

## INVESTIGATING THE RELATIONSHIP OF ATTITUDINAL CONSTRUCT TOWARDS THE CONTINUANCE OF BROADBAND INTENTION IN MALAYSIA WITH MODERATING EFFECT OF DEMOGRAPHIC

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### Abstract

This paper is to investigate the relationship of attitudinal construct towards continue intention using broadband in Malaysia with moderating effect of demographic. In today's world, Information and Communication Technology (ICT) is the most efficient way to develop literacy of knowledge and skills (Gholami, Higon, Hanafizadeh, & Emrouznejad, 2010; Hilberg & Gabriele, 2000). This became one of factor to motivate people to capture and acquire ICT knowledge and skill. By utilizing ICT, it will permit individual to make use of computers and software's or any other applications or technology as tools to acquire variety of knowledge or success in work related or personal goals (Polykalas et al., 2012; Hanadi, Mark, & Lan, 2011; Muraina, 2014). Internet is the catalyst of giving enormous impact on the ICT development in business, infotainment and education such as streamlining access to communicate remotely inside or outside organisation. After all, broadband are the catalyst technologies for the expansion and the usage of internet. Therefore this study will focus on Decomposed Theory of Planned Behaviour (D-TPB) and Model of Adoption of Technology in the Household (MATH) in order to understand the factors affecting the factor of deployment and household broadband penetration.

**Keywords:** *Household Broadband Penetration (HBP), Continue Intention, Public telecenters*

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### Introduction

It is important to understand the variables influencing the internet deployment and penetration due to the regale of the information and knowledge spread by them, especially in the household. In general, broadband is a significant evolutionary step to deliver fast and "always-on" internet services to the subscribers where users could access to new services, applications and content that fulfil their lifestyle and improve their productivity (Sawyer et al., 2003; LaRose et al., 2007; Choudrie & Dwivedi, 2006). Further to that Dwivedi et al. (2007) stressed that broadband penetration is consider to be a critical strategy issue in numerous nations yet just few studies have been led with the objective of understanding it in the perspective of developing countries. It leads to the establishment of National Broadband Policy following the step taken by other developed countries. At the same time Sawyer et al. (as cited in Ooi et al., 2011, p.72)

agreed and determined that broadband is a matured technology that deliver a high-speed Internet access technology. It's already became a significant evolutionary step to deliver fast and "always-on" internet services to the subscribers where they could access to new services, applications and content that fulfil the user's lifestyle and improve their productivity. As defined by Sawyer et al. (2011) the broadband as single technology, the term of 'broadband technology' embraces a variety of high-speed access technologies, including Asymmetric Digital Subscriber Line (ADSL), cable modems, satellite, and Wireless Fixed (Wi-Fi) Networks (Sawyer et al. 2003). In term of definition, the term broadband is commonly used to describe recent Internet connections that are significantly faster than earlier dial-up technologies, but it does not refer to a certain speed or specific service. As stated in skmm.gov.my (2015) the Universal Service Provision (USP) fund was established under the provision of the Communications and Multimedia Act (CMA) in 1998 is to increase broadband accessibility in rural Malaysia. Further to that, skmm.gov.my (2009) indicated this initiatives are one of continue effort by the government of Malaysia under the Ministry of Communication and Multimedia Malaysia (MCMC) to bridge the digital divide. It involves projects to establish and improvise broadband services in the rural communities such as Community Broadband Library (CBL) and Community Broadband Centre (CBC). In skmm.gov.my (2015) also mentioned one of the recent project Pusat Internet 1Malaysia (Pi1M) as part of the total expenditure by Malaysian government already spent more than RM4.8 billion so as to achieve their target in financing the community broadband projects from 2003 to 2014.

### **The Problem**

As broadband is the catalyst for internet penetration, and is considered to be an important policy issue in many countries (Dwivedi & Wahab, 2007). Mobile broadband is the segment that is growing fastest and be the most dynamic segment of the telecommunications market (www.gsm.com, 2013). It directly affects business productivity with estimations suggest that with ten percent increase in a mobile penetration in the long run it could increases country's total productivity factor by 4.2% (ITU, 2015). However only few studies have been conducted on this critical technology management especially in term of broadband penetration in the household. In 2007, Malaysian Communication and Multimedia Commission (MCMC) have targeted to achieve 70% of Household Broadband Penetration (HBP) by the year 2010 (www.skmm.org, 2014). However due to various factors, it was revised to only 51% eventhough many initiatives and projects was developed to meet the objectives. The latest initiative by MCMC is by deploying public telecenters called Pusat Internet 1Malaysia (Pi1M) in identified location (skmm.gov.my, 2014). The challenges now is for SKMM to focus on how to increase attraction, intention to use broadband, create awareness and motivate the people to continue using the broadband at the public telecenters or to subscribe theirs at home. Unfortunately, the data as in Figure 1 shows reversed trend in the HBP in certain state of Malaysia especially Perlis, Negeri Sembilan and Terengganu.

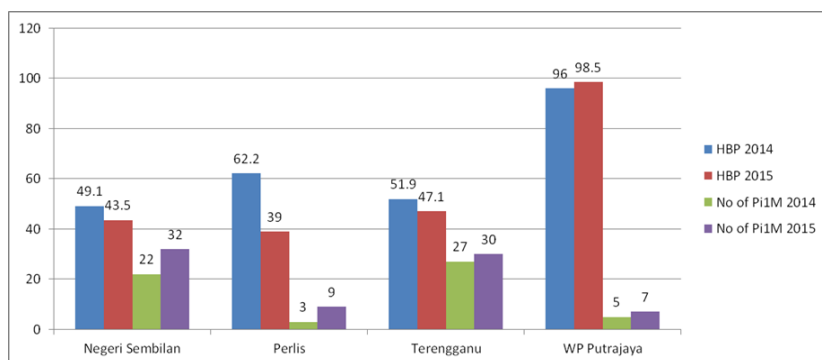


Figure 1

*Household Broadband Penetration for 1 year period 2014-2015*

(Source: Communication & Multimedia Pocketbook, www.skmm.gov.my, 2015)

Even though, in year 2015 the average broadband penetration in Malaysia already surpassed 71% in 2015, surprisingly the HBP in these 3 states were drop significantly (skmm.gov.my, 2015). Based on Figure 2.1 the HBP in Perlis was drop by 23% from quarter2 (Q2) of year 2014 to only 39% even though the numbers of public telecentres (Pi1M) increase from three centers to nine in the state. At the same time Negeri Sembilan recorded a drop by -5.6% to 43.5 eventhough ten new Pi1M installed in the state in the period of time. While for state of Terengganu (the third 3rd lowest in term of HBP) recorded a drop of -4.8% for the same period as three new Pi1M installed in the state (skmm.gov.my, 2015). As indicated by Prieger (2013), this drop may be caused by many reasons such as unaffordability, inadequate service quality, lack of computers in the household, lacking in the perception of broadband' s usefulness, poor digital literacy, lack of trust in the broadband and internet security raised as concern. This fall was innocuous and requires response by all policy makers and players in the field of telecommunication. Furthermore, this scenario was mentioned by Irani et al., (2009) that many countries in the world still experienced low rate of demand on broadband despite affordable pricing of broadband access by their governments

### Underpinning theory

Many previous studies have stressed that many of the IS theories have been used and addressed in different perspectives and produce solutions to the issues at hand (Eriksson & Nilsson, 2007; Park et al., 2009; Ho, 2010). At the same time Eriksson et al. (2010) also mentioned that other theories such as Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Combined TAM and TPB (C-TAM-TPB), Diffusion of Innovation Theory (DOI) and Social Cognitive Theory (SCT) are widely used to investigate the adoption and usage of technology. In the initial studies of technology adoption, the Theory of Reasoned Action (TRA) was used on attitudes toward behaviour and subjective norm. The theory assumes that individuals are rational and will make systematic use of information available to them. The major determinants of this model are; individuals' perceptions, attitudes towards the behaviour and social influence, while the model serves as the foundation for explaining and predicting human behaviours. Later Ajzen and Fishbein (1985) proposed the theory of planned behaviour due to the limitations found in TRA. However, the addition of construct of Perceived Behavioural Control to TRA brings about Theory of Planned Behaviour (TPB) was later criticized by Taylor and Todd (1995) was saying that TPB and TRA that the models required individuals to be motivated to perform certain behaviour. According to Taylor & Todd (1995) the assumption is vulnerable to many problems while studying consumer behavioural related research. Further to that, Taylor & Todd (1995) later examined the appropriateness of TRA, TPB and DTPB as models to predict consumer

behaviour. Where the DTPB is an improvement of the Theory of Reasoned Action (TRA) where it contains constructs like perceived usefulness, complexity, compatibility, subjective norms, self-efficacy and facilitating conditions. The results showed that TRA and TPB were capable

Another significant and common theory for technology adoption like Technology Acceptance Model (TAM) by Davis (1989) to predict the acceptance and use of new information technology (software and information systems) within organizations. This model focus on two theoretical constructs perceived usefulness (PU) and perceived ease of use (PEOU) where both of which factors will influence customers' intention of using the system. Many of research done in previous studies found where these factors have significantly influenced customer interaction with online banking and have in recent years been documented by studies incorporating various external variables ( Pikkarainen, Pikkarainen, Karjaluoto & Pahnla, 2004; Wang et al., 2003; Cheng, Lam, & Yeung, 2006, Al-Somali, Gholami & Clegg, 2009). However, on the contrary, TAM does not consider the satisfaction of users of technology towards the long-term usage for future purposes (Ho, 2010; Park et al., 2009; Venkatesh et al., 2011). Therefore, TAM could not be unilaterally used for predicting the frequent usage of technology since it lacks consideration of satisfaction of the users of technology. Thus, this study will focus on the theoretical models of Diffusion of Innovation (DOI), Theory of Planned Behaviour (TPB) and Model of Adoption of Technology in Households (MATH) as a foundation to this research. This model is the extended concepts from the Theory of Planned Behaviour (TPB). In MATH model, it consist of normative, attitudinal, and control construct that is to predict people's intention to adopt technology in households. Besides that these studies also include the other factor from Information System (IS) continuance usage model that might also have effect on the adoption of broadband. However this paper will focus on the Attitudinal and Satisfaction factor from IS continuance usage model

### **Attitudinal**

The literature on attitude has highlighted several definitions and one of the term referring to as an individual's positive or negative feelings when performing target behaviour (Ajzen, 1985; 1991; Fishbein and Ajzen, 1975; Taylor and Todd, 1995). In overall TRA, TAM, TPB, and DTPB have proven success in illustrating relationship between the attitude or attitudinal factors and behavioural intentions especially in technology adoption/acceptance theories and models. In anytime the attitude of individuals is positive then they are likely to form an intention to perform the behaviour (Tan and Teo, 2000). Following TPB it can be assumed that if the perception of the respondents regarding the attitudinal factor is positive, then it is more likely that it will have a positive influence on the behavioural intention. In the Attitudinal factor of MATH model the variables that will be used the measurement construct are Relative advantage, Utilitarian Outcome, Hedonic Outcome and Service Quality. These factor wan mentioned by Venkatesh and Brown (2001) and Heijden (2004) as their study found that all these factors are the factors that influences PC adoption in the home and this study will further investigate the continuance of broadband in household using the same model.

### **Satisfaction**

It is believed that the users are viewed as the central part of information system, thus they are the determinant of both satisfaction and dissatisfaction of technology which could suggest the onward usage (Lenka, 2010). Therefore as mentioned by Kari et al. (as cited in Muraina, 2015, p.) satisfaction is the substitute of efficiency and success where it can be as means of measuring information system success. The Technology Acceptance Model (TAM) focuses on two

theoretical construct, Perceived Usefulness (PU) and its Perceived Ease of Use (PEOU) which influence consumers' intention of using the system. As mentioned by Wu, Lin, Li & Lin (2010) that Davis (1989) referred perceived usefulness as the degree to which a person believes that using a particular system will enhance his or her performance influence consumers' intention of using the system. Thus, user satisfaction can be described as means of measuring information system success (Kari et al., 2006). Thus the research model will be as per the following diagram.

### Moderating of Demographic

In overall, demographic variables were not very powerful predictors of broadband intentions even when considered in isolation. It should be noted that the range of the demographic variables was attenuated by limiting the analysis to those who had prior knowledge of broadband Internet, and thus included many Internet adopters, who are generally younger, better educated, and wealthier than the general population (US Department of Commerce, 2004; LaRose et al., 2007). As recommended by (Ooi et al., 2011) for future research to include moderating construct in order to examine the inter relationship among the adoption factors. This may be the effect of correlation among the constructs that may weaken or strengthen the result. The inconsistent pattern could be as a verification of what was mentioned by Pérez-Hernández & Sánchez-Mangas (2011) who have estimated the location factors as one of the of Internet access on top of other factors such as personal and household subscription and digital literacy that could be the cause of the inconsistent pattern. Additionally Rahman and Aziz (2014) also mentioned that demographic characteristics, such as age, income, gender and race are often assumed to have a significant effect on consumers' perceptions but some of these variables need to be assessed more directly, such as a cross country comparison. Therefore based on the underpinning theory the research model will be as per the Figure 2

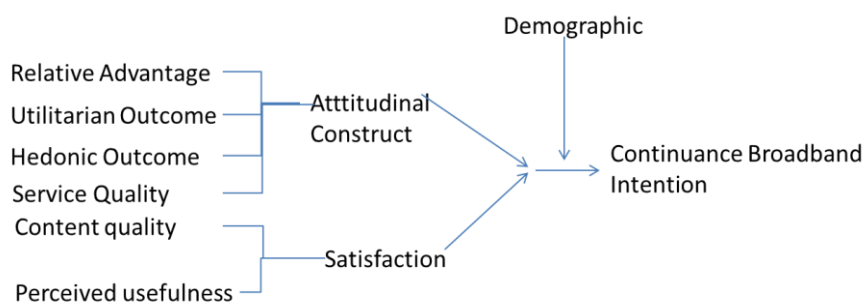


Figure 2

*The research framework for the Continuance of Broadband Intention*

(Source: Adopted from Venkatesh et al., 2011)

### Research Questions and objectives

Based on the highlighted issues from the problem statement and the underpinning theory, this paper is prepared in attempts to investigate and provide answers to the following questions:-

- i. What is the relationship of Attitudinal Construct to the continue intention of using broadband among the users of Public Tele centers in Malaysia?
- ii. What is the relationship of Satisfaction factor to the continue intention of using broadband among the users of Public Tele centers in Malaysia?
- iii. What is the effect of demographic factor of knowledge as moderating factor to the continuance of broadband intention among the public telecentres users?

Based on the research questions there are several objectives that this research is going to achieve:-

- i. To investigate the relationship between Attitudinal Construct and the continue intention to use broadband among the users of public telecenters in Malaysia.
- ii. To investigate the relationship between Satisfaction and the continue intention to use broadband among the users of public telecenters in Malaysia.
- iii. To analyse the demographic factor as moderating effect towards the continue intention of using broadband technology among the public telecenters users.

### Scope of the Study

In ensuring sufficient ICT access to their people telecentres deployments is among the most favourable steps by any developing countries (Afacan, Er, & Arifoglu, 2013). This study will focus on the telecenters that are being developed by MCMC such as *Pusat Internet 1 Malaysia* (Pi1M), *Kampung Tanpa Wayar 1 Malaysia* (KTW1M) together with the receivers of Netbook 1Malaysia programmes. These three projects are choosen because they are operated directly by MCMC and among one of the highest costing project by them. As for this study, the population will be the users of public telecenters such as Pi1M, KTW1M and Netbook1M aged between 16 and 65 years old. A self-administered questionnaire will be distributed to users of public telecentres nationwide.

### Methodology Overview

Many methods of data collection in surveys exist, as fabrication of an appropriate research design is very crucial to determine the type of data, data collection technique, and sampling methodology; in order to achieve the research objectives (Puspitasari & Ishii, 2016). As for this study, the population will be the users of public telecenters aged between 16 and 65 years old. The basic research design utilized for this study was a survey method and questionnaire in nature where a self-administered questionnaire will be distributed to users of public telecentres nationwide. In this regards the number of population is estimated at 370,000 as shown in Table 1.

Table 1 *Summary of number of Pi1M users by state*  
(Source: skmm.gov.my. 2014)

No.	State	No. of Users
1	Perlis	1,710
2	Kedah	31,148
3	Kelantan	46,629
4	Terengganu	25,780
5	Pahang	57,630
6	N.Sembilan	20,026

7	Johor	47,188		
8	Melaka	11,655		
9	Putrajaya	153		
10	Kuala Lumpur	1,443		
11	Selangor	26,832		
12	Perak	20,029		
13	Sarawak	40,678		
14	Sabah	29,846		
15	Labuan	85	Total	360,832

From Figure 1 by using the Krejcie and Morgan (1970) table based on standard deviation 0.05 the minimum sample size for this study will be 384 respondents.

85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

*Note: N is Population Size; S is Sample Size* *Source: Krejcie & Morgan, 1970*

Figure 2

*Table of Krejcie and Morgan for sample size of finite population*

(Source: www.kenpro.org, 2016)

As this is cross-sectional study, data will be gathered only once from the respondents who are the users of the selected telecenters and as the unit analysis. The selection of telecenters will use clustered random sampling method where the telecenter are clustered in five zones such as Northern Region, Central Region, Southern Region, East Coast and East Malaysia. It is due to its simplicity and cost effective (Ranjit, 2011; Creswell, 2009). After that the selection of respondent will be based on simple random sampling method where the respondents will be chosen from the user listing of the selected telecenters. The manager of the telecentres will act as an agent for data collection. This to ensure the receipts of the questionnaires is guaranteed. However those selected respondent who has difficulty to come at the telecenter, will be contacted via email and the softcopy of the questionnaire will be attached or they could also answer it via a Google form. The primary data will be analysed using SPSS and AMOS software. AMOS is an additional SPSS module, and is extraordinarily utilized for Structural Equation Modelling (SEM) analysis, and confirmatory component analysis. The hypotheses that have been formulated in this study will be tested that includes descriptions of the research design, population, sampling methods and sample size. The proposed framework and model will be used as the basis for hypotheses testing. This study will also perform confirming and disconfirming the hypotheses using deduction method.

### Concluding remarks

The deployment of broadband across many countries is a continuing effort and as it progress forward, the strategies often change and further research work is required to define the appropriate roles of governments (Jain, 2014). As Turk and Trkman (2012) mentioned, the adoption of new technologies in households is always a complex process, the diffusion of broadband has attracted unprecedented attention in the research and political community. It continues to be a salient social, economic and political issue and the development of statistical

approaches to forecast its future distribution is important. In this study, will consist the detailed explanation of sampling, measurement scales, construct reliability and validity, questioner design data collection procedure and data analysis techniques. The result of this study will be able to advice government's policies. It should be beyond the traditional roles as regulator and spectrum managers, optimal institutional mechanisms. This research should be able to recognize the need to tailor these roles to particular national circumstances that in general will benefit not only policy maker but also telecommunication service provider and users.

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