

## DETERMINING DIGITAL MATURITY AMONG ICT USERS IN MALAYSIA

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### **Abstract**

With the fast development in ICT, the need for digital maturity becomes increasingly important. Measuring ICT maturity has always been on the infrastructural, applications, and ICT Policy. Taking a different orientation, the present study views ICT maturity of the individual users vis a vis the ICT tools as a solid foundation for successful digital maturity in a digital economy. This paper aims at determining the level of digital maturity among ICT-Mobile Phone (smart phone and internet) users by looking at the intensity of usage of smart phone applications (apps) and functions and the level of indispensability of internet and its related characteristics and functions. A nationwide survey was conducted among 2124 respondents based on the population ratio of the main ethnic groups in Malaysia. Data were analysed using SPSS 20.0 and both descriptive and inferential analysis are applied to analyse the data. The results revealed that the smart phone functions, facilities, and apps which are mostly used include social media (Facebook/Twitter), instant messaging (WhatsApp/Viber/Skype), Wi-Fi, downloading apps from 'Play Store' or 'App Store' and camera. The findings also indicated that a fast internet service, availability of internet at anytime and anywhere and the access to internet

content without limit are the most indispensable characteristics and functions of internet for the users. The results implied that the respondents are above average in digital maturity in terms of intensity of usage of ICT-Mobile Phone functions, facilities, and apps. Meanwhile, their ICT-Mobile Phone engagement seemsto be high in digital maturity for the indispensable characteristics and functions of internet. The findings of this study have implications on ICT system and apps providers on the needs of the users. This is crucial in order to achieve digital maturity which will prepare the grounds for digital inclusion in a digital economy.

**Keywords:** *Digital Maturity, Digital Economy, ICT, Critical Success Factors, Internet Users*

## MENENTUKAN CIRI-CIRI KEMATANGAN DIGITAL DALAM KALANGAN PENGGUNA ICT DI MALAYSIA

### **Abstrak**

Dengan perkembangan ICT yang pantas, keperluan untuk kematangan digital menjadi semakin penting. Mengukur kematangan ICT kebiasaannyaberada dalam polisi infrastruktur, aplikasi dan ICT. Mengambilkira dari perspektif yang berbeza, kajian ini melihat kematangan ICT pengguna individu melalui perolehan dan penggunaan alat alat ICT sebagai asas yang kukuh kearah kejayaan kematangan ICT ekonomi digital. Kertas kerja ini bertujuan menentukan tahap kematangan digital dalam kalangan pengguna ICT-telefon mudah alih (telefon pintar dan internet) dengan melihat kepada kekerapan penggunaan aplikasi telefon pintar dan juga fungsi dan tahap keperluan internet sertafungsi dan ciri ciri nya yang berkaitan. Satu kajiselidik telah dijalankan keatas 2124 responden melalui kadar populasi kumpulan etnik utama di Malaysia. Data di analisis menggunakan SPSS 20.0 bagi menjanakanstatistik deskriptif dan inferensial. Dapatan kajian menunjukkan bagi fungsi telefon pintar, kemudahan dan aplikasi paling kerap digunakan termasuk juga media social (Facebook, Twitter), mesej segera (WhatsApp/Viber/Skype), Wi-Fi, muat turun aplikasi dari 'Play Store' atau "App Store" dan juga kamera. Dapatan kajian ini juga menunjukkan khidmat internet yang pantas, capaian Internet yang mudah pada bila bila masa dan tempat dan capaian ke

kandungan Internet tanpa had menjadi ciri dan fungsi yang utama pada pengguna Internet. Keputusan kajian menunjukkan pengguna Internet adalah di tahap sederhana tinggi dalam kematangan digital dari segi kepesatan penggunaan fungsi, kemudahan dan aplikasi ICT-telefon mudah alih. Sementara itu, penggunaan fungsi ICT-telefon mudah alih adalah di tahap kematangan digital yang tinggi, khususnya untuk ciri ciri penting dan fungsi Internet.

***Kata kunci:*** *Kematangan digital, ekonomi digital, ICT, faktor kejayaan kritikal, pengguna Internet*

## **INTRODUCTION**

Today's technology penetration rate, especially smart phone technology has shown a tremendous speed and is predicted to halve the 20 years saturation period recorded by mobile phone. Coupled with decent internet infrastructure, i.e., the internet, Wi-Fi facilities, more and more people are attracted to be part of this digital world community. Apart from infrastructure, application and ICT policy as factors in measuring ICT maturity, the presence of social media and the current development in the field of ICT, especially the introduction of smart phones and tablets has increased the level of usage of ICT among many. The level of usage as well as adoption rate has shown huge increment which has never been seen before since the introduction of telephone decades ago.

Apart from the increased demand in the use of such applications targeting the basic needs of human being that is to socialize, they are also being designed to be very much user friendly to which anybody with very limited basic knowledge of ICT would be able to use them almost immediately.

A smart phone shipment worldwide is expected to be 823 million units in 2013 and will reach 1.3 billion in 2017 (Smartphone Futures 2012). Smart phone has allowed easy access to the internet at almost anytime, anywhere parallel to today's lifestyle where mobility in accessing the internet has become almost a necessity rather than luxury aspect in life. The trend in ownership of ICT devices in 2013, in almost all ASEAN countries, has shifted to smart phone and tablet from desktop and laptop (Nielsen 2012). Such phenomena have fuelled the mobile application downloading activity from all stores and it is expected to reach a staggering 309.6 billion applications by 2016 from 24.9 billion in 2011.

It is also expected that the shipment of smart phone and tablet in 2016 to reach 1.342 billion (+17.9%) and 383.5 million (+35.3%) respectively (Mobile Device Market 2012). Furthermore, all the other gadgets including basic phone, feature phone, notebook and netbook, as oppose to smartphone and tablet are all expected to show negative growth rate in 2016 (Mobile Device Market 2012).

In 2013, it is reported that there are 2.7 billion people or 39% of the world's

population are online and 750 million households are connected to internet (ITU Report 2013). The study on individual users of such technology is very interesting especially in this part of the world, Asia, where with only 27.7% (second lowest rate worldwide) of overall internet penetration, it recorded the highest number of internet users (Internet World Statistics 2012). It has become obvious that with a huge room of growth, Asia will become the trend setter of future ICT development. Therefore, insights on ICT usage especially in Asia is very important and significant.

The Malaysian society, with the help and support of both the public and private sector initiative, has seen a tremendous leap in the uptake and use of ICT (Digital Malaysia Progress Report 2012). The Internet has brought about a huge change in the way we do things and on many aspects of our society. It triggers innovation in a different manner from previous technologies, with new ideas spreading quickly across national borders (Xue 2005). Malaysia is no exception to this development. Like in many other countries, the Internet has now become ubiquitous in the life of Malaysians. It is a household name, especially with the advent of Facebook. Malaysia has seen a meteoric rise in Internet usage among its populations couple with high broadband penetration.

Malaysia's Internet initiative and development began in 1990 with the establishment of Malaysian Institute of Microelectronic Systems (MIMOS) and the subsequent launching of Joint Advanced Integrated Networking (JARING) as the main Internet Service Provider. In 1992 a satellite was installed to link Malaysia and the USA and JARING was fully connected to the Internet, henceforth providing Malaysian users with access to Internet resources in more than 140 countries (Hashim & Yusof, 1999). However, the year 1995 was considered the beginning of the Internet age in Malaysia. The growth in the number of Internet hosts in Malaysia began around 1996, when the government seriously engaged in ICT development and opened the telecommunication market to three additional companies. The country's first search engine and web portal company was also founded that year (Pillai 2001).

In addition to the above initiatives, there are also the Multimedia Super Corridor (MSC) and the newly launched High Speed Broadband (HSBB) (Salman 2010; The Malay Mail, March 2010). The HSBB is a flagship project of the National Broadband Initiative and aims to boost the country's competitiveness. The national project, worth RM11.3billion, is a joint effort between Telekom Malaysia (TM), a Malaysian Telecommunication Company, and the government to develop the next generation high speed broadband infrastructure and services. Some of the initiatives include implementation of broadband community centres to provide services to 615,000 households in 246 locations with an allocation of RM60 million. The High Speed Broadband (HSBB) was to be implemented in certain areas to encourage business and economic growth and Broadband to the General Population (BBGP) shall be installed. The NBI fragment the nation into three zones. Zone 1 comprises of high economic impact areas such as the Klang

Valley and Iskandar Development Region in Johor. Zone 2 includes towns and suburban areas. Whilst Zone 3 primarily includes rural areas.

Other initiatives also comprise the building of people's internet centres in 138 Information Ministry premises nationwide providing broadband coverage to 400,000 users. E-kiosks will also be provided at community centres and sub-district offices in 1,105 sub-districts in the country with an allocation of RM40. There is a provision for public cellular coverage whereby 873 new telecommunication towers will be built, as well as 278 telecommunication towers in Sabah and 257 in Sarawak; channelling of RM1 billion from the Universal Service Provision (USP) programme through the agreement of service providers to provide notebooks to underprivileged students in the country; and a TM agreement to introduce broadband-netbook packages at reduced prices of RM38 (from RM50) and RM20 (from RM30) for USP areas.

With all these developments and in achieving a fully digital economy, monitoring and improving ICT usage and network readiness is crucial. The Network Readiness Index(NRI) is based on 4 sub-indexes and 10 pillars (Bilbao-Osorio, Dutta, Geiger, & Lanvin 2013). One of the pillars is 'individual usage' as what has been the focus of this paper. Hence, following similar orientation, the present study focuses on the ICT maturity of the individual users, vis. a vis. the ICT tools as a solid foundation for successful digital maturity in a digital economy. Thus this paper aims at determining the level of digital maturity among ICT (smart phone and internet) users by looking at the intensity of usage of smart phone applications (apps) and functions and the level of indispensability of internet and its related characteristics and functions to the users.

## **LITERATURE REVIEW**

### ***Social Media, Mobility and Internet***

We can now safely say that ICT technology has almost reached the bottom of the pyramid in certain parts of the world in terms of ownership and penetration. In the case of Facebook, there are currently 1.15 billion users and 65.3% of its users access Facebook from their mobile devices (Social Media Facts 2013). Yet another example is from Twitter where 60% of the 500 million Twitter users access twitter from mobile devices (Digital Economy Ranking 2010). These two striking examples are sufficient in illustrating the preference of the users – social networking through social media and the need to be mobile in accessing the internet. Mobility in internet surfing has become almost like a need in today's living not only limited to social networking or making calls but, of course, other internet related activities. This is proven true because in 2009, for the first time, data traffic had exceeded the volume of voice calls across the world's mobile networks (The Global Information Technology Report 2013).

Mobility is a real big issue not only to the end users but also to business organizations. The facts and figures on the use of mobile devices have attracted more business organizations to take advantage of the opportunity to engage

more potential customers to spur their business. This is because in 2012, 25% of internet searches were made by mobile devices and 9 out of 10 mobile searches result in an action (SEO Predictions 2013).

### ***Digital Maturity and Digital Economy***

The usage of internet has become more sophisticated in the sense that more activity that could not be done before has been made possible through the advancement of ICT technology. The yesteryears technology that was used to be separated in nature with telephone, television and video, voice and data transmission were separate entity that called for different tools to be used in accessing them. Today, all of these technologies are converged into the internet media (Internet World Statistics) In this era of converged media, users are taking advantage of such development in conducting various activities from searching of information, trading, social networking, learning and even decision making. This also requires certain level of knowledge on the users' side. The more advance or mature the users in leveraging those technologies the more involved they are in contributing towards digital economy. The prevalence of internet-connected consumers, business and government, the role of digital communications and services play utmost importance in most of the world's economies. It is so important that the digital economy is estimated to be worth \$20.4 trillion by 2013 equivalent to 1/3 of world GDP (Making sense of digital change 2011).

In the economy of several countries, the ICT industry has become increasingly important and now accounts for a significant share of value-added and employment. In addition, ICTs interact closely with many other sectors, thus enabling innovations to accrue and affecting productivity (The Global Information Technology Report 2013). In Australia, for instance, its government has laid out plan in uplifting its digital economy which in return will benefit its citizen in so many ways. One of the initiatives is to increase teleworking. An increase of 10% in teleworking would save Australia an estimated 120 million litres of fuel, avoiding 320,000 tonnes of carbon dioxide, and a reduction of A\$470 million in congestion costs' (National Digital Economy Strategy 2011). In other studies assessing the direct and indirect impact of mobile broadband in economies such as India, South Africa, Nigeria, Taiwan, China, and the United States show that a 10% increase in mobile broadband penetration is likely to yield an impact of between 1 and 1.8 percent in GDP (The Global Information Technology Report 2013).

Positioning Malaysia towards a much better and improved digital economy requires a rigorous and careful planning. This initiative would also take into account the participation of Malaysia citizens in activities that could contribute to digital economy. Understanding and exploring the trend and pattern of usage would be a good start as plans could be made in catering for the needs and improving what is already in place.

## **MATERIALS AND METHODS**

A nationwide survey was conducted to find out the baseline data for the patterns of ICT- mobile phone users and activities in relation to the digital economy development in Malaysia. Respondents were selected based on stratified sampling technique. Of the 3000 questionnaires distributed to identify groups, 2124 respondents returned the questionnaire voluntarily. Some 55.2% of the respondents are males and 44.8% females. Based on the population ratio of the main ethnic groups in Malaysia, 60.4% of the respondents are Malays, 28.5% Chinese, 9.0% Indians and 11% represents the Bumiputera in Sabah and Sarawak. For the age range, 12.2% belong to the 15-19 age group, 21.8% are in the 20-29, 24.3% fall within the 30-39, 18.6% in the 40-49% and 23.1% in the 50 years and above category. Data were descriptively and inferentially analysed using SPSS 20.0. Prior to the actual data collection a pilot study was conducted on 50 respondents to help test and fine tune the questionnaire.

## **FINDINGS**

The findings are presented according to 2 themes: intensity of the usage of ICT-mobile phone and characteristics and functions of internet. Results of the study on these two themes are explained in the following lines.

It appears that Malaysians have reached a satisfactory level of maturity in terms of usage of ICT with regard to mobile phone functions, facilities, and apps as illustrated in Table 1. More than 50% indicated that they often used mobile phone functions to send messages via Bluetooth, transfer files from device to device, and send business cards via SMS. In terms of facilities, the trends showed that more than 70% have been using phone facilities like camera, alarm clock, and Wi-Fi. Among the least facilities used are watching TV and Planner. Interestingly, over 70% of the respondents have been using mobile apps and functions such as social media (Facebook/Twitter), instant messaging (WhatsApp/Viber/Skype), and mobile apps from 'Play Store' or 'App Store'.

**Table 1: Intensity of usage of smartphone Functions, Facilities and Applications (Apps)\***

	Never	Sometimes	Often	More often
	%	%	%	%
<b>Functions</b>				
Sending a message via Bluetooth	22.3	56.5	18.2	2.9
Transferring of files from device to device (e.g. pc to mobile)	28.8	47.5	20.0	3.8

Sending 'business cards' via mobile phone	35.0	47.8	15.4	1.8
Sending messages or pictures via MMS	12.7	54.2	28.2	4.9
<b>Facilities</b>				
Video	11.6	39.8	36.5	11.2
Camera	4.5	31.5	38.0	26.0
Radio	20.5	46.3	24.9	8.3
Watching TV*	52.6	31.0	12.1	4.2
Using alarm Clock	6.0	19.3	32.9	41.7
Email	19.8	37.4	26.3	16.6
Planner*	40.7	32.1	17.6	9.6
Wi-Fi	17.7	23.2	31.0	28.1
<b>Mobile Apps</b>				
GPS to identify location	33.5	42.8	19.3	4.4
Downloading applications from 'play store' or 'app store'	24.1	29.5	28.1	18.3
WhatsApp/BBM/Viber/Skype etc.	27.8	24.6	29.4	18.1
Facebook/Twitter/Instagram etc.	19.2	23.4	31.5	25.9

\*n=2124

As far as characteristics and functions of internet that the users need are concerned, the results showed that a fast internet service (m=5.94), availability of internet everywhere (m=5.89), availability of internet service at any time (m=5.87) and the access of internet content without limit (m=5.85) as the most indispensable characteristics and functions of internet that the users need (Table 2). All the means of the items are quite high showing a high level of maturity among the respondents as they know what they need to be present for a smooth internet usage.

**Table 2: Indispensable characteristics and functions of internet for the users (Means and SD)\***

	<b>Means</b>	<b>SD</b>
A fast Internet service	5.94	1.38
Internet service wherever I am	5.89	1.36
Availability of Internet service at anytime	5.87	1.38

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Access to unlimited internet content	5.85	1.41
Affordable internet access	5.75	1.36
Internet service in my daily activities	5.63	1.52
Skills in doing media activities simultaneously (e.g. downloading video, listening to radio, surfing internet)	5.29	1.68
ICT skills in doing two or more activities simultaneously (e.g. using word document and Google search at the same time)	5.23	1.71
Storage location of information on the internet (e.g. cloud computing: cloud, drop box, sky drive)	5.03	1.71

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\*Likert rating of 1 to 7: 1=Not Necessary to 7=Very Necessary

## DISCUSSION

Internet World Statistics shows that Malaysia population has reached 17,723,000 internet users which representing 60.7% of the population at mid-year 2012 (Internet World Stats 2012). Almost three-quarters (71%) are keeping in touch with friends and family via these sites, a 24% increase from 2009. Instant messaging and reading local news rounded out the top three online activities. The findings in this study revealed that most respondents are currently internet users and at the same time have adopted mobile phones and/or smartphones that have internet connection or carry Wi-Fi facility to access the internet.

The activities of sending of messages using mobile phones/smartphones is quite high i.e., more than 70%. The functions in mobile phone that allows users to send/receive message in not new but when the phone has internet connection, more messages and longer messages can be sent/received via email. The convenience of accessing email messages via phones has given the respondents to stay in contact online with friends, relatives and other people. This implies that the respondents are not bound by the wired internet anymore as the mobility of internet access is not an issue. Respondents can access the Internet directly using their phone line and Wi-Fi facilities available in surrounding areas.

In relation to this trend, the findings show indispensable characteristics and functions of internet among the respondents. The mean scores for internet dependent are almost 6 which indicate a high tendency polarization in internet usage. In line with these findings, an earlier survey in Malaysia on internet users by The Nielsen Company (Nielsen Survey 2011) shows that the highest usage among internet users was recorded among people aged 20-24. The ratio is 6:10 or 57% of users regularly use the internet, spending an average of 22.3 hours online per week. Once online, according to Nielsen survey (2011), Malaysians primarily use social networking sites such as Facebook and Twitter. Likewise, this study depicts similar patterns of a heavy engagement of respondents in social media networking, i.e., 70% and more.

The study also shows that most respondents have been exploited the facilities available in their mobile phones that shape their life style. They use camera, listen

to radio, set alarm clock, and use Wi-Fi facilities in their routine activities. Very seldom we hear people carry alarm clock to wake up themselves in the morning or carry camera to take quick photos or video to record short segments of video, but they can now use their mobile phones to accomplish those tasks. In fact, the digital technology allows them to store the data quickly, transfer or share the data with other people immediately. As the respondents are adults above 18 years old, they would know how to use the facilities at their own discretions.

What is new now is the trend of mobiles used among the respondents in Malaysia is the use of mobile apps. More than 70% of the respondents have been downloading apps from Play Store or Apps Store for various purposes. Normally people download communication apps such as WhatsApp/BBM/Viber/Skype, and GPS like Waze, and other apps for immediate needs to ease their life routine.

The findings reveal that phenomenon of ICT-mobile phone functions, facilities, and apps have opened up a wider possibility of strengthening the digital economy growth and development in Malaysia since customers can be contacted by manufacturers and suppliers easily; and customers would have more opportunities to survey and select alternative products and services available online. We have yet to witness how the digital economy would shape a new life style among Malaysians in a more globalized community.

## **CONCLUSION**

It goes without contesting that ICT (Internet and smartphones) users in Malaysia have become of age and they know what they want as far as characteristics and functions of the internet are concerned. Hence the level of digital maturity among the users is encouraging. This is reflected in the high level of indispensability of the characteristics and functions of internet in the lives of the users. Hence, impacting, most aspects in the lives of the Malaysian society. This finding concurs with the finding by Hasim and Salman (2010) on the indispensability of the Internet among urbanised users in Malaysia. The findings of this study have implications on ICT system and apps providers on the needs of the users. This is crucial in order to achieve digital maturity which will prepare the grounds for digital inclusion in a digital economy.

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