AN INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ENABLED KNOWLEDGE-BASED MALAY SOCIETY[*]

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ABSTRACT

Identify five conditions of an information rich society: the existence of a conducive info-structural environment, a reliable and robust ICT infrastructure, a community that is ICT literate, a community that have the necessary information skills, and the existence of supportive governance. The barriers comprise situations that are not in consonance with overall development objectives such as brain drain from developing countries to developed nations, the inability to recognize the potential of local knowledge databases, which if collated and provided widely through the ICT would increase the value and global use, the failure to apply, use or add value to existing knowledge, the lack of information skills in locating, searching and handling information; and lack of ICT skill. ICT is seen as an enabler and not the sole instrument of an information rich society. Describe studies that indicate that the Malay society is not ICT illiterate and do know the importance of IT in their daily lives. The Malays are aware of current S& T issues and readily utilize the widely available public information channels. The Internet is mainly used for communication via e-mails and searching for information. In Malaysia, a supportive governance (government and citizens) is already in place but there is the need to improve the info-structure environment and increase ICT literacy to enable a knowledge-based Malay society.

Keywords: Information technology; Communication technology; ICT literacy; Knowledge-based society; Malay society, Information literacy; Info-structure; Information rich

INTRODUCTION

The terms, information rich or information poor have been used widely without due consideration given to its meaning or definition. It requires an understanding of what is meant by information and how it becomes "rich" and how this "richness" helps in economic growth and development or in the creation of a knowledge-based society. Information does not have meaning if it is not used for a purpose. In other words, information only becomes meaningful when a person adds value to it. A person does this within a specific context or based on his experience. When information is combined with context and experience, it becomes knowledge. The

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context here refers to an individual's view of life, his social values, religion and cultural heritage. His experience refers to previously acquired knowledge. The correct understanding and interpretation of this knowledge depends again on the receiver's experience, cognitive abilities and the context within which the information was communicated. Information and knowledge are therefore related to "richness". Hence, although the availability and accessibility of information is an important criterion for information richness or poorness, it is knowledge that contributes significantly to making the information "rich". This is because without meaning (knowledge) being added, the available or accessible information has little value. This implies that the inability to add development substance to available information results in being information poor and this inability handicaps both development and livelihood. (Blitz, Blignaut and Ponelis, 1998; Britz and Blignaut, 1999). Hence, within the context of the Malay society, what need to be harnessed is information that stimulates knowledge among members of its society, who could make use of this knowledge for social, economic and technological advantage.

Knowledge itself can further be categorised as "explicit" and "tacit". Explicit knowledge can be articulated in formal language or documented, where else, tacit knowledge is personal knowledge, embedded in individual experiences, beliefs, perspectives and values. Explicit knowledge may be used and protected as the intellectual property of a community and would further stimulate the generation of new knowledge. Knowledge can also either be local or general (Braman, 1998). Local knowledge refers to knowledge that originates and utilised by a specific community. An example is the knowledge of the socio-communal involvement in weddings, birth rituals or rice planting ceremonies that the Malay community possesses. Local knowledge can enhance the understanding of local psyche that motivates or inhibits members of the community in undertaking certain economic or social decisions. General knowledge refers to the general information that is available on the communication infrastructure such as the television or the Internet that have broader applications to the Malaysian society as a whole. Information can also be categorised as deep (Ponelis and Fairer-Wessels, 1998) if it has the ability to give the correct meaning to information within a specific context that can be used to make decisions in everyday life.

It is therefore evident that the conducive information environment plays an important role in determining the richness of information. The information environment refers to the messages and meanings that a person encounters in his daily lives through oral conversations or the written word and through the media. Yet, personal experiences and knowledge may result in different levels of meanings obtained or added within the same information environment. Hence, the inability to add meaning to information obtained within a specific context and the inability to utilise it in a different information environment results in information poverty. In this context therefore the information rich society is synonymously associated to the knowledge-based society. Such a society must be confident in locating,

assimilating, handling information within its own socio- economic structure and infrastructure, that can be subsequently used to generate new knowledge, which are disseminated and shared. In order to understand what is takes to become an information rich society, it is necessary to be aware of the environment that perpetuates its evolution.
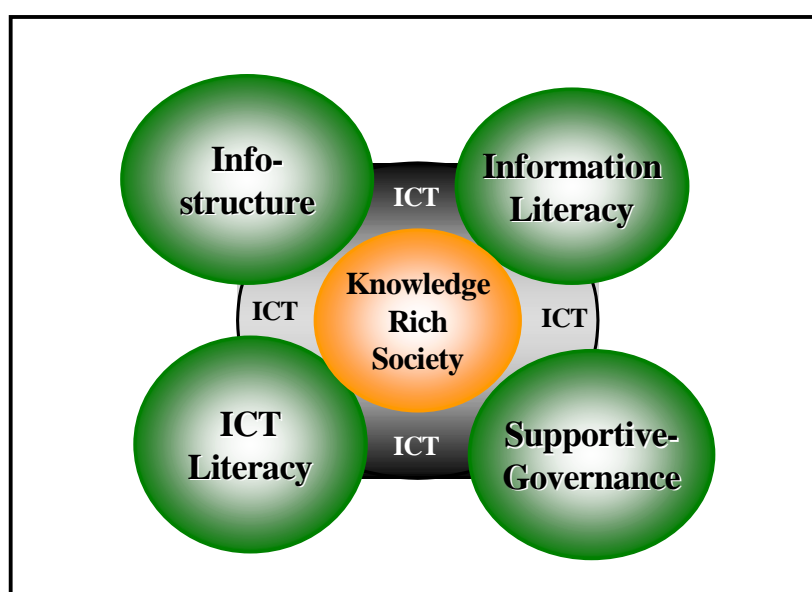
THE INFORMATION-RICH SOCIETY

The information rich or knowledge-based society requires the existence of supportive factors that encompasses five conditions: the existence of a conducive info-structural environment, a reliable and robust ICT infrastructure, a community that is ICT literate, a community that have the necessary information skills, and the existence of supportive governance. Figure 1 explains the inter-related factors that enabled an information rich or knowledge-based society.

(a) Well Developed Info-structure
Info-structure refers to the system that ensures the effective flow of information. Todays info-structure systems are technology based. The quality of the info-structure lies in the degree of its accessibility and usability by the community. The creation and implementation of ICT-based info-structure is an attempt to remove information poverty, as a community would be provided with options to choose from. This info-structure environment requires the ability to access information at the right time in order to make educated decisions in everyday activity. Access to information is empowering, as it enables an individual to think, analyse and understand his/her existing situation, and are aware of the implications of each action taken. It gives the individual a choice to act or be passive, to transform his condition or remain in-situ. Information itself is not scarce and it is definitely expandable and it proliferates with use. Knowledge and information is therefore the quintessence of initiating the development change process (Nath, 2000). Another underlying requirement is knowledge-sharing, which must occur at all levels, within and between communities, within and between countries. The availability of information about the performance of Malay students at schools and higher educational levels can help special committees formulate realistic remedial plans. It allows for the creation of action plans based on available information, and this in turn generates new knowledge, which can be disseminated and shared for further actions. Of course, this availability should come hand in hand with the awareness of the relevance of information and access to infrastructure facilities that amalgamate information held in remote databases or information repositories as well as accelerates the flow of information. The ICT network breaks all natural, social, cultural and hierarchical barriers to knowledge-sharing. It invites inclusion and participation of information generation meant for both private and public domain. It perpetuates the knowledge-based repositories of information, allowing continuous value-addition and customisation. It increases the capacity to absorb and generate more information and helps the communities to take appropriate steps to document

what they possess. It allows for the recovery and ugrading of traditional knowledge into new ways in doing business and new ways of creating livelihoods.

Figure 1: The ICT Enabled Knowledge Society

Access to information should ultimately reduce the "gap" between the information rich and poor individuals within and between ethnic groups within the country and between countries. It is the usefulness and applicability of information per se are the prerequisites for information richness. Information that contributes to human development, especially those related to basic human needs, information tools necessary for trade and economic development, information needed for the development of backbone industries, basic science, health, education, welfare, agriculture and labour are considered essential information. Such information must be universally available and accessible without check or hindrances.

(b) ICT Literacy
The assessment of an effective info-structure requires that the community be literate in using the information and communication technologies that support it. ICT literacy enables utility of accessible information. The race or nation that is quick to adopt and apply new innovations be it economic or in everyday human activity will always have the competitive edge over their rivals (ACC statement.., 1997; Aguolu, 1997). This condition also requires the appreciation to financial commitment for information systems and networks development and maintenance.

Information communication and technology literacy refers to an intellectual process, comprising the abilities and dispositions needed to understand the link between technology, themselves and society in general. The technological literate person is aware of how technology is related to broader social system, how technological system cannot be fully separated from the political, cultural and economic framework which shape them. In order to be informed and acquire a balanced state, a certain level of knowledge, skills and abilities are required. These include:

(i)   Understanding that technology includes basic hardware and software know-how. The know-how includes having the skills necessary to design, produce and use technology;

(ii)   Understanding how technology shapes and is shaped by society;

(iii)   Understanding that technological issues involve conflicting assumptions, interpretations and options;

(iv)   Having the necessary data collection and decision making skills to make intelligent choices; and

(v)   Having the ability and desire to take responsible action on social issues that may arise out of technological change.

A technological literate person is someone who critically examines and questions technological progress and innovation. Advances in science and technology have touched the lives of people in basic ways everyday, affecting the manner in which they obtain food, transportation, clothing and housing. As it plays a vital role in people's lives, it is therefore important to develop a basic understanding of both good and risk factors associated with the technologically rich society.

An understanding of how technology shapes and is shaped by society is based on two principles. Firstly, the innate understanding that technology is an agent of social change, increases speed of communication, make mass production possible, reduce physical labour, provides abundant products and services. Secondly, social, historical and cultural factors would determine if and how technology is used. This can be promoted through well-defined public and private sector ICT literacy programmes targeted at different levels of society.

(c) Information Literacy
Refers to the ability to locate data or sources leading to information, to be able to choose as well as discriminate among a variety of sources, analyse, interpret what has been gathered for relevancy and accuracy (Ponelis and Fairer-Wessels, 1998). This ability is regarded as one of the main skills in order to become information rich and can be acquired through the implementation of information skill programmes. This can be incorporated within the ICT literacy programmes or developed separately by resource centers at school levels, information centres and libraries at public and higher educational levels. The measurement of success of such programmes can be seen in a community that recognise the value of information and know where or how to obtain information at the right time.

(d) Supportive Governance

Supportive governance here refers to both the government and the citizens. Supportive citizens come in the form of positive cognitive make up, such as the appropriate attitudes and motivation towards information. The people or government involved should appreciate the role of information and understand the importance of national information policies to support the process of becoming "information rich". A society that cannot appreciate the importance of having access to the right information and the necessity of utilising ICTs to obtain such information would not propagate an information rich society.

Local and national government administrative processes are highly information intensive. Public administration relies heavily on the use of ICT technologies to gather, process and diffuse information within both public and private domains. Consumers of government services demand a more open and transparent transactions in their dealings. This entails giving the public access to information and formulating a conducive, clear as well as visionary ICT policies and laws. This environment promotes equitable partnership between civil and official sectors in the knowledge society. It also requires rapid digitization of public information for which access is moderately controlled. Better governance mobilises and strengthens the civil society's involvement in formulating and adopting public policies. The *Digital governance* (2000), proposed various generic models upon which e-government can be established, and these are:

(i)   Wider broadcasting of information (broadcasting model) - this is based on the dissemination of government information already available in the public domain into the wider public domain through the use of ICT. The informed citizen would understand the functioning of the governance mechanism and become more empowered to exercise their rights and responsibilities. Its application can be implemented by putting governmental laws and legislation online, making official governmental contacts online, making available information pertaining to budgets, expenditures and performance online;

(ii)   Channeling critical-information to targeted audience (critical-flow model) – this is based on the principle of disseminating information of critical value to a targeted audience or wider public through the use of ICT. This could be applied by making available research studies, public enquiry reports, impact studies commissioned by the government, critical environment information online, etc.

(iii)   Comparing available information from both public and private domain to derive at strategic learning and arguments (comparative analysis model) – this entails assimilating new knowledge products and using them as benchmarks to evaluate or advocate changes in current policies and actions. This could be applied by learning from historic policies for future policy making, enhancing background knowledge and providing rationale for

future course of action. The information can be in the form of archived statistical information, seismological data, electoral data, etc.

(iv) Dissemination and exchange of information through virtual communities, which share similar values and concerns (e-advocacy/ mobilisation and lobbying model) – This involves active sharing of information within and between communities. The strength of this approach is the availability of expertise across geographical, institutional and bureaucratic barriers. This could be applied through providing electronic platform for public debates, conferences and consultation over key issues that allow for wider participation in decision-making processes.

(v) Interactive exchange of information between government and consumers or citizens (Interactive-service model). This fundamentally opens an interactive (G2C2G) "Government to consumer to government" model, that provides avenues for the direct participation of individuals in the governance processes. ICT provides the opportunity for individuals to interact in a digital network and leads to not only greater participation but also efficiency and transparency, as well as savings in time and costs relating to decision-making. An example is *FirstGov* in the United States (Digital governance, 2000). This is a free-access web site designed to be a centralised place to find information about local, state and federal government web sites. The web sites provide various services which includes availability of forms to apply for governmental jobs, web-forms for giving feedbacks concerning government policy, online filing of taxes, etc.

(e) Information and Communication Technologies

In Figure 1 the ICTs are indicated as the drivers of the knowledge society. They provide new and faster ways of delivering and accessing information, innovative ways for real-time communication, new ways of doing business and creating livelihood opportunities. The technologies help put more information into the public domain. ICT innovations allow the absorption and use of information. The ICT permits fast location and access of information, provide the user with options to choose the information wanted, to assimilate information obtained, disseminate and share new knowledge. The ICT invites openness and greater interactivity between citizens and the public and private sectors.
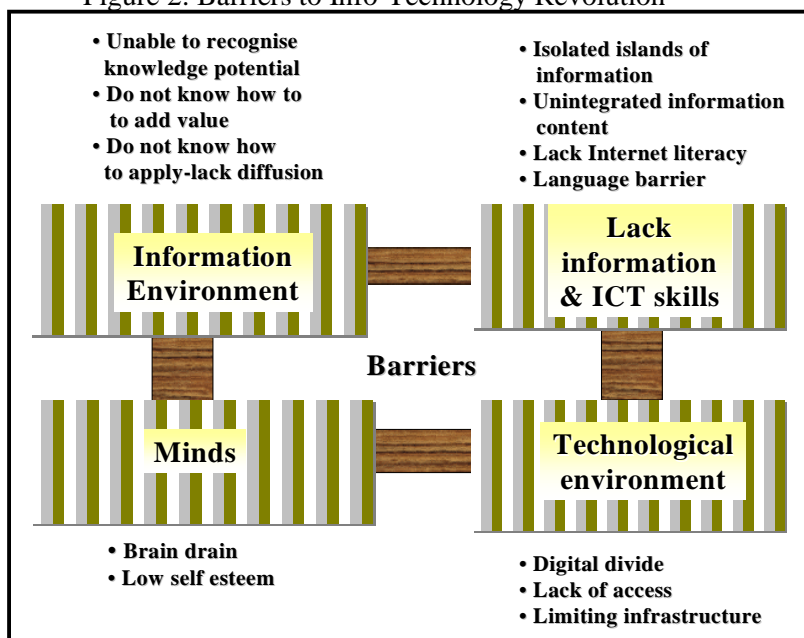
The six factors above are the prime movers of a knowledge or information rich society. It pictures a community who have access to information, who are information and technology literate, who recognises the importance ICT in their daily lives, who also have accessed to the necessary information, are supported by a sound communication and technological infrastructure.

BARRIERS TO KNOWLEDGE SOCIETIES

There are number of barriers to the knowledge revolution, which comprises of situations that are not in consonance with overall development objectives (Figure 2).

(a) Minds of the experts – This first barrier refers to the human will and mind. This is indicated by the trends of brain drain from developing countries to developed nations. The highly skilled people usually go to countries where their talents gets recognition, enriched and valued. Developed nations seem to be able to harness these potential knowledge sources and this naturally puts them in an advantaged position. The second barrier is the low self –esteem syndrome, which developing countries suffer from. This encompasses the inability to recognise the potential of local knowledge. Often, the value of information in vernacular languages are accepted only when it gets noticed, valued, recognised and put to use in the developed nations. This is a self-imposed barrier and need to be removed. This is especially relevant for Malay cultural, language and literary knowledge, which if collated and provided widely through the ICT would increase the value and use by Asian studies institutes and centres, which are established throughout the world.

Figure 2: Barriers to Info-Technology Revolution

- Unable to recognise knowledge potential
- Do not know how to to add value
- Do not know how to apply-lack diffusion

- Isolated islands of information
- Unintegrated information content
- Lack Internet literacy
- Language barrier

Information Environment

Lack information & ICT skills

Barriers

Minds

Technological environment

- Brain drain
- Low self esteem

- Digital divide
- Lack of access
- Limiting infrastructure

(b) Information isolates - The barrier in this case is in the failure to apply knowledge. This includes the lack of enabling policies to empower people to use the knowledge or add value to existing knowledge. This is the result of the development of information pockets that lack connectivity and hinders wider

access. In such a situation, available information cannot be diffused effectively for societal use. There is therefore a need to develop relevant locally specific information contents, which can grow in content and value after connectivity.

(c) Lack of information skills – society need to be skilled in locating, searching and handling information. This skill would be greatly enhanced with the development of Internet tools such as search engines, web robots and interactive portals that could focus on managing Malay-based data.

(d) Lack of ICT skills – Hosting of information, retrieving and handling information from the net requires a fair amount of technical skill and net literacy. The level of skills about computer use and Internet navigation is still low in developing countries and also in Malaysia. This forms a barrier to a nation's or community's transformation to a knowledge society. ICT skills need to be inculcated across the population among all groups. The schools, universities and private agencies could play their roles on imparting training on Internet technologies through formal or informal education. The private sectors should also play their role in developing self-learning modules on computer operations, web site designing, and web-surfing in the local languages.

(e) Language barriers – Each day over two million pages are added on the Internet, but there is very small content representation on the net in the vernacular languages. Statistics points that 85% of the content on the Net is in English. This definitely hinders use of available relevant world information by the large number of people in developing countries who are unable to read the content. Private sector could play an important role in making available open source software for developing contents in local languages or for translation purposes. The format of information representation could be widened to include voice-data and visual representations.

**THE ROLE OF ICT IN KNOWLEDGE SOCIETY**

It is evident that ICT, though an enabler, is not the sole instrument of an information rich or knowledge-based society. The social environment must be conducive. The community members must be mentally ready to accept re-arrangement and sharing their info-structure from being isolates to inter-connectivity through information portals, kiosks and services. Increased collaboration, openness and transparency are needed between agencies that hold information. Together, the local content information becomes more valuable then if it exists in isolation. The availability of applicable info-structure could provide a community with the necessary context, experience and content to utilise information into knowledge. The conducive experiences, context and content contribute to a positive attitude among community members towards the potentiality of information and how it can be harnessed for development. This situation could be strengthened by a government that functions on an ICT-base-model, spearheading efforts towards the digitization of information

to be made available in the public domain and to be hosted on the information superhighway for wider reach and value-addition. This calls for a change in the governance mindset from restrictive to an open flow of information. This transparency enabled greater participation, faster decision-making, greater accountability of the government towards the society it serves.

Within this context, the state and the private sector have a crucial role in creating skilled, educated intellectual force with strong penetration till the village and household level. It is this human capital and ICT that can propel new approaches to solving problems, create new business culture, new products, services, and new knowledge. This would ensure that the dot.orgs grow hand in hand with the dot.coms. The ICT infrastructure exists to enable the implementation of IT-based governance by the government, public and private sector (Figure 3). However, communities can only reap benefits in the information revolution if they actively rectify these issues:

(a)   provide sound technologies and infrastructure to access information resources available in the public domain;

Figure 3: Policy Implications for State and Public Sector
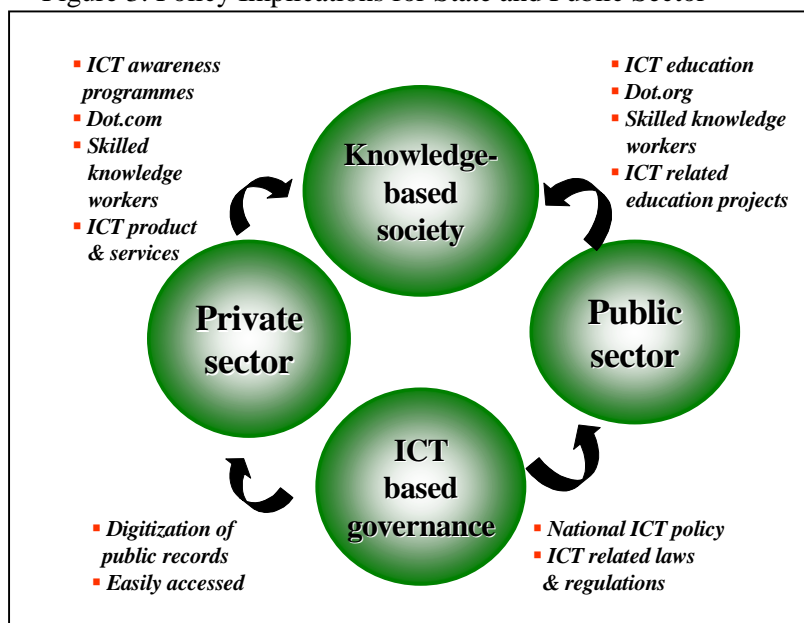
(b)   committed to training skilled workforce to develop, maintain and provide value added products and services. This effort would increase the technical and managerial capabilites of decision makers or economic agents;

(c)   institute conducive policies that promote equitable participation of the civil society in the knowledge society as both producers and consumers of

information and knowledge. This would increase members participating in the process of production; and

(d)   make known to the public of success stories so that such ventures can be replicated or followed.

THE MALAY SOCIETY AND ICT

Is the Malay society ready to embrace ICT and use it to her advantage? Results of a national survey indicated that the Malay society are doing not too badly in terms of awareness of the importance of science and technology in improving their daily lives. The MASTIC's survey (*Public awareness..*, 1997) on the public's awareness of general scientific and technological concepts indicated that the performance of the Malays is generally similar with the other ethnic groups. The results from a questionnaire posed to 2,000 respondents (48% of whom are Malays) who rated on 16 questions that tested their understanding of basic scientific terms, indicated that the Malay respondents scored an average of 54.9% correct responses, compared to 52.9% Chinese and 51.1% Indians. The mean scores among children and youths of the Malays did not differ with the other ethnic groups (Children – Malays:6.08, Chinese:6.18, Indians:5.96; Youth – Malays 6.82; Chinese:7.09; Indians: 6.4 - on the mean score obtained out of 16). The survey also ascertained the respondent's interests of various general and S & T policies among the ethnic groups and indicated that all races have average attitude towards the "application of computer technology", with the Malays scoring a mean score of 3.39, Chinese – 3.25, and Indians 3.31 (based on the Likert scale of 1 none to 4 excellent). The survey also indicated that most Malaysians hold positive views on science and technological issues. For example, 78% indicated that science is necessary, 82.8% felt that science & technology improve lives and 58.6% have the opinion that computers create more jobs and this positive attitude is more so among those with tertiary education. Respondents from other countries indicated mixed reaction towards the statement "computers and automation would create more jobs than they would eliminate" (*Science and engineering indicators*, 1993), Only 19% of European adults, 39% of American adults and 43% of the Japanese shared optimistic view about automation and job creation. Perhaps they are more experience with respect to automation than Malaysians and thus were aware of the consequences.

To say that the Malays are not aware or not using the currently available info-structure is not true. The results of the survey also indicated that 98.2% watched television, 96.1% read the newspapers, 87.9% listened to the radio, 80.9% read magazines but only 20.3% read science-based magazines. However, this pattern is equally similar among the Chinese and Indians (*Public awareness…*, 1997, p.158). The most watched programme among the Malays (by degree of choice) were the news (43.5%), entertainment (12.6%), drama (11.3%), documentary/general knowledge (8.1%), film (7.1%), and others (17.4%). About 52.6% of the Malays

indicated that they read everyday and only 9.7% indicated that they seldom do so. The most read sections in the newspapers by the Malays are internal affairs (43.7%), sports (22.9%), entertainment (17.8%), external affairs (7.4%) and others (6.9%).

Another study that focused on digital divide in a housing estate in Lembah Pantai, Kuala Lumpur, (Noor Bathi, et al., 2001) sampled 231 housing units, comprising 75 Malay homes, 96 Chinese, 49 Indians and 11 others. The study revealed that 38.5% of the homes has a personal computers. Out of the 38.5%, 9.1% has 2 PCs and 4.5% have more than two PCs. Among those interviewed, 28.1% (including those already with and without PCs) indicated their intentions to purchase a PC in the near future. They intended to do this either by using monies from their savings, withdrawals from KWSP, through hire purchase and borrowing from banks or their employers. This indicates that the majority of Malaysian citizens are aware of the need to expose their families to the use of PCs and perhaps only economic limitations prevents them from owning one. From the 982 respondents, 50.6% indicated that they have used computers at various places (such as at their homes, offices, schools, cyber cafes, and friend's houses) and for various purposes (personal use, office work, school projects, entertainment). When self-assessment were requested of the respondents, 49.8% indicated they do not know how to use computers, 34% felt that they have the basic skills, 12.6% and 3.3% assessed themselves as being at the intermediate or skilled level respectively. One curious finding is that over half (61.3%) of the users have never used the Internet and those who have used Internet (363), the majority used it for communication or to find information. Only a small percentage used the Internet for research, entertainment or purchasing products. Internet use by ethnic composition indicated that 35% (128) are Malays, the majority of whom used the Internet from their offices, homes or cyber cafes. The Chinese also indicated similar pattern in Internet use, with more than half accessed the Internet from their homes.

A more recent study by Narimah and Zamree (2002), surveyed 2015 respondents out of which 1148 (57%) were Malays, 867 were non-Malays (43%) located in the Klang Valley, Batu Pahat, Sungai Petani and Pekan. The indicators explored are respondents' knowledge on information technology, ownership and usage of computers, Internet subscription and training in ICT related courses. The results indicate that the Malay respondents have some knowledge of IT but were less ready in terms of computer skills and Internet use. The study proposes that future studies should focus on the actual needs and skills needed, exposure to the value of information, and promotion of language skills especially in the English language, the widely used medium of instruction in the Internet.

It cannot be ascertained that the results from the studies above is true for the general Malaysian society. However, the studies do indicate that the Malay society is not

ICT illiterate and do know the importance of IT in their daily lives. They are aware of current issues and readily use the public information channels that are widely available. For those who used the Internet, communication via e-mails and searching for information is the main focus. In this instance, supportive governance (government and citizens) are already in place and appreciative of utilizing ICT to enable a knowledge-based society. It is the other environmental factors as described in section (2) that need to be worked upon.

CONCLUSION

Are there knowledge bases relevant to the Malay society? The Malay society has rich repositories of archival and current resources on her language, culture, sociology, economy and technology. Scholars from around the world working on Malay language, literature and culture would find heaven in collections held at the older University libraries, Dewan Bahasa dan Pustaka, the National Archives and the National Library. Most of the unique collection are not digitized and are therefore not easily accessible. Even in this limiting situation, there has been some tenacious European scholars, who has carried out the necessary "leg work" (going to one repository to another) to study the collections and some has published and disseminated works abroad using local resources, which are now referenced by local scholars. This situation may have arisen because the inability to recognize the value and utility of resources in the vernacular language that could be managed (centrally or distributed) through structured scholarly and portals on Malay scholarly and literary works. Such portals might include resources ranging from manuscripts to strategic economic and social data. Currently, such information repositories exist in isolate environments, not widely accessible or available within the public domain. What is needed is a unanimous concerted effort to pool strategic information resources by and about the Malays, to increase its accessibility. The question of copyright and ownership is still upheld through well planned secured IT infrastructure, where access is given to authorized users only. The strength of such info-structure is in the accessibility and sharing of resources especially for those from remote locations at any time. This would satisfy the condition of developing local knowledge contents that subsequently nurtures knowledge sharing at all levels of the society.

Another area that needs special attention is the promotion of information skills and ICT literacy. We have often heard of the Tamil and Chinese Associations offering ICT awareness programmes for their community members. The same effort should be initiated by the Malay language and literary societies; Malay entrepreneurs associations, Malay chamber of commerce as well as related social or student associations. The ICT awareness might already exist, but the community member' skills need to be cultivated so that members know how to search for available information effectively, choose and make sound educated decisions based on the

information assimilated. This could mean more involvement by schools that can be the center for ICT literacy programmes for their community. In the ideal situation, the schools, colleges and universities provide the venue and the expert members of the community volunteer in programme delivery. This requires supportive governance at all levels within the community, making public policies more transparent, easily diffused and assimilated. We would have reached the state of a knowledge-based society if our community has the ability to acquire, organize, retrieve, disseminate private and public information through information communication technologies to support policy making and development process. Information exchange, utility and diffusion help sustain development process and reduces the gap between the information rich and poor members of the community. The underlying catalyst of this environment is the ICT infrastructure, that act as the backbone for knowledge networking, enabling speedy delivery of local and general content information to all sectors ranging from long-distance education programmes, telemedicines (access to information about best practices and experiences) and the creation of new livelihoods. The technology allows individuals to harvest data from sites and add value to it by prioritizing, translating and updating. Knowledge is therefore perpetuated through continuous value-addition and customization

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