2	4
5	5	15	Japan	8%	7%	3	8	4	3	2
6	7	21	Thailand	5%	4%	11	5	5	6	8
7	8	20	Vietnam	5%	3%	9	3	12	11	7
8	6	22	Australia	4%	5%	4	11	7	8	5
9	12	32	Indonesia	3%	2%	6	7	8	12	9
10	10	33	Philippines	2%	2%	5	10	9	10	11

Source: Symantec Corporation

India ranked second for malicious activity in the AP J region in 2009, accounting for 15 percent of the total, an increase from 10 percent in 2008. India ranked sixth globally in 2009, with 4 percent of that total. For specific categories of measurement in the region, India increased one rank in malicious code, spam zombies and phishing hosts from 2008, while it dropped one rank in bot activity. As noted above, malicious activity tends to increase in areas experiencing rapid growth in broadband infrastructure and connectivity, and India has experienced significant growth in these areas over the past few years³.

South Korea ranked third for malicious activity in the AP J region in 2009, with 11 percent of the total. This is the same percentage as in 2008, when South Korea ranked second. For specific categories of measurement, South Korea ranked first for phishing hosts, up from second 2008. It ranked slightly less for other categories than in the previous year, although the percentage differences represent typical variances in activity from one reporting period to the next.

² <http://www.symantec.com/connect/blogs/drop-cn-spam>

³ See <http://point-topic.com/dslanalysis.php> and

<http://www.indiabroadband.net/india-broadband-telecom-news/11682-india-register-500-growth-broadband-services-within-5-years.html>

Originating Attacks

This metric discusses the location of originating attacks that are targeting the APJ region. An attack is generally considered to be any malicious activity carried out over a network that has been detected by an intrusion detection system (IDS), intrusion prevention system (IPS) or firewall.

In 2009, the United States ranked first for attacks detected by APJ-based sensors, accounting for 26 percent of all detected attacks in the region—a decrease from 28 percent in 2008 (table 2). Globally in 2009, the United States ranked first for originating attacks against worldwide targets, with 23 percent of that total. As has been the case in previous reporting periods, the proportion of attacks originating in the United States that were detected by APJ-based sensors were similar to Internet-wide attacks originating there, which indicates that attacks from the United States are not targeting the APJ region in particular.

Table 2. Originating attacks targeting APJ

APJ Rank		Region	Percentage		
2009	2008		2009 APJ	2008 APJ	2009 Global
1	1	United States	26%	28%	23%
2	4	Japan	15%	5%	3%
3	2	China	11%	15%	12%
4	3	South Korea	11%	11%	2%
5	5	Australia	6%	4%	2%
6	14	Singapore	4%	2%	<1%
7	11	Taiwan	3%	2%	2%
8	16	India	2%	1%	1%
9	12	France	2%	2%	4%
10	6	United Kingdom	2%	3%	6%

Source: Symantec

Japan ranked second for attack origination in the APJ region in 2009, with 15 percent of the total; this is an increase from 2008, when it ranked fourth with 5 percent of the total. Globally in 2009, Japan accounted for 3 percent of originating attacks. This indicates that attacks originating in Japan are being specifically directed at targets in the APJ region. Previous editions of the Symantec Global Internet Security Threat Report have noted that attacks originating in a location often target the region in which they originate due to proximity, shared language, or similar social and cultural interests⁴. It is also likely that targets within the region are of more interest to attackers based there than are external targets. Japan's increased percentage in attack origin in the region in 2009 is also partly due to the drop in percentage of attacks targeting the region that originated from China during this reporting period.

APJ-targeted attacks originating in China dropped from 15 percent and second rank in 2008 to 11 percent and third rank in 2009. In previous reporting periods, China accounted for a substantially larger proportion of APJ-targeted attacks than attacks directed globally. However, the proportion of APJ-directed attacks originating in China in 2009 was very similar to its percentage for worldwide attacks, indicating that attacks originating in China were not focusing on APJ targets in particular. This would explain its drop in regional percentage and rank in 2009 in this measurement.

⁴ http://eval.symantec.com/mktginfo/enterprise/white_papers/ent-whitepaper_symantec_internet_security_threat_report_v.pdf : p. 11

Web-based Attacks by type

This metric will assess the top distinct Web-based attacks that targeted Web users in the APJ region that originated from compromised legitimate sites, as well as websites that were intentionally developed for malicious purposes. The increasing pervasiveness of Web browser applications along with increasingly common, easily exploited Web browser application security vulnerabilities has resulted in the widespread growth of Web-based threats.

In 2009, the most common Web-based attack targeting the APJ region was related to the Microsoft® Internet Explorer® ADODB.Stream Object File Installation Weakness vulnerability, which accounted for 23 percent of the total (table 3)⁵. This attack was ranked second for Web-based attacks observed globally in 2009, accounting for 18 percent of the worldwide total. It did not rank in the top 10 in the APJ region in 2008. This weakness allows attackers to install malicious files on a vulnerable computer when a user visits a website hosting an exploit. This issue was published on August 23, 2003 and fixes have been available since July 2, 2004.

Table 3. Top Web-based attacks, APJ

Rank	Attack	Percentage
1	MSIE ADODB.Stream Object File Installation Weakness	23%
2	HTTP MSIE7 Uninitialized Memory Code Execution	22%
3	PDF Suspicious File Download	16%
4	HTTP MS MPEG2TuneRequestControl ActiveX Buffer Overload	10%
5	HTTP Adobe SWF Remote Code Execution	7%
6	HTTP MSIE Malformed XML Buffer Overload	4%
7	HTTP MSIE WPAD Spoofing	3%
8	HTTP MS MPEG2TuneRequestControl ActiveX Instantiation	2%
9	MSIE BaoFeng MPS ActiveX Buffer Overload	2%
10	MSIE Baidu Soba Search Bar ActiveX Buffer Overload	1%

Source: Symantec

The second most common Web-based attack in the APJ region in 2009 was related to the Microsoft Internet Explorer 7 Uninitialized Memory Code Execution vulnerability, which accounted for 22 percent of the regional total⁶. It was the third most common Web-based attack globally in 2009, accounting for 6 percent of the worldwide total. This vulnerability was not ranked in the top Web-based attacks observed in the region in 2008. It was published on February 10, 2009 and fixes have been available since that time. One week later, the issue was being actively exploited in the wild and exploit code was publicly available on February 18, 2009.

The third most common Web-based attack in the APJ region in 2009 was related to malicious PDF download activity⁷, which accounted for 16 percent of the regional total—up from fourth rank and 2 percent in 2008. This attack ranked first globally in 2009, with 49 percent of the worldwide total. This attack consists of attempts by attackers to distribute malicious PDF content to victims through the Web. The attack is not directly related to any specific vulnerability, although the contents of the malicious PDF file would be designed to exploit arbitrary vulnerabilities in applications that are able to process PDFs. Successful attacks could ultimately result in the compromise of the integrity and security of the affected computers. This attack is assumed to be popular due the common use and distribution of PDF documents on the Web, especially because most browsers can be set-up to automatically render a PDF document by default.

⁵ See http://www.symantec.com/business/security_response/attacksignatures/detail.jsp?asid=50031 or <http://www.securityfocus.com/bid/10514>

⁶ See http://www.symantec.com/business/security_response/attacksignatures/detail.jsp?asid=23291 or <http://www.securityfocus.com/bid/33627>

⁷ http://www.symantec.com/business/security_response/attacksignatures/detail.jsp?asid=23153

Web-based attacks by Region

This metric will assess where the most Web-based attacks against users in the APJ region are originating by determining the location of computers from which the attack occurred. Note that the server used for the attack may not necessarily be the same server that the user has visited due to redirection. A user could visit a website that redirects his or her browser to a malicious server in another location.

Globally in 2009, China ranked second for Web-based attacks with 7 percent of the worldwide total. In 2009, China ranked first for Web-based attacks against users in APJ, accounting for 37 percent of the regional total (table 4). This is a significant decrease from the 79 percent recorded in 2008. The main reason for the higher percentage in 2008 was likely due to compromised websites relating to the 2008 Beijing Olympic Games. It is reasonable to assume that the number of attacks from these websites has tapered off since the conclusion of the games and may be a significant factor in the decrease of Web attacks originating from computers in China in 2009.

Table 4. Top Web-based attacks by region, APJ

Overall Rank		Region	Percentage	
APJ	Global		APJ	Global
1	2	China	37%	7%
2	7	India	16%	3%
3	12	Japan	10%	2%
4	15	South Korea	9%	2%
5	16	Taiwan	8%	2%
6	20	Philippines	6%	1%
7	25	Australia	4%	1%
8	26	Indonesia	3%	1%
9	32	Thailand	2%	0%
10	36	Singapore	2%	0%

Source: Symantec

In 2009, India ranked second for Web-based attacks in APJ, with 16 percent of the regional total. This is a significant increase from the previous reporting period, when India accounted for less than 1 percent of Web-based attacks in the region. Globally in 2009, India ranked seventh with 3 percent of the worldwide total. In previous reports, Symantec discussed indications that malicious activity in India was likely to increase substantially as broadband Internet infrastructure and usage grew. This was true in 2009, with India increasing its percentage share in malicious activity across a number of different categories that Symantec measures, including overall malicious activity, spam zombies, phishing URLs, and originating attacks.

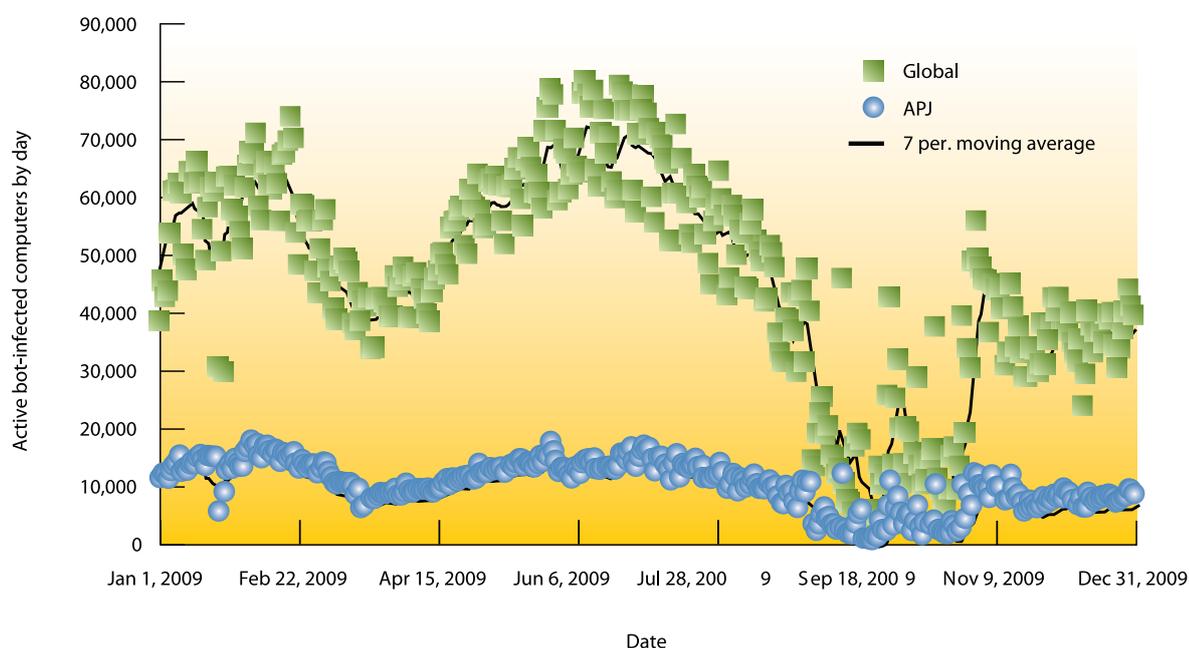
Japan ranked third for Web-based attacks in the APJ region in 2009, with 10 percent of the total. This percentage is similar to 2008, when Japan accounted for 9 percent of Web-based attacks in APJ and ranked second in this metric. The small variance in percentage and large increase of activity in India indicate that Web-based attack activity in Japan remained consistent with 2008, despite the drop in rank.

Bot-infected Computers

A bot-infected computer is considered active on a given day if it carries out at least one attack on that day. This does not have to be continuous; rather, a single such computer can be active on a number of different days.

In 2009, 26 percent of bot-infected computers observed globally were located in the APJ region (figure 1). Symantec observed an average of 10,440 active bots per day in the APJ region. This is an 11 percent decrease from 2008, when Symantec observed an average of 11,683 active bot-infected computers per day in the region.

Figure 1. Active bot-infected computers, APJ and glo



Source: Symantec

Symantec also measures distinct bot-infected computers, which are computers that were active at least once during the reporting period. There were 1,756,793 distinct bot-infected computers recorded in the APJ region in 2009. This is 15 percent less than the 2,075,968 observed in the region in 2008.

It is worth noting that while the global pattern in active bot-infected computers showed considerable variability in 2009, the rate of activity in the APJ region was relatively steady. The global variance was strongly influenced by the activity of the Peacomm Trojan (a.k.a., the Storm botnet)⁸, as well as by the shutdown of two U.S.-based Web hosting companies late in 2008 that were responsible for hosting command-and-control (C&C) servers for a number of major botnets⁹. The latter event likely contributed to the decrease in active bot-infected computers globally in September and November 2009, and would explain the drop in APJ numbers at that time.

⁸ http://www.symantec.com/security_response/writeup.jsp?docid=2007-041314-1900-99

⁹ See http://eval.symantec.com/mktginfo/enterprise/other_resources/b-state_of_spam_report_12-2008.en-us.pdf and http://eval.symantec.com/mktginfo/enterprise/white_papers/b-whitepaper_internet_security_threat_report_xiv_04-2009.en-us.pdf

Bot-infected Computers by Region

Globally, China ranked second for bot-infected computers, with 11 percent of the worldwide total. In 2009, China ranked first for bot-infected computers in the APJ region, accounting for 41 percent of the total, which is a double-digit decrease from 5819 percent in 2008 (table 5). The decrease in percentage in botinfected computers in China is partly due to increases elsewhere in the APJ region, specifically in Taiwan and Japan, both of which significantly increased their percentages for bot-infected computers in the region in 2009.

Table 5. Bot-infected computers by region, APJ

APJ Rank		Global Rank 2009	Region	Percentage		
2009	2008			2009 APJ	2008 APJ	2009 Global
1	1	2	China	41%	58%	11%
2	2	4	Taiwan	28%	12%	7%
3	5	11	Japan	11%	4%	3%
4	3	16	South Korea	6%	8%	2%
5	4	20	India	4%	5%	1%
6	8	27	Thailand	2%	2%	1%
7	6	28	Singapore	2%	3%	1%
8	7	30	Australia	2%	3%	<1%
9	9	33	Malaysia	1%	2%	<1%
10	10	38	Philippines	1%	1%	<1%

Source: Symantec

Taiwan had the second-highest percentage of bot-infected computers in the APJ region in 2009, with 28 percent of the total. This is a significant increase from 2008, when 12 percent of the region's botinfected computers were in Taiwan. Globally in 2009, Taiwan accounted for 7 percent of the worldwide total. Taipei, Taiwan was again the top city for bot-infected computers in APJ and worldwide in 2009, with 19 percent and 5 percent, respectively.

Taiwan has ranked second in this category for a number of reports. The high bot activity in Taiwan may be due to the high broadband penetration there. Previously, the Symantec Global Internet Security Threat Report attributed this to the increasing levels of fiber-to-the-home/building (FTT H/B) deployment in Taiwan¹⁰. As noted, malicious activity tends to grow with increased broadband capacity and FTT H/B connections currently provide the highest bandwidth capacities over traditional DSL or cable lines.

Japan had the third-highest percentage of bot-infected computers in the APJ region in 2009, with 11 percent of the total. This is an increase from 4 percent in 2008, when Japan ranked fifth in the region. Globally in 2009, Japan had three percent of the total for bot-infected computers. Japan's high rank may also be explained by its advanced Internet infrastructure as well as by the significant deployment of FTT H/B there.

¹⁰ <http://www.ftthcouncil.org/en/newsroom/2010/02/26/g-20-need-to-speed-up-on-fiber-to-the-home>

Phishing and Spam Trends

This section will discuss the following metrics:

- Phishing URLs by region and top targeted sectors
- Originating spam

Phishing URLs By Region And Top Targeted Sectors

This metric assesses where the most phishing URLs are hosted during the reporting period, as well as the sector most frequently targeted in each location. This data is a snapshot in time and does not offer insight into changes in the locations of certain phishing URLs over the course of the reporting period. It should also be noted that the fact that a phishing URL is hosted in a certain area does not necessarily mean that the attacker is located there.

In 2009, South Korea hosted the highest percentage of phishing URLs in the APJ region, with 43 percent of the total (table 6). This is an increase from 29 percent in 2008, when South Korea ranked second behind China in this measurement. Globally, South Korea ranked second in 2009, with 5 percent of the phishing URLs identified, although this was significantly less than the 36 percent total of the top-ranked United States. Of the phishing URLs identified in South Korea in 2009, 91 percent targeted the financial services sector.

Table 6. Top phishing URLs by region and top-targeted sectors

APJ Rank		Global Rank	Region	Percentage		2009 Top Sector Targeted	Percentage of URLs Targeting Sector
2009	2008	2009		2009	2008		
1	2	2	South Korea	43%	29%	Financial services	91%
2	4	17	Japan	12%	9%	Financial services	88%
3	1	18	China	12%	35%	Financial services	37%
4	3	22	Taiwan	8%	10%	Financial services	90%
5	6	24	Thailand	6%	4%	Financial services	88%
6	7	27	India	5%	2%	Financial services	91%
7	5	28	Australia	4%	5%	Financial services	78%
8	11	34	Philippines	3%	1%	Financial services	92%
9	8	36	Indonesia	2%	2%	Financial services	91%
10	9	40	Malaysia	2%	1%	Financial services	86%

Source: Symantec

South Korea's high ranking here is due to it having the highest number of phishing website hosts in the APJ region during this reporting period. South Korea's high ranking may also be due to its extensive broadband infrastructure, which makes an appealing target for attackers looking to host phishing and spam sites. Not only is South Korea one of the most broadband-connected areas globally¹¹, it also has the highest penetration of FTT H/B in the world¹². South Korea's rise is also partly due to the drop in percentage and rank of China in this measurement in 2009.

Japan ranked second for phishing URLs identified in the APJ region in 2009, with 12 percent of the total. This is an increase from 9 percent in 2008, when Japan ranked fourth in the region. Along with being partly due to the decrease in percentage and rank of China in this measurement in 2009, Japan's increased percentage may be because it had the fourth highest percentage of phishing website hosts in the APJ region in 2009.

¹¹ http://www.google.com/publicdata?ds=wb-wdi&met=it_net_user_p2&tidim=true&dl=en&hl=en&q=global+internet+usage#met=it_net_user_p2&tidim=country:USA:KOR:FRA:DEU:ESP:ITA:CAN:GBR&tidim=true

¹² <http://www.ftthcouncil.org/en/newsroom/2010/02/26/g-20-need-to-speed-up-on-fiber-to-the-home>

China ranked third for phishing websites in APJ in 2009, with 12 percent of the regional total. This is a significant decrease from 2008, when China ranked first regionally with 35 percent of the total. One reason for this drop may be that Chinese companies and government organizations last year formed an antiphishing group that may have helped reduce phishing incidents¹³.

The top sector targeted by phishing UR Ls in each of the top 10 locations in the APJ region in 2009 was the financial sector. Globally, financial service organizations were spoofed by 79 percent of all detected phishing URLs in 2009. The motive behind the predominant percentage of phishing is likely financial gain. Phishers typically exploit brands associated with the financial sector because data garnered from phished financial websites is most likely to yield online banking account and login details.

Interestingly, the financial services sector was only targeted by 37 percent of phishing activity in China, significantly less than in any of the other top-ranked countries in the region. In 2008, the most frequently targeted sector in China was ISPs, with 46 percent of the total at that time. ISP accounts can be valuable targets for phishers because people frequently use the same authentication credentials (such as usernames and passwords) for multiple accounts, including email accounts. This information may provide access to other accounts, such as online banking accounts. Phishers actively targeting users in China likely shifted their focus to financial services because it is a more effective tactic to gain financially rewarding information.

Originating Spam

In 2009, 21 percent of all spam detected worldwide originated in the APJ region. Regionally, India ranked first with 21 percent of all spam detected in 2009 (table 7). India's regional share increased substantially from 2008, when it accounted for 12 percent of spam and ranked third. Globally, India accounted for 4 percent of spam detected in 2009 and ranked third.

Table 7. Originating spam, APJ

Overall Rank		Region	Percentage	
APJ	Global		APJ	Global
1	3	India	21%	4%
2	4	South Korea	21%	4%
3	6	China	15%	3%
4	9	Vietnam	13%	3%
5	18	Taiwan	8%	2%
6	20	Thailand	6%	1%
7	24	Japan	5%	1%
8	36	Indonesia	2%	0%
9	40	Australia	2%	0%
10	41	Philippines	2%	0%

Source: Symantec

¹³ <http://news.techworld.com/security/3208909/chinese-virus-makers-end-up-in-jail/>

One reason for India's high percentage of originating spam is that it has recently experienced significant growth in IT infrastructure and broadband penetration¹⁴. Moreover, India's broadband penetration is still expanding to meet its burgeoning economy and large population and it is estimated that India will continue to rise in the rankings for broadband connectivity in the coming future¹⁵.

South Korea ranked second for originating spam in the APJ region in 2009, with 21 percent of the total. This is an increase over 2008, when South Korea had 13 percent of originating spam in the region, and also ranked second at that time.

China ranked third for originating spam the AP J region in 2009, accounting for 15 percent of the total. In 2008, China had the highest percentage of originating spam detected in the region, with 22 percent of the total during that period.

The drop in China's percentage of malicious activity in 2009 was mainly due to a decrease in spam zombies there. China ranked second for spam zombies this reporting period, down from first in 2008. This may decline further in 2010 because of the enhanced domain registration procedure introduced by the China Internet Network Information Center (CNNIC), discussed previously in "Malicious activity." In addition, China's regional percentage share for bots dropped to 41 percent in 2009 from 58 percent in 2008. This likely had an impact on the decrease in spam originating from China over the past year because bots are the primary means for sending spam.

Appendix A—Symantec Best Practices

Symantec encourages all users and administrators to adhere to the following basic security best practices:

Enterprise Best Practices

- Employ defense-in-depth strategies, which emphasize multiple, overlapping, and mutually supportive defensive systems to guard against single-point failures in any specific technology or protection method. This should include the deployment of regularly updated antivirus, firewalls, intrusion detection, and intrusion protection systems on client systems. Using a firewall can also prevent threats that send information back to the attacker from opening a communication channel.
- Administrators should limit privileges on systems for users that do not require such access and they should restrict unauthorized devices, such as external portable hard-drives and other removable media.
- Turn off and remove services that are not needed for normal company network operations.
- Test security regularly to ensure that adequate controls are in place.
- Educate management on security budgeting needs.
- If malicious code or some other threat exploits one or more network services, disable or block access to those services until a patch is applied.

¹⁴ <http://point-topic.com/dslanalysis.php>

¹⁵ <http://www.indiabroadband.net/india-broadband-telecom-news/11682-india-register-500-growth-broadband-services-within-5-years.html>

- Administrators should update antivirus definitions regularly to protect against the high quantity of new malicious code threats and ensure that all desktop, laptop, and server computers are updated with all necessary security patches from their operating system vendor. IDS, IPS, and other behavior-blocking technologies should also be employed to prevent compromise by new threats.
- Always keep patch levels up to date, especially on computers that host public services and applications—such as HTTP, FTP, SMTP, and DNS servers—and that are accessible through a firewall or placed in a DMZ.
- As compromised computers can be a threat to other systems, Symantec recommends that affected enterprises notify their ISPs of any potentially malicious activity.
- Consider implementing network compliance solutions that will help keep infected mobile users out of the network (and disinfect them before rejoining the network).
- Enforce an effective password policy. Ensure that passwords are a mix of letters and numbers, and change them often. Passwords should not consist of words from the dictionary.
- Perform both ingress and egress filtering on all network traffic to ensure that malicious activity and unauthorized communications are not taking place.
- Mail servers should be configured to block email that appears to come from within the company, but that actually originates from external sources.
- Consider using domain-level or email authentication in order to verify the actual origin of an email message to protect against phishers who are spoofing email domains.
- Configure mail servers to block or remove email that contains file attachments that are commonly used to spread viruses, such as .vbs, .bat, .exe, .pif, and .scr files.
- Clicking on links and/or attachments in email messages (or IM messages) may also expose computers to unnecessary risks. Ensure that only applications approved by the organization are deployed on desktop computers.
- Isolate infected computers quickly to prevent the risk of further infection within the organization.
- Train employees to not open attachments unless they are expected and come from a known and trusted source, and to not execute software that is downloaded from the Internet unless it has been scanned for viruses.
- Perform a forensic analysis and restore the computers using trusted media.
- Ensure that emergency response procedures are in place. This includes having a backup-and-restore solution in place in order to restore lost or compromised data in the event of successful attack or catastrophic data loss.
- Be aware that security risks may be automatically installed on computers with the installation of filesharing programs, free downloads, and freeware and shareware versions of software.
- Employ Web-server log monitoring to track if and when complete downloads of company websites, logos, and images are occurring, as this may indicate that someone is attempting to use the legitimate website to create an illegitimate website for phishing.
- Network administrators should review Web proxy logs to determine if any users have visited known blacklisted sites.

Consumer Best Practices

- Use an Internet security solution that combines antivirus, firewall, intrusion detection, and vulnerability management for maximum protection against malicious code and other threats.
- Ensure that security patches are up to date and that they are applied to all vulnerable applications in a timely manner.
- Ensure that passwords are a mix of letters and numbers, and change them often. Passwords should not consist of words from the dictionary.
- Never view, open, or execute any email attachment unless the attachment is expected and the purpose of the attachment is known.
- Keep virus definitions updated regularly. By deploying the latest virus definitions, you can protect your computer against the latest viruses known to be spreading in the wild.
- Routinely check to see if your operating system is vulnerable to threats. A free security scan is available through the Symantec Security Check at www.symantec.com/securitycheck.
- Get involved by tracking and reporting attack attempts. With Symantec Security Check's tracing service, users can quickly identify the location of potential hackers and forward the information to the attacker's ISP or local police.
- Deploy an antiphishing solution, such as an antiphishing toolbar for Web browsers. Also, never disclose any confidential personal or financial information unless and until you can confirm that any request for such information is legitimate.
- When conducting higher-risk Internet activities, such as online banking or purchases, consumers should do so only on their own computers and not public ones. Further, they should not store passwords or bankcard numbers.
- Review bank, credit card, and credit information frequently to monitor any irregular activities. For further information, the Internet Crime Complaint Center (IC3) has also released a set of guidelines on how to avoid Internet-related scams. See <http://www.ic3.gov/default.aspx> for more information.
- Be aware that security risks may be automatically installed on computers with the installation of filesharing programs, free downloads, and freeware and shareware versions of software.
- Avoid clicking on links and/or attachments in email or IM messages, as these may also expose computers to unnecessary risks.
- Read end-user license agreements (EULAs) carefully and understand all terms before agreeing to them as some security risks can be installed after an end user has accepted the EULA or because of that acceptance.
- Be aware of programs that flash ads in the user interface. Many spyware programs track how users respond to these ads, and their presence is a red flag. These ads may be spyware.

CHAPTER 9

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The e-Commerce Ecology: Leapfrogging Strategies for Malaysia

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Abstract

Over the last decade, there has been much discussion and debate among industry analysts, policy-makers and researchers on the enabling environment that enhances electronic commerce. In this paper, key blueprints of the e-Commerce ecology and the impact of these blueprints on e-Commerce development will be discussed. This study will take a two-stage approach to map the development of the e-Commerce ecology of Malaysia vis-à-vis other countries. In the first stage (*macro level analysis*), this study will benchmark the developments of the e-Commerce ecologies of Malaysia and other countries. In the second stage (*micro level analysis*), the e-Commerce ecology of rural and urban communities will be benchmarked. The empirical evidence shows that the e-Commerce ecosystem in Malaysia is relatively weaker than that of more advanced countries. The empirical analysis also shows that the pre-conditions for e-Commerce development in rural areas are not in place, hence rural communities do not benefit from the very technology that can raise their socioeconomic well being. Key strategies and policies to strengthen the e-Commerce ecosystem in Malaysia are discussed in the paper.

Keywords : e-Commerce, e-Commerce ecology and rural-urban divide.

1. Introduction

The global economic landscape has transformed rapidly over the last three decades and much of the changes have been powered by the Information and Communication Technology (ICT) revolution. This new medium of communication has allowed people across the globe to decouple the 'space-time' continuum, thus enhancing their reach for information, knowledge, resources and wealth.

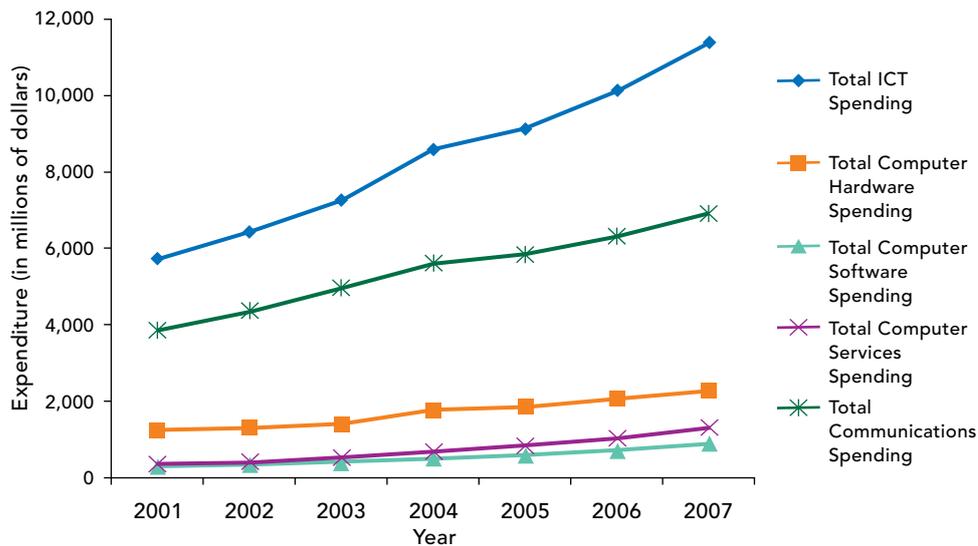
Electronic commerce has opened up new possibilities for people, especially marginalized communities to enhance their economic wealth. Other spill-over benefits of electronic commerce include easy access to products and services anytime and anywhere (Jarvenpaa and Todd, 1996-1997); wider selection of products and services (Alba et al., 1997); ability to test products prior to purchasing, obtain real-time information on prices and product availability (Franz, 2000); ability to make comparison between prices and quality of products (Bhatt and Emdad, 2001); and receive personalized information and customized products & services (Brown, 2000).

While e-Commerce has several benefits to people, these benefits can only be realized if key building-blocks to support e-Commerce activities are in place. Among the key factors that impact e-Commerce development are access to affordable ICT infrastructure such as computers, fast broadband, software and contents (Mercer, 2006 and Clay and Strauss, 2002); availability of online trading services such as credit card and electronic banking (Hawk, 2004 and Hilbert, 2001); regulations to protect consumers who trade online (Tigre and Dedrick, 2004, Keoy et al. (2005), Pavlou, 2006 and Palvia, 2009); Internet security, speed and interoperability (Elahi and Hassanzadeh, 2009); ICT literacy, proficiency in English and availability of contents in local languages (Nair et al. 2009 and Nair 2009).

Malaysia, like all other economies, has introduced a number of policies and strategies to enhance e-Commerce development. In 1996, Malaysia launched the National Information Technology Agenda to increase the use of ICT and e-Commerce across all segments of the economy. Figure 1 shows the ICT spending in Malaysia doubled from 2001 to 2007. While these policy initiatives have been successful in raising the level of ICT use among people in Malaysia, the level of e-Commerce development remains unclear.

The objective this study is two-fold. First, this study will assess the state of Malaysia's e-Commerce ecology. Here, we will benchmark Malaysia's e-Commerce ecology with that of other developing and developed countries. Secondly, this study will also examine the state of the rural and urban e-Commerce ecologies. The study will examine the key factors that encourage and hinder e-Commerce development in Malaysia.

Figure 1: ICT Spending in Malaysia



Note: Data Source from WITSA (2006). The 2007 data is a forecasted value.

This paper is structured as follows. In Section 2, a brief review of the key policies to enhance e-Commerce in Malaysia is examined. In Section 3, the methodology for this study will be outlined. In Section 4, key macro and micro patterns of e-Commerce development will be studied. In Section 5, key findings of the study will be discussed and policies to help Malaysia catch up with more developed economies, in terms of e-Commerce development. In this section, strategies to close the divide in the rural and urban e-Commerce ecosystems in Malaysia will be discussed. In Section 6, concluding remarks are given.

2. ICT and e-Commerce Policies in Malaysia

Malaysia under the leadership of the former Prime Minister, Dr. Mahathir Mohamad embarked on a visionary plan to transform Malaysia into an information driven and knowledge-based society by the year 2020 (also known as Vision 2020). A key feature of Vision 2020 is connecting the population to the global community using the global information highway. In 1996, the Multimedia Super Corridor (MSC) initiative was introduced. The MSC initiative was the biggest ICT-based infrastructure project developed at a cost of RM76 billion (US\$1=RM3.54). The MSC plan was envisioned to be a platform for leading technology-based organizations to relocate to Malaysia, in order to help the nation develop customized next-generation multimedia technologies; spur innovation and enhance economic wealth via e-Commerce.

The MSC was also an important catalyst for changing the mindset of Malaysians; especially rural communities with regards to using ICT as a means of improving their quality of life. To help the various communities increase economic wealth in the digital economy, a number of policies were introduced from 1990s up to 2010. Among them include the introduction of the national broadband policy for the systematic deployment and operationalisation of broadband across the country. Further greater access to ICT infrastructure was provided to rural and remote areas within the country under the 7th, 8th and 9th Malaysia Plans (1995-1999, 2000-2004 and 2005-2009, respectively).

To increase the reach and quality of ICT services, measures were taken to privatize the state-owned telecommunications provider. The telecommunications sector was also opened up for greater competition. The above initiatives were complemented by a five-year strategic plan called MyICMS-886 to coordinate the development of ICT infrastructure in a world of growing technological integration and convergence between the Internet, mobile phones and broadcasting. Under this plan, it was envisaged that 60% rural homes will have broadband Internet connectivity by the end of 2010.

To raise the awareness of ICT and wealth creation opportunities in the digital economy, the Malaysian Government stepped up investments in ICT education and training over the last two decades. Under the 8th and 9th Malaysia Plans, the Malaysian Government invested significant resources to connect schools, colleges and universities to the global information network using Very Small Aperture Terminal (VSAT) and wireless loop technology. The *MySchoolNet* portal was introduced, which enabled teachers and students in the rural areas to source educational materials, and create contents for the local education sector. Large financial allocations of the education budget were devoted to intensive training of teachers in the use of multimedia and network-based technologies in the classroom environment. The *Smart School Program* was introduced with the aim of producing ICT-savvy new generation Malaysians. The smart schools were equipped with advanced ICT and multimedia technologies and digital teaching materials. Further, under the Human Resource Development Fund, financial support was made available to encourage the private sector to invest in ICT skills training.

The Malaysian Government also introduced a number of policies and incentive schemes to encourage PC ownership among Malaysians. Among these initiatives include the *One Home One PC*, *PC Gemilang 2* and *PC Mesti Beli* programs. As part of these programs, the Malaysian Government removed sales tax on PCs and related components; granted accelerated capital allowance for PCs and ICT equipment; introduced tax rebate of RM400 for PC purchases; and permitted the purchase of PCs under the Employment Provident Fund (EPF) scheme.

Several ICT awareness programs and publicly funded telecenters were introduced across the country to increase the use of PC and e-Commerce. In 1996, the Gerakan Desa Wawasan was launched to increase ICT awareness among the rural communities. Under this program, the rural communities were provided PCs and training to assist management and administration of villages and the rural communities. The program also encouraged these communities to use the electronic medium to access services, which otherwise were not available in the rural areas. Among the online services that rural and marginalized communities had access to the e-learning, e-government and e-health services. The telecenters, established across the country, continue to play an important role in providing access to ICT services, ICT training and online services for people who are unable to afford these services.

A number of initiatives were introduced to promote B2B electronic transactions. Among them include the TIGeR (Technology, Industry and Government for the e-Economic Revolution), which provides a platform for Malaysian firms to establish linkage with buyers from other countries and provide e-Commerce services to firms in the manufacturing sector. Other online platforms were introduced for the business communities in Malaysia to increase their market reach. Among them include the *Agribazaar* and the *Oilpalmworld.com*. The former was to promote online trading of farm products and the latter an electronic exchange for the palm oil sector.

In summary, a number of plans and programs were introduced by the Malaysian Government in partnership with the private sector to increase e-Commerce to all segments of the population. These initiatives include improvement of the ICT infrastructure; implementation of ICT awareness programs, ICT education & training programs; and incentive schemes to encourage ownership of PCs and access to online services. While there is a number of initiatives to increase e-Commerce in the country, the level of e-Commerce development vis-à-vis other countries remains unclear. Further, the efficacy of these initiatives in providing rural and marginalized communities access to e-Commerce services is unknown. The objective of this paper is to study the state of e-Commerce development in Malaysia; identify gaps in the e-Commerce ecology; and examine strategies that will enhance e-Commerce development in Malaysia.

3. Methodology

In this section, I will provide an empirical method to measure the e-Commerce ecology. The methodology section is segmented into two sections. First, the methodology to measure the e-Commerce ecosystem in Malaysia and other countries will be provided. Then, the methodology to measure the rural and urban e-Commerce environments in Malaysia will be discussed.

3.1 **Global Benchmarking of e-Commerce Ecologies (macro analysis)**

The new economy is one where the socioeconomic development and global competitiveness are powered by the ICT revolution. In this economy, competitiveness of nations is dependent on their ability to use the digital medium to create value in the economy. The digital medium allows firms and people across the globe to access information, products and services at 'warp speed'. Enterprises and communities can also access financing such as venture capital, angel funds and other financial schemes from global financial markets. Mullaney (2006) states that the online peer-to-peer micro-credit lending community functions as a bank, providing cheaper financing for development.

Countries and communities that understand the underlying structure of the e-Commerce ecology are in a better position to enhance their wealth. In this section, the blueprints of the e-Commerce ecology are examined. In the current framework, we argue that the ecosystem of the new economy entails five factors and they will be discussed below.

One of the key building-blocks of the e-Commerce ecosystem is the ICT infrastructure that facilitates connectivity to the global economy. The telecommunication infrastructure is an important facilitator for speedier, cost-effective and faster integration of the various communities to the global economy. Several studies have shown that ICT is important in generating economic wealth in the several economies (refer to Brynjolfsson and Hitt (1995 and 2000), Nair (2007) and Nair and Shariffadeen (2009)).

Wealth creation in the new economy takes place via two channels – as a sector and as a source of spillover benefits. The emergence of electronic commerce has resulted in new services such as online banking and e-money. e-Commerce has also resulted in several spillover benefits in the form of increasing reach for markets, resources (physical or financial), information and knowledge.

It is widely accepted that people who are ICT savvy tend to use the digital medium to more regular than other to create value for themselves in the form of accessing information, knowledge and purchasing products and services. Thus, ICT literacy is an important factor that impacts the state of development of e-Commerce in any country or community.

In many countries, the push for higher diffusion of e-Commerce comes from the government. For example, in countries such as South Korea and Singapore, the government played a key role in not only promoting ICT awareness, but also championing the cause of e-Commerce as a medium for wealth creation in the new economy. The governments in these countries also played an important in rolling out electronic delivery systems that benefitted a broader segment of the population in the urban and rural areas.

Several studies have also shown that the role of the legal institutions is paramount for the sustained development of e-Commerce. Campos and Nugent (1998), Aaron (2000), and Roderick et al. (2002) suggest that effective institutions such as the regulatory and legislative architecture can lead to higher inflow of FDI and increase return on investment, leading to higher wealth creation opportunities. Well defined and enforced laws relating to electronic transactions, digital signatures and consumer protection can instill greater confidence in the use of e-Commerce as an alternate way of obtaining information, products and services.

In summary, the factors that contribute to the development of the e-Commerce ecology are given in Figure 2. The variables to measure building blocks of the e-Commerce ecology are given in Table 1. The data consists of both hard and survey data. The data was obtained from Dutta and Mia (2010).

Figure 2: Blueprints of the e-Commerce ecology



Table 1: Data description for the blueprints of the e-Commerce ecology

Blueprints		Variable	Description
Cost of ICT	X	Fixed broadband tariffs	Residential monthly fee (PPP \$) 2008
e-Commerce Development	Y	Extent of business internet use	To what extent do companies within your country use the internet for their business activities (e.g., buying and selling goods, for interacting with customers and suppliers)? (1=not at all; 7 = exclusively) 2008-2009 weighted average.
Infostructure	Z11	Secure Internet servers (hard data)	Secure Internet servers per million population 2008
	Z12	Accessibility of digital content	In your country, how accessible is digital content (e.g., text and audiovisual content, software products) via multiple platforms (e.g., fixed-line Internet, wireless Internet, mobile network, satellite, etc.)? (1 = not accessible; 7=widely accessible) 2008-2009 weighted average
	Z13	Internet bandwidth (hard data)	International Internet bandwidth (Mb/s) per 10,000 population 2008 or most recent year available
	Z14	Mobile telephone subscriptions (hard data)	Mobile telephone subscriptions per 100 population 2008
	Z15	Personal computers (hard data)	Personal computers per 100 population 2008 or most recent year available
	Z16	Broadband Internet subscribers (hard data)	Total broadband Internet subscribers per 100 population 2008
	Z17	Internet users (hard data)	Internet users per 100 population 2008
	Z18	Internet access in schools	How would you rate the level of access to the Internet in schools in your country? (1 = very limited; 7 = extensive) 2008-2009 weighted average

Blueprints		Variable	Description
Intellectual Capital	Z21	Tertiary education enrolment	Gross tertiary education enrolment rate 2007 or most (hard data) recent year available
	Z22	Quality of the educational system	How well does the educational system in your country meet the needs of a competitive economy? (1 = not well; 7 = very well) 2008-2009 weighted average
Government Usage	Z31	Government success in ICT promotion	How successful is the government in promoting the use of information and communication technologies in your country? (1 = not successful at all; 7 = extremely successful) 2008-2009 weighted average
	Z32	Government Online Service Index (hard data)	The Government Online Service Index assesses the quality of government's delivery of online services 2009
	Z33	ICT use and government efficiency	To what extent has the use of information and communication technologies by the government improved the efficiency of government services in your country? (1 = no effect; 7 = has generated considerable improvements) 2008-2009 weighted average
	Z34	Presence of ICT in government agencies	To what extent are information and communication technologies used by the government agencies in your country? (1 = not used at all; 7 = highly used) 2008-2009 weighted average
	Z35	e-Participation Index (hard data)	The e-Participation Index assesses the quality, relevance, usefulness of government websites in providing online information, participatory tools, and services to citizens (1 = high and 0 = low) 2009
Government Readiness	Z41	Government prioritization of ICT	How much priority does the government in your country place on information and communication technologies? (1 = weak priority; 7 = high priority) 2008-2009 weighted average
	Z42	Government procurement of advanced technology products	Do government procurement decisions foster technology innovation in your country? (1 = no, not at all; 7 = yes, extremely effectively) 2008-2009 weighted average
	Z43	Importance of ICT to government vision of the future	To what extent does the government have a clear implementation plan for utilizing information and communication technologies to improve your country's overall competitiveness? (1 = no plan; 7 = clear plan) 2008-2009 weighted average
Institutions	Z5	Laws relating to ICT	How would you assess your country's laws relating to the use of information and communication technologies (e.g., electronic commerce, digital signature, consumer protection)? (1 = nonexistent; 7 = well developed) 2008-2009 weighted average

Data source: Dutta and Mia (2010)

To measure the state of e-Commerce ecology for all the countries, the variables were standardized to base 100. Then, the state of the e-Commerce ecology was measured using the following index:

$$Z = \frac{1}{5} \left(\frac{\sum_{i=1}^8 Z_{1i}}{8} + \frac{\sum_{j=1}^2 Z_{2j}}{2} + \frac{\sum_{k=1}^5 Z_{3k}}{5} + \frac{\sum_{l=1}^4 Z_{4l}}{3} + Z_5 \right)$$

Once X, Y and Z were computed for 118 countries, the countries were partitioned into 8 bands. Band 1 represented the countries with lowest cost of broadband, highest e-Commerce development and most developed e-Commerce ecology. On the other hand, countries in Band 8 are countries with the highest broadband cost, lowest e-Commerce development and weakest e-Commerce ecology. Based on the empirical analysis the Malaysian e-Commerce ecosystem will be benchmarked with ecosystems from other countries.

3.2 National Benchmarking of e-Commerce Ecosystems (micro analysis)

In this study to map the Malaysia e-Commerce ecosystem, a survey was conducted, where the level of diffusion for three types of ICTs (personal computers, mobile phones and the Internet) in four rural communities in Malaysia were assessed. The rural communities included in this study were agricultural farms, plantations (rubber and palm oil) and fishing sectors. The locations of the rural communities and type of employment are summarized in Table 2.

Table 2: Types of Rural Communities

Type of Rural Community	Location	Nature of Work
Government Assisted Land Scheme (GALS)	Trolak in Perak and Mempega in Pahang.	Oil palm farming
Privately Operated Plantations (POP)	West and East Carey Island; Bukit Cloh Estates in Jeram; Bukit Talang Estate in Kuala Selangor. All the estates are in the state of Selangor.	Rubber & oil palm farming
Traditional Agriculture Communities (TAC)	Kampung Sungai Limau and Kampung Haji Dorani, Sabak Bernam, Selangor.	Vegetable and fruit farming
Fishing Villages (FV)	Kampung Nelayan and Kampung Bagan in Sabak Bernam, Selangor.	Fishing

Information on the communities were assessed using a structured questionnaire. Information related to personal information (number of household members, monthly household income and information on the ICT items in the homes); demographics of the respondents (year of birth, gender, ethnicity, marital status, education, language proficiency, occupation and monthly personal income); and patterns ICT use.

The survey was administered in the third quarter of 2007 and a total of 552 households were visited and data from 1020 respondents were obtained. A systematic sampling method was used to obtain the households from GALS. In the study a sample of 249 respondents were interviewed. In the case of POP, where there were no maps available, all 192 homes in the location were sampled and 443 respondents completed the questionnaire. In the case of TAC, there were 200 to 300 households in the locations selected, a convenience sampling method was used to obtain 75 homes in the locations and a total of 113 usable questionnaires were obtained. A convenience sampling method was also used to obtain the sample from the locations for FV. A sample of 215 completed questionnaires were obtained. From the sample, 45% were from POP, 24% from GALS, 21% from Fishing Villages (FV) and 11% from the TAC. A summary of the profile of the sample is given in Table 3.

Table 3: Profile of the Sample of the Rural Communities

Type of Communities		GALS	POP	TAC	FV
% of Respondents		24	43	11	21
Gender	Male	38	32	35	45
	Female	62	68	65	55
Ethnicity	Malay	100	3	100	23
	Chinese	0	0	0	77
	Indian	0	97	0	0
	Others	0	0	0	0
Age	18 and below	15	16	18	17
	19 to 30	18	27	15	17
	31 to 40	2	11	12	21
	41 to 50	27	19	19	19
	51 to 55	18	13	9	7
	55 and above	20	14	27	19
Household income	No regular income	22	2	42	37
	RM500 or below	3	24	20	8
	RM501 to RM1300	61	56	30	33
	RM1301 to RM2100	6	12	3	9
	RM2101 to RM2900	5	3	3	7
	RM2900 or more	2	2	3	6
Education level	No school	8	24	16	20
	Primary	44	39	31	41
	Junior high	18	23	18	18
	High school	26	13	32	18
	Higher studies	5	2	4	3
Language proficiency	Malay	100	66	100	74
	English	38	26	38	27
	Chinese	0	0	1	79
	Tamil	0	98	0	1

Using the sample discussed above, the state of the e-Commerce ecology in the four rural communities will be studied. The rural e-Commerce ecologies in the four rural communities will be benchmarked with that of Malaysia and Kuala Lumpur. Factors that hinder the development of the rural e-Commerce ecosystem will be identified using information obtained from the four rural communities.

4. Results

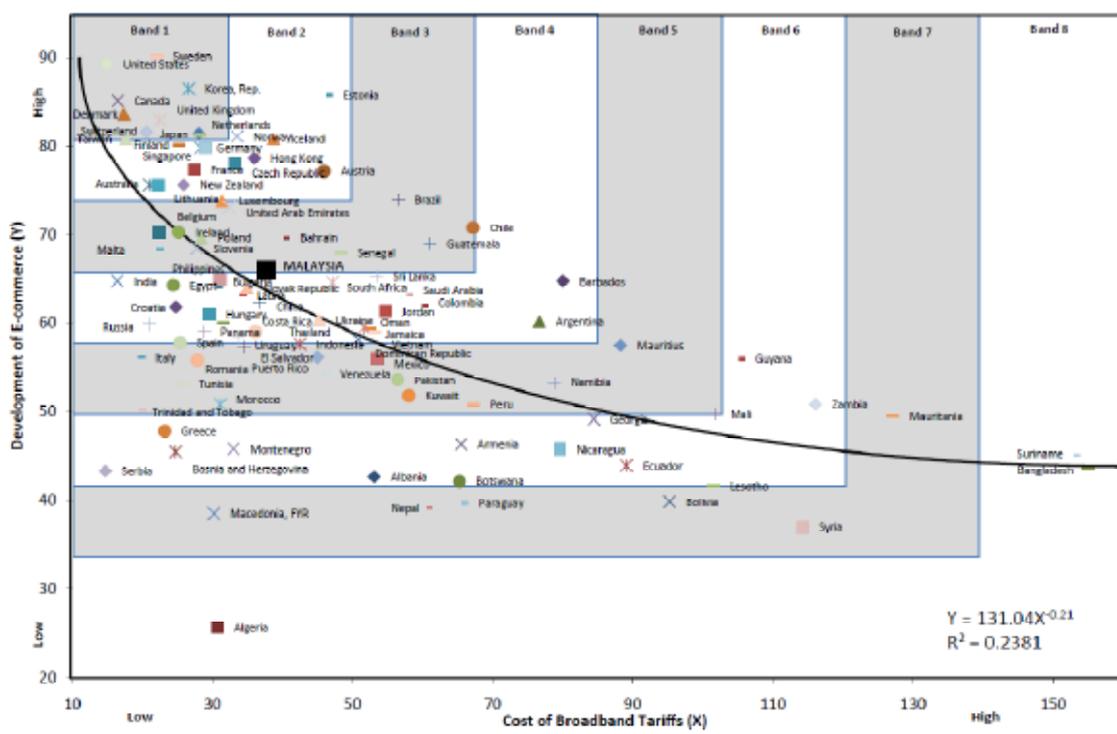
In this section of the paper, the empirical results based on the macro and micro level benchmarking analysis will be discussed. The empirical analysis will identify the gaps in e-Commerce ecology in Malaysia, especially in the rural areas.

4.1 Macro Level Analysis

As highlighted in the previous section, cost of broadband has an important impact on the level of e-Commerce development in countries across the globe. Figure 3 shows the relationship between cost of broadband and e-Commerce development for 118 countries. The empirical evidence suggests that there is an inverse relationship between cost of broadband and e-Commerce development. This implies that countries with low broadband cost have higher e-Commerce development.

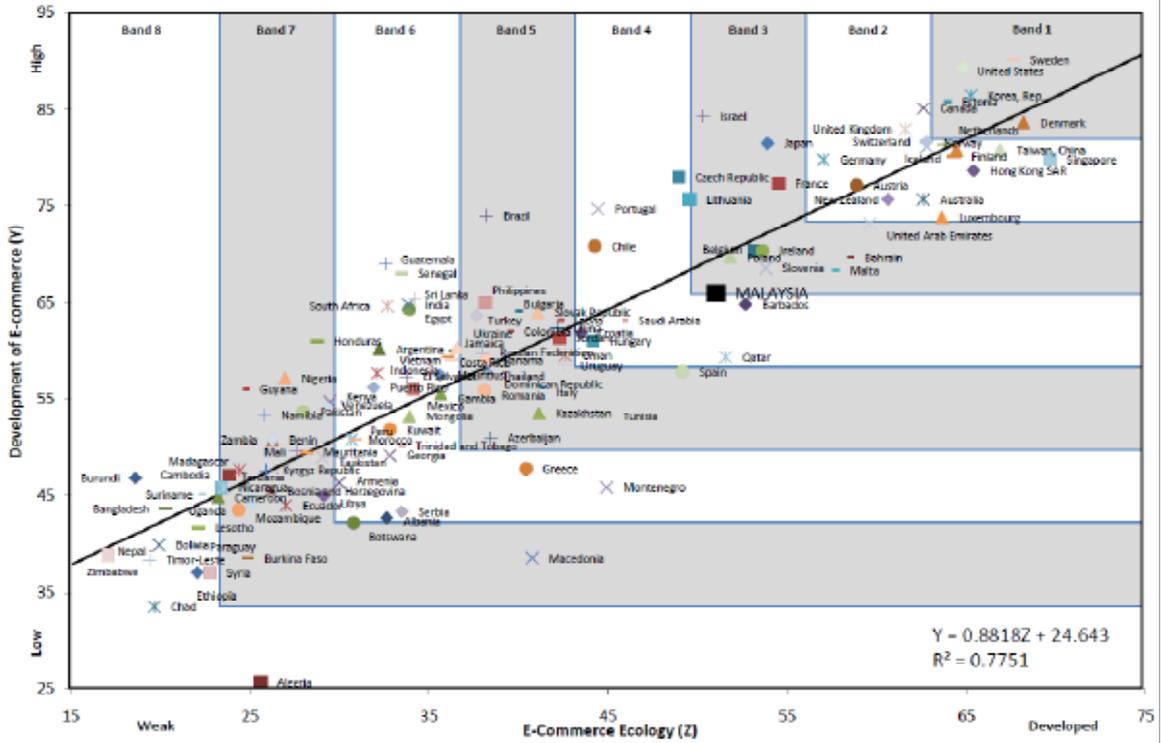
The empirical analysis shows that most developed countries were classified in Band 1. Developing and under-developed countries were clustered into lower bands, where the cost of broadband was high, resulting lower use of e-Commerce in these countries. In this benchmarking study, Malaysia was placed in Band 3. Though Malaysia was regarded as a leading developing country in terms of e-Commerce development, the development was significantly lower than that of more advanced economies.

Figure 3: Cost of broadband and e-Commerce development



The patterns of the e-Commerce ecology for the 118 countries are given in Figure 4. The empirical analysis shows that countries with sound e-Commerce ecology are in a better position to benefit from the wealth generated from e-Commerce activities. The benchmarking analysis shows that Malaysia is one of the leaders in the developing world in terms of development in the e-Commerce ecology and e-Commerce growth. However, the Malaysian e-Commerce ecology is significantly less sophisticated than that in more advanced countries such as Sweden and Korea. This implies that the building-blocks of the Malaysian e-Commerce ecosystem is relative weaker than more developed countries.

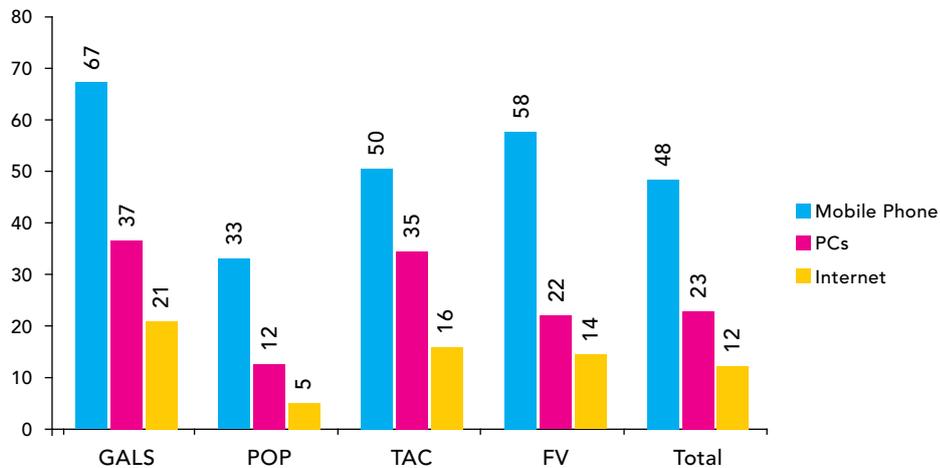
Figure 4: State of e-Commerce ecology and e-Commerce development



4.2 Micro Level Analysis

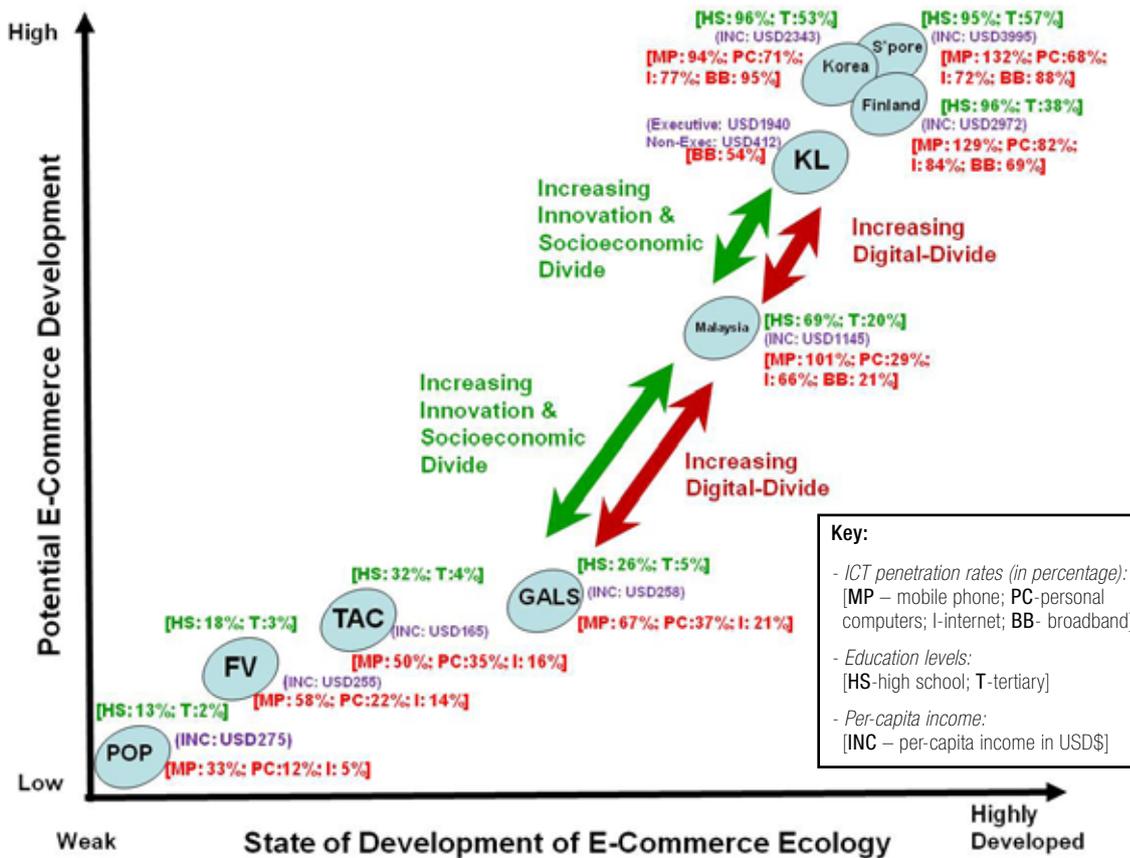
The percentage of rural communities that use the three ICTs in sample study is given in Figure 5. The study shows that mobile phones are the most popular among the three ICTs in all four communities in Malaysia. However, the percentage of use of PCs and the Internet in all four communities were very low. The levels of ICT adoption in these rural areas are significantly lower than that of the national average. The percentage of use of mobile phone, PCs and the Internet across the country are 101%, 29%, 66% and 21%, respectively.

Figure 5: ICT usage in rural communities in Malaysia



The study found that the broadband penetration rate in Kuala Lumpur was 54%, significantly higher than the national average of 21%. This shows the stark realities of the digital-divide problem and uneven development of e-Commerce between the rural and urban communities in Malaysia. The digital-divide has the potential of exacerbating the wealth gap between these communities, as summarized in Figure 6. Increasing gap in employment opportunities and wealth will lead to increasing flow of rural people to the urban areas, leading to 'urban poverty' and related social problems.

Figure 6: Differences in the rural and urban e-Commerce ecologies



Notes: Data for PC penetration rates for Malaysia, Singapore, Finland and Korea are from IMD (2009). Data for mobile phone, Internet ICT penetration rates, education levels and per-capita GDP income for Malaysia, Singapore, Korea and Finland are from <http://data.worldbank.org>. ICT use in Kuala Lumpur was obtained from <http://www.skmm.gov.my>. The income levels for Kuala Lumpur are from Malaysia Employer's Federation (2009a and 2009b)

The study also examined the reasons for the low ICT adoption and e-Commerce development in the rural areas in Malaysia. Respondents were asked reasons for low use of the three ICTs. The results for each of the three ICT are summarized in Figures 7 to 9. The results show that the factors that hinder the use of ICTs and e-Commerce development in rural communities in Malaysia are as follows: high cost of ICT services relative to income levels; don't know how to use ICT; and the ICT services were not relevant to these communities. The latter two factors were a result of low levels of ICT literacy, low proficiency of the English language and relatively fewer online facilities that provide services in the local languages (Malay, Tamil and Chinese).

Figure 7: Reasons for not using PCs among rural communities

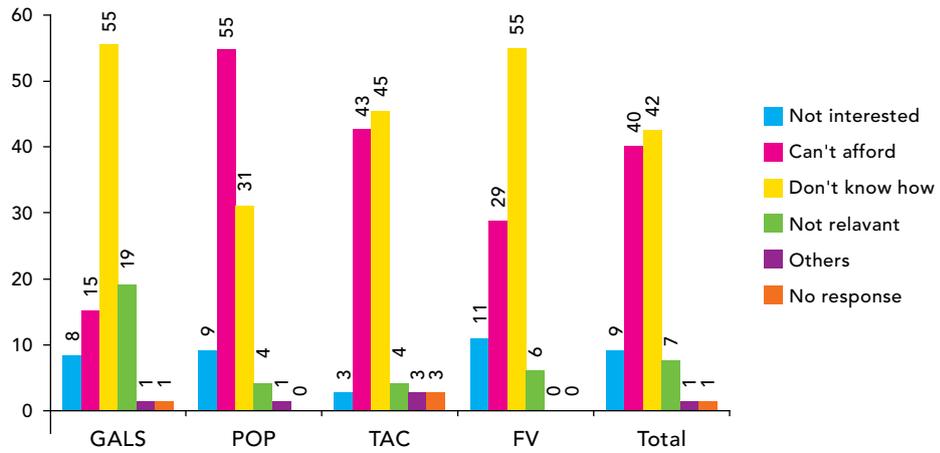


Figure 8: Reasons for not using Internet among rural communities

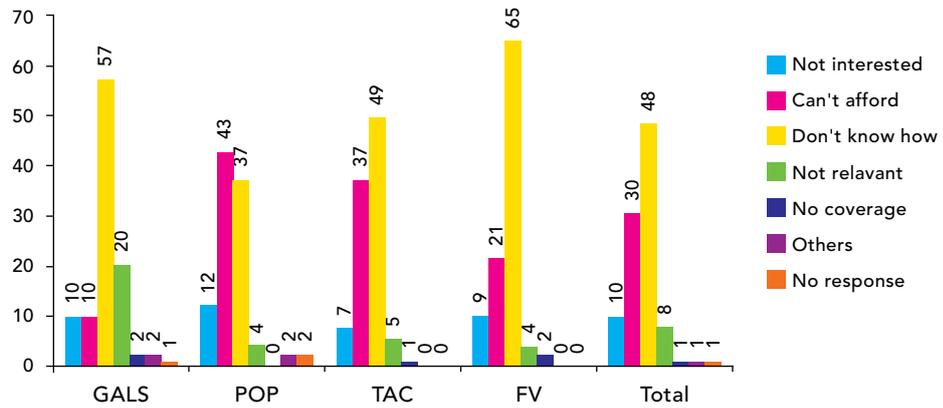
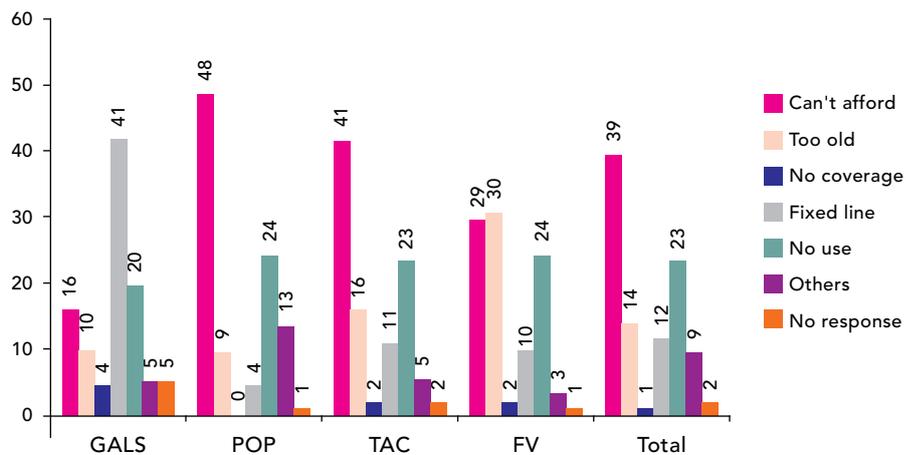


Figure 9: Reasons for not using mobile phones among rural communities



5. Discussion and Policy Implications

The empirical analysis shows that Malaysia has made great progress in enhancing the e-Commerce ecosystem over the years. Based on the macro level analysis, Malaysia is ranked as one of the leading developing countries in terms of e-Commerce development. However, the Malaysian e-Commerce ecology still lags behind the more advanced countries because of the following reasons:-

- ICT infrastructure and info-structure in Malaysia are less developed than the more developed countries;
- slow deployment of broadband and high bandwidths for speedier transmission of information;
- diffusion of computers, Internet, ICT services and online facilities in Malaysia are relatively lower than that in more developed countries, especially in rural areas - hence, the cost of the Internet and other ICT services are relatively higher in Malaysia than in developed countries;
- level of ICT literacy in Malaysia is relatively lower than in more developed economies; and
- concerns with security risks, fraud and illegal access to personal and financial information.

The micro level analysis highlights that while Malaysia as nation has made significant progress in developing a viable e-Commerce ecology. However, the stages of development of the different ecosystems within the country vary. For example, the e-Commerce ecology of a developed city, such as Kuala Lumpur, is similar to that of more developed countries such as Singapore, Korea and Finland.

The empirical analysis also shows that the e-Commerce ecosystems in most communities are relatively weaker than that of more developed cities such as Kuala Lumpur. The trend which raises concerns is that the e-Commerce ecosystems in rural areas are significantly weaker than the ecosystems for the rest of the country. This implies that the very technologies that can bridge the wealth gap between the urban and rural areas are the very technologies that are increasing the economic gap between urban and rural areas. The weaker e-Commerce ecologies in the rural areas are attributed to the following reasons:-

- lack of access to affordable ICT infrastructure (telecommunication services, PC and software) and services;
- low levels of knowledge workers and ICT literacy;
- low levels of English proficiency, compounded with low number of online services in the local languages (Malay, Chinese and Tamil);
- national ICT policy formulation is fragmented, in that there is weak linkage between national, state, local government ICT initiatives – ICT policies and e-Commerce initiatives are not contextualized to meet the needs of the diverse rural communities and efficacy of rural ICT development initiatives are not tracked regularly and benchmarked to global standards;
- weak cooperation among key stakeholders in the rural areas to enhance ICT development and e-Commerce among the rural population; and
- lack of local champions to foster greater use of ICT and e-Commerce in rural areas.

Next, we will discuss the strategies and policies which will facilitate Malaysia to leap-frog from Band 3 to Band 1 in terms of e-Commerce development. To enhance e-Commerce development in Malaysia, a number of major policy initiatives must be in place to address the factors that hinder e-Commerce development. A major factor that hinders e-Commerce development is the slow roll out of the high speed broadband, especially in the rural areas. Low number of users of e-Commerce results in firms providing online services unable to achieve economies of scale and scope.

To increase the use of e-Commerce, national ICT policy must be targeted towards connecting the bottom of 40% of the population, who are poor and residing in the rural areas to the information highway. Greater access to the information highway to poor communities will open up new possibilities for them to use the online medium to access information, knowledge, resource and wealth.

Among the key initiatives to connect people to the information economy include improving the quality of the ICT infrastructure and services in the rural areas, which includes basic and advanced telephone networks, Internet backbone, interconnection and access points. In the cases of remote communities, cost-effective technologies such as satellite and Very Small Aperture Terminal (VSAT) technology can be used to support the Internet connectivity.

Further, new cost effective technology, such as WiFi found in urban hotspot zones, should be considered as a means of providing WiFi-enabled mobile phone services to rural communities. Advanced WiFi mesh can provide good ICT connectivity for people in the rural areas over several kilometers. Hammond (2008) states that an advanced WiFi backhaul can send data up to 100 megabits per second over distances of up to 50 kilometers. Thus, it can be a viable technology to provide firms and communities in rural areas access to e-Commerce services.

Low levels of ICT literacy among rural population in Malaysia reduce the probability of them using e-Commerce facilities, resulting in firms providing e-Commerce services unable to pursue economies of scale. Thus, the primary goal of national ICT policy is to ensure that people from all segments of the population not only have access to affordable e-Commerce facilities, but also adequate skills to use these facilities to improve their quality of life. As mentioned, ICT literacy in rural areas in Malaysia was very low. To overcome this problem, usage of ICT at all levels of education in the rural areas should be intensified. Further, the virtual learning environment should be encouraged to be a gateway for students and teachers in the rural areas in order to foster greater interaction with their peers and educational experts from other parts of the country.

Language is one of the major factors that hinder e-Commerce development in the rural areas. Approximately 2 million pages are added onto the world wide web and more than 85% are in English (Bhatnagar, 2006). Most of these contents in English are not accessible nor is relevant for the rural communities in Malaysia. To overcome the language barrier in using e-Commerce facilities, greater efforts should be in place to encourage the development of contents and web portals in the local languages. There should be greater incentives to encourage the development and use of ICT contents in local languages (Malay, Chinese and Tamil) and user-friendly technologies.

Among the initiatives include tax incentives for firms who develop user-friendly contents in local languages and multimedia technologies, such as the development of voice-recognition tools using local languages (software requiring little use of keyboards). Fiscal incentives (grants) and non-fiscal incentives (patenting & commercialization facilities and support systems) should also be provided to Malaysian enterprises who develop ICT and multimedia technologies that are relevant to the rural agricultural and fishing communities. Subsidies and tax incentives should be given to small enterprises in the rural agricultural and fishing communities, who adopt e-Commerce and new business models which use technology.

Sustainable development of the e-Commerce in rural areas requires careful planning. A 'top-down' approach to e-Commerce development program may render the program exogenous to the communities and in most cases, these exogenous initiatives may not meet the needs of the communities. To ensure national e-Commerce policies are successful, local champions in the communities must be entrusted to help mobilize the local stakeholders (enterprises and non-governmental agencies) to encourage and assist the local communities to use e-Commerce facilities to improve the quality of life. These local champions can be the first port of assistance for rural communities to understand the rules of engagement in the digital environment and key regulations that protect their interest. Awareness of the potential of e-Commerce will enhance rural communities' interest in using e-Commerce to access the resources and markets that are not readily available in their communities.

Gnanih et al. (2006) report that four years after the inception of the e-Bario project, the computers and telecenters were fully utilized, and some of the members in the community had started using the facilities for e-Commerce. The researchers also report that the e-Bedian initiative had not been as fortunate as the e-Bario project, as the ICT awareness remains low. The absence of progress in the e-Bedian project was due to the lack of local champions and lack of appreciation towards the provision of the ICT facilities to the local environment. Based on these two examples, the researchers argue that with any ICT initiative, the community should from the very start play a key role in developing relevant ICT strategies to meet the needs of the local community and the type of ecosystem they wish to establish for their future generation.

6. Concluding Remarks

e-Commerce is the life blood of a digital economy. Weak e-Commerce ecology can hinder nations and communities from increasing the wealth in the new economy. In this paper, we assessed the Malaysian e-Commerce ecology vis-a-vis other developed and developing countries. The macro level analysis showed that there are gaps in the Malaysian e-Commerce ecology. The micro level analysis also showed that rural areas do not have viable e-Commerce ecosystems that assist rural communities to migrate to a high income economy. This study showed that widening gaps in the e-Commerce ecosystems in the rural and urban areas will lead to further increase in the wealth gap between people living in these two locations.

In this paper, several policies to strengthen the Malaysian e-Commerce ecosystem, especially in rural areas were discussed in this paper. In conclusion, societies across the globe are undergoing major transformation at 'warp speed'. These changes are powered by the Internet and digital revolution. Communities must change with the time or face the risk of falling behind in the knowledge society. Policy makers, industry and community leaders should treat the e-Commerce ecology as an important enabler for facilitating Malaysia to leap-frog to a higher stage of socio-economic development.

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CHAPTER 10

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Official Definition of ICT Sector: Concordances and Gaps Viewing from Industry Perspectives

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1. Introduction

This paper attempts to expound the definition of the Information Communications Technology (ICT) sector in the Malaysian context. The definition of ICT seems to differ among policy formulators in the mainstream and industry players. The ICT definition, referred to by the public policy formulators and planners, is guided by the definition promulgated by the Department of Statistics Malaysia (DOSM), which uses the definition formulated by the United Nation Statistical Division (UNSD) but modified to suit local conditions. In particular, the Malaysian Standard Industrial Classification 2008 Version 1.0 (MSIC 2008) was prepared by making due references to the recommendations in the International Standard Industry Classification Revision 4 (ISIC, Rev. 4) of the United Nations.

On the other hand, the definitions used by the consulting or research agencies in the private sector, as well as by the industry representatives like The National ICT Association Malaysia, (popularly, known as PIKOM) are typically market-orientated or suit the clients' needs. Such a discord in definitions assigned by the public and private sectors cause confusion and sometimes, sent wrong signals to the policymakers, development practitioners and investors.

The scope and coverage differ greatly at least for three reasons. Firstly, there are a number of industries that the private sector considers as rightfully belonging to the ICT sector (e.g. call centres) but ISIC Rev.4 or MSIC 2008 classified them elsewhere. Secondly, a number of industrial classifications fail to differentiate the traditional business activities from the new age ones (e.g. traditional book publishing and online book publishing should be a distinct category). Thirdly, a number of new emerging areas have yet to be identified and defined as being an ICT sector (e.g. outsourcing). Such differences need to be sorted out through harmonizing the ICT concepts and definitions so that data users and producers in public and private sectors refer and speak the same language when dealing with ICT matters.

Technically speaking, the private sector should adopt the concepts and definitions promulgated by the public sector. But, the private sector is hesitant to do so simply because they do not understand the nuances and the complexities involved in the formulation of ICT definition. On the other hand, the public sector also fails to do their part in sharing or disseminating the right information to their counterparts. Sometimes, the public sector is also not receptive and responsive to the views from the private sector. At the international level, the involvement of the private sector in the preparation of ISIC is questionable. Taking cognizance of the communication gap, this exercise makes it a point to share pertinent aspects involved in the formulation of ICT definitions in the country, including its historical perspective and evolution as well as gaps and limitations.

2. Historical Perspective

The first Malayan Industrial Classification (MIC) was published in 1957, the year the nation gained its independence from the British colonial powers. This publication was subsequently updated in line with the recommendations made in the United Nations' International Standard Industrial Classification (ISIC), 1959. The update was done to serve two purposes. Firstly, to provide a common framework as a basis for statistical compilations from different sources; thus, facilitating comparisons of data. Secondly, it is to provide a key to the users of statistical series, who need to determine what is included under the various headings (MIC, 1967). More importantly, the classifications included all the industries operating within the country, although the ISIC may entail many more industries that are applicable to other nations. This principle of revision of industrial classification still holds and this series has undergone numerous changes.

The MIC, 1957 was subjected to a major revision in 1967. This revision was carried out to ensure that the Malaysian industry classification was in-line with the International Standard Industrial Classification of All Economic Activities (ISIC) of 1958 as per Statistical Papers, Series M, No.4, Rev. 1 of United Nations. This was followed by another revision in 1972, when MIC 1972 was produced to incorporate recommendations and changes reflected in the ISIC 1968 as per Statistical Papers Series M, No.4, Rev. 2. Since the publication of MIC 1972, numerous changes in terms of policy, structure and institutions took effect in the Malaysian economy. Thus, to reflect the new economic activities, technological advancement and diversification of industries, the country was compelled to bring about MSIC 2000, an update of MIC 1972. As in the previous classifications, the MSIC 2000 conforms closely to the ISIC, Revision 3, published by the United Nations. The country has revised the Malaysian industry classification following the recommendations and guidelines provided in the ISIC Rev 4 of the United Nations, released in December 2006. Indeed, the DOSM, being an active and responsive statistical agency, has positively responded to this call and has prepared the MSIC 2008 Ver.1.0 for implementation in 2010. Like the previous revisions, the latest MSIC is also aimed at gauging the latest economic structure and kinds of economic activity. As being reiterated in the past, the MSIC 2008 is NOT a classification of goods and services or occupations. In complementing the industry classification, the MCPA 2005 (Malaysian Classification of Product by Activity) has been revised based on the Central Product Classification (CPC) Ver 2.0. Together with MSIC 2008 Ver 1.0, these classifications will be implemented in 2010.

3. MSIC 2000 and ICT Definition

In 2000, the definition for the ICT sector adopted by DOSM closely followed the Organization for Economic Cooperation and Development (OECD) 2002. In defining the ICT sector, OECD had adopted both the production and services sectors. The ICT sector, as defined by DOSM then, covered eight Divisions, represented by two-digit codes namely 30, 31, 32, 33, 51, 52, 64 and 72. In the structure and coding system of MSIC 2000 that constituted four hierarchical levels, each *Division* represented by two-digit code occupied the highest position followed by *Group* represented by three-digit codes, which in turn consisted of *Class* represented by four-digit codes. The structure and coding system of the MSIC 2000 was defined, as such that the Division, Group and Class closely conformed to the ISIC Rev. 3 to make them internationally comparable. At the lowest level, the five-digit code provided the description the way each economic activity was organized within the establishments and provided the realistic reflections of the Malaysian ICT sector and its economy (MSIC 2000). Thus, for understanding the dynamics of the ICT sector, Box 1 below provided the two and five digit representations and their descriptions.

Box 1: Elements of ICT in the MSIC 2000 Classification

MSIC 2000 CODE	MSIC 2000 CLASSIFICATION DESCRIPTIONS	CLASSIFICATION SCOPE DETAILS
30	MANUFACTURE OF OFFICE, ACCOUNTING AND COMPUTING MACHINERY	
30001	Manufacture of office and accounting and computing machinery	Includes (a) hectograph or stencil duplicating machines, addressing machines and sheet-fed office type offset printing machines; (b) type-writers and word processing machines (c) photocopying machines (d) calculators, accounting machines, cash registers, postage franking machines and ticket issuing machines (e) other office machinery or equipment that for example, can be used for sort, wrap or count coins, bank note dispensers, pencil sharpeners, stapling and perforating machines. However, it excludes maintenance and repair of office and accounting machines which are classified under Maintenance and Repair of Offices, computing and accounting machinery (Code: 72500).
30002	Manufacture of computers and computer peripherals	Includes printers, readers, plotters, analogue, digital or hybrid automatic data processing machines, scanners, computer diskettes, Compaq discs and other computer peripherals. The classification excludes manufacture of electronic parts under Class 3210, manufacture of electronic games under code 36940 and maintenance and repair of computing.
31	MANUFACTURE OF ELECTRICAL MACHINERY AND APPARATUS n.e.c	
31301	Manufacture of telecommunication cables and wires	Includes manufacture of insulated wire, insulated strip, optical fibre cables made up of individually sheathed fibres.
31302	Manufacture of electric power cables and wires	However, it excludes the manufacture of un-insulated non-ferrous metal (code: 27209) or un-insulated metal cable or insulated cable not capable of being conductor of electricity (code : 28999) or wiring sets classified under code 31900 or optical fibres not individually sheathed (code: 33201).
31309	Manufacture of other insulated wires and cables n.e.c.	

MSIC 2000 CODE	MSIC 2000 CLASSIFICATION DESCRIPTIONS	CLASSIFICATION SCOPE DETAILS
32	MANUFACTURE OF RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS	
32101	Manufacture of semi-conductor devices	<p>Includes diodes, transistors and similar semi-conductor devices, photosensitive semi-conductor devices including photo-voltaic cells, mounted piezo-electric crystals, electronic integrated circuits and micro-assemblies of moulded module, micro-module or similar types.</p> <p>Excludes, manufacture of an assembly consisting of a number of electronic micro-circuits mounted on appropriate carrier or transformers classified under item 31100 or switches under Item 31200.</p>
32102	Manufacture of electronic valves and tubes and printed circuit boards	<p>Includes thermionic, cold cathode or photo-cathode valves or tubes, printed circuits i.e. circuits which are made by forming on an insulating base, by conventional or non-conventional printing process, process, conductor elements, contacts or other printed "passive" elements such as inductances, resistors and capacitors, among others; electrical capacitors or condensers, fixed, variable or adjustable; resistors including rheostats and potentiometers, other than heating resistors.</p> <p>Excludes, as above mentioned for 32101.</p>
32109	Manufacture of other electronic components n.e.c.	<p>Includes electronic display devices except light emitting diodes and other electronic components, n.e.c.</p> <p>Excludes, as above mentioned for 32101.</p>
32200	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraph	<p>Includes manufacture of apparatus for radio broadcasting, television transmission, including relay transmitters and television transmitters for industrial use transmitters-receivers and "facsimile" radio-telegraphic apparatus, television cameras of all kinds, apparatus, for line telephony or line telegraphy (including apparatus for carrier-current line systems), reception apparatus for radio-telephony and radio-telegraphy, telephone sets, automatic and non-automatic switchboards and exchanges, Morse or Morse-type keys, recorders, printer type receivers and picture telegraphic transmitters and receivers.</p> <p>Excludes manufacture of general purpose parts, which are classified in the appropriate item of Division 31 or items of Class 3210.</p>
32300	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	<p>Includes the manufacture of television receivers such as video monitors and projectors, reception apparatus for radio-broadcasting, magnetic tape recorders, and other sound recording generators such as those incorporating a sound reproducing device, video video recording or reproducing apparatus, turntables, record players, cassette players, microphones, loud speakers, headphones, earphones, amplifiers, and specialized parts of the equipment classified in this item (e.g. pick-ups, tone arms, sound heads, tables for turntables, record cutters, aerials, aerial reflectors and aerial rotors).</p>

MSIC 2000 CODE	MSIC 2000 CLASSIFICATION DESCRIPTIONS	CLASSIFICATION SCOPE DETAILS
33	MANUFACTURE OF MEDICAL, PRECISION AND OPTICAL INSTRUMENTS, WATCHES AND CLOCKS	
33120	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	<p>Includes the manufacture of sensitive balances, drawing marking–out or mathematical calculating instrument (e.g. calipers, measuring rods and tapes, micrometers, gauges) , non-optical microscopes, electrical measuring and checking apparatus (e.g. spectrum analysers, oscilloscopes, voltmeters, etc), radiation detectors and counters, apparatus for telecommunications, apparatus for testing vehicle motors, thermostats, pressure controllers, navigational, metrological, geophysical and related instruments, supply meters for water, gas and electricity, machines for testing physical properties of metals, textiles, rubber, wood, plastic, concrete and other materials, instruments for carrying out physical and chemical analyses (e.g. polarimeters, pH-meters, colorimeters, refractometers, etc), and other measuring, checking or testing instruments, apparatus or machines (e.g. hydrometers, thermometers, barometers, manometers, pedometers, revolution counters, taximeters, balancing machines etc), except industrial process control equipment.</p> <p>Excludes, a) manufacture of pumps incorporating measuring devices which is classified under Item 29120; manufacture of pumps, compressors, taps and valves; manufacture of medical and surgical instruments which is classified under Item 33110; manufacture of medical and surgical equipment and orthopaedic appliances; manufacture of industrial process control equipment (Item 33110); manufacture of industrial process control equipment and manufacture of binoculars, monoculars and similar optical devices (Item 33201); manufacture of optical instruments.</p>
33130	Manufacture of industrial process control equipment	<p>Includes manufacture of instruments and apparatus used for automatic continuous measurement and control of variables such as temperatures, pressure, viscosity and the like of the materials or products as they are being manufactured or otherwise processed.</p>
51	WHOLESALE TRADE AND COMMISSION TRADE, EXCEPT FOR MOTOR VEHICLE AND MOTORCYCLES	
51511	Wholesale of telecommunications equipment and accessories	
51512	Wholesale of electrical and electronic components and wiring accessories	
51520	Wholesale of office machinery and business requirements	Not covered in DOSM Census of ICT Services.
51530	Wholesale of computer hardware, software and peripherals	

MSIC 2000 CODE	MSIC 2000 CLASSIFICATION DESCRIPTIONS	CLASSIFICATION SCOPE DETAILS
52	RETAIL TRADE, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES, REPAIR OF PERSONAL AND HOUSEHOLD GOODS	
52360	Retail sale of computers, computer equipment and supplies, non-customized software and printers	
52370	Retail sale of telecommunication	Not covered in DOSM Census of ICT Services.
64	POST AND TELECOMMUNICATIONS.	
		Telecommunication services include transmission of sound, images, data, or other information via cables, broadcasting, relay or satellite. Also includes maintenance of the network.
64201	Telephone services (fixed line, public and cellular)	Includes telegraph and telex communications and facsimile transmission.
64202	Television and radio transmission services	Includes cable television. Excludes production of radio and television programmes, whether or not combined with broadcasting, which is classified in Item 92131 or 92132.
64203	Data communications services (including network operations)	
64204	Paging services	
64205	Other telecommunication services n.e.c.	
72	COMPUTER AND RELATED ACTIVITIES	
72100	Hardware consultancy	Includes consultancy on the type and configuration of hardware with or without associated software application. The consultancy typically involves analyzing the users' needs and problems and presenting the best solution. Excludes , similar activities carried out by units selling computers (Item 30002 Manufacture of computers and computer peripherals or in the appropriate items of Division 51. Wholesale trade and commission trade, except of motor vehicles and motorcycles; the appropriate items of Division 52. Retail trade, except of motor and motor cycles; repair of personal and household goods.

MSIC 2000 CODE	MSIC 2000 CLASSIFICATION DESCRIPTIONS	CLASSIFICATION SCOPE DETAILS
72200	Software consultancy and supply	<p>Includes activities in connection with analysis, design and programming of systems ready for use. This usually involves analyzing the users' needs and problems, consultancy on the most economic solution and producing the necessary software to realize this solution. Also included is the simple writing of programmes following the directives of the users. Specifically, these activities involve development, production, supply and documentation of order-made software based on orders from specific users and easy-order, and ready-made (non-customized) software.</p> <p>Excludes reproduction of non-customized software; (Item 2230 Reproduction of Recorded media); similar activities carried out as integrated part of the reselling of software (Item 52360 Retail sale of computers, computer equipment and supplies, non-customized software and printers); Software consultancy provided in conjunction with hardware consultancy (Item 72100 Hardware Consultancy).</p>
72300	Data processing services	<p>Includes the processing or tabulation of all types of data. This may consist of the complete processing and preparation of reports from data by the customer. It may also be specialized, such as key punching or other input preparation, conversion, such as card to tape etc, optical character recognition etc. The services may be supplied either over-the-counter or via remote access terminals and may employ either the customer's or proprietary program. Also included is the provision of such services on an hourly or time share basis and management and operation of data processing facilities of others on a continuing basis.</p> <p>Excludes renting and leasing of computers and computer related hardware, adding and calculating machines (Item 71230 Renting of Office machines and equipment, including computers); development of computer systems ready to use including programming (Item 72200 Software consultancy and supply); maintenance and repair of computing machines (Item 72500 Maintenance, and repair of office, accounting and computing machines).</p>
72400	Database activities	<p>Includes three types of database activities: i) database development, i.e. assembly of data from one or more sources; ii) data storage, i.e. the preparation of a computer record for such information in a predetermined format; iii) database availability, i.e. the provision of data in a certain order or sequence, by on-line data retrieval or accessibility (computerized management). The data can be of any kind, such as financial, economic, statistical or technical. The data may be accessible to everybody or to limited users and can be sorted on demand.</p> <p>Excludes computerized documentation activities provided by libraries and archives (Item 92310 Library and archives activities).</p>
72500	Maintenance and repair of office, accounting and computing machinery	<p>Includes maintenance and repair of office and accounting machinery and of computers and computer peripheral equipment.</p>
72900	Other computer related activities	

Of the eight Divisions mentioned earlier, the Production Sector uses four codes, namely 30, 31, 32 and 33; the others that are assigned the codes 51, 52, 64 and 72 represent elements of Services Sectors.

On further comparison, the scope of ICT Manufacturing and related services in OECD 2007 differed from OECD 2002 in the following areas:-

- ICT Manufacturing
 - o 3130 - Manufacturing of insulated wire and cable;
 - o 3312 - Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment;
 - o 3313 - Manufacture of industrial process control equipment.
- ICT Services
 - o 6010 - Radio broadcasting;
 - o 6020 - Television programming and broadcasting activities;
 - o 7123 - Renting of office machinery and equipment (including computers).

In line with the migration to MSIC 2008 Ver. 1.0 in 2010, DOSM will follow the definition spelt out in the OECD 2007.

For the sake of analysing the services aspects of the ICT sector, economic activities listed under Item 51 (Wholesale), 64 (Telecommunications) and 72 (Computing) will be considered, excluding 52 (Retail).

4. Evolution of ICT Elements: MIC 1972, MSIC 2000 and MSIC 2008

Box 2 below outlines the elements of ICT in MSIC 2008, MSIC 2000 and MIC 1972. The box outlines the evolution of the ICT sector since 1970, when the development of ICT-related activities was still at its infancy stage. The MSIC 2008 Ver. 1.0 can be used as lens for expounding the historical evolution, in particular, how elements of ICT-related activities started four decades ago in Malaysia over the years, have been shaped to become an important economic sector in the present day.

When the MIC 1972 was fully implemented, the relevant economic activities in the ICT sector were depicted broadly using 12 codes, namely:-

- i) 38250 – Manufacture of office and accounting machinery (*30001*); manufacture of computers and computing peripherals (*30002*) and maintenance and repair of office, accounting and computing machinery (*72500*);
- ii) 38321 – Manufacture of television and radio receivers, sound or video recording, or reproducing apparatus and associated goods (radio and television sets, sound reproducing and recording equipment). In the subsequent revision, these economic activities were not disaggregated and described under the code 32300;
- iii) 38322 – This item included activities such as publishing of recorded media (*22130*); reproduction of recorded media (*22300*); manufacture of television and radio receivers, sound or video recording, or reproducing apparatus and associated goods (gramophones records, and pre-recorded magnetic tapes) (*32300*);

- iv) 38329 – Manufacture of semiconductor devices (*32101*); manufacture of electronic valves and tubes, and printed circuit boards (*32102*); manufacture of other electronic components n.e.c. (*32109*); manufacture of television and radio receivers and apparatus for line telephony and line telegraphy (*32200*); manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods (semi-conductors and other electronic components and communication equipment and apparatus) (*32300*);
- v) 38391 – Manufacture of telecommunication cables and wires (*31301*); manufacture of electric power cables and wires (*31302*); manufacture of other insulated wires and cables n.e.c. (*31309*);
- vi) 38399 – Manufacture of other electrical equipment n.e.c (*31900*). But, this item also contained the manufacture of engines and turbines, except aircraft, vehicle and cycle engines (*29110*);
- vii) 61420 – Wholesale of telecommunication equipment and accessories (*51511*); wholesale of electrical and electronic components and wiring accessories (*51512*); wholesale of computer hardware, software and peripherals (*51530*);
- viii) 62323 – Retail sale of computers, computer equipment and supplies, non-customized software and printers (*52360*).
This industry only involved for reference year 2002 until 2006. Since ICT Services definition in OECD 2002 excluded this code, the DOSM did not cover this industry in the present year.
- ix) 72009 – data communication services (*64203*), other communication services nec (*64209*); paging services (*64204*) and telephone services, public and mobile (*64201*);
- x) 71320 – Other telecommunication services nec (*64209*); Codes referring to 63019 and 71130 representing cargo handling services and rental of air transport equipment are irrelevant to ICT;
- xi) 83230 – Hardware consultancy (*72100*); software consultancy and supply (*72200*) and data processing services (*72300*); database activities (*72400*) and other computer related activities (*72900*);
- xii) 94130 – television and radio transmission services (*64202*); data communications service including network operations (*64203*);

Of the foregoing listing, the first five items, namely Item 38321, 38322, 38329, 38391 and 38399 are pertaining to ICT Production activities while the remaining are in the ICT Services realm, mainly wholesaling, retailing and consultancy. During the MIC 1972 era, the elements of ICT activities were not distinctly defined and sometimes lumped under unassociated items. For example, the retail sale of computers and computer peripherals were placed under a major group, where items such as sale of leather goods, hardware, sports goods, toys, aquarium fishes, pet birds and recreational goods are included. In other words, such “impurities” needed to be eliminated for studying the time series trend development of the ICT sector in the country. The ICT-relevant activity that was subsequently mentioned under MSIC 2000 has been highlighted in italic. Even in MSIC 2000, the ICT sector did not gain explicit recognition with their classification and nomenclature, until MSIC 2008.

Box 2: Evolution of Elements of ICT in MIC 1972, MSIC 2000 and MSIC 2008

Description for ICT Sector, MSIC 2008	MIC 1972(U)	MSIC 2000	ICT Class Nomenclature, MSIC 2000	MSIC 2008 Ver.1.0
Manufacture of diodes, transistors and similar semiconductor devices	38329p	32101p	32- Manufacture of Radio, television and communication	26101
Manufacture of electronic integrated circuits, micro assemblies	38329p	32101p		26102
Manufacture of electrical capacitors and resistors	38329p	32102p		26103
Manufacture of printed circuit boards	38329p	32102p		26104
Manufacture of display components	38329p	32102p		26105
Manufacture of other components for electronic applications	38329p	32109p		26109
Manufacture of communication equipment	38329p	32200p		26300
Manufacture of consumer electronics	38321p, 38322p, 38329p	32300p		26400
Manufacture of computers	38250p	30002p	30- Manufacture of Office, Accounting and Computing machines	26201
Manufacture of peripheral equipment	38250p	30002p		26202
Manufacture of fibre optics cable	38391p	31301p	31- Manufacture of electrical machinery and apparatus n.e.c.	27310
Manufacture of current-carrying and non-current carrying wiring devises for electrical circuits regardless of material	38391p, 38399p	31309		27330
Repair and maintenance of electrical equipment except domestic appliances	38391p	31301p, 31302p, 31309p		33140
Wholesale of computer hardware, software and peripheral	61420p	51530	51- Wholesale trade and commission trade, except for motor vehicle and motor cycles	46510
Wholesale of telephone and communications equipment, cell phones, pagers	61420p	51511		46521
Wholesale of electronic components and wiring accessories	61420p	51512 51599p		46522
Wholesale of office machinery and business equipment, except computers and computer peripheral equipment	61420p	51520p		46591

Description for ICT Sector, MSIC 2008	MIC 1972(U)	MSIC 2000	ICT Class Nomenclature, MSIC 2000	MSIC 2008 Ver.1.0
Retail sale of computers, computer equipment and supplies	62323p	52360p	52- Retail trade, except motor vehicles and motor cycles, repair of persona and household goods	47411
Retail sale of video game consoles and non-customized software	62323p	52360p		47412
Retail sale of telecommunication equipment	62323p	52370		47413
Radio broadcasting	94130p	64202p, 92131	64- Post and telecommunications	60100
Television programming and broadcasting activities	94130p	64202p, 92132p		60200
Wired telecommunication services	72009p	64201p, 64203p		61101
Internet access providers by the operator of the wired infrastructure	72009p	64201p, 64203p		61102
Wireless telecommunication services	72009p	64201p, 64203p, 64204		61201
Internet access providers by the operator of the wireless infrastructure	72009p	64201p, 64203p		61202
Satellite telecommunication services	72009p, 71320p	64209p		61300
Provision of Internet access over networks between the client and the ISP, not owned or controlled ISP	72009p	64203p		61901
Provision of telecommunication services over existing telecom connection	71320p, 72009p	64209p		61902
Telecommunication resellers	71320p, 72009p	64209p		61903
Provision of telecommunication services over existing telecom connections VOIP (Voice Over Internet Protocol) provision	72009p	64203p		61904
Provision of specialized telecommunications applications	71320p, 72009p	64209p		61905
Other telecommunication activities n.e.c.	71320p, 72009p	64209p		61909

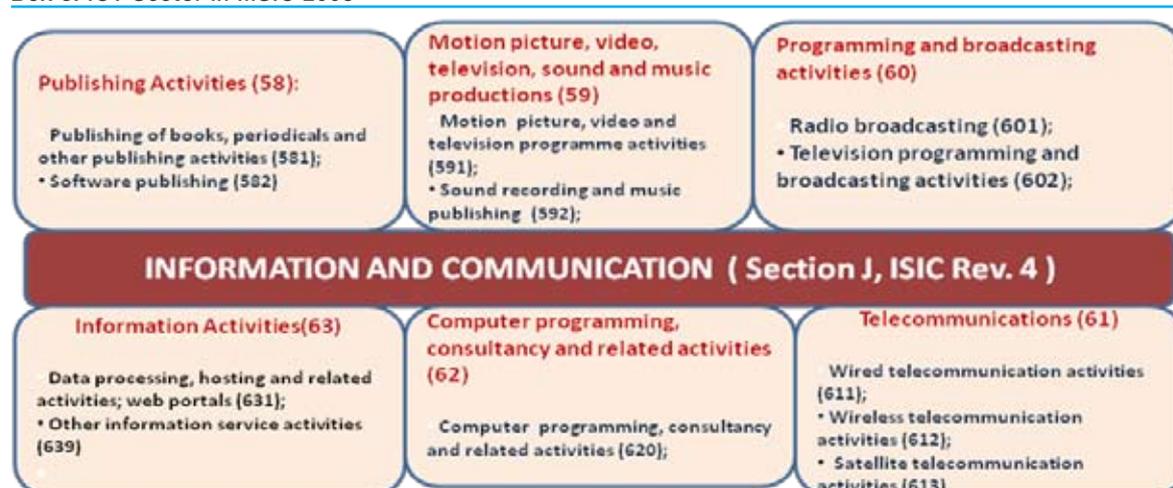
Description for ICT Sector, MSIC 2008	MIC 1972(U)	MSIC 2000	ICT Class Nomenclature, MSIC 2000	MSIC 2008 Ver.1.0
Computer programming activities	83230p	72200p	72- Computer and related activities	62010
Computer consultancy	83230p	72200p		62021
Computer facilities management activities	83230p	72100		62022
Information Communication Technology (ICT) system security	83230p	72900p		62901
Other information technology service activities n.e.c.	83230p	72900p		62099
Activities of providing infrastructure for hosting, data processing services and related activities	83230p	72300p, 72400p		63111
Data processing activities	83230p	72300p, 72400p		63112
Web portals	72009p	64203p		63120

5. Emergence of ICT as a Distinct Sector within the MSIC 2008 and the Missing Links

The ISIC Ver. 4 and MSIC 2008 was the first attempt to define the Information and Communication sector as a distinct sector within the broader industry classification. Such a sector nomenclature and classification was absent in the MSIC 2000 or MIC 1972 classifications. In the past, the ICT industry was subsumed under various divisions of the economy; as such, they were scattered and fragmented. With the introduction of MSIC 2008, as outlined in Box 3, the ICT industries are explicitly defined under six broad divisions, as follows:-

- A. Publishing activities;
- B. Motion pictures, video, television, sound and music production;
- C. Programming and broadcasting activities;
- D. Information activities;
- E. Computer programming, consultancy and related activities;
- F. Telecommunications.

Box 3: ICT Sector in MSIC 2008



However, a close examination of the ICT economic activities defined under the **Information and Communication: Section J, ISIC Rev.4 / MSIC 2008 for Malaysia** showed that a number of economic activities elements of ICT are defined elsewhere, especially viewing from the industry perspective. In this regard, there is a discord between the private and public sectors in the definition of contemporary ICT sector. The scope of contemporary ICT not only entails the traditional technology dimension *per se*, but also as an enabler and driver of Knowledge Base Economy (KBE) and Knowledge Base Society (KBS). As such, the missing components or links in Section J of MSIC 2008 can be broadly grouped under any of the following categories: “digital content development”, “e-Commerce”, “e-learning”, “e-Government, e-Public Services” or “ICT associated R&D and intellectual property”. As it is now, these elements in the MSIC 2008 are either subsumed or considered as integrals of traditional activities; thus there is no distinct differentiation made. In other words, the scope and coverage of Section J needs to be expanded either by allowing insertions of new age ICT categories or sieving the contemporary ICT activities distinctly from the traditional descriptions, where they are being placed now (e.g. separate the online publishing from traditional publishing) and incorporate with Section J, if technically viable. Such distinct classifications are crucial for defining and measuring precisely the contribution of ICT sector in the economy. Currently, it is felt that the contribution of ICT sector is understated, especially the ICT services component.

Recognising the emerging concerns, a closer scrutiny of MSIC 2008 has identified a number of economic activities having the features of contemporary ICT. They are as follows:-

i. Electrical, plumbing and other construction installation activities (Group 432)

Group 432 is classified as "Specialized construction activities (Division 43), which entails specialized activities or special trades, that is, the construction of parts of buildings and civil engineering works, without assuming responsibility for the entire project." Under this group, Class 4321 on "Electrical installation" has three items having elements of ICT, namely:-

- o Telecommunications wiring (43212);
- o Computer network and cable television wiring (43213); and
- o Satellite dishes (43214).

The industry code 43213 also includes the fibre optic activity, which is considered an important infrastructure activity for transmitting high quality digital signals in great volume and speed.

ii. Wholesale trade, except of motor vehicles and motorcycles (Group 46)

Group 46 consists of a wide range of items subjected to either wholesale trade on own account or on a fee, or on a contract or commission basis, related to domestic wholesale trade, as well as international export/import wholesale trade. Among the items listed, the items that have elements of ICT are as follows:-

- o Wholesale of electrical and electronic goods (46496);
- o Wholesale of computer-controlled machine tools (46593);
- o Dismantling of automobiles, computer, televisions and other equipment to obtain and re-sell usable parts (46699).

An examination of Item 46496 at five-digit level, revealed that the electronic goods include wholesale of radio and TV equipment; CD and DVD players and recorders; stereo equipment; video games consoles; digital media players like MP3, MP4 and iPOD; blank audio, video tapes, diskettes, magnetic and optical disks (CDs, DVDs). The lists show that a number of items considered under the Item 46496 are either micro-electronics driven or supporting directly the growth of ICT activities. For the purpose of gauging ICT, the wholesale electrical goods must be differentiated from the electronics goods.

Item 46593 includes wholesale of both computer-controlled machinery for the textile industry and computer-controlled sewing and knitting machines. This category does not suggest that they belong to the ICT category despite having elements of being computer-controlled.

The classification for 46699 excludes dismantling of automobiles, computers, television and other equipment for material recovery, as they are classified under 38302.

iii. Retail sales of information and communications equipment in specialized stores (Group 474).

Group 474 also comprises a number of ICT items that have undertaken sale or resale, without transformation of new and used goods, to the general public for personal or household consumption or utilization, by shops, department stores, or mail-order houses. They are as follows:-

- o Retail sales of audio and video equipment in specialized stores (47420), including retail sales of radio and television equipment, retail sales of stereo equipment and retail sales of CD, DVD players and CD, DVD recorders;
- o Retail sales of musical records, audio tapes, compact discs, cassettes, video tapes, VCDs and DVDs, blank tapes and discs (47620);
- o Retail sales of second-hand electrical and electronic goods (47742), which excludes retail sales of second-hand motor vehicles, Internet auctions (see 4791) and other non-store auctions (retail) (see 4799);
- o Retail sales of household appliances and consumer electronics via stall or markets (47894);
- o Retail sales of music and video recordings via stall or the market (47895);
- o Retail sales of any kind of product over the Internet (47912);
- o Direct sales via television, radio and telephone (47913);
- o Internet retail auctions (47914).
- o Specifically, Items 47912, 47914 and 47913 can be construed for “e-Commerce” activity as transactions involve online and or real time modes, be it over the Internet, radio, television or the telephone. Similarly, Items 47420, 47620 and 47895 can be considered as ICT products aimed at promoting “content development”. In order for the Item 47742 to be considered an ICT product, its electrical components need to be separated out. The “Retail sale of any kind of product by mail order (47911)” is considered a traditional transactional activity, which was popular before the advent of Internet age.

iv. Publishing of books, periodicals and other publishing activities (581).

This broad category entails the following activities:-

- o Publishing of books, brochures and other publications (58110), which includes publishing of audio books, publishing of encyclopedias on CD-ROM and online publishing of books;
- o Publication of mailing lists, telephone book and other directories (58120), including on-line publishing of directories and mailing lists;
- o Publishing of newspapers, journals, magazines, and periodicals in print or electronic form (58130), including on the Internet and publishing of radio and television schedules, and online publishing of newspapers, besides publishing of advertising newspapers;
- o Publishing of catalogues, photos, engraving and postcards, greeting cards, forms, posters, reproduction of works of art, advertising material and printed matters n.e.c. (58190), including items on publishing of catalogues, photos, engraving and postcards, greeting cards, forms, posters, reproduction of works of arts, advertising material and other printed material n.e.c., it also includes online publishing of other information (for example, greeting cards and statistics), database publishing.

The category 58110, 58120, 58130 and 59190 includes the activities of publishing books not only in print but also in electronic (for example, CD, electronic displays) or audio form or on the Internet, thus giving rise to "*digital / analog content*". To separate out the new media activity, the digital print activity must be differentiated from the traditional media print.

v. Software Publishing (582)

MSIC 2008 classifies items 58201, 58202 and 58203 as integrals of "Software Publishing (582) or Publishing of ready-made software (5820)", which includes *on-line software publishing*.

- o Business and other applications (58201);
- o Computer games of all platforms (58202). This item also includes publishing of software for video game consoles;
- o Operating Systems (58203)

The on-line publishing activities are indeed part and parcel of the development of "*digital and analog content*" activity.

vi. Motion picture, video and television programme activities under the Group 591

This group entails the 59110, 59120, 59130 and 59140 five-digit industry codes, as described below:-

- o production activities (59110);
- o post-production activities (59120);
- o distribution activities (59130);
- o projection activities (59140)

The Group 591 activity includes production of commercial messages for radio, television and film, production of television programmes and commercials, not done in broadcasting facilities and activities of stock footage film libraries. These are ICT- related services, which can be classified under the "*digital / analog content*" development industry.

vii. Sound recording and music publishing activities (59200)

As identified in the MSIC 2008, the industry code 5920 includes a number of activities such as

- i) production of original (sound) master recordings in tapes and CDs; sound recording service activities in a studio or elsewhere, including the production of taped or non-live radio programming, audio for film and television;
- ii) music publishing, which includes activities of acquiring and registering copy rights for musical compositions, promoting, authorizing and using these compositions in recordings, radio, television, motion pictures, live performances, print and other media; distributing sound recordings to wholesalers, retailers or directly to the public.;
- iii) online music publishing;
- iv) sound-recording activities; and
- v) production of taped or non-live radio programming.

As acknowledged, in the Internet era, sound recording and music publishing are increasingly making use of new media materials and digital modes, including online publishing. Thus, the industry code 59200 can be classified under the "*digital and content development*" activity.

viii. Other information service activities (639)

This category entails two broad categories, namely:

1. News agency activities (6391) or News syndicate and news agency activities (63910). This item includes news syndicate and news agency activities furnishing news, pictures and features to the media.
2. Other information service activities n.e.c. (63990), which includes.
 - i) Telephone based information services;
 - ii) Information search services on a contract or fee basis;
 - iii) News clipping services and press clipping services .

Again, Group 639 pertains to content development activities involving both old and new media modes. The old and new media approaches have to be differentiated, in order to be able to measure the “*digital content*” elements.

ix. Credit card services (64922)

The credit card services (64922) is defined as one of the integral components of financial service activities, except Insurance / Takaful and Pension Funding activities (Division 64) or Other Credit Granting (6492) in the MSIC 2008. As widely acknowledged, credit card services is one of the modes of e-payment, not only within national borders but across the globe, irrespective of time. In that sense, credit card services are considered a crucial component in the development of “*e-Commerce*” framework, that entails online buying and selling of goods and services at anytime and anywhere. Thus, economic activities or value added services contributed, should be given due recognition under the e-Commerce activity, which also lacks explicit mention in the ISIC / MSIC, 2008.

x. Research and development on Information Communication Technology (ICT) (72106)

The industry code 72106 on research and development on ICT needs to be explicitly monitored, measured and evaluated, in both public and private sectors. Its economic worth should be integrated as part and parcel of the ICT sector, which in many cases, have been overlooked. Indeed, the MOSTI in Malaysia, as in many other countries elsewhere, have begun to measure the contribution of the industry code 72106. However, this component is best studied together with the contributions made in the intellectual property rights (IPR). The significance of R&D to the economy is attributed to the number of patents commercialized and economic value generated, rather than number submitted for registrations or patented but could not be commercialized.

xi. Leasing of intellectual property and similar products, except copyrighted works (77440)

This item includes leasing of non-financial intangible assets (except copyrighted works like books or software). It also entails receiving royalties or licensing fee for the use of patented entities, trademarks or service marks, brand names, mineral exploration rights, franchise agreements, or other intangible non-financial assets. However, attempts are needed to differentiate the IPs associated with ICT or ICT-driven R&D activities. As mentioned above, the contributions of IP must be studied in the context of R&D.

xii. Photocopying, document preparation and other specialized office support activities (Class: 8219)

This item is placed under the office administrative, office support and other business support activities (Division 82). As widely acknowledged, modern offices undertake office administration using ICT tools and fresh graduates entering workforce, irrespective of fields of study, tend to have acquired basic ICT skills. On this premise, the items described under the Office Administrative and Support Activities (Group 821) warrants a differentiation from traditional modes and means, as follows:-

- o Document preparation, editing and/or proof reading (82191);
- o Typing, word processing or desktop publishing (82192), includes letter or resume writing, proposal writing, assignment writing and report writing;
- o Secretarial support services (82193);
- o Transcription of documents and other secretarial services (82194);
- o Provision of mailbox rental and other postal and mailing services (82195);
- o Photocopying, duplicating, blueprinting (82196), includes document copying services without also providing printing services such as offset printing, quick printing, digital printing, prepress services;
- o Photocopying, document preparation and other specialized office support activities n.e.c. (82199).

xiii. Activities of call centres (82200)

Activities of call-centres are also classified under Division 82. As acknowledged, call centres are ICT-driven. This item classification includes:-

- o Activities of inbound call centres, answering calls from clients by using human operators, automatic call distribution, computer telephone integration, interactive voice response systems or similar methods to receive orders, provide product information, deal with customer requests for assistance or address customer complaints;
- o Activities of outbound call centres using similar methods to sell or market goods or services to potential customers, undertake market research or public opinion polling and similar activities for clients.

The foregoing depicts an integral component of e-Commerce.

xiv. Energy, telecommunication and postal affairs (84136)

Among others, this item is considered as an industry under the Public Administration and Defence; Compulsory Social Security (Division 84). In particular, the item 84136 is placed under the Class 8413, which entails "Regulation of and contribution to more efficient operation of businesses". As it can be seen, the activities pertaining to telecommunication and postal affairs have been lumped together with the energy segment; it is highly recommended to differentiate the two, in order to measure contributions made by to the telecommunication and postal affairs to ICT sector.

xv. Education (Division 85)

The MSIC 2008 revealed that, the education industry which has been classified under the Division 85, directly or indirectly, include some form of computer-related training such as:-

- o Technical and vocational education below the level of higher education in public (85221) and in private (85222), including
 - i) computer repair training;
 - ii) technical and vocational education;
 - iii) instruction for tourist guides;
 - iv) instruction for chefs, hoteliers and restaurateurs;
 - v) special education for handicapped students; and
 - vi) cosmetology and barber schools;
- o Computer Training (80909).

In particular, the computer repair training is currently subsumed under Class 8522 which refers to “Technical and vocational secondary education”; while the computer training industry is classified under the Class 8549, which pertains to “Other education n.e.c.”. Being a critical component in the promotion and uptake of ICT, the computer-related trainings need to be classified as a distinct class; similar to sports and recreation education, (Class 8541) and cultural education (8542), which have been accorded distinct recognition in the education industry (Division 85); not as a sub-component or as a subsumed activity, but as a distinct class of their own. Besides that, Class 8530, referring to “Higher education”, entails items on “College and university education (public) (85301) and private (85302) needs to differentiate the ICT education from others. This is crucial, because following the liberation of education sector via the Education Act, 1995, many colleges and universities, both in public and private domains, have sprung up to provide ICT courses towards meeting the requisite workforce for the KBE. The number of private colleges and universities in the year 2007 was 245, with a gross output of RM3.232 billion compared to the gross output in 2002, which stood at only RM1.528 billion (DOSM, June 2009). The number of students enrolled in the private higher learning institutions in 2007 was 365,800, which was projected to reach 400,000 by 2008 (DOSM, December 2009(a)). These figures indicate that the higher education in the country has emerged as an economic activity rather than a mere social sector that it used to be prior to mid-nineties.

6. Emerging ICT Activities

Furthermore, a close scrutiny on ISIC version 4 or MSIC 2008 revealed that some fast growing ICT segments such as Shared Services Outsourcing (SSO), Business Process Outsourcing (BPO), Information Technology Outsourcing (ITO), cloud computing, online banking or mobile banking are not explicitly mentioned in the industry classifications, though popularly referred to by the ICT industry players and development practitioners in the mainstream. Similarly, items like call centre activities, which are regarded as ICT-related activities in the Malaysian policy context, are not classified under the Information and Communications sector; rather, it is defined under the Office Administrative, Office Support and Other Business Activities. The exercise also duly recognizes the vagueness and complexities, as well as difficulties that can be encountered in the measurability of those items listed. The list may not be comprehensive and all inclusive. Nonetheless, the list warrants due attention for future considerations, when revision of ISIC Ver.4 /MSIC 2008 is due for update in the near future. Due considerations for the list is also important when definitions of “information sector” or “knowledge sector” are increasingly linked with ICT related activities. Indeed, the Third Outline Perspective Plan 2001-2010 (OPP3:2001-2010) has explicitly identified ICT as the main driver of envisaged Knowledge Based Economy (KBE) and Knowledge Base Society (KBS) (EPU, 2000). The New Economy Model (NEM), which is promulgated by the Prime Minister in March 2010, did not exempt itself from emphasizing the significance of contemporary ICT as a key enabler of innovation-based economy, especially those driven by ICT modes and means (NEAC, 2010).

More importantly, it is not the technology per se, but the information that matters, which helps to improve lives, business, society and economy (Shariffadeen, 2005). The National Information Technology Agenda (NITA), when it was first mooted in the mid-nineties, duly recognized this. However, with progression of time, the emphasis has lost its significance. More focus was directed to the development of infrastructure, which is a lot easier task to implement, though costly. Creating value through effective use of information and knowledge requires intellectual effort. Recognizing the significance of Information as a New Age “commodity”, the North American Industrial Classification System 1997 (NAICS) has incorporated the elements of ICT under the “Information sector” a decade ago (NAICS, 1997). See the Box 4 below.

Box 4

51 Information

- » **511 Publishing Industries**
 - **5111 Newspaper, Periodical, Book, and Database Publishers**
 - o 51111 Newspaper Publishers
 - o 51112 Periodical Publishers
 - o 51113 Book Publishers
 - o 51114 Database and Directory Publishers
 - o 51119 Other Publishers
 - 511191 Greeting Card Publishers
 - 511199 All Other Publishers
 - **5112 Software Publishers**
 - o 51121 Software Publishers
- » **512 Motion Picture and Sound Recording Industries**
 - **5121 Motion Picture and Video Industries**
 - o 51211 Motion Picture and Video Production
 - o 51212 Motion Picture and Video Distribution
 - o 51213 Motion Picture and Video Exhibition
 - 512131 Motion Picture Theaters (except Drive-Ins)
 - 512132 Drive-In Motion Picture Theaters
 - o 51219 Postproduction Services and Other Motion Picture and Video Industries
 - 512191 Tele-production and Other Postproduction Services
 - 512199 Other Motion Picture and Video Industries
 - **5122 Sound Recording Industries**
 - o 51221 Record Production
 - o 51222 Integrated Record Production/Distribution
 - o 51223 Music Publishers
 - o 51224 Sound Recording Studios
 - o 51229 Other Sound Recording Industries
- » **513 Broadcasting and Telecommunications**
 - **5131 Radio and Television Broadcasting**
 - o 51311 Radio Broadcasting
 - 513111 Radio Networks
 - 513112 Radio Stations
 - o 51312 Television Broadcasting
 - **5132 Cable Networks and Program Distribution**
 - o 51321 Cable Networks
 - o 51322 Cable and Other Program Distribution
 - **5133 Telecommunications**
 - o 51331 Wired Telecommunications Carriers
 - o 51332 Wireless Telecommunications Carriers (except Satellite)
 - 513321 Paging
 - 513322 Cellular and Other Wireless Telecommunications
 - o 51333 Telecommunications Resellers
 - o 51334 Satellite Telecommunications
 - o 51339 Other Telecommunications
- » **514 Information Services and Data Processing Services**
 - **5141 Information Services**
 - o 51411 News Syndicates
 - o 51412 Libraries and Archives
 - o 51419 Other Information Services
 - 514191 On-Line Information Services
 - 514199 All Other Information Services
 - **5142 Data Processing Services**
 - o 51421 Data Processing Services

7 Conclusion

As succinctly put with evolution over time, the ICT from its era of diode technology to micro-chips era, has evolved into ICT production and ICT Services sectors (DOSM, December, 2009 (b)), as elucidated under OECD definition as well. The ICT Services sector, in turn, comprises of Telecommunication Services and Computer Services. As articulated, the components of ICT Services require further review and expansion to consider emerging areas such as e-Commerce, multimedia content development and outsourcing, among others, as distinct components in the Section J classifications of MSIC, 2008. Indeed, the NAICS is considered more advanced than that of OECD. Therefore, it will not be surprising that in the near future, the “Knowledge sector” will be defined distinctly as an industry, as elements of people and institutions are inter-wined and integrated increasingly with ICT phenomena (Ramachandran, 2002; Ramachandran, 2003; Ramachandran, 2008).

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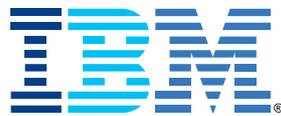
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CHAPTER 11

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A Vision of Smarter Cities: How cities can lead the way into a prosperous and sustainable future

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IBM Institute for Business Value

IBM Global Business Services, through the IBM Institute for Business Value, develops fact-based strategic insights for senior executives around critical public and private sector issues. This executive report is based on an in-depth study by the Institute's research team. It is part of an ongoing commitment by IBM Global Business Services to provide analysis and viewpoints that help companies realize business value. You may contact the authors or send an e-mail to iibv@us.ibm.com for more information.

Preamble

A few years ago, the world crossed a threshold. For the first time, more than half the human race is living in cities. By end this year, there will be 59 metropolitan areas with populations greater than five million – up 50% from 2001. By 2050, the figure will rise to 70%. We are adding the equivalent of seven New Yorks to the planet every year. In Malaysia, more than 60% of the population is urban.

This means the most important locus for 21st century innovation – technological, economic, and societal – will be our cities. They present the most promising opportunity to make our planet smarter.

This unprecedented urbanization is both an emblem of our economic and societal progress – especially for the world’s emerging nations including Malaysia – and a huge strain on the planet’s infrastructure.

Cities bring together systems by which our world works: education, transportation, public safety, and healthcare, among others. We have the capacity to inject new intelligence into these systems. Enormous computational power can be delivered in forms so small and inexpensive that it is being put into phones, cars, and appliances, as well as things we would not recognize as computers, such as roadways (to monitor traffic) or rivers (to monitor pollution and better allocate water use). The data captured by these digital devices – soon to number in the trillions – will be turned to intelligence, because we now have the processing power and advanced analytics to make sense of it all.

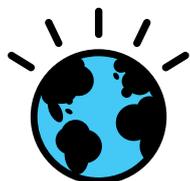
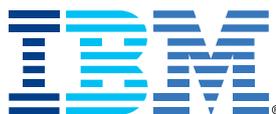
Our challenge is to apply this technology to improving the places we live. And IBM has the business and technology leadership and solutions to help Malaysia build smarter cities. The IBM Institute of Business Value study “A vision of smarter cities” gives an insight into how cities are gaining greater control over their development, economically and politically, and are also being empowered technologically, as the core systems on which they are based become instrumented and interconnected, enabling new levels of intelligence. To seize opportunities and build sustainable prosperity, cities need to become smarter.

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Let's build a smarter planet

An urbanizing world means cities are gaining greater control over their development, economically and politically. Cities are also being empowered technologically, as the core systems on which they are based become instrumented and interconnected, enabling new levels of intelligence. In parallel, cities face a range of challenges and threats to their sustainability across all their core systems that they need to address holistically. To seize opportunities and build sustainable prosperity, cities need to become “smarter.”

A century ago, fewer than 20 cities around the world had populations in excess of 1 million people¹. Today, that number has swelled to 450 and will continue to grow for the foreseeable future².

As cities grow in both numbers and population, they are taking their place on the world’s center stage, with more economic, political and technological power than ever before. Economically, they are becoming the hubs of a globally integrated, services-based society. Politically, they are in the midst of a realignment of power – with greater influence, but also greater responsibility. From a technology standpoint, advances are underway that can provide them with better understanding and control of their operations and development.

Operationally, cities are based on a number of core systems composed of different networks, infrastructures and environments related to their key functions: city services, citizens, business, transport, communication, water and energy. The city services system constitutes the operational activities and coordination of service delivery provided by the city authority, such as coordinating delivery across different agencies, allocating public funds, conducting physical planning activities and more. A city’s citizens system includes public safety, health and education and is central to whether it delivers a good quality of life for its citizens. A city’s business system refers to the environment that businesses face in terms of policy and regulation. Cities offer citizens and business the ability to move things around through their transport systems and to share ideas and information through their communication systems. Cities also offer two core utilities necessary for all economic and social activity – water and energy.

These systems are not discrete, however. They interconnect in a synergistic fashion that, ideally, promotes optimum performance and efficiency. These core systems, in effect, become a “system of systems.”

However, while providing the potential for significant positive transformation, each element of this “system of systems” faces significant sustainability challenges and threats. For example, cities are confronted by considerable service coordination and planning challenges as a result of urban sprawl. Citizens face healthcare threats, such as infant mortality and the worldwide HIV pandemic. For businesses, cities must balance regulatory requirements with the need to decrease costly administrative overhead. Inefficient transportation systems continue to drive up costs. Increasing communications and connectivity demands challenge the ability of cities to meet the needs of its citizens and businesses. Water resources fall victim to leakage, theft and poor quality. And current energy systems are often insecure and inefficient.

As cities face these substantial and interrelated challenges, it becomes clear that the *status quo* – business as usual – is no longer a viable option. Cities must use their new power to become *smarter*. They must act now, using new technologies to transform their core systems to optimize the use of limited resources.

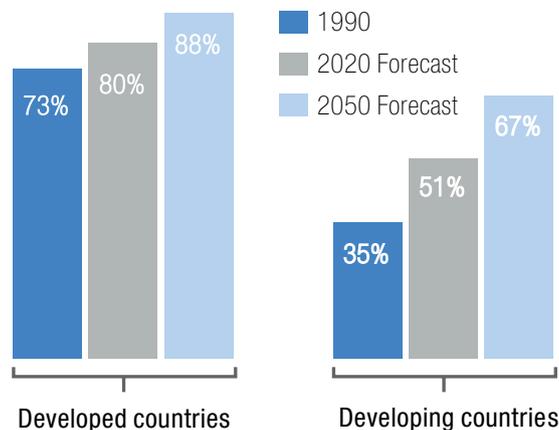
The opportunity presented by smarter cities is the opportunity of sustainable prosperity. Pervasive new technologies provide a much greater scope for instrumentation, interconnection and intelligence of a city's core systems. Around the world, leading cities are putting in place smarter systems, such as Galway's SmartBay advanced water management system, Songdo's *Wired City* initiative or Singapore's *eSymphony* transport system.

Becoming a "smarter city" is a journey, though, not an overnight transformation. Cities must prepare for change that will be revolutionary, rather than evolutionary, as they put in place next-generation systems that work in entirely new ways. City administrations must decide what activities are core, and, therefore, what they should shed, retain or expand into. Not only that, cities must "assemble the team" – integrate their own administrations and work with other levels of government, especially country-level, as well as private and non-profit sectors. Cities must also take into account the interrelationships among the systems they are based on, as well as the interactions among the challenges they face.

Power and responsibility as cities take center stage

In 2008, for the first time in human history, the majority of the world's people lived in cities³. And cities for the foreseeable future will continue to grow faster than the countrysides surrounding them (see Figure 1). Globally, the number of people living in cities of 1 million or more will grow from about half a billion in 1975 to almost 2 billion in 2025⁴. As a result, cities have assumed a central role in the urbanized world of the 21st century. They are wielding more economic power, developing greater political influence and increasingly employing more advanced.

Figure 1. Percentage of total population living in cities, 1990-2050 (forecast).



Source: IBM Institute for Business Value analysis of United Nations data.

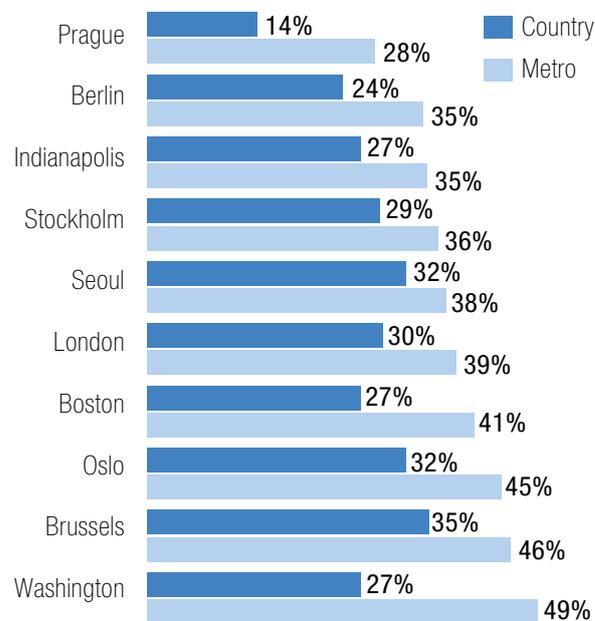
The world economy is now globally integrated and services-based, with cities as its hubs

The nature of commerce has transformed appreciably since 1990, with global trade now accounting for two-thirds of all output, compared to only one-third 20 years ago⁵. In developed economies, service provision has supplanted production as the primary economic activity, accounting for nearly three-quarters of all trade⁶.

A globally integrated, services-based world economy means that business will locate activities where capital – both human and physical – is concentrated, i.e., cities. Three-fifths of businesses list availability of qualified staff (human capital) and quality of telecommunications (physical capital) as absolutely essential⁷. Cities have higher levels of physical and human capital compared to the countries around them. They have higher shares of workforce with tertiary education (see Figure 2) and a stronger capacity for innovation – more than 81 percent of Organization of Economic Cooperation and Development (OECD) patents are produced in urban regions⁸.

Cities are based on a number of different systems central to their operation and development.

Figure 2. Percentage of workforce with tertiary education, selected cities compared to country average, 2005 or latest.



Source: IBM Institute for Business Value analysis of OECD and US Census data.

The political landscape has changed, with cities becoming more important actors

Politically, systems around the world are migrating away from the nation-state model prevalent in the past century. This has led to the emergence of multi-level governance, giving cities greater freedom. New forms of vertical collaboration are emerging among different levels of government. Within metropolitan regions, organizations are choosing a range of levels of cooperation – from informal networks, such as those in Spain's Bilbao and Germany's Rhine-Ruhr, right through to amalgamation of formerly separate urban districts as in Melbourne, Australia, and Montreal, Canada. This has expanded across borders with the growth of international cities such as Basel-Mulhouse-Freiburg (Switzerland, France and Germany) and Copenhagen-Malmö (Denmark and Sweden). Cities are also assuming greater legal and fiscal powers. And more cities now have directly elected mayors, instead of political appointees.

Technological advances mean that cities can better understand and control their operation and development

Technological advances mean that aspects of the operation and development that city managers have previously been unable to measure – and therefore unable to influence – are increasingly being digitized. This instrumentation creates brand new data points about, for example, the efficiency of a city's water or transport systems. In addition to being instrumented, different parts of a city's systems can be interconnected, so that information flows between them. With the greater digitization and interconnection of a city's core systems, the newly gained information can be used for intelligent and informed decision making.

Today's challenges put cities under pressure to act now

Cities are based on a number of core systems – infrastructures, networks and environments – central to their operation and development: city services, citizens, business, transport, communication, water and energy. The effectiveness and efficiency of these systems determine how a city works and how successful it is at delivering its goals. These systems are not discrete and must be considered holistically, as well as individually.

- *City services*: The city services system is the operational activities and coordination of service delivery provided by the city authority, such as coordinating delivery across different agencies, allocating public funds, conducting physical planning activities and more.
- *Citizens*: A city's citizens system refers to its human and social networks. These include public safety (fire, police and disaster recovery), health, education and quality of life.
- *Business*: A city's business system encompasses its regulation and policy environment and includes planning regulations, openness to foreign trade and investment, and labor and product market legislation.
- *Transport*: A city's transport system includes all aspects of its road network, its public transport network and its sea and air ports, from provision to pricing.
- *Communication*: A city's communication system includes its telecommunications infrastructure, including telephony, broadband and wireless. The ability to access and communicate information is central in a modern economy and key to a smarter city.
- *Water*: A city's water system is an essential utility that includes the entire water cycle, water supply and sanitation.
- *Energy*: A city's energy system, as essential as its water resources, includes its power generation and transmission infrastructure, as well as its waste disposal.

These core systems are interconnected and must be treated as such. Understanding one system and making it work better means that cities must comprehend the bigger picture and how the various systems connect.

Cities are being empowered at a time when they face significant challenges and threats to sustainability in each interrelated system and must act now to secure future prosperity.

City services: From greater individualization to fiscal constraints, city services are coming under increasing pressure

Greater demands for individualized and tailored service delivery mean that city authorities are under increasing pressure to transform their approach to managing service delivery to citizens. This is reflected in opinion polls showing that people want greater choice in the use of services, with people looking for public services that are more responsive to the needs and wants of individual citizens⁹. Tony Blair summarized the challenge to public service delivery as follows: “In simple terms, we are completing the re-casting of the 1945 welfare state to end entirely the era of ‘one size fits all’ services and put in their place modern services which maintain at their core the values of equality of access and opportunity for all¹⁰.” This in turn requires far greater integration of the different services and actors involved in their delivery, in order to give greater focus on the end user rather than the individual provider of services¹¹. Meeting the growing demands of citizens is made more difficult by the severe budget constraints facing many cities. For example, a review of 13 major U.S. cities found that 12 of them faced budget deficits ranging from 5-20 percent of the general funds available¹².

Citizens: From demographic changes to health, cities face major challenges and threats to their sustainability

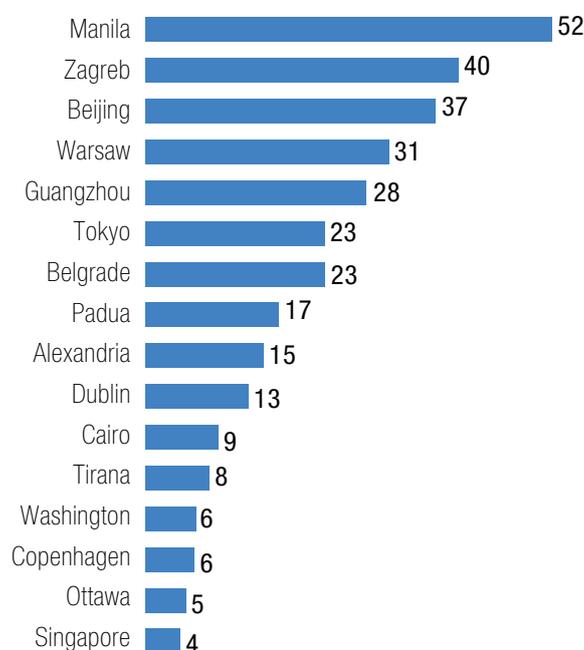
While on average urban populations are growing, cities in developed countries often face shrinking populations – in the last 30 years, more cities in the developed world shrank than grew¹³. These cities will require new ways to stay globally competitive and attractive to skilled labor. In developing cities, even though they are growing, the skills challenge is likely to be just as great due to brain drain, the flight of people with skills to areas perceived to offer greater economic opportunity¹⁴. Cities also face significant healthcare challenges, ranging from infant mortality to the HIV/AIDS pandemic. With growing health challenges, the fiscal sustainability of health systems will be pushed to the limit. In North America, for example, the costs of healthcare are anticipated to increase dramatically – to 20 percent of GDP in the United States and more than half of provincial tax revenues in Canada¹⁵.

Business: Cities must balance complex regulatory requirements with the need to minimize unnecessary administrative burdens

Cities depend on their business systems for their prosperity. Less efficient administrative systems can cost as much as 6.8 percent of GDP in some economies¹⁶. A 25-percent reduction in administrative costs – e.g., time spent filling out forms – could yield savings of up to 1.5 percent of GDP, or some €150 billion (approximately US\$209 billion)¹⁷. As Figure 3 shows, the number of days it takes to undertake the same process – starting a business – in different cities varies dramatically, even within the same country. With cities becoming more important actors politically and economically, solving the dichotomy between where laws are made and implemented will be central to the efficiency and effectiveness of cities’ business systems.

Issues such as traffic congestion are costly and are likely to only get worse as cities grow.

Figure 3. Number of days to start a business, various cities, 2007/2008.



Source: World Bank Doing Business Sub-national reports.

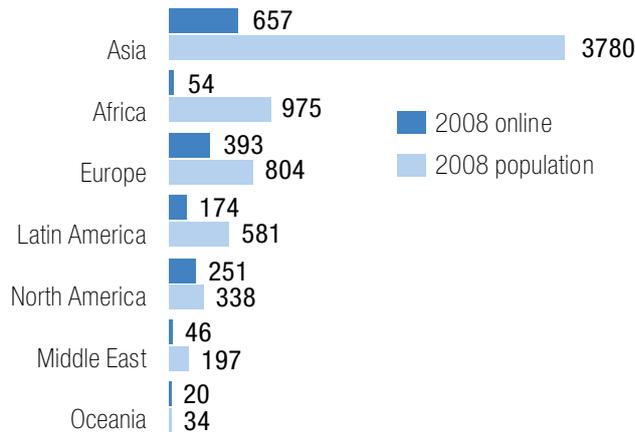
Transport: Inefficient systems will continue to drive up costs without city action

Urbanization and globalization create more commuters and more freight traffic in the world's ports. Traffic congestion cost the U.S. economy US\$78 billion in 2005, resulting in 4.2 billion lost hours, as well as pollution and wasted fuel¹⁸. These costs are growing at 8 percent per annum¹⁹. The economic costs of congestion in New York alone are close to US\$4 billion a year²⁰. A number of estimates suggest that congestion costs – in developed and developing cities – are between 1 percent and 3 percent of GDP.²¹ In emerging market cities, car ownership rates are currently a fraction of the 75-90 percent of OECD countries. As car ownership grows from less than one in ten people to one in three or higher, even greater strain will be placed on the transport infrastructure.

Communication: Cities face challenges in meeting evergreater demands for connectivity

The last 20 years have seen a revolution in how we communicate and inform ourselves, in particular the ability to share information through the Worldwide Web. However, while the online population has grown by almost 350 percent since 2000, the vast majority of the world's population – 5.1 billion – is still not online and is denied the benefits of tapping into a worldwide network of information (see Figure 4). The speed of connectivity has also become increasingly important. In March 2009, average speeds for those with broadband varied from 4.6 megabits per second in Asia to 1.1 megabits per second in Africa²². As the citizens of Tokyo and Yokohama prepare for gigabit-per-second connectivity, city managers must begin planning for a terabit world²³.

Figure 4. Online versus total population (millions), by continent, 2008.

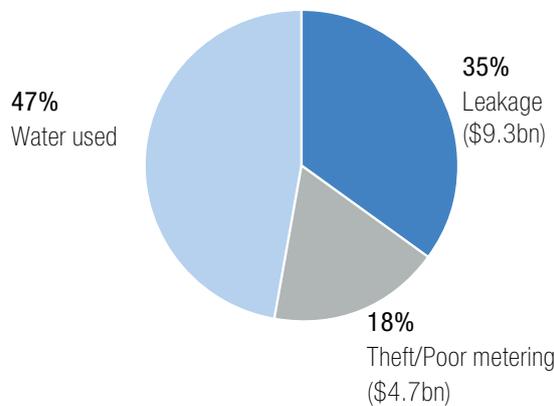


Source: Internetworldstats.com; UNCTAD.

Water: Problems with water efficiency, leakage, quality and the threat of flooding pose a significant threat to cities' sustainability

Water is fundamental for sustaining human life. Every economic exchange involves a virtual exchange of water. As cities grow, so does their thirst for water. Cities today account for 60 percent of all water allocated for domestic human use²⁴. However, globally, less than half of water supplies are accounted for (see Figure 5). Leakage rates often represent up to 60 percent of water supplied, costing water utilities worldwide US\$14 billion every year²⁵.

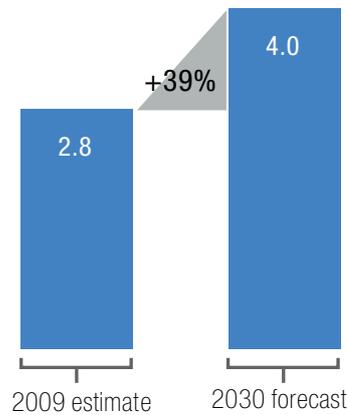
Figure 5. Usage of global water supplies and estimated costs.



Source: World Bank, 2006.

Currently, 2.8 billion people, or 44 percent of the world's population, live in areas of high water stress²⁶. Present trends suggest that this will rise to almost 4 billion by 2030 (see Figure 6)²⁷. Globally, water shortages are estimated to cause an annual loss to economic growth of about 3.6 per cent²⁸. In California, the cost of water issues is already 2 percent of the state budget²⁹.

Figure 6. Global population in high water stress areas (billions).



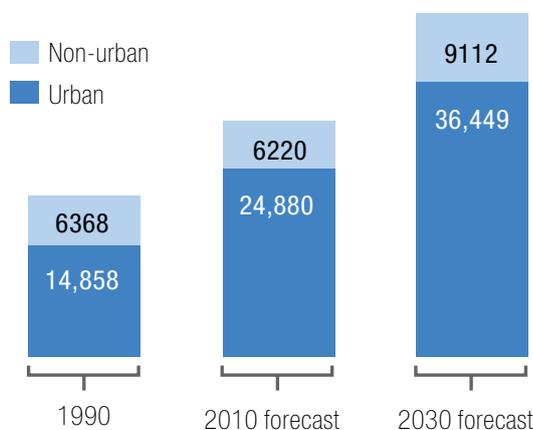
Source: World Economic Forum.

Energy: Cities are realizing current energy systems are insecure, inefficient and unsustainable

Global emissions of CO₂, the principal greenhouse gas, are expected to have increased by more than 45 percent between 1990 and 2010, driven largely by the growth of cities (see Figure 7). Cities generate the vast bulk of CO₂ emissions; therefore reducing their CO₂ emissions is necessary for a healthier planet. As a result, city policymakers are under growing pressure – from citizens and from investors – to incorporate into their policymaking environmental sustainability in general and greenhouse gas emissions in particular. Cities are starting to rise to this threat to their sustainability, with the mayors of 400 European cities, for example, pledging in February 2009 to make “drastic” cuts in CO₂ emissions by 2020³⁰.

Sustainability challenges are significant and interconnected.

Figure 7. Global CO₂ emissions (metric tons), 1990, 2010 and 2030, urban/non-urban.



Source: U.S. Energy Information Administration Annual Outlook 2008; IBM Institute for Business Value estimates.

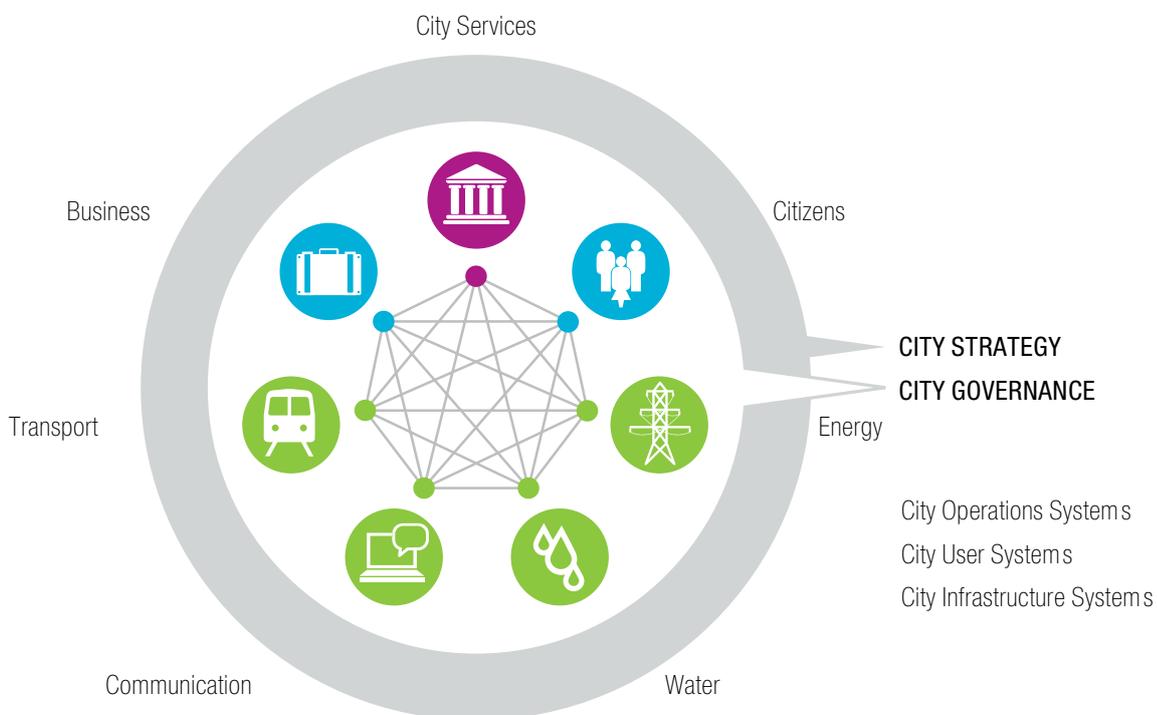
Providing secure and sustainable energy for their citizens is a key challenge for cities over the coming generation. Globally, almost one in three people lack access to electricity. And while access to energy is widespread in more developed cities, it is still not secure. In the United States, for example, blackout threats are increasing in the wake of an overall reduction of baseload energy reserves from 30 percent in the early 1990s to only 17 percent in 2007³¹.

Cities face interconnected challenges

These challenges and threats to sustainability are not only significant in and of themselves, they are also interrelated (see Figure 8). For example, a city's information and *communication* infrastructure is central to its attractiveness to business and mobile investment. The business networks of a city are a key factor for *transportation* usage, itself a primary consumer of energy and an emitter of greenhouse gases – buildings and transport alone account for 25 percent of all emissions³².

Energy production currently accounts for between 30 and 40 percent of all *water* withdrawals in the OECD³³. Assuming business as usual, energy-related water consumption will more than double in the next 20 years in the European Union and the United States³⁴. Water underpins all economic activity – be it the 2,000 gallons required to make one gallon of milk or the 39,000 gallons to make a car³⁵. Water is also one of the most important factors for a city's *health*, with water-borne disease affecting hundreds of millions of people around the world. Some of these intricate interrelationships are outlined in Figure 8.

Figure 8. Cities systems and their interrelationships within the larger framework of the city's strategy and governance.



Source: IBM Center for Economic Development analysis.

“Smart” cities know how to transform their systems and optimize use of largely finite resources

The scale and nature of the challenges facing cities across each of their core systems mean that business as usual is not a viable option. Despite these challenges, cities have a range of goals they want to deliver for their citizens. They strive to provide a healthy, pleasant and safe living environment for their residents.

They also endeavor to attract business, help it thrive in a competitive global economy, as well as provide an effective and efficient infrastructure in a sustainable way. To deliver the goals they have established, cities must look to the systems on which they are basing their aspirations and make them more efficient and effective, i.e., smarter.

Smarter cities make their systems instrumented, interconnected and intelligent

Pervasive information and communication technology means that there is much greater scope for leveraging technology for the benefit of cities:

- *Instrumentation*, or digitization, of a city's system means that the workings of that system are turned into data points and the system is made measurable. By 2010, there is likely to be 1 billion transistors, the building block of the digital age, for every human being³⁶.
- *Interconnection* means that different parts of a core system can be joined and “speak” to each other, turning data into information.
- *Intelligence* refers to the ability to use the information created, model patterns of behavior or likely outcomes and translate them into real knowledge, allowing informed actions.

Smarter cities transform their systems and their “system of systems”

A smarter city is one that uses technology to transform its core systems and optimize the return from largely finite resources. By using resources in a smarter way, it will also boost innovation, a key factor underpinning competitiveness and economic growth. Investment in smarter systems is also a source of sustainable employment. It has been estimated that a US\$30 billion investment in smarter broadband communication, healthcare and energy systems grid could create almost 1 million jobs in the United States alone³⁷. Imagine the possibilities across all the world's cities.

Each of the core systems identified can be made smarter, by taking advantage of the potential to digitize systems and, thereby, enable more informed decision making.

The city as a “system of systems”

It is critical that the interrelationship between a city's core systems is taken into account to make this “system of systems” smarter, too. No system operates in isolation; instead, a web of interconnections exists. For example, transport, business and energy systems are closely interrelated – the transport and business systems are key users of energy. Connecting these systems will deliver even greater efficiencies and address the interrelated, long-term threats to sustainability. The connection between smarter water and energy systems is another example of the linkages that exist between systems. A substantial amount of electricity generated goes toward pumping and treating water. In Malta, for example, a new smart utility system will inform citizens and business about their use of both energy and water, enabling them to make better decisions about resource consumption.

Becoming “smart” is a journey, not an overnight transformation

Cities have limited resources. To deliver on the range of ambitious goals they have, cities must take account of the interconnected challenges they face and the interrelated systems they influence. This is a journey for cities, not an overnight transformation. But the first step requires a shift in thinking and a break from the past.

To become smart, city administrators must develop an integrated city-planning framework and leverage the city's core competencies.

Figure 9. How cities can and have transformed their core systems.

Today...	What if a city could...	Already, cities are...
City services <ul style="list-style-type: none"> • Service delivery in silos with one size fits all 	<ul style="list-style-type: none"> • Tailor services to the needs of individual citizens 	<ul style="list-style-type: none"> • Using technology to integrate the information systems of different service delivery agencies to enable better services for citizens
Citizens <ul style="list-style-type: none"> • Cities have difficulty using all the information at their disposal • Citizens face limited access to information about their healthcare, education and housing needs. 	<ul style="list-style-type: none"> • Reduce crime and react faster to public safety threats, by analyzing information in realtime? • Use better connections and advanced analytics to interpret vast amounts of data collected to improve health outcomes? 	<ul style="list-style-type: none"> • Putting in place a new public safety system in Chicago, allowing realtime video surveillance and faster more effective response to emergencies • Giving doctors in Copenhagen instant access to patients' health records, achieving the highest satisfaction and lowest error rates in the world³⁸.
Transport <ul style="list-style-type: none"> • Transporting people and goods is dogged by congestion, wasted hours and wasted fuel. 	<ul style="list-style-type: none"> • Eliminate congestion and generate sustainable new revenues, while integrating all transport modes with each other and the wider economy? 	<ul style="list-style-type: none"> • Bringing in a dynamically priced congestion charge for cars to enter Stockholm, reducing inner-city traffic by 25 percent and emissions by 14 percent, while boosting inner-city retail by 6 percent and generating new revenue streams³⁹.
Communication <ul style="list-style-type: none"> • Many cities have yet to provide connectivity for citizens • "Going online" typically means at slow speeds and at a fixed location. 	<ul style="list-style-type: none"> • Connect up all businesses, citizens and systems with universal affordable high-speed connectivity? 	<ul style="list-style-type: none"> • Merging medical, business, residential and government data systems into a so-called ubiquitous city in Songdo, Korea, giving citizens and business a range of new services, from automated recycling to universal smartcards for paying bills and accessing medical records.
Water <ul style="list-style-type: none"> • Half of all water generated is wasted, while water quality is uncertain. 	<ul style="list-style-type: none"> • Analyze entire water ecosystems, from rivers and reservoirs to the pumps and pipes in our homes? • Give individuals and businesses timely insight into their own water use, raising awareness, locating inefficiencies and decreasing unnecessary demand? 	<ul style="list-style-type: none"> • Monitoring, managing and forecasting waterbased challenges, in Galway, Ireland, through an advanced sensor network and realtime data analysis, giving all stakeholders – from scientists to commercial fishing – up-to-date information.
Business <ul style="list-style-type: none"> • Businesses must deal with unnecessary administrative burdens in some areas, while regulation lags behind in others. 	<ul style="list-style-type: none"> • Impose the highest standards on business activities, while improving business efficiency? 	<ul style="list-style-type: none"> • Boosting public sector productivity, while simplifying processes for business in Dubai through a Single Window System that simplifies and integrates delivery and procedures across a range of almost 100 public services⁴⁰.
Energy <ul style="list-style-type: none"> • Insecure and unsustainable energy sources. 	<ul style="list-style-type: none"> • Allow consumers to send price signals – and energy – back to the market, smoothing consumption and lowering usage? 	<ul style="list-style-type: none"> • Giving households access to live energy prices and adjust their use accordingly, as in a Seattlebased trial, reducing stress on the grid by up to 15 percent and energy bills by 10 percent on average⁴¹.

Source: IBM Center for Economic Development analysis.

This means that city administrations should develop an integrated city-planning framework, based on deciding where their internal expertise lies – in essence identifying a city's core competencies – and bringing in outside expertise where necessary (see Figure 10). This will rarely align to a city's current allocation of tasks, meaning cities must look at which activities to shed, which to retain and potentially reorganize, which to partner for, and which new activities to expand into. Structured modeling tools, such as component business modeling, can help city administrations map out the activities in each of their systems and identify where they should retain, expand, shed and partner⁴².

Figure 10. A framework for strategic planning.



Source: IBM Center for Economic Development analysis

What cities need to do to become smarter

To put in place a plan for transforming into a smarter city, a city needs to do more than just strategize:

- *Assemble the team*: No city is an island. Administrations – at city level and elsewhere – are recognizing the importance of “perpetual collaboration.” To deliver the goals a city has set, city administrations will need to work seamlessly across their own organizational boundaries and partner effectively with other levels of government, as well as with the private and non-profit sectors⁴³. Many issues that cities face will require significant collaboration among city, state and national levels of government. In addition to formulating new policies themselves, cities must be able to articulate the challenges they face to influence policies made elsewhere.
- *Think revolution, not evolution*: Rising to the challenges and threats to sustainability requires a city to be more than just focused or efficient; it will require the next generation of city to emerge – one based on smarter systems. These systems are interconnected – people and objects can interact in entirely new ways. These systems are instrumented – the exact condition of the system's different parts can be measured. These systems are intelligent – cities can respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.
- *Don't forget the big picture*: The interrelationships between the various systems mean that while cities obviously must prioritize, just “solving one” is not a viable long-term option. The challenges and threats to sustainability come from all angles and require a holistic strategy that addresses all factors and feedback mechanisms.

Conclusion

“The 19th century was a century of empires, the 20th century was a century of nation states. The 21st century will be a century of cities.”

– Wellington E. Webb, former Mayor of Denver, Colorado44

Ultimately, a city aims to deliver sustainable prosperity for its citizens. Cities stand on the cusp of their century, with new power – and new responsibility – economically, politically and technologically. Across all systems on which cities are based, they are facing significant challenges and threats to their sustainability. Cities must use new technologies to transform their systems into smarter systems that optimize the use of finite resources. Many cities around the world are already starting to seize this opportunity. Is yours?

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