THE RELATIONSHIP BETWEEN ATTITUDINAL, NORMATIVE, CONTROL AND SATISFACTION WITH CONTINUE BROADBAND INTENTION AMONG HOUSEHOLD USERS IN MALAYSIA

ABDUL RAHMAN BIN MOHAMAD SALEH

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ABDUL RAHMAN BIN MOHAMAD SALEH

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Tarikh: **21 March 2018**
(Date)

Nama Pelajar *(Name of Student)*	:	**Mr. Abdul Rahman Bin Mohamad Saleh**
Tajuk Tesis / Disertasi *(Title of the Thesis / Dissertation)*	:	**The Relationship Between Attitudinal, Normative, Control And Satisfaction With Continue Broadband Intention Among Household Users In Malaysia**
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Nama Penyelia/Penyelia-penyelia *(Name of Supervisor/Supervisors)*	:	**Assoc. Prof. Dr. Mustakim Melan** Tandatangan *(Signature)*
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ABSTRACT

For broadband internet service providers, loss of subscriber base due to termination of service is inevitable. Meanwhile, it is alarming to see unpredictable broadband penetration in major cities while at the same time, the government strives to overcome slow broadband penetration in rural areas due to lack of continue broadband service intention. This research has adopted the factors from MATH Model, and information system (IS) continuance usage model to investigate the relationship with the continuance of broadband intention (CBI) where satisfaction is developed and integrated as a new construct. By understanding the factors affecting the CBI, it also describes the factors that influence household broadband penetration (HBP). This study has gauged the 1Malaysia Internet Center or Pusat Internet 1Malaysia (Pi1M) users' experience to measure their response towards CBI. The relations among the constructs of the proposed model are then hypothesized according to the literature findings and examined using SMART PLS 3.0. The study has drawn the samples of its population from the Pi1M in six regions of Malaysia (northern, central, southern, east coast, Sabah, and Sarawak). The cross-sectional study was conducted from October 2016 to January 2017 with 406 respondents from the target population. The results indicate that attitudinal and normative constructs are the critical factors followed by control construct that have shaped CBI. On the contrary, this study finds a negative association between satisfaction and CBI among the Pi1M users. Despite the growing number of studies on intention and adoption of technology, only a few number of researches have been done on theory-building and its linkage with CBI. In addition, the findings of this study and the new development of satisfaction as a new construct have also contributed to the existing literature which can be used by policymakers to improve their strategy in ensuring sustainable growth of broadband penetration in Malaysia.

Keywords: continuance of broadband intention, M.A.T.H, household broadband penetration.

ABSTRAK

Bagi pembekal perkhidmatan internet jalur lebar, kehilangan pelanggan disebabkan penamatan perkhidmatan memang tidak dapat dielakkan. Sementara itu, agak membimbangkan apabila melihat penembusan jalur lebar yang tidak menentu di bandar-bandar utama dan pada waktu yang sama, kerajaan pula terus giat berusaha untuk mengatasi masalah penembusan jalur lebar yang perlahan di kawasan luar bandar disebabkan kekurangan permintaan perkhidmatan. Kajian ini telah menerima pakai faktor-faktor dari model MATH dan model penggunaan sistem maklumat (IS) berterusan untuk menyelidik hubungan dengan niat berterusan bagi jalur lebar (*continuance of broadband intention* (CBI)) di mana kepuasan pengguna dibangunkan dan digabungkan sebagai konstruk baharu. Dengan memahami faktor-faktor yang mempengaruhi CBI, kajian juga menerangkan faktor-faktor yang mempengaruhi penembusan jalur lebar seisi rumah (HBP). Kajian ini telah mengenal pasti pengalaman pengguna Internet 1Malaysia atau Pusat Internet 1Malaysia (Pi1M) untuk mengukur maklum balas mereka terhadap CBI. Hubungan antara pembinaan model yang dicadangkan itu kemudiannya dihipotesiskan menurut penemuan sorotan kajian dan diuji menggunakan SMART PLS 3.0. Kajian ini mengambil sampel populasinya dari Pi1M di enam kawasan di Malaysia (utara, tengah, selatan, pantai timur, Sabah, dan Sarawak). Kajian keratan rentas dijalankan dari bulan Oktober 2016 hingga Januari 2017 dengan 406 responden daripada populasi sasaran. Keputusan menunjukkan bahawa konstruk sikap dan normatif adalah faktor kritikal, dan diikuti dengan konstruk kawalan yang telah membentuk CBI. Pada waktu yang sama, kajian juga mendapati ada perkaitan negatif di antara kepuasan dengan CBI dalam kalangan pengguna Pi1M. Walaupun semakin banyak kajian tentang niat dan penggunaan teknologi telah dilakukan, hanya beberapa kajian dilakukan terhadap pembinaan teori dan hubungannya dengan CBI. Di samping itu, penemuan kajian ini dan perkembangan kepuasan sebagai konstruk baharu turut menyumbang kepada kajian sedia ada yang boleh digunakan oleh penggubal dasar untuk memperbaiki strategi dalam memastikan pertumbuhan berterusan penembusan jalur lebar di Malaysia.

Kata kunci: penerusan niat jalur lebar, M.A.T.H, penembusan jalur lebar isi rumah.

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LIST OF ABBREVIATIONS

ATT	Attitudinal Factors
AVE	Average Variance Extracted
CBI	Continue Broadband Intention
CBL	Community Broadband Library
CQ	Content Quality
CR	Composite Reliability
DOI	Diffusion of Innovations
ADSL	Asymmetric Digital Subscriber Line
D-TPB	Decomposed Theory of Planned Behavior
F^2	Effect size
FC	Facilitating Condition
FTTH	Fiber to the Home
GOF	Goodness of Fit
HBP	Household Broadband Penetration
HO	Hedonic Outcome
ICT	Information Communication Technology
IP	Internet Protocol
IS	Information System
ISDN	Integrated Services Digital Network
ISP	Internet service providers
ITU	International Telecom Union
KTW1M	Kampung Tanpa Wayar 1Malaysia

MATH	Model of Adoption Technology in Household
Mbps	Megabits per second
MCMC	Malaysia Communication and Multimedia Commission
MODEM	Modulator and Demodulator
PBC	Perceived Behavioral Control
PI	Primary Influence
PK	Perceived Knowledge
PLS	Partial Least Square
PU	Perceived Usefulness
Q^2	Construct Cross-validated Redundancy
R^2	R-squared value
RA	Relative Advantage
ROADM	Reconfigurable Optical Add-Drop Multiplexer
SE	Self-Efficacy
SEM	Structural Equation Modeling
SCT	Social Cognitive Theory
SI	Secondary Influence
SKMM	*Suruhanjaya Komunikasi dan Multimedia Malaysia*
SPSS	Statistical Package for the Social Sciences
SQ	Service Quality
TAM	Theory Acceptance Model
TRA	Theory Reasoned Action
TPB	Theory Planned Behavior
UO	Utilitarian Outcome

UN	United Nations
UNESCO	United Nation Educational, Scientific and Cultural Organisation
USA	United States of America
USP	Universal Service Provision
UTAUT	Unified Theory Acceptance and Use Technology
VIF	Variance Inflated Factor
VSAT	Very Small Aperture Terminal
World Health Organisation (WHO)	
WIFI	Wireless Fidelity

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In order to establish a shared understanding of the purpose of the research, this chapter presents the background of the study and provides a general review of the factors that influence a household's continuing broadband intention, as identified from previous studies. In addition, this chapter presents the problem statement, research questions, research objectives, scope of the study, and the significance of the study. The organisation of the thesis is explained at the end of the chapter.

In today's world, information and communication technology (ICT) is the most efficient tool for acquiring literacy, knowledge, and skills (Gholami, Higón, Hanafizadeh & Emrouznejad, 2010). Therefore, this has become a motivational factor that ignites the intention of people around the globe to capture and acquire ICT knowledge. By utilising ICT, an individual can make use of computers and software or any other applications to acquire a breadth of knowledge or success in work-related or personal goals (Prezerakos & Polykalas, 2007; Buarki, Hepworth, & Murray, 2011). The Internet, in particular, appears to be the catalyst for ICT developments in businesses, education, entertainment, and social activities. The Internet can also facilitate the streamlining of access to information in people's daily activities. For a student, the broadband internet enables online learning and a 24-hour classroom to become a reality. Broadband internet can also help officers to limit the need for travelling as information becomes more accessible from

anywhere. Previous studies have shown an increased interest in the area of broadband internet due to the benefits of the information and knowledge made possible by the internet technology, specifically in households.

Although broadband penetration is considered a critical issue in numerous nations, very few studies have aimed to increase the understanding of broadband use in developing countries (Dwivedi & Wahab, 2008). Such dearth of progress has led to the establishment of National Broadband Policy in an attempt to emulate the steps taken by developed countries. As mentioned, some nations are claiming to have accomplished broadband accessibility (Howick & Whalley, 2007).

When looking at the impact of ICT and broadband technology towards knowledge sharing, it is essential to understand the variables influencing the Internet deployment and penetration. By having broadband internet access in a household, the users could access new services, applications, and content that can fulfill their lifestyle needs and improve their productivity. High-speed broadband internet thus could deliver benefits to an individual and a nation in terms of commercial quality, open esteem, and enhancement of individuals' lifestyles (Ooi, Sim, Yew, & Lin, 2011).

Dwivedi et al. (2010) refers to broadband technology as "an umbrella that embraces a variety of high-speed access technologies" (p.28). At the same time, broadband technology is based on either Asymmetric Digital Subscriber Line (ADSL), cable modems, satellite, or Wireless Fidelity (Wi-Fi) Networks technology. In terms of definition, broadband is commonly used to describe a new type of Internet connections

that are significantly faster than earlier dial-up technologies. However, broadband does not refer to a particular speed or services. For instance, what was termed a "fast" internet connection two years ago is now designated as "narrowband." While the term *broadband* is used to describe many different Internet connection speeds, one of the recommended definitions by Standardisation Sector of ITU is that broadband is "a transmission capacity that is faster than primary rate ISDN, at 1.5 or 2.0 Mbit/s" (ITU, 2011, p.5). Previous study by Dwivedi et al. (2006) confirmed the effectiveness of broadband internet in the households across different socio-economic backgrounds and geographical locations. The high penetration rate of broadband is seen to have positively affected the development and advancement of the Internet, electronic businesses, and the information primarily to a country whose economies are information-centric.

Regardless of the uneven expansion of ICT and the development of the Internet in the past two decades, many people from different parts of the world have yet to own a computer and use the internet, particularly those in the developing countries (Gomez, 2013). Despite the aggressive programmes to achieve a higher broadband penetration rate, approximately 28% of the American households have yet to subscribe to high-speed internet (Carare, McGovern, Noriega, & Schwarz, 2015). In responding to similar problem, Malaysia has established a reputable agency like Malaysia Communication and Multimedia Commission (MCMC) to ensure that the broadband policies are planned and implemented well, despite the many factors that have been impeding its penetrations.

Given the above points, it is essential to understand the vital role of broadband in the knowledge and global economy. The Malaysian government has been deriving

programmes to accelerate broadband penetration and eventually established Universal Service Provision (USP) (MCMC, 2015). In developed countries like the United States of America (USA), before the reform of the Universal Service programs, efforts were aimed primarily at telephone communications. In the USA, the programme "Connect America Fund" was created in 2011 and consequently shifted the focus of the Universal Service programs from telephone to broadband communications (Carare et al., 2015). In Malaysia, the Malaysian Universal Service Provision (USP) fund established under the provision of the Communications and Multimedia Act (CMA) in 1998 aims to increase broadband access in rural Malaysia (Muraina, 2015). Since 2007, MCMC has been treating USP as a "part of initiatives and continuous effort by the government of Malaysia to grow telephony and broadband services" (MCMC, 2014, p.23). The objective of USP is to bridge the digital divide in Malaysia by improving broadband penetration, as well as establishing and improvising broadband services in the rural communities. In fact, the Malaysian government allocated RM2.4 billion to the USP to achieve their target in financing the community broadband projects from 2009 to 2010 (Muraina, 2015). According to a report by MCMC (2014), the organisation was established as an arm of ministry of the Malaysian government. MCMC is also responsible for the planning, managing, and the improvement of broadband access into underserved areas so that the rural communities can assess the Internet as effortlessly as those in the urban areas.

One of the key drivers of the Malaysian government initiatives in accelerating broadband penetration is to enrich the rural dwellers' lives and indirectly contribute towards making Malaysia a developed nation by 2020. The Malaysian government had targeted for

household broadband penetration to be at 70% by the year 2010, which was later reviewed to only 50% (Ooi et al., 2011). Furthermore, broadband internet was considered a necessity because it could enhance economic opportunities in rural areas as well as encourage and stimulate the development of home businesses (LaRose, Strover, Gregg, & Straubhaar, 2011). Increasing rural broadband networks could snub some of the negative perceptions of rural life that lead to depopulation and despair. Thus, the Malaysian government has been encouraging programmes to accelerate broadband penetration to 75 % (MCMC, 2015). The government's projects and initiatives financed by the USP fund, in particular Kampung Tanpa Wayar 1Malaysia (KTW1M) and internet centres known as Pusat Internet 1Malaysia (Pi1M), are being developed in identified locations in the rural and underserved areas of Malaysia with the objective of providing free WIFI services to the public, especially the recipients of the 1Malaysia netbook. As MCMC (2015) mentioned, with this deployment, the agency was hoping that the provision of basic wireless internet access through KTW1M will generate interest in users to subscribe to better individual internet service (MCMC, 2015). This understanding is similar to what was stated by Jayakar and Park (2012), who mentioned that USP constitutes "projects to establish new public computer facilities or upgrade existing ones."

The objective of Pi1M is to provide broadband access to the general public or specific vulnerable populations, such as low-income individuals, unemployed, seniors, children, minorities, and people with disabilities (p.51). In Pi1M, users get to experience high-speed broadband connectivity of at least eight megabits per second while those living in the vicinity will enjoy Wi-Fi coverage by KTW1M. Every Pi1M is equipped with twenty

computer terminals with pre-loaded applications and also provides faxing and printing services. Free ICT courses are also provided, administered, and conducted by the Pi1M manager and the assistant manager (MCMC, 2016).

As shown in Table 1.1, in 2013, around RM173 million was spent on the new Pi1M and KTW1M deployment throughout Malaysia, and more than RM500 million was spent on Notebook1M. These amounts represent almost half of the total expenses of RM1.5 billion for Pi1M, KTW1M (KTW1M), and Netbook1M. Also, the amount is notably significant despite the reduction of expenditure in 2014, with only RM70 million spent compared to the amount in the previous year. As of the end of 2014, a total of 513 Pi1M were built with registered users estimated at 487,000 while about 5000 KTW1M were delivered with 622,852 registered users (MCMC, 2015).

In another project, MCMC delivered a smaller telecentre called Community Broadband Library (CBL), which consists of 99 centres, along with 120 Mini CBL nationwide (MCMC, 2015). The commitment and tenacity of the Malaysian government to achieve the expected penetration level of broadband can be seen from the MCMC expenses (Table 1.1). Table 1.1 shows the expenditure for the MCMC projects from the year 2003 to 2014 on projects related to Universal Service Provision (USP) as the effort was geared towards developing and enhancing the communication system in Malaysia (MCMC, 2015).

Table 1.1
Disbursement of USP fund by MCMC for two years

Project	Payment (RM) in 2013	Payment (RM) in 2014
Telephony	90,034,114.88	81,308,389.14
Perpustakaan Jalur Lebar	11,574,997.25	9,903,763.82
Pusat Internet 1Malaysia	96,505,743.15	3,308,920.82
Perluasan Liputan Selular – Time 3	325,728,584.33	227,013,847.87
Netbook 1Malaysia	549,746,400.00	111,475.00
Kampung Tanpa Wayar 1Malaysia	77,872,490.64	65,575,909.03
Skim Clawback	345,569,378.35	342,683,642.62
Total Payment	1,149,031,708.60	729,905,948.30

Source: (MCMC, 2014)

Table 1.2
Disbursement of USP Fund from the year 2003 to 2014

Year	Disbursement (RM'000)	Year	Disbursement (RM'000)
2003	10,639	2009	47,684
2004	23,592	2010	263,882
2005	44,304	2011	896,550
2006	22,788	2012	1,421,298
2007	59,318	2013	1,149,032
2008	153,843	2014	729,905
		Total	**4,822,833**

Source: (MCMC, 2015)

1.1.1 Broadband Technology

As defined by OECD (2009), broadband is a technology that is incorporated into other information communication technologies (ICTs), which enables changes in how and where economic activities are managed and affected through many channels. At the same time, broadband technology can have an impact on the investment in ICT-related infrastructure and related ICT application, as well as on economic activities and growth (Manzoor, 2014). One of the significant issues in the early stage of Internet connection was speed; people were using the internet through a dial-up Modulator and Demodulator (MODEM) or Integrated Services Digital Network (ISDN) via a telephone line. This system is also known as the "narrowband" technology that gives a maximum speed of two megabits per second (2Mbps).

When the Internet was first launched, narrowband dial-up was the most popular technology for deploying the Internet because the dial-up service was then widely available, the cheapest to use, and that the broadband services at that time were available only at limited places. In the United States of America (USA), the public libraries also provided Internet-connected computers to the public throughout the country. The provision of this facility is crucial for introducing many late adopters to the benefits of computers and the Internet (Whitacre & Rhinesmith, 2015). As Lütkepohl and Xu (2009) concluded, the impact of internet usage on the economy is considered significant; they reported that the increase of 10 percentage-point in broadband penetration of a country could raise annual per-capita growth by 0.9–1.5 %. At the same time, evidence on the economic benefits of broadband access is relatively unambiguous.

In the past decade, researchers have been examining the key factors that influence broadband adoption in order to increase adoption rates (Tsai & LaRose, 2015). It is unclear to what extent this supply-side driven strategy is effective in increasing actual broadband penetration rate. Other than the coverage and availability, the effectiveness of the strategy is an important question to be answered because the costly implementation of any approved policies can impede the effort to increase broadband penetration and continuous usage.

1.1.2 Overview of Broadband Technology

The inception of broadband services started in the 1990s when the Organization for Economic Co-operation Development OECD (2009) discovered broadband penetration in 1997. Research by ITU (2016) showed that only 40% of increment in broadband penetration was recorded specifically for mobile broadband, and half of the contribution to the statistics were from South America, Asia, and the African regions. This finding implies that mobile broadband is commonly accessible in the developing countries due to the alternative purposes it serves for having internet access and using personal computers at an exorbitant rate.

1.1.2.1 Definition of broadband

In defining broadband, most of the previous researchers have focused merely on what can be achieved by particular networks. Another apparent shortcoming of the data that we used is the lack of specificity in regard to what a household would consider to be "broadband," i.e., the characteristics of the broadband connection that household users have in mind. As defined by OECD (2009), broadband is a communication device that is

capable of downloading and uploading data at a minimum speed of 250 kbps. The OECD (2009, p.37) also classifies broadband with "a minimum download speed of 256 Kbps and upload speed of 64 Kbps for every broadband device." On the other hand, the ITU and OECD agrees on a unified definition of broadband with "a download speed of 256 Kbps for both fixed and wireless broadband service." Other scholars (Mujamdar, Carare, & Chang, 2010; and Yamakawa, Cadillo, & Tornero, 2012) maintained that broadband is an internet speed that is faster than dial-up and is more convenient to the users for being an "always-on" service. Other definitions of broadband are given in Table 1.3.

Table 1.3
Definition of Broadband

Authors	**Definitions**
Mileta, Antun, & Sajnovic (2011)	Broadband is any technology that has the ability of two-way high-speed internet transfer by receiving and sending data and allows users to be always on.
ITU (2011)	Broadband is a transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0 megabits per second.
MCMC (2015)	Broadband is defined as a transmission medium of wideband frequencies used to transmit information that can be multiplexed and sent throughout many different frequencies or channels within a certain bandwidth (from audio up to video frequencies) and allowing more information to be transmitted than usual within a given period.

The inconsistent definitions of broadband as listed in Table 1.3 have complicated previous researchers in explicitly defining what constitutes a broadband service, hence the likelihood that the term *broadband* can be misunderstood by the public. Furthermore,

the latest technology, which could deliver terabits per second of connectivity, may require a new definition of broadband.

1.1.3 Universal Service Provision (USP) Projects

In telecommunications, the compatibility of competition with universal service obligations is the object of intense political and economic debates. Competition destroys cross-subsidies to a great extent that some areas might be left with very high costs of provision of telecommunications (perhaps even the breakdown of provision), resulting in prices that are not considered socially reasonable or "affordable." "Universal service policies" refers to those regulatory and fiscal measures that governments undertake to ensure that as many people as possible are connected to the telecommunications infrastructure (Mueller, 1999, p.353).

In the USA, internet access and related network services are available in public libraries around the United States, despite the policy issues. Common issues such as sufficiency of connectivity, levels of public access, the need for training, continuing gaps in access, sources of funding for technology, and questions of public policy were raised in previous studies (Jaeger, Bertot, McClure, & Langa, 2006). As discussed by Jaeger et al. (2006), internet connection was one of the critical issues for the public to access the internet. As shown in Figure 1.1, only about 33% of the public has a connection speed of more than 1.5Mbps. This consumption is not evenly distributed across libraries or necessarily sufficient for increasingly bandwidth-intensive applications. Like many other countries, the Malaysian government through MCMC has made efforts to ensure that all citizens, including those in the rural areas, have access to essential telephone service at any time

and any place at an affordable price. Also in Malaysia, the Universal Services Provision (USP) fund that was formed under the Ministry of Communication and Multimedia under Regulations 2002 (P.U.[A] 419/2002) serves to provide (a) collective access to basic telephony and Internet access services and (b) individual access to basic telephony and Internet access services.

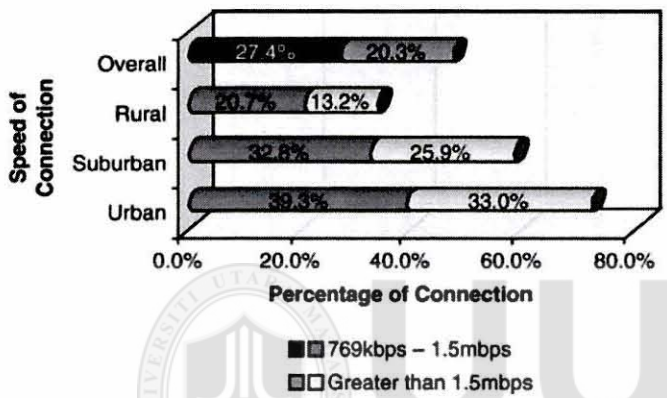

Figure 1.1
Public library internet connection speed in the USA
Source: (Jaeger et al., 2006)

However, in the event the first objectives specified cannot be met simultaneously in a universal service target, the order of priority for the provision of universal service provision, collective access, and basic telephony will have higher priority over internet access (MCMC, 2002). The deployment and the delivery of USP projects are targeted based on underserved areas and groups (Muraina, 2015). In the earlier stage, the deployment of public telecentre was one of the projects that could provide a collective access to broadband internet to the targeted areas and groups throughout Malaysia.

Since 2007, the Malaysian government has allocated RM2.4 billion from the USP fund so as to achieve their target in financing projects from 2009 to 2010 by covering 135 selected districts across the country (MCMC, 2015). A total amount of RM883 million from the USP fund was also allocated for the community broadband projects that are located in the rural areas. In 2007, MCMC targeted for 75% of household broadband penetration (HBP) by 2010, but the committee further revised the target to only 50% of penetration after considering several factors (MCMC, 2013). As reported in 2013, the USP fund focused on four initiatives namely Pusat Internet 1Malaysia (PI1M), Kampung Tanpa Wayar 1Malaysia (KTW1M), Cellular Coverage Expansion (Time 3) and 1Malaysia Netbook. Although such endeavours depict the MCMC's tenacity in improving the government's objective towards improving HBP throughout Malaysia, what remain questionable are the recognition and the effectiveness of the existing projects as well as the efforts implemented through the project deployment.

1.1.3.1 Public telecentres

Although the digital divide has narrowed somewhat within and across countries, efforts have continued to further increase access to the technology in all areas that require infrastructure in terms of hardware and software as well as connectivity. Sometimes, these efforts sparked a heated debate about the types of technology access and support that are needed to benefit people who are impoverished or otherwise socially marginalised (Matuchniak & Warschauer, 2010). The initiative to establish a telecentre is one of the ongoing efforts and such facilities are seen as a location for the public to use computers and access the Internet. As a telecentre, some arrangements in the United

States of America have become community technology centres where the public can access the technology with formal and informal support from the telecentre staff (Matuchniak & Warschauer, 2010).

In Malaysia, as of December 31, 2013, as part of a total of 5,802 USP projects, 424 telecentres, known as Pusat Internet 1Malaysia (Pi1M), have been implemented successfully and become one of the significant projects by Malaysian Communication and Multimedia Commission (MCMC). The objective is to provide Internet access on a shared basis broadband to a minimum of 100 households in selected urban areas with the least broadband penetration (Mat Aji, 2014). Meanwhile, the low demand for Internet or broadband in the rural areas is due to the urban-digital divide where the usage of broadband is significantly low and distracted (Townsend, Wallace & Fairhurst, 2015). In the same vein, Townsend et al. (2015) mentioned other factors that can affect low penetration, specifically the demographic components, such as salary, age, level of knowledge, and advanced proficiency. These factors will be confirmed in a numerical study such as that of the present study.

1.1.3.2 1Malaysia Internet Computing Centre (Pusat Internet 1Malaysia)

As reported by the MCMC (2009), various new technologies were introduced in Malaysia in order to extend the usage of broadband to the rural and underserved communities. One such initiative was Public Access Center (PAC), known as Pi1M, which provided the use of broadband internet access on a shared basis to 100 Citizen Housing Program in selected urban areas (Mat Aji, 2014). On a similar note, United Nations Educational, Scientific and Cultural Organisation (UNESCO) and International

Telecommunication Union (ITU) set up a commission called Broadband Commission for Digital Development in 2010. The commission was established to boost the importance of broadband to meet the Millennium Development Goals (MDGs) (Broadband Commission for Digital Development, 2013). MDG was formed by the World Health Organisation (WHO) to combat poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women and related target (WHO, 2016).

In 2013, the Malaysian government spent almost RM400 million building up Pi1M and KTW1M, which resulted in a total of 4,679 KTW1M being built nationwide in Q1 2015. However, in an earlier research, Jayakar and Park (2012) argued that basing funding for public telecentres on broadband availability (or non-availability) is not as cost-effective considering a broad array of factors related to the demand for internet access at public telecentres. In another study by Prieger (2013), it was found that in many developing countries, policy makers treat mobile broadband as one of the essential tools to close digital divides. Other issues that should also be looked into are the factors that motivate the use of broadband at home and government-related online application or website.

As indicated by Pérez-Hernández and Sánchez-Mangas (2011), 34% of the people who use the Internet at home will have a higher drive to shop online compared to those who do not have the technology at home. Broadband use is quickly getting interwoven into numerous parts of ordinary life, including money saving, shopping, working, examining, and person-to-person communication. This developing reliance on the Internet requires that broadband be accessible to all. Other demographic factors could also impact the low penetration rate (Townsend et al., 2015). In line with this, the new challenges for MCMC

include devising ways to increase the attractiveness of PiIM Centre and inculcate an awareness of how the centre could help the underserved community to continue using broadband to the extent that it will benefit their daily activities (MCMC, 2016). MCMC also plays a vital role in gauging how the user gains knowledge and takes advantage of it.

Despite the deployment of telecentres in Malaysia, household broadband penetration (HBP) has not increased as expected in many states of Malaysia. As reported by Haring, Rohlfs, and Shooshan (2002), the current deployment of broadband in Malaysia could be based on "demand constrained" rather than on "supply constrained." Therefore, as suggested by Stanton (2004) and Dwivedi et al. (2010), current studies must focus on understanding the factors that influence the decisions of household consumers regarding broadband usage. Such an understanding will enhance the homogenous penetration and promote the use of broadband while reducing the digital divide.

As explained by Aziz, Razak, Malek, and Amir (2009), studies carried out in Malaysia have indicated that the telecentres have prioritised on introducing the Internet that they, to a certain extent, have failed to foreground the importance of education. Although these telecentres have been used as training centres, they are still seen as a place where children, teenagers, and youth can access only government's websites and games. Given these points, the study is considered significant following the necessity for policy makers to understand the factors that influence the usage and success of the public telecentres. As mentioned by Mat Aji (2014), the objective of the centres is to provide public access to computers and the Internet with the aim of enhancing individual and community development.

Hence, MCMC needs to give priority and focus on providing compelling content applications to complement all its infrastructure initiatives carried out. It is believed that the provision of content applications that are relevant to the underserved communities is necessary to ensure the continued enjoyment of the target community and the services provided by the PI1M and the KTW1M. At the same time Pick, Gollakota, and Singh (2014) also mentioned that despite the interest in telecentres, research suggests that many telecentres have not met their potential and were subsequently closed down after a short while due to lack of demand from users. As Townsend et al. (2015) concluded, the low demand for internet or broadband either in telecentre or rural area, in general, was impacted from the urban-rural digital divide following the low levels of penetration of broadband services. A number of factors were found to influence the low levels of penetration, particularly demographic factors such as income, age, level of education and digital literacy.

Given the above points, there is a necessity to measure and investigate the impact of public telecentres in Malaysia despite much research being conducted in regard to the broadband issues. As shown in the summary of telecentre-related studies, most of the previous researches have focused on areas other than continuing broadband intention. Thus, no efforts have yet to be made to understand the behaviour of existing household broadband consumers and the factors influencing their likelihood to continue subscribing to a broadband connection at home once they had used the service provided in public telecentre or public hotspots. This is the gap that the present study intends to fill.

1.1.3.3 Community WIFI (Kampung Tanpa Wayar 1 Malaysia)

As mentioned by Middleton and Chambers (2010), free WIFI in public areas, including the municipal areas, is a vital tool in bridging the digital divide. Free WIFI can encourage participation in the broadband economy and is proven to give positive impact on a country's growth and development. Since its introduction in 2011, the Community WiFi (CW) initiative has been providing free internet access through WiFi hotspots in underserved areas nationwide. MCMC (2014) reported that since 2013, the implementation of CW has been enhanced using the "hub & poke approach." Through this approach, the network of 1Malaysia Internet Centre (Pi1M) is connected to three WIFI hotspots (as spoke). At the same time, the Pi1M network (as hub) will manage and act as the CW central management together with the monitoring service of the WiFi hotspots. The hub & spoke approach was chosen because it can optimise the bandwidth usage and is seen to be more efficient in providing stability and better internet speed to WK users. As of 31 December 2015, a total of 2,978 WKs has been implemented, and 788 WKs were deployed in the year 2015. The fact that the implementation of USP programme has made manifest some positive and negative aspects indicates that the facility can help to ameliorate some glaring social inequalities and improve the living standards of those on the lower rungs of the social hierarchy. However, if it is taken too far, it can destroy individual initiative and freeze economic progress in its tracks. Such subsidies in support of universal service, in and of themselves, are not objectionable, but are best deployed in a carefully targeted manner and confined to a minor role as supplements to the overall workings of the market economy (Mueller, 1999). Table 1.4 summarises the previous studies related to telecentres.

Table 1.4
Summary of previous studies on public telecentre

Source	Title	DV	Independent Variable	Results
(Kuriyan & Ray, Kuriyan2009)	Outsourcing the State? Public-Private Partnerships and Information Technologies in India	Public-private Partnership (PPP)	Civil Society Outsourcing economy Political economy	Middle class benefits more than the poor
(Naik, Joshi, & Basavaraj, 2012).	Fostering inclusive growth through e-Governance Embedded Rural Telecentre (EGERT) in India	Government Service Delivery effectiveness	Business to Company (B2C) Government to Company (G2C)	G2S improve the government service delivery
(Gomez, 2014).	When You Do Not Have a Computer: Public-Access Computing in Developing Countries	Impact of Public Internet Access center usage	Social media Knowledge E-government	Less usage for education, e-government or e-commerce activities more to social networks, personal relationship and entertainment

Table 1.4 *(Continue)*

Source	Title	DV	Independent Variable	Results
(Gould & Gomez, 2010)	New challenges for libraries in the information age: A comparative study of ICT in public libraries in 25 countries	The usage of public internet access venue	Perceptions of user	Libraries perceived as not essential to access current information technology
(L. F. Baron & Gomez, 2013)	Relationships and Connectedness: Weak Ties that Help Social Inclusion Through Public Access Computing	Benefits of PAC on	Community development and Social inclusion Personal relationship	Contribute significantly
Gomez R., Fawcett P., Turner J.	Lending a visible hand: An analysis of infomediary behaviour in Colombian public access computing venues	2012	Role of PAC in helping extend the reach of ICT.	Training, ICT Resources, Support and Activities	Formal and informal training is essential to strengthen the contribution of PAC to human development.
Mat Aji (2014)	An Investigation on Individual Empowerment of Telecentre Users: A Case Study of Three Pusat Internet Desa (PIDs) in the Northern States of Malaysia.	2014	The effect of empowerment	Factor of training and infrastructures	Training and ICT accessibility significant effect to the empowerments.
Muraina (2015)	The Factors That Contribute to the Continous Usage of Broadband Technologies Among Youth in Rural Areas.	2015	Factor of continue usage of broadband	IV from UTAUT and IS Continuance Model	Broadband adoption among youth in the northern region of Malaysia

1.2 Problem Statement

Broadband is the catalyst for internet penetration and therefore is considered to be an esstial policy issue in many countries (Dwivedi and Wahab, 2008). The importance of ICT services particularly broadband service is well established worldwide and therefore could be a crucial factor in increasing the social and economic competitiveness, specifically in a developing country like Malaysia. The issues of low subscription of broadband internet in specific areas and significant numbers of termination of broadband services among the telecommunication company (TELCO) have impacted the broadband penetration rate. Since the year 2014, the year on year (YOY) annual reports of big telcos like MAXIS and CELCOM have reported a loss of subscribers from its revenue generation subscriber (RGS), including broadband subscriptions, which might have been caused by unknown factors (Malaysianwireless, 2018). The downward trend of these TELCO's subscriber-based might be due to the discontinuing intention to use broadband among the subscribers.

At the same time, MCMC attributed the inconsistent broadband penetration in Malaysia to the lack of continuing intention to use broadband. This phenomenon may be due to the lack of broadband awareness among the public or the readiness of online digital lifestyle. Based on the MCMC report, the Household Broadband Penetration (HBP) in quarter 3 (Q3) of the year 2016 was at 77.9% (note: the total number of the household was at 7.57million). Even though in some states the household broadband penetration experiences impressive growth, it is notable that the percentage of household broadband penetration dropped significantly in some states (Figure 1.2). This may be due to the

impression that the projects and initiative that were initiated by MCMC were detracted from the goals of increasing household broadband penetration, notably the establishment of more Pusat Internet 1Malaysia (Pi1M) and Kampung Tanpa Wayar 1Malaysia (KTW1M).

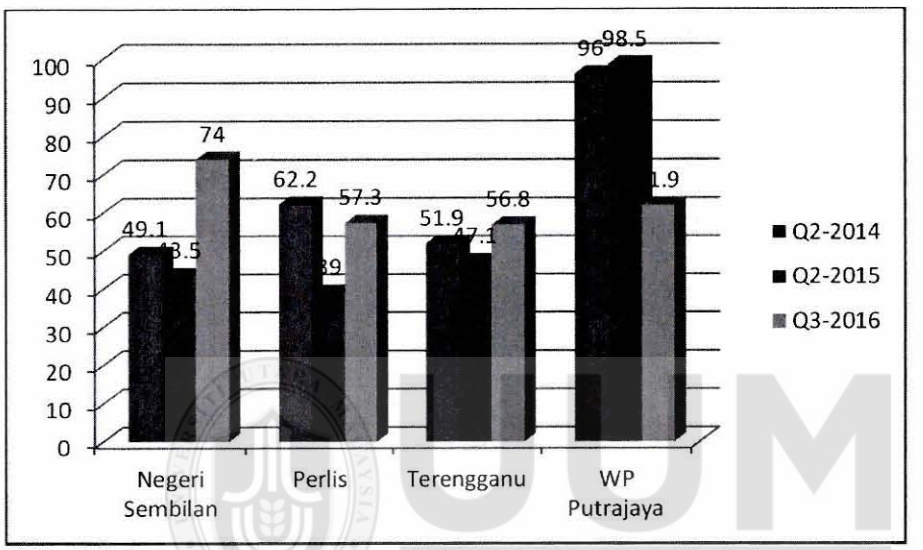

Figure 1.2
Comparison among the state in Malaysia with lowest HBP and Putrajaya
Source: (MCMC, 2015 & MCMC, 2016)

As shown in Figure 1.2, the Household Broadband Penetration (HBP) in Perlis dropped by -23.2% from 62.2% in quarter two (Q2) 2014, even though the number of Pi1M increased from 3 to 9. At the same time, the state of Negeri Sembilan recorded a drop of HBP by -5.6% to only 43.5%. Another state that was recorded with significant HBP drop is Terengganu (- 4.8 %), whereas the number of Pi1M increased by 3 new centers (MCMC, 2015). As illustrated in Figure 1.2, much uncertainty still exists about the broadband penetration in a certain state of Malaysia thus requiring further academic

research. Despite the increase in HBP for the state of Negeri Sembilan, Perlis, and Terengganu, the fact that a significant decrease of HBP by almost 40% was recorded for Putrajaya, the administration of Malaysia, is a matter that necessitates further study.

Despite several notable studies being conducted in the area of broadband internet, the barriers or factors affecting the continuing intention to use broadband have yet to be identified (Ooi, Sim, Yew, and Lin, 2011). Many of the previous studies have focused on certain group of populations or regions and do not include a nationwide study. This shortcoming necessitates studying the broadband penetration particularly in households. One of the leading obstacles mentioned by Mat Aji (2014) is the challenge to increase the attraction to continue using broadband particularly among the users of public telecentres. In fact, other countries are still experiencing low rate of interest on broadband even though their government has made considerable effort to ensure that the people enjoy affordable pricing of broadband access (Irani et al., 2007; Muraina, 2015).

A combination of statuses such as a spouse, adolescent, youth, and children or age that determine an education will influence a household's decision whether to use broadband (Brown & Venkatesh, 2005). Betty et al. (2007) and Brown and Venkatesh (2005) postulated that the presence of children in household necessitates different purchasing and spending patterns as the needs of the household tend to reflect the changing nature of the children's needs. The present study thus suggests better plans to ensure a sustainable growth of broadband penetration in Malaysia. Karahanna et al. (2009) and Hong et al. (2008) also suggested the importance of studying the determining factors of continuing information technology usage. It is believed that findings from this study could help to

overcome the drawbacks of other studies. It can be entirely different from the element that motivates only initial adoption where it will study the factor contributes towards continuing broadband intention. Studies by Dwivedi et al. (2007) and Venkatesh and Brown (2001) on household user's Attitudinal, Normative, and Control factors could propel broadband usage before consumers in any society (Dwivedi et al., 2007; Venkatesh and Brown, 2001).

The findings further recommend the Model of Adoption of Technology in the Household (MATH) onto the behaviour of continuing intention and usage of broadband among the household need to be studied empirically (Irani et al., 2009; Manzoor, 2014; Wong et al., 2013). At the same time, this study also investigates another determining factor that may give moderate effect on pre-determined MATH's factor to the continue broadband intention as it covers nationwide studies that have a different demographic group of people such as age, gender, education. As recommended by Wu et al. (2014), in the era of 4G technologies, there is a need for study of factors that drives continue intention of using broadband. Moreover, this study attempts to address the gaps by investigating the relationship between various factors and consequences towards Continue Broadband Intention (CBI) within the Malaysian context.

Given the research problems addressed, especially among the users of public telecentres of Malaysia by analyzing those factors, findings from this study will be able to answer the issue of household broadband penetration. Based on limited knowledge, the researcher believes that none of the existing studies provide determining factors that contribute to the continued intention to use broadband that will help broadband

penetration in Malaysia. As a conclusion, there is a need to study the factors that drives continue intention of using broadband especially in the era where 4G technologies that were deployed extensively.

The outcome of this study can inform policymakers in planning and actualising better policy especially to meet the requirement of the targeted groups. Service providers will also benefit from the understanding of factors towards continuing broadband intention in term of the strategy to maximize customer retention. At the same time, the contribution of this thesis can fill the void in the literature by examining the factors to continue broadband intention and promoting consistent broadband penetration in Malaysia. In conclusion, this study seeks to address the following research questions.

1.3 Research Questions

Based on the highlighted problem and gaps in the previous section, this research aims to address the following research questions:-

i. What is the relationship of attitudinal factor of the household users to continuing broadband intention?

ii. What is the relationship of normative factors of the household users to continuing broadband intention?

iii. What is the relationship of control factor of the household users to continuing broadband intention?

iv. What is the relationship of satisfaction factor of the household users to continuing broadband intention?

v. What is the effect of a demographic factor on the relationship of attitudinal, normative, and control factor and satisfaction factor to continuing broadband intention?

1.4 Research Objectives

The specific objective of this study is to validate the modified MATH model on the continuing broadband intention of the users of public telecentre in Malaysia. At the same, the study sets the following sub-objectives to be achieved:-

i. To determine the relationship between Attitudinal Construct and the continuing broadband intention of household users in Malaysia.

ii. To determine the relationship between Normative Construct and the continuing broadband intention of household users in Malaysia.

iii. To determine the relationship between Control Construct and the continuing broadband intention of household users in Malaysia.

iv. To determine the relationship between Satisfaction and the continuing broadband intention of household users in Malaysia.

v. To identify the moderating effect of demographic onto the continuing broadband intention of household users in Malaysia.

1.5 Scope of Study

This study focuses on the telecentre that is being developed by MCMC, which is Pusat Internet 1 Malaysia (Pi1M). Pi1M was selected because it is among the three projects owned and managed directly by MCMC and has incurred the highest expenses to the

organisation since 2007 (MCMC, 2015). Out of more than seven hundred PiIM centres, only four were chosen based on simple random sampling to represent each region of the country. These telecentres were purposely selected as the case studies because they can facilitate the researcher's understanding of the problem and research questions (as suggested by Creswell, 1994). Because all the PiIM centres are similar in terms of objectives and administration, they could represent a homogeneous population. PiIM was also selected for the following reasons:

a) The users of PiIM are registered with the centers compared to the users of other MCMC initiatives and therefore are able to represent the target demographics, such as age, gender, and education.
b) Building public internet centers and access point throughout the country is the most chosen ideas and famous by any developing countries in becoming a digital nation by ensuring equitable ICT access to their people (Afacan et al.,2013) .

A self-administered questionnaire was distributed to the users of the public telecentres nationwide.

1.5.1 Significance of the Study

This study is expected to contribute to the understanding of the theoretical, methodological, and practical use of motivating household broadband penetration rate in the context of Malaysia. It will specifically study the relationship between the various factors affecting continuing broadband intention and is expected to contribute to the understanding of the theoretical, methodological, and practical use in an effort to increase household broadband penetration rate in Malaysia. As for many business-to-consumer *e*-commerce firms, the continuing intention of broadband decision or consumer retention is much more critical than the pre-adoption decision for the long-term profitability of these firms (Bhattacherjee, 2001; Teng, 2010; Hong, Thong, Moon, & Tam 2008; Muraina, 2015). From this perspective, identifying the factors that influence existing customers' continuing usage is essential for the long-term viability of the telecommunications operators. At this point, post-adoption perceptions are more salient than pre-adoption perceptions in determining the ultimate success of an information technology innovation (Bhattacherjee, 2001; Muraina, 2015).

As postulated by Mat Aji (2014) this is a critical study where the access to information and ICT skills using broadband technology can enhance poor peoples' capabilities, which in turn, can enhance their socio-economy level. Substantial research nevertheless has been conducted on broadband adoption in other countries, for example, the studies by Armenta et al., (2012), Gupta et al., (2013), Irani et al., (2009), Miri et al., (2014) and Tsai and LaRose (2015). However, these studies do not focus on continuing broadband intention, which could inform on how to overcome the issue of slow household

broadband penetration (HBP). Although the literature has established the factors for achieving continuous usage of technology (see Bhattacherjee et al., 2001; J. Park et al., 2010; Limayem & Cheung, 2008; Karahanna et al., 2006), very little research has focused on continuing broadband intention, let alone on the case that is related to Malaysian government policy and projects under the Ministry of Malaysian Communication and Multimedia Commission (MCMC).

This study will help to bridge the gap in the existing literature on continuoing intention to use broadband technology among Malaysians. This study will contribute to the knowledge of MATH and IS Continue Usage model among academics and practitioners. At the same time, the findings from the study could inform decision makers in drafting IT- and broadband-related policies in the country. Also, the study will enable better understanding among the academicians and scholars on the model and the program that needs to be developed to accelerate broadband penetration, particularly in households.

1.7 Organization of the Thesis

This research is structured in five chapters. Chapter one describes the background of this study which provides an overview of the study. It describes the research background and outlines the problem statement, research question, research objectives, significance of the study, scope of study, and research framework. Chapter two explains in detail the definition of broadband, and provides a review of literature related to the study, the theoretical model background, and the comparison of the outcomes of the previous studies. It will explain the related studies for the independent variables, such as attitudinal, satisfaction, normative, and control constructs, which are based on related

theories or models established from previous studies. At the same time, the demographic factors will be selected as moderating variables that will be investigated as well. Chapter three reports the research methodology used to achieve the research objectives. It covers research the philosophy, research design, measurement of variable and instrumentation, the population of study, sample size, and data collection procedures. The chapter also explain the exposition of relevant empirical studies and formulates the research hypotheses, instruments of the research, and method of data analysis. The fourth chapter deals with data analyses and presents the study findings. Finally, the fifth chapter discusses the findings in detail by linking them to theories and past works. This chapter also highlights the implications of the findings for both theory and practice. It also recommends for the areas to be looked into by future studies, as well as the limitations of the present study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the previous studies and is divided into three main parts. Part One reviews the important studies on broadband internet penetration and broadband technology, including the state of the internet before the introduction of broadband and the current forms of broadband technology. In Part Two, the researcher reviews the background of Universal Service Provision (USP) fund in Malaysia, the setup of public telecentres, and its benefits to households. Part Three explains the issue of continuing intention of broadband technology and its related factors by reviewing the literature. Part Three also covers the review of related theories on the use of technology, which lead to the discovering the base models for this study.

2.1.1 Broadband Internet Penetration

There has been considerable interest in understanding the key factors that drive broadband penetration. The key objective of these studies is mainly to understand the key factors to the penetration. As reported by ITU (2015), Malaysia has reached 60% of internet penetration. However, the internet penetration itself does not reflect the economic performance nor the economic growth of a country. Nevertheless, as mentioned by International Telecommunication Union (ITU), household penetration is the crucial indicator of a country's total productivity factor (ITU, 2011). The penetrations of broadband technologies among the household users have a pivotal role as the catalyst for the internet penetrations. Therefore, as concluded by Dwivedi and Wahab (2008), it is

imperative to study the factors affecting the deployment and penetration of broadband internet.

2.1.2 Household Broadband Penetration (HBP)

As mentioned by Irani et al. (2009) and Muraina (2015), numerous nations on the planet are still experiencing a low rate of interest on broadband, despite their government's earnest effort to ensure the people enjoy affordable pricing of broadband access. In the meantime, MCMC (2016) reported that the HBP for Putrajaya dropped significantly from 98.5% in the year 2015 to 63.7% in the first quarter of 2016, and further dropped to 61.7% in the second quarter. This trend points to an issue that requires policy makers and the industry players of telecommunications to take immediate action. Also, the literature review uncovered that continuing broadband intention can facilitate consistent broadband penetration, particularly in households. Therefore, it is suggested that the present study is necessary to cater to this important issue mentioned, particularly in regard to the users of the Pi1M internet centers. Part of the objectives of this study is to gauge the effectiveness of the USP projects, particularly Pi1M, KTW1M, and Netbook 1Malaysia.

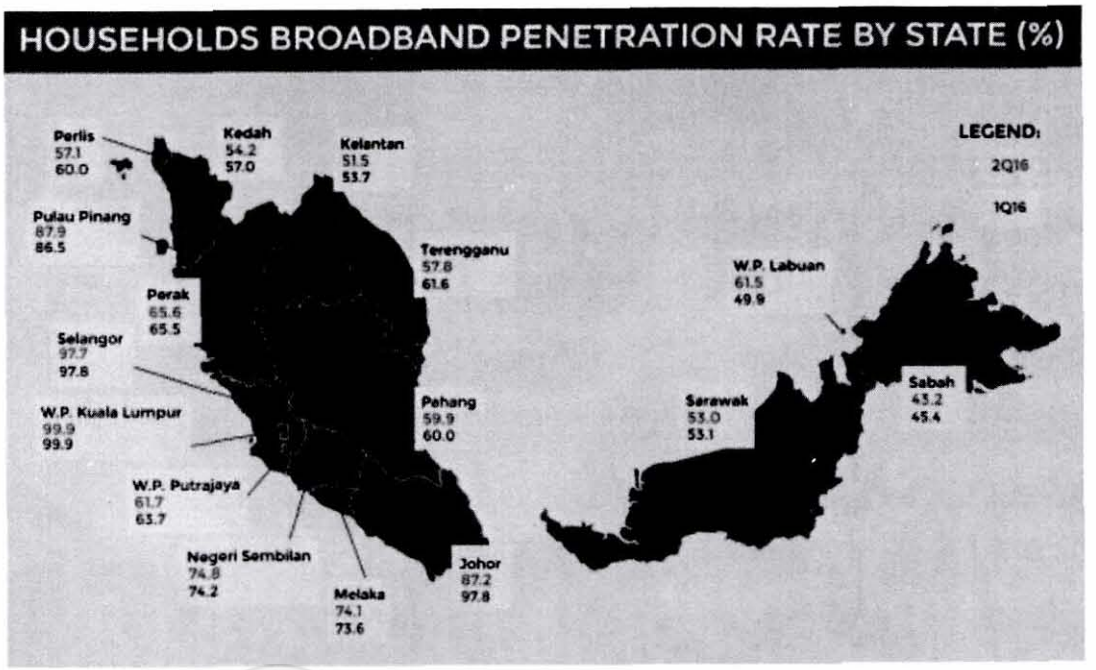

Figure 2.1
Nationwide Household Broadband Penetration (HBP) for 2016
Source: (MCMC, 2016)

This study could also provide evidence and suggestion to policy makers and industrial players on how to improve the implementation of USP projects. This is particularly beneficial because many of the previous studies have focused only on the intentions to use or adoption of IS and broadband technology. Limited studies have been conducted specifically on continuous usage or long-term use (Santhanamery & Ramayah, 2012; Thong et al., 2006).

2.2 Continuing intention to use technology

Continuing usage of technology has been perceived differently by previous scholars. Limayem and Cheung (2008) and Bhattacherjee (2001) argued that continuing use of a device or technology has to be determined by the intention made by the users. On the other hand, the consistency in performing a specific behaviour may turn into an intrinsic habit within people, which is bound to turninto continuous usage of technology (Limayem & Cheung, 2008). As agreed by Thorngate (1976), continuous usage of the device is not preceded by the intention of the users but by the formed habit. Related studies by Lee and Kwon (2009) and Hsu et al.(2015) take the stance of Thorngate (1976) who contended that continuous usage proofs an adaptive behaviour of users which possesses a regular sequence of action and confirmation of ongoing activities. Therefore, continuous usage either on devices or technology is built on the intended behaviour of users of technology.

Many researchers have emphasized the factor of intention be a psychological situation that precedes the usage intention of devices on a frequent basis (Hsiao, Chang, & Tang, 2016; Davis, Bagozzi, & Warshaw, 1989; Davis, Bagozzi, & Warshaw, 1989). Other scholars contended that attaining continuous usage of technology is attributed to cognitive and affective factors, which are related to knowledge processes, such as perceived usefulness, ease of use, security, and satisfaction (Shaikh, Karjaluoto, & Chinje, 2015). On the contrary, sufficient factors may portray emotions and feelings, such as perceived playfulness, enjoyment, and pleasure. In one study, Wang, Meister, and Gray (2013) argued that perceived usefulness, perceived ease of use, and perceived

playfulness are the factors that may directly or indirectly cause continuous usage of systems or technology.

2.2.1 Continuing Broadband Intention

Continuous intention to use any technology has been investigated from many perspectives. Based on the background of continue intention theory, the model that was developed by Howick and Whalley (2007) have identified future policy intitatives in general areas. As maintained by Howick and Walley, such initiatives should be developed by more tailored policy initiatives. Therefore, Howick and Whalley (2007) also suggested that future research targets those who express no interest in adopting broadband because such a discovery can facilitate the understanding of the impact of broadband services on this group is unclear whereby it is crucial to increase broadband penetration. As indicated by Dwivedi, Khoumbati, Williams, and Lal (2007) this could be attributed to the late rollout of broadband services resulted in slow infrastructure development and slow rate of penetration at the same time the evidence of broadband deployment and diffusion in developing countries is insufficient. In this study researcher used MATH Model (Model of Adoption Technology in the Household) as compared to other previous studies. As reported by Thong (2016) and c Hsiao et al., 2016, p.156)ontinue intention behaviours to broadband is where a user keep using and updating individual expectations and gaining more knowledge and experience from using ICT or nowadays broadband internet. After all one of thc most significant factor in term of post adoption expectation is perceived usefulness.

However, many of the previous studies have focused only on intentions to use or adoption of IS and technology, and limited studies have been conducted to study continuous usage or long-term use (Santhanamery & Ramayah, 2012; Thong et al., 2006). In most of the cases, first-time users revert to the traditional way of doing things due to not getting satisfaction and expected service quality. Santhanamery and Ramayah, (2012) and Teo, Srivastava, Jiang (2008) argued that most of the times, the initial usage of technology by some users is followed by reverting to the traditional ways due to the failure to get expected satisfaction and service quality. Therefore, it is paramount to research technology continue intention knowing the viability and the benefits of frequent usage especially in the continuance of broadband intention and subscription. The theory of Planning Behaviour (TPB) and the concept of EDT led to the suggestion that user's behavioural intention determines their continuing usage intention, and this is affected by perceived usefulness and subjective norm. Previous research on broadband has mainly focused on identifying the factors that influence consumers' willingness as well as reluctance to subscribe to broadband services.

In terms of the willingness to adopt broadband, Dwivedi et al. (2010) mentioned the following three contributory factors: public sector action, private sector actions, and the social-cultural environment. These factors were adopted to explain the high rate of broadband penetration in South Korea. In their study, Dwivedi et al. suggest six success factors that are responsible for driving the high penetration rate of broadband amongst South Korean residential consumers. The six key factors identified were (1) government's vision, strategy, and commitment; (2) facilities-based competition; (3)

pricing; (4) the PC Bang phenomenon, (5) culture and geography, and (6) demographics. In another study in the UK context, Dwivedi et al. (2003) examined the views of ISPs on factors affecting broadband penetration within the UK. They then suggest that high prices and lack of content and awareness were the factors severely affecting the penetration of broadband amongst UK residential consumers (Dwivedi et al. 2003). Understanding the behaviour of individuals thus has always been a concern for social researchers. The Fishbein and Ajzen's (1975) theory of reasoned a ction (TRA) and Ajzen and Madden's theory of planned behaviour are widely accepted and often used to explain individuals' behaviour.

Delivering broadband services with the aim of providing Internet infrastructure in the rural and remote areas can reduce the entry cost of commercial Internet service providers (ISPs) hence increase the attractiveness of these marginal markets. More great entries by ISPs can stimulate competition and create more favorable supply-side conditions, such as lower price and better service quality, which in turn, can boost the local Internet (Ma & Huang, 2014).

Building Public Internet Access Points (PIAPs) is the government's significant contribution towards achieving an information society. Although many developing countries have been investing vast amounts of money in establishing PIAPs, their citizens may not use the facility effectively (Afacan et al., 2013). The related argument buttresses that behavioural intention has a direct relationship with technology usage at individual level (Lim et al., 2011). This notion implies that user behavioural intention mediates the

relationships between the independent variables and continuing broadband usage in the context of this study.

Conclusively, many researchers have confirmed that behavioural intention does influence user behaviour, which could be synonymous to continuous usage (Shin et al., 2009; Limayem & Cheung, 2008; Y.S Wang & Shih, 2008; Al-Gahtani, Hubona, & Wang, 2007). Hence, in this study, user behavioural intention is measured through the adaption of four questions from the previous study by Venkatesh et al. (2003). Therefore, to suit the context in Malaysia, the questions were modified as follows:

1. "I believe that everyone in my village should use ICT facilities in broadband in the future."

2. "I perceive using broadband as a voluntary."

3. "I intend to continue my current subscription of my broadband."; and

4. "I intend to continue the usage of broadband internet service in the future."

Based on the studies by Cho et al. (2009) and Premkumar et al. (2008) it can be concluded that the continuous usage of technology is considered as a long-term usage of innovation. The usage of technology is either on a regular or ad hoc basis, which creates survival for the service technology and revenue for the firms (Bhattacherjee, 2001). However, a study by Eriksson and Nilsson (2007) proposes that continuous use of technology may only be achieved and triggered by the acceptance and user satisfaction towards service delivery. Even though there exist substantial research and literature on

broadband penetration in other countries that established the factors for achieving continuous usage, this study would complement the previous studies by investigating the factors in Malaysia's context and focusing on the users of the public telecentres in Malaysia. The models and theory used in previous studies of broadband continueing intention are summarized in Table 2.1.

Table 2.1
Summary of previous studies on the continuous intention

Authors	Year	Dependent Variables	Independent Variables	Models / Theory
Chen I.Y.L.	2007	Continuance intentions of Professional Virtual Communities (PVC)	1. Social capital 2. Satisfaction	Expectation-confirmation theory, IS Success
Tao Y.-H., Cheng C.-J., & Sun S.-Y.	2009	Continue use of business simulation games	1. Perceived playfulness 2. Satisfaction 3. Perceived ease of use 4. Perceived attraction	Technology Adoption Model, Expectation Confirmation Theory and Agency Theory
Hsieh J.J.P.-A., Rai A., & Keil M.	2011	Continued ICT usage among SED (Social Economically Disadvantage)	1. Social relationship 3. Cultural capital 2. Capital factors	Capital theory, IS continuance usage
Premkumar & Bhattacherjee, 2008)	2008	Continue usage of Corporate E-learning English language programmed	1. Perceived Ease of Use 2. Perceived Usefulness 3. Perceived enjoyment 4. Technology Satisfaction 5. Affective reaction	TAM, IS continuance usage
Tsai H.-T & Chien J.-L., T	2014	Continued use of internet banking	1. Perceived usefulness 2. Perceived compatibility 3. Satisfaction	Extended TAM

2.2.2 Justification of Adapting MATH Model

This study of continuing broadband intention focuses on the users of telecentre (PiIM and KTW) who have had prior exposure to the broadband internet using the telecentre or public WIFI access (Tsai & LaRose, 2015). These users are also home users who may consider factors other than organisational objectives, such as productivity improvements, including entertainment and social functions that MATH recognises. The three primary

constructs of this model are attitudinal, normative belief, and control belief. The elements of attitudinal belief consist of utilitarian outcomes, hedonic outcomes, and social outcomes. In Choudrie and Dwivedi's (2006), they argued that the decomposed TPB's constructs should be developed to examine the IT adoption within the organizational perspective (Choudrie & Dwivedi, 2006). Conversely, the Model of Adoption of Technology in Households (MATH) has been employed, and this model hence is believed to bemore appropriate and useful to study broadband, especially in households (Ooi et al., 2011).

2.3 Model of Adoption Technology in the Household (MATH)

The MATH model was developed by Brown and Venkatesh (2005) from the concepts of theory of planned Behaviour (TPB). The same theory was later studied and expanded by Bandura (2001) to shared many assumptions about human behaviour with the social cognitive theory (SCT). The MATH model set parallel among critical variables so that theoretical integration of the two is possible. MATH includes normative, attitudinal, and control beliefs to predict people's intention to adopt technology in households. Normative beliefs refers to other people's influence (including influence from friends and family, secondary [media] sources, and workplace referents) on an individual's behaviour (Venkatesh & Brown, 2001).

In this study, MATH is chosen because MATH was explicitly developed to explain technology adoption at the household level whereas the other models explain less variance in the dependent variables (Brown, Venkatesh, & Hoehle, 2014). In the MATH model, attitudinal beliefs include applications for personal use, children, and work, fun,

and status gains. Control beliefs entail fear of technological advances, fear of declining cost, cost of the product, perceived ease of use, and possession of the requisite knowledge of using the innovation. The summary of MATH is shown in Table 2.2 which explains the related latent variables. The study focuses on the user of telecentre (Pi1M and KTW) who have had prior exposure and experience using a broadband internet either at the telecentre or via the public KTW Wifi services (Tsai & LaRose, 2015). The three primary constructs of this model are attitudinal belief, normative belief, and control belief. The elements of attitudinal belief consist of Utilitarian Outcomes, Hedonic Outcomes, and Service Quality.

Table 2.2
Summary of MATH Model Definition
Source: (Rogers, 1995; Brady & Cronin, 2001; Brown and Venkatesh, 2005)

Constructs Definition Source	Constructs Definition Source	Constructs Definition Source
Behavioural Intention	The consumer's intention to adopt and continue to using broadband internet	Brown and Venkatesh (2005); Venkatesh and Brown (2001)
Attitudinal		
Relative advantage	The degree to which the consumer perceives broadband internet beneficial	Rogers (1995)
Utilitarian outcomes	The degree to which broadband internet is helpful in enhancing the effectiveness of typical daily activities of the consumer	Brown and Venkatesh (2005); Venkatesh and Brown (2001)
Hedonic outcomes	The degree of pleasure that the consumer derives from the use of broadband internet	Brown and Venkatesh (2005); Venkatesh and Brown (2001)
Service quality	The perceived quality of service of Internet service provider	Brady and Cronin, (2001); Cronin, Brady, and Hult (2000); DeLone and McLean (2003); Parasuraman, Berry, and Zeithaml (1991); Sweeney, Soutar, and Johnson (1999); Szymanski and Henard (2001); Teas and Agarwal (2000)
Satisfaction	The satisfaction a consumer derives from the service of the Internet service provider	Brady and Cronin (2001); Brady et al. (2001); Cronin et al. (2000); Sweeney et al. (1999); Szymanski and Henard (2001);
Primary influences	Influences from the consumer's family and friends to use or not to use broadband internet	Brown and Venkatesh (2005); Venkatesh and Brown (2001)

Table 2.2 *(Continue)*

Constructs Definition Source	Constructs Definition Source	Constructs Definition Source
Secondary influences	The degree of power from the secondary sources of information (such as newspapers, advertisement) on consumer's intention of the broadband internet.	Brown and Venkatesh (2005); Rogers (1995); Venkatesh and Brown (2001)
Facilitating conditions	How resourceful a consumer feels when he or she subscribes to a broadband Internet	Venkatesh and Brown (2001) Venkatesh
Perceived knowledge	The consumer's perceived knowledge about the broadband internet.	Rogers (1995); Venkatesh and Brown (2001)
Self-efficacy	The consumer's skill to use the broadband internet without assistance	Dwivedi (2005)

In Choudrie and Dwivedi's (2006) study, they proposed that the decomposed TPB's constructs be developed to examine IT usage from organisational perspective (Choudrie &Dwivedi, 2006). On the other hand, the Model of Adoption of Technology in Households (MATH) was employed in Ooi, Sim, Yew, & Lin's (2011) study because the researchers considered the model to be more appropriate and useful for studying broadband compared to the TBP.

2.3.1 Attitudinal Construct

In regard to the future broadband penetration, Dwivedi et al. (2010) recommended examining whether their findings are specific to UK consumers or transferable to other countries, particularly in developing nations where broadband penetration is still at an embryonic stage. At the same time, Dwivedi et al. (2010) suggested that further research employs the Model of Adoption of Technology in the Household (MATH) to derive new findings as the technology becomes established, and as consumers become more experienced using the technology. Although this study has adapted the MATH adoption model, all the constructs concern users' continuing intention to subside and continuing

intention to use of broadband internet in the future (Yogesh et al., 2008; Dwivedi 2005, 2007; Venkatesh and Brown 2001). The MATH model includes attitudinal, normative, and control beliefs that can predict people's intention to adopt technology in households. Attitudinal factors are related to an individual's norms, values, and beliefs that this present study determines norms as local culture demand context, values explained as monetary values and moral values.

In Choudrie and Dwivedi's (2006) study, they proposed that the decomposed TPB's constructs be developed to examine IT adoption organisational perspective (Choudrie &Dwivedi, 2006). Attitudes towards the behaviour represent the general favourable or unfavourable evaluation of performing the behaviour, and more favorable attitudes towards the behaviour are expected to translate into stronger intentions to perform the behaviour (Ajzen, 1991). The first issue in the present study on attitudinal factors is norms. In particular, the theory of planned behaviour proposes norms to be subjective thus accounting for consumers' perceived social pressure to engage in the behaviour and are hypothesized to contribute to stronger intentions to perform the behaviour (Ajzen, 1991). The attitudinal belief that is constructed from the behavioural beliefs consists of utilitarian outcomes, hedonic outcomes, and social outcomes–all of which relate to the favorable outcomes from performing the behaviour (Venkatesh & Brown, 2001).

2.3.1.1 Relative Advantage

Rogers' (1995) Diffusion of Innovations theory suggests that the perceived relative advantage of innovation is positively related to its rate of penetration. Several previous empirical studies have found that perceived relative advantage (RA) is an essential factor

in determining the penetration of innovation (Tan & Teo, 2000; Taylor & Todd, 1995). At the same time, there is a need to gauge the relative advantage and hedonistic factor of a user to use broadband in the public telecentres and how it benefits the user. Several studies have documented that state of diffusion of innovation and revealed factors such as relative advantage, observability, complexity, and compatibility of broadband technology to affect its usage (Rogers, 2003 & Wu et al., 2014). After all, there would be a higher possibility of broadband continuing usage if the non-broadband-adopters population is assured that the services derived from the use of broadband technology, such as those provided by public telecentres, would support their activities (Muraina, 2015).

In MATH, It also includes applications for personal use, children, work-, fun, and status gains that were derived from the technology adoption/acceptance theories and models including RA, TAM, TPB, and DTPB (Tsai & LaRose, 2015). The illustration of relationships between the attitude or attitudinal factors and behavioural intentions indicates that if the attitude of individuals towards the technology in question is positive, then they are likely to form an intention to perform the behaviour (Tan & Teo, 2000). It can also 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 their behavioural intention. Referring to the study by Moore and Benbasat relative advantage is "the degree to which an innovation is perceived as being better than its precursor" (Brown, Venkatesh, & Hoehle, 2014, p.15). Relative advantage (RA) has been found to be easily applied and integrated with other constructs used to examine the diffusion of broadband (Ooi, Sim, Yew, & Lin, 2011). It is a balancing feedback loop that indicates

that dial-up business users will continue to migrate to broadband as long as there are obvious financial benefits in such a move (Howick & Whalley, 2007). Similarly, when compared to narrowband, broadband offers faster, un-metered, always-on access to the Internet, and provides some advantages, conveniences, and satisfaction to its users. Considering the advantages that broadband offers, it would be expected that individuals who perceive broadband as advantageous would also be more likely to continue using the technology.

2.3.1.2 Utilitarian Outcome

The perceived usefulness construct (Davis, 1989) is one of the strongest predictors used to examine the penetration and usage of workplace technology. Utilitarian outcomes (UO) is the extent to which using a PC enhances the effectiveness of routine, household activities, such as budgeting, homework, and work (Venkatesh and Brown, 2001). In terms of PC adoption, utilitarian outcomes (UO) has been defined by Venkatesh and Brown (2001, p.74) as the extent to which using a PC enhances the effectiveness of household activities and at the same time, proposes and validates the utilitarian outcomes factor that can be used to examine the penetration and usage of technology in a household setting. In terms of broadband penetration in the household, Broadband Stakeholder Group (BSG) suggests that broadband "can offer a more flexible lifestyle where people who have broadband may work from home instead of traveling to the office" (Yogesh et al., 2009, p.359). Broadband can assist children with their homework, and many more household activities can be performed conveniently using a faster access to the Internet offered via broadband. Therefore, it is expected that the greater the perception of

broadband's usefulness for work or household related activities, the more likely that broadband technology will be adopted in the home (Dwivedi et al., 2009).

In Dwivedi et al.'s (2007) study, they found that utilitarian outcomes (UO), hedonic outcomes (HO), primary influence (PI), secondary influence (SI), self-efficacy (SE), and facilitating conditions (FC) have significant influence behaviour intention to adopt broadband within the UK households. These factors were used to predict a person's intention to accept new technologies. However, some difficulties were found to be better at predicting the initial use of technology when past experiences were not available than when they were (Kim & Malhotra, 2005). The study focuses on the users of telecentre (PiIM and KTWIM) who have prior exposure and experience in using the broadband internet (Tsai & LaRose, 2015).

2.3.1.3 Hedonic Outcome

In the study by Liou, Hsu, and Chih (2015), they attributed hedonic factor (HO) to the sense of pleasure, fantasy, and joyful of feelings for users. Further to that additional diversification functions such as higher quality of audio and video, these functions consider the key factors for consumers decisions to continue to use a particular service in the future (Liou et al., 2015). However, at times, the internet service provider (ISP) of a broadband service may reduce price. Although this strategy may prove successful in a short term, a sustainable business model requires a detailed understanding of other factors beyond those mentioned above. A sustainable business model may help SPs to attract future customers. In light of this, the aim of this study is to examine the influence of various factors–including utilitarian outcomes (UO), hedonic outcomes (HO), and

perceived resources–on the continuing intention to use broadband within the Malaysian context.

One study by Venkatesh and Brown (2001) concludes that the households studied initially emphasised the utilitarian aspects of household technology, and later, the hedonic aspects became more important once a purchase decision was made to sustain the continue intention. The same study also found that the MATH outperformed the remaining models in explaining the fear of obsolescence in household technology adoption. In another study, Venkatesh and Brown (2001) found that hedonic outcomes was one of the factors that influenced PC usage in home. In the study, hedonic outcomes is defined the pleasure derived from PC use, for example, games, fun, and entertainment. In another work, Heijden (2004) and Dwivedi et al. (2009) describe hedonic in information systems as self-fulfilling and being strongly connected to the home and leisure activities, focused on the fun aspect of using even though the result of a hedonic factor on the same study was found insignificant due to regulatory limitation.

2.3.1.4 Service Quality

Service quality (SQ) can be defined as the perceived quality of service a consumer obtained or is obtaining from the current internet service providers. Service quality is measured by (1) the speed of connection; (2) the security problems with internet connection, virus, and popup problems; and (3) the customer support obtained from the ISPs (Y. Dwivedi et al., 2010). Other scholars (Delone and McLean, 1992; Teo and Choo, 2001) proposed the concepts of system quality. In addition to its crucial role in Information System Success (ISS), the type of perceived quality is a critical predisposing

factor in the tricomponent attitude model for understanding the cognitive attitudes of broadband television users. In IPTV or any broadband-related services, the service provider should focus on building high-quality transmission networks and on rapidly enhancing the infrastructure of telecommunication networks using "Fiber-to-the-Home" (FTTH) as a foundation. Consequently, the service provider can deliver sufficient network bandwidth and a reliable video service quality to consumers (Liou, Hsu, & Chih, 2015). At the same time, broadband subscription is different from a PC purchase; Venkatesh and Brown (2001) contended that service quality was not employed on PC purchase. For a broadband service, consumers may need to sign an annual contract, and during the contract period, if the service provided is not satisfactory, the consumers can discontinue the broadband subscription and may subscribe to a competitor's service.

2.3.2 Normative Construct

In any community such as neighborhood, working groups, departments, and organizations, norms that reflect the commonalities among their members can be seen and these norms that influence the members to coordinate their actions (He, Qiao, & Wei, 2009). In addition, normative factors are built by primary and secondary influences that can be described as the perceived social pressure in performing a behaviour that influences a user to use the telecentres provide "cool" venues. A "cool place" in this sense implies a venue where the users spend time with friends (online and in person). Such a perception was also found to be an essential factor that draws users, specifically youth, to prefer cybercafé to libraries or telecentres (Mat Aji, 2014). Based on the principle of a straight consequence of subjective norms or normative factor on behaviour

intention, it is found that spending time together with friends may perhaps increase the desire to perform a behaviour if their referents support the action. Therefore, this element may influence users's continuing i ntention to use broadband (Wong et al., 2013).

Broadly, the importance of personal experience or outcome expectancies is also supported in work of Compeau et al. (1999) and Venkatesh and Brown (2001), who both identified the expectancies in term sof normative and control belief. More specifically, shared norms govern how its members behave, think, make judgments, and perceive the world. Therefore, shared norms generate propositional attitudes that tend to affect the members' behaviours (He et al., 2009).

Because the effect of social influence on customer behaviour is an important explanatory factor, researchers have attempted to define this factor. Ajzen (1985) studied social influence as subjective norms in the TRA / TPB model in which social influence is defined as a user's perception that people important to him think he should, or should not, perform a certain behaviour. In another study, Thompson et al. (1991) defined social influence as social factors an individual's internalization of the reference group's subjective culture and specific interpersonal agreements between the user and members of the group. Similarly, Choudrie and Lee (2004) explained social influence as the degree to which a person's social status is enhanced by the use of a technology or innovation. At the same time, social factors as part of normative constructs are defined as a consumer's perception that most people who are important to them should or should not perform the behaviour (Ajzen, 1985; 1991; Fishbein & Ajzen, 1980; Tan & Teo, 2000; Taylor & Todd, 1995; Venkatesh & Brown, 2001).

Originally a normative factor, such as social influence in its original form in the TRA and TPB, was employed as a single construct and was considered to be directly related to behavioural intention. This is because a consumer's behaviour is based on his or her perception of what others think of what he or she should be doing (Tan and Teo, 2000). Therefore, for the purpose of the study, it will adapt the TPB by assuming the normative factor (NORM) to be highly contributory to continuing broadband intention. The stronger the social influence under the normative factor (NORM), the more likely that consumer would develop a strong continue intention to subscribe to broadband.

2.3.2.1 Primary Influences

In this study, social influence from friends, colleagues/peers, and family members that takes the form of a conversation and messages is considered to be a primary influence (PI) that can assist in forming the perceptions of continuing broadband intention (Venkatesh & Brown, 2001). Based on the UTAUT model, it includes the definition of social influence as the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology. In the context of broadband usage, social influence can be defined as the extent to which a user perceives that the important members of his social circle support the use of broadband technology. The Primary Influence (PI) construct was also found to be significant in explaining the continuing intention of broadband because it is becoming an important tool that can influence the usage among peers. One example is the policy that all schools be equipped with broadband so that children can use broadband to do and submit homework using the internet. With the presence of such policy , the children will influence their parents to

subscribe to broadband and such a strategy has been successfully implemented in South Korea. As reported by Choudrie and Lee (2004), in South Korea, one of the important factors that determined the fast and high penetration of broadband was the influence of children on parents to use personal computers. At the same time in Korea, PC Bang (PC Room) is not simply a place to use the internet and to play online games. Strong evidence has suggested that PC Bangs are a place for meeting friends and playing together. The continuing, persistent popularity of PC Bangs, despite the availability of broadband in the home, proves that the PC bangs is a factor to consider when investigating the use of broadband in Korea. In Korea, PC Bangs are used not only as a place for web access but also as a place for socialising. In another aspect, in Korea, it is a practice for school children to discuss with their classmate and submit their homework electronically using the internet (Dwivedi et al., 2009). Also other previous researchers (Venkatesh and Brown, 2001; Taylor and Todd, 1995) assume that if their social networks influence broadband adopters with positive messages, they are more likely to have a strong behavioural intention to continue and increase their intention to use the broadband technology.

2.3.2.2 Secondary Influence

Previous studies have suggested that messages disseminated using the mass media, such as the television (TV) and newspaper advertisements (secondary sources of information) are likely to influence an adopter's intentions (Rogers, 1995; Venkatesh and Brown 2001). In the traditional forms of advertising, media are passive. In general, advertising messages are displayed in text, pictures, or graphics in media forms, such as magazines

and newspapers, whereas radio broadcasting and TV are potent media that can deliver voice and video advertising messages to consumers (P. T. Chen & Hsieh, 2012).

However, magazines/newspapers, radio broadcasting, and TV advertising media cannot deliver personalised advertising for different target markets. For this research, it is expected that secondary sources of information will affect that consumer who has already adopted broadband but are not satisfied with service quality. Hence, if advertisements are viewed on TV or read in a newspaper advertisement about broadband packages that are economical and offer a better quality service, then they are more likely to cause adopters to contract with the new provider. At the same time, previous study (Wei, 2006) contends strong influence and effect of media at the earliest stages of the adoption process in creating awareness of innovation. The fact that Roger (1995) and Wei (2006) also mention that early adopters tend to be more substantial users of mass media as compared to late-adopters users. Another study by Wei (2006) on the usage of home computers found that TV viewing was a significant predictor, but the use of radio, magazines, and newspapers was not. The same pattern was observed by Rhee et al. (2004) and Wei (2006) who found that media use as variables failed to show predictive power.

However, in a recent study on the usage of online applications, Lin (2001) found reading newspapers to be a significant but negative predictor of adopting communication-related applications, whereas reading magazines was a significant predictor of adopting marketing-oriented services. Given the high penetration rate of the Internet and its interactive nature, instead of only receiving advertising messages, consumers can now

proactively search for necessary advertising information. After all, the question that needs to be asked is whether the factor of secondary influence (SI) will positively affect the continuing broadband intention.

2.3.3 Control Construct

In general, if an individual's control over the external and internal constraints is low, he or she is less likely to adopt the technology besides having a high behavioural intention (Ajzen, 1991; 1985). The TPB suggests that the presences of constraints can inhibit both the behavioural intention to perform a behaviour, which is referred to as the perceived behavioural control (PBC) (Ajzen, 1991). Support for this theoretical argument is obtained from the empirical findings in several studies which demonstrated that the higher the perception of an individual's control over their internal and external constraint, the more likely would be the individual to adopt the technology in question (Ajzen, 1991; Tan & Teo, 2000). In general, if the individual's control over the external and internal constraints is low, then besides having a high behavioural intention, she or he is less unlikely to adopt the technology (Ajzen, 1991). However, few limitations must be noted in that the finding does not explain how consistent were the internal factors towards any determining factor because every individual is unique.

2.3.3.1 Facilitating Condition

The South Korean government's vision recognizes an affordable monthly cost of broadband for middle-income households as one of the most crucial factors that lead to the high rates of penetration (Choudrie & Lee, 2004). one exploratory study on broadband penetration in the UK also suggests that a high monthly cost is a significant

barrier that inhibits the penetration of broadband in households (Dwivedi et al., 2003). Therefore, it is expected that if the anticipated cost of obtaining broadband is high, then penetration will be slow. Broadband technology is not compatible with the specifications of old PCs and thus necessitating either an upgrade or purchase of a new PC. Yet, PCs are not easily replaceable devices for medium- and lower-income households. Thus, an economic barrier in the form of costs incurred when upgrading or purchasing new personal computers may inhibit the penetration of broadband in households. Another study on facilitating condition factors emerged and was criticized by Anderson and Swaminathan (2011) on the basis that many of the previous studies have not fully explained the hybrid factor of perceived usefulness and costs. These factors are necessary in order to lead consciously to higher levels of inertia tend to patronize more and continue subscribe the services repeatedly.

2.3.3.2 Perceived Knowledge (PK)

The level of knowledge regarding innovation, its risks and benefits affect the penetration rate (Rogers, 1995). The higher the awareness of the benefits of the innovation amongst the consumers and users, the more likely it is that the innovation will get adopted. Research by Lee and Choudrie (2002) suggested that, in South Korea, consumers knew what the potential of broadband was. The consumers were aware of the benefits of faster internet access, which was essential to satisfy their needs. It is assumed that the penetration of broadband requires a clear message of its usage and benefits amongst the overall population. Also, if consumers are not aware of the benefits of adopting a

particular innovation, then it is expected that they are more likely to reject the decision to purchase due to the lack of the perceived needs

2.3.3.3 Self Efficacy

The importance of self-efficacy (SE) is evident from its sizable causal link with expected outcomes. SE suggests that before individuals process information about the benefits of the broadband internet, they must first believe that they can use the innovation to achieve those outcomes (LaRose, Gregg, Strover, Straubhaar, & Carpenter, 2007). Further to that, SE suggests that before an individuals process information about the benefits of the broadband internet, they must first believe that they can use the innovation to achieve those outcomes. Unlike the TAM models (Tsai & LaRose, 2015) mentioned that suits TAM model is for an organization where organizations provide training and support to users while home users must rely on themselves; accordingly, their belief in their ability to successfully use broadband (i.e., self-efficacy) is paramount. It is used to predict a person's intention to accept new technologies.

However, there are some difficulties it was found to be better at predicting the initial use of technology when past experiences were not available than when they were (Kim & Malhotra, 2005). In one study among farmers conducted by Pick et al. (2014), they found that using telecentres constitute one of the essential means for farmers and others in rural areas to access computers and the Internet. These farmers can provide valuable information to agricultural users, including farming techniques, market information, financial data, Internet-based government records, and e-mail communication. Amore informed rural workforce could be more productive, allowing inroads in raising the

standard of living in villages. However, another previous study (Gollakota, Pick, & Sathyapriya, 2012) found that only two respondents cited the reason for coming to the telecentre to be individual use of computer. The reasons for the ICT-user farmers not using the computer more often are mostly the perceived difficulty to use.

2.4 Satisfaction

In measuring intention, many studies have noted that satisfaction and attitude are conceptually different dimensions (Ho, 2010). In establishing the difference between IS adoption and sustained usage, Bhattacherjee (2001) and He et al. (2009) proposed that the intention to continue using an information system is strongly predicted by user's satisfaction, with perceived usefulness as a secondary predictor. In general, Information System (IS) Continue Usage Model is derived by Oliver (1980) on Expectation Confirmation Theory (ECT), which holds that expectations and perceived performance lead to post-purchase satisfaction while influencing repurchase intention and post-acceptance behaviour. The mediation effect of confirmation through the positive and negative effect of expectation and performance that resulted in the consumer repurchase decision because both decisions are influenced by the initial use (Hsu & Lin, 2015).

2.4.1 Information System (IS) Continue Usage Model

In this study, the PiIM users are viewed as the central part of the information system. Thus from the findings of Lenka et al. (2010), we can assume that users are the determinants of both satisfaction and dissatisfaction with technology, which could suggest the continuing intention to use. Customer satisfaction is not a new concept and many of the previous studies and efforts have been made to understand the determining

factor and consequences of customer satisfaction in order to understand customers' continue purchase intention. The justification is that customers' behaviour can usually be predicted by their intention (Hsu, Chang, & Chen, 2012). Also, many of the previous studies have cleared the distinction between use and satisfaction. These researchers contended that "use" is voluntary in the case of enforcing policy or rules, whereas "satisfaction" is the substitute of efficiency and success and is described as a means of measuring information system success (Ives, Olson, & Barudi, 1983). In Bhattacherjee's (2001) study, continuing use of information systems (IS) is explained as a process using the expectation-confirmation theory. At first, the initial expectation of a system is formed. Second, the system is accepted and used by consumers. Third, after a period of initial use, users acquire impressions of system performance and assess it in relation to their expectations. Satisfaction is achieved if the system performance satisfies the expectations of the customers. Finally, users continue to use the system when they are satisfied with it, as shown in Figure 2.2 (Bhattacherjee, 2001).

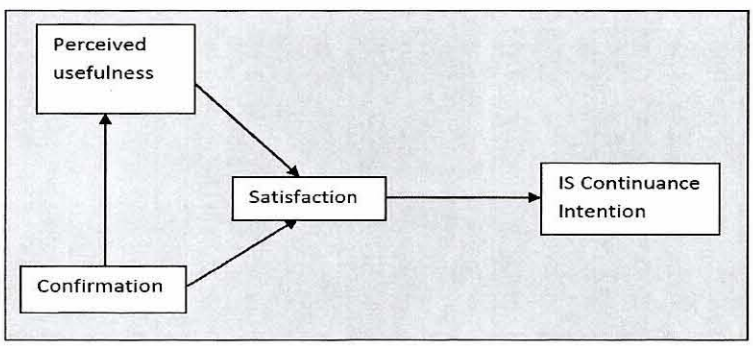

Figure 2.2
IS Continuance Post Acceptance Model
Source: (Bhattacherjee, 2001).

2.4.2 Perceived Usefulness and Satisfaction

In Bhattacharjee (2001) and Eriksson and Nilsson's (2007) studies, they concluded that users perceive usefulness and satisfaction with Internet banking as indicators of their continued usage. At the same time, another study reported a satisfaction construct to be worthy of being studied due to its positive contribution towards the feelings of users of technology (Bhattacherjee, 2001).

In the present research, the combination of MATH model and Information System (IS) continue usage model will be adapted to measure users' satisfaction and its relationship with the continuance of broadband intention. It is thought that a study on behaviour intention that usually applies just for the first-time use of technology may not facilitate solving the challenge in regard to increasing the continuing broadband intention among the Malaysian public.

Previous studies on continuing usage model on information system (IS) as shown by Figure 2.2 were conducted by integrating two or more theories or models in order to establish users' continuous usage of different technologies (Lin et al. 2013; Lee & Kwon, 2009). However, these study have focused on the long-term use of broadband technology and not on first-time use, and therefore, the confirmation construct from the IS continuance model was found not contextually irrelevant as a factor for continuing intention to use broadband technology in Malaysia.

Accordingly, the continuance model in IS research must be fused with perceived usefulness in order to garner better understanding of broadband continuing intention.

Besides that, IS user's continuance follows the initial acceptance intention which could lead to ex-post retrieval of previous intention (Cheung & Lee, 2009; Bhattacherjee, 2001). The studies by Vatanasamount (2008) and Hsu and Lin (2015) particularly blended the models of Commitment-Trust Theory, ECM, and TAM, and the integration then led to the development of a research model for continuous usage intention of mobile devices that was validated empirically. Besides that, TAM was decomposed based on the Expectancy Disconfirmation Theory (EDT), with perceived performance forming perceived quality and perceived usability towards continuous usage intention (Roca et al., 2006). This explains the vital role of merging two or more models while establishing the continuous usage of technological devices like in this study which combining with MATH model. The aim of the study is to determine the factors driving continuing intention of using the broadband technology.In this study, we will explore the influence of content quality and perceived usefulness that determine the satisfaction that motivates inactive users of broadband technology to become active. Previous studies have found that people often refrain from continue using the broadband Internet not because they cannot afford it or access is not available, but because they perceive no need to be online or lack the necessary technical know-how (Ma & Huang, 2014).

The technology acceptance model (TAM) focuses on two theoretical constructs" perceived usefulness (PU) and perceived ease of use (PEOU). These two factors influence consumers' intention of using the system. One study by Sajad et al. (2015), revealed that in the Malaysian context, perceived usefulness is the most dominant factor that has a consistently strong relationship between perceived usefulness and continue

intention that influences the online purchase intention through social media. Other studies by Davis (1985) and Wu et al. (2010) contended perceived usefulness as the degree to which a person believes that using a particular system will enhance and influence consumers' intention of using the system. In the research of the relationships between perceived usefulness and customer satisfaction, empirical studies of the conventional retailers discovered that perceived usefulness in most cases positively influenced customer satisfaction (Brady & Cronin, 2001; Deng, Lu, Wei, & Zhang, 2010). A similar conclusion was also proposed in the studies of online shopping websites and *e*-commerce (Hsu et al., 2006; Yang & Peterson, 2004). In another study on the mobile commerce industry in Taiwan (Lin and Wang, 2006) perceived usefulness was also found to be positively related to satisfaction. Table 2.4 summarises the combination of the measurements for both research models as found from the literature review.

2.4.3 Content quality and satisfaction

Several studies on mobile service satisfaction and the success of information system were conducted by incorporating the construct of content quality, and all of these studies have confirmed the importance and relevance of the construct (Jung, Chung, & Leue, 2015). In certain fields, (information systems, system quality, information quality, and service quality), these factors have specific relevance to people regarding particular quality attributes (Bailey and Pearson, 1983; DeLone and McLean, 1992; McKinney et al., 2002; Liou et al., 2015). Furthermore, in the tricomponent attitude model, information quality is a predisposing factor in the development of positive attitudes among broadband users, particularly in today's competitive market. Most service providers or operators have a

challenging task to capture market share and to understand how to maintain their consumer base by matching the consumers' perceived service quality and what was obtained or obtaining and the secondary influence (Dwivedi et al., 2010). Thus, the success of information technology is mainly dependent on its content value in that the users' belief would derive more benefits for future purposes (Lu & Hsiao, 2007; Du & Wagner, 2006). Meanwhile, researchers have emphasised that factors that bring about continuous usage or success of a technology, as conceptualised by the social cognitive theory, are user expectations, social factors, and belief (Phang et al., 2006). In another study, Jung, Chung, and Leue (2015) reviewed the use of the content quality construct in information system success research and found that all studies confirmed the importance and relevance of content quality in many areas thus confirming the importance of information (content) quality in the behavioural intention. Another study by Hsu et al. (2012) also advocated the use of content quality as one of the dimensions to validate website quality because the factor can affect users' continuing intention to use. Further studies by Lai (2013) and Jung et al. (2015) also postulated the importance of information (content) quality in behavioural intention, such as mobile applications for mobile tour guides, and acknowledged the influence of the quality of online content in inviting more usage and participation.

Therefore, there is a need to address the factors that see the continuing usage of broadband technology among the users in different domains. From a conceptual perspective, perceived content quality is similar to information quality. One study has found that information quality is frequently hidden within the context of perceived

content on the Internet (Liou et al., 2015). In 2000, Lin and Lu investigated the factors affecting users' intention to use a website and found that content quality was also a predictive factor of the consumer behaviour. As a result, practitioners and policy makers were advised to emphasise the quality of a website's content and the efficiency of the website in order to facilitate the penetration of broadband internet. Further investigation by Jung et al. (2015) also recommended that future studies consider perceived content quality as a useful dimension for motivating the penetration of more complex IS system, which is also applicable to broadband technology. The question for the measurement of content quality was adapted from the research by Jung et al. (2015) as follows:

> "The Marker-based AR application provides relevant information on traditional tales" was adapted to

- "Telecentres provide me with various information."
- "Public Telecentres provide various information that I needed."
- "The information that I can get from a public telecentre is valuable."

At the same time, the following question was addressed:

> "The Marker-based AR application provides easy-to-understand information of traditional tales" was adapted to formulate the following queries:

- "Telecentres provide me with various services."
- "The services that I can get from a public telecentre are valuable."
- "Public Telecentres provide various services that I needed."

2.5 Demography as a moderating factor of continuing broadband intention

In general, a moderator is a variable that affects the direction and strength of the relation between an independent and a dependent variable (Baron and Kenny, 1986). Certain variables are frequently found to be linked to individuals' innovativeness. One such set of variables is termed "socio-demographic," which includes age, gender, educational level, Internet experience, and voluntariness of use (Dwivedi and Williams, 2008; Rogers, 1995). As postulated by Ooi, Sim, Yew, and Lin (2011), what remains unclear is whether the moderating factor in the MATH model will moderate the objective of this research. Such identification requires further studies to include a moderating construct to examine the interrelationship among the variables. The relationship may be the effect of correlation among the constructs that may weaken or strengthen the result. For example, the location factor displayed an inconsistent pattern of moderating factor.

Ooi et al. (2011) suggested that a study be conducted on the continuous broadband intention based on a cross-country comparison or cross-cultural research on the usage of broadband. Finding from such study could verify the claim by Pérez-Hernández and Sánchez-Mangas (2011), who perceived location as one of the determining factors towards internet penetration in addition to other moderating factors ,such as digital literacy, which could also be the cause of the inconsistent pattern. Rogers (1995) explained that demographic variables are related to an individual's innovativeness and can affect the rate of penetration and diffusion of innovations. Users' relevant social and psychological characteristics of IS systems are derived from psychological theories, such as TPB and TAM, which will determine the factor of continued intention to use

technology. As mentioned by Rahman and Aziz (2014), demographic characteristics, such as age, income, gender, and race, are often assumed to have a significant effect on consumers' perceptions, thus requiring a more direct assessment, including a cross-country comparison. The use of broadband is quickly getting incorporated into numerous parts of ordinary life, including online banking, shopping, working, and person-to-person communication (Pick et al., 2014).

2.5.1 Age and gender as moderating factors of continuing broadband intention

Weiner et al. (2012), in their study, adopted a user-centric approach to technology adoption in extending the theory of planned behaviour (TPB) to include age and gender as moderating variables. In this way, the study can better explain the adoption outcomes as the interactions between behaviour and perceived behavioural controls with continuing intentions, particularly in the aspects of norms, attitudes, and beliefs. It should be noted that the range of demographic variables as attenuated by Baron and Kenny (1986) indicated that the moderator variables are typically introduced when there is an unexpected weak or inconsistent relation between a predictor and a criterion variable. This study did not limit the analysis to those who had prior knowledge of the broadband internet only and only youth. Several scholars (Park, Im and Noh, 2016; Ooi et al. 2011) have suggested the need for future research to extend the age brackets because the previous studies do not plainly apply to people of all ages. In addition, the studies did include many internet adopters, who can consists of users among all age brackets and education level with purchase capability (LaRose et al., 2007). As recommended by Ooi et al. (2011), future research should include a moderating construct in order to examine

the interrelationship among the penetration factors and determine the effect of their correlation, which may weaken or strengthen the result. In the meantime, a study to assess the distinction between broadband cost and the non-adopters' eagerness to pay will help policy makers to review the factors that will reduce the broadband affordability gap (Carare et al., 2015).

According to the theory, factors that influence BI are essentially moderated by gender and age; such an effect would be stronger for men, particularly younger workers (Venkatesh et al., 2003, p. 450). Statistics from previous studies have shown that a majority of the users of public access center (PAC) venues are young moderately educated, and low- or middle-income individuals. While cybercafés are far more numerous compared to telecentres and libraries, their users all appear to follow a similar distribution. Following is a description of the general trends in PAC-venue usage by age, education, income and gender across the 25 countries studied (Gomez, 2013).

Given the above points, there is a necessity to conduct a study on the influence of moderating factors, such as gender, age, and broadband experience, on continuing broadband intention (CBI) because these factors may moderate the studies conducted by previous researchers, for example, such an effect can be found to be stronger for women, particularly younger women (Venkatesh et al., 2003, p. 450). The same study also found that gender, along with age, voluntariness, and experience, will moderate the impact of social influence on CBI. These factors can be shown to have stronger effect for women, particularly older women, mostly in the mandatory settings or in the early stages of experience.

2.5.3 Education as a moderating factor of continuing broadband intention

The limited demographic analyses on continuing broadband intention appear to be inadequate in explaining the effect of demographic characteristics, such as age and gender, on continuing broadband intention (Weiner et al., 2012). Previous studies have demonstrated that a relatively large group of people do not intend to use broadband merely for for their education because they do not need such a facility, and that the technology does not fit with their lifestyle and values (Turk & Trkman, 2012). In one study, Pérez-Hernández and Sánchez-Mangas (2011) examined and later recommended education factor as one of the factors that can accelerate internet access. Other factors, such as personal, household subscriptions, and digital literacy could also be the causes of the inconsistent pattern. Other studies have also reported that individual responses to information technology (IT) may vary other than age and gender that was shared in the previous section is education, functional experience, and technology usage experience (Hsieh, Sharma, Rai, & Parasuraman, 2013).

In their attempt to bridge the digital divide, other researchers have also identified the importance of understanding the demography and other factors of broadband adopters and non-adopters in an effort to increase the growth rate of broadband (Stanton, 2004; Dwivedi et al., 2010). In some countries, such as Korea (Choudrie and Lee, 2004), dense housing patterns delivered significant economies of scale for broadband network deployment. A favourable characteristic for the cost-effective deployment of the broadband infrastructure is the fact that 80% of Koreans live in densely-populated urban areas. Other demographic factors such as gender and prior experience have proven to be

significant moderators in UTAUT research, and age has been established as a moderator in both UTAUT and MATH (Tsai & LaRose, 2015a).

Following the dearth of such studies, the present researcher suggests a need for a systematic study on the variety of possible factors affecting the continuing intention of using broadband technology among public telecentre users. Such scarcity of study could also be attributed to the late rollout of broadband services, which resulted in slow infrastructure development, low teledensity, and slow rate of penetration. The evidence of broadband deployment and diffusion in developing countries, however, is very limited.Studies on continuing broadband intention that affects broadband penetration as related to the analysis of the gaps between a group of consumers are becoming essential for an assortment of stakeholders (Robertson, Soopramanien, & Fildes, 2007). In the mind of some people, broadband may be too costly, whereas others may feel that broadband is not essential. Given these points, it is imperative to investigate the motivating factors for continuing broadband intention (Pérez-Hernández & Sánchez-Mangas, 2011). As Pérez-Hernández & Sánchez-Mangas indicated, people who use the internet at home (34% of them) will have a higher drive to shop online compared to those who do not have internet at home.

2.6 Conceptual Framework

Conceptual research, as emphasised by Sekaran and Bougie (2013), models the relationships among several factors that have been identified as relevant to the problems, thus providing the necessary foundation for other research structures in extending the frontier of the knowledge. The subsequent chapter will explain the proposed research

framework based on the discussions in the literature review. In this chapter, the researcher presents the research model based on the related theories, particularly the model of adoption of technology in the household (MATH) and Information System (IS) Continue usage model. The researcher also focuses on the factors that contribute to the continuing usage of broadband technology among the users of a public telecentre in Malaysia. The following chapter also explains the research methodology as well as a proposed research framework. For this study, the researcher used the existing three main constructs of the research framework: attitudinal belief, normative belief, and control belief. The MATH itself, which is derived from the model of TRA, TPB, and DTPB, is known to be appropriate for assessing the usefulness of technology in households. Moreover, the three frameworks of MATH, TPB, and DTB will constitute a directing system to be added to the theoretical model. The theoretical model constructed for this study serves to (1) inspect the behavioural intention to adopt broadband and (2) measure the user's actual broadband continuing intention only at the adoption stage.

As MATH is directly engaged in the research of technology adoption from the perspective of household, most of the constructs are adapted from it (Venkatesh and Browns, 2001). The researcher will also add satisfaction as a construct using IS continuance post-acceptance model because the model stresses that only perceived usefulness or performance expectancy and user satisfaction are the determinants of continuous usage of technological devices (Bhattacherjee et al., 2001; Muraina, 2015). However, in Information System (IS), this study on continuous usage, previous studies have recommended that an emphasis should be given on the factors affecting the

perceived usefulness and user satisfaction, particularly in a smaller domain similar to the rural area (Chen, 2010; John & Khaled, 2010; Muraina, 2015). Along with these theories, the conceptual framework shown in Figure 2.2 is believed to be able to represent the perspectives of the research on continuing intention, particularly in discussing the continuing intention of using broadband (Oh, Kim & Joongho, 2003).

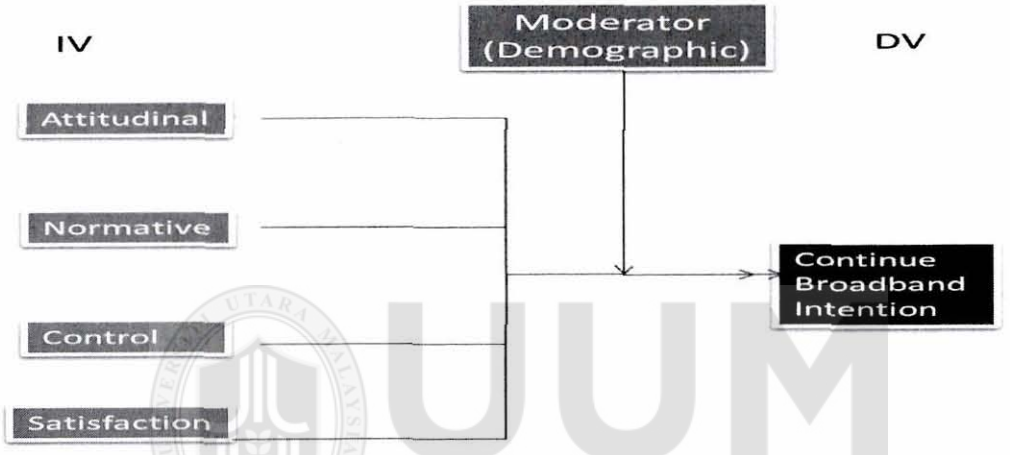

Figure 2.3
Proposed conceptual framework

2.7 Underpinning Theory

Previous researchers noted the use of many technological adoptions and IS theories in providing the solutions to the issues at hand (Ho, 2010; J. Park et al., 2010; Eriksson & Nilsson, 2007). Among the theories discussed were Davis's (1989) technology acceptance model (TAM), the theory of reasoned action (TRA), the theory of planned behaviour (TPB), the diffusion of innovation (DOI) theory, and the social cognitive theory (SCT). Researchers also noted that many of the IS theories are capable of

discovering factors or drivers for achieving particular issues in the societies (Ho, 2010; Premkumar & Bhattacherjee, 2008; Damiani et al., 2008; Venkatesh et al., 2003).

2.7.1 Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) and the theory of planned behaviour (TPB) are two foundation theories that led to the development of the technology acceptance model. The TRA is a widely used theoretical model from social psychology designed to assess and understand human behaviour and has been applied to IT. The theory of reasoned action focuses on attitudes towards behaviour and subjective norm (Ajzen & Fishbein, 1980). Theory of Reasoned Action (TRA) was developed with a model that focuses on the behavioural intention instead of actual usage. According to the TRA, the individual performance of a particular behaviour is determined by his or her intention to perform that behaviour, with the behavioural intention being jointly determined by the individual's attitude and subjective norm concerning the specified behaviour (Davis, 1989). According to Chen (2012), TRA is one of the widely used models to determine behavioural intention due to its high correlation with the use of its four determinants: attitude, behavioural intention, actual use, and subjective norms. In TRA, the actual use is determined by the behavioural intention instead of by the attitude towards users' behaviour (Norman & Smith, 1995). The behavioural intention is determined by user's attitude and subjective norms (Ajzen & Fishbein, 1980). Figure 2.4 shows the diagram of the theory of reason of action model.

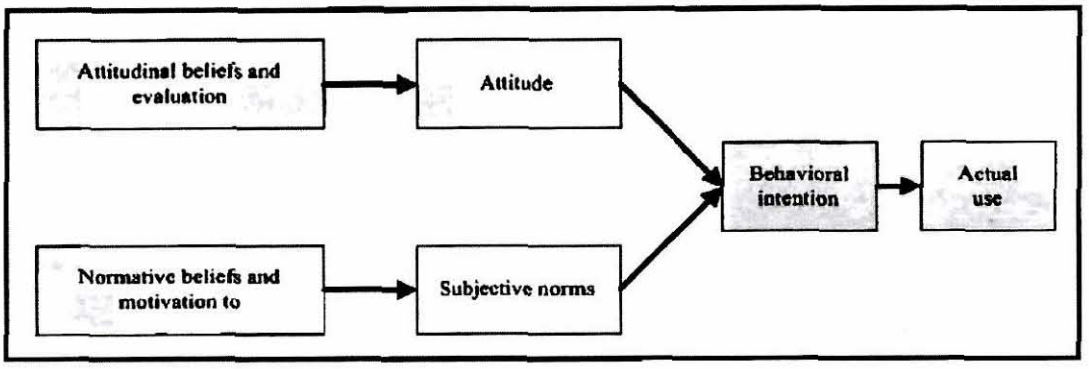

Figure 2.4
Theory of Reason of Action Diagram
Source: (Ajzen,1991)

Behavioural intention is a measure of the strength of a person's intention to perform a particular behaviour (Davis et al., 1989). Attitude is a person's positive or negative feelings (evaluative affect) about performing the target behaviour. Subjective norm (SN) refers to the perceived social pressure to perform or not to perform towards behavioural intention.

2.7.2 Technology diffusion and adoption theories

Technology Acceptance Model (TAM): The technology acceptance model (TAM) was illustrated by Davis (1989) to predict the acceptance and use of new information technology (software and information systems) within organisations. This model focuses on two theoretical constructs, which are perceived usefulness (PU) and perceived ease of use (PEOU). Both constructs will influence customers' intention of using the system, and both have significantly influenced customers' interaction with online banking and have in recent years been documented by studies incorporating various external variables (Pikkarainen, 2015; Wang, 2003; Cheng et al., 2006; Al-Somali et al., 2009). In the

present study, the original constructs of perceived usefulness and perceived ease of use, along with other variables (such as relative advantages and service quality), were adopted for an empirical test. TAM is one of the most well-known models that have been used to investigate resistance to new technologies in the workplace. In 1989, Davis developed TAM in purest form, Davis devised a scale that produced measures on two factors, ease of use and perceived usefulness that correlate the user/acceptances of technology especially in information systems (Edmunds, Thorpe, & Conole, 2012). TAM has since been widely used to understand the reason behind the acceptance of a new technology using these two significant determinants to investigate intention to use (Baek, Park, & Lee, 2011).

The present study will focus on TAM, TPB, DTPB, and MATH as the basis for the research. Along with these theories, the Technology Acceptance Model (Davis, 1989) and Diffusion of Innovation (Rogers, 1983) perspectives are also widely supported, particularly in discussing the adoption of technology (Oh, Kim, & Joongho, 2003).

Understanding the behaviour of individuals has always interested social researchers. The theory of reasoned action by Fishbein and Ajzen (1975) and the theory of planned behaviour by Ajzen and Madden (1986) have been widely accepted and are often used in explaining individuals' behaviour. Along with these theories, the TAM model by Davis (1989) and Diffusion of Innovation by Rogers (1983) are also widely supported, particularly in discussing the adoption of technology (Oh, Kim, & Joongho, 2003). In order to comprehend technology adoption in the household context, Venkatesh and Brown (2001) altered the TPB to look at drivers and obstructions of PC adoption. Due to

the high quantity of decisions of speculations and models (e. g. TRA, TPB, DTP, TAM, DI, MATH), a determination of a proper model or different builds from various models postured to be an issue for the up and coming innovation reception specialists. Venkatesh et al. (2003) contended that researchers scheme a decision amongst a vast number of models and that they should "pick and choose" the models, or pick a "favoured model", and to a great extent, disregard the commitments from other models.

2.7.3 Technology Acceptance Model (TAM)

Davis (1989) predicted information technology acceptance and usage using the models that were developed as the Technology Acceptance Model (TAM). The model was based on the underlying theory of reasoned action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This fundamental theory postulates that beliefs or perceptions about the characteristics of the target system are antecedents to behavioural intent to adopt and use the system. In regard to social psychology, the TRA was developed with the objective to explain and gauge individual behaviours (Ajzen and Fishbein, 1980). The TAM is often used in the area of information technology as the foundational theory to predict and explain IT use and acceptance (Davis, 1989; Venkatesh and Morris, 2003; Boakyevet al., Prybutok, 2014). Individuals with the intention to use technology also go a step further to having the intent to purchase the technology, as proven in the correlation established in many of the previous studies (Boakye et al., 2014).

TAM used the TRA by Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980) as its theoretical base. Thus, Davis, (1989) stressed that a user's behavioural intention to use technology is affected by their perceived usefulness and perceived ease of use of the

technology. The model was extended to TAM2 by including subjective norm as an additional predictor of intention in a mandatory environment. Davis (1989) further argued that both Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) affect people's intention to use a system, as shown in Figure 2.5.

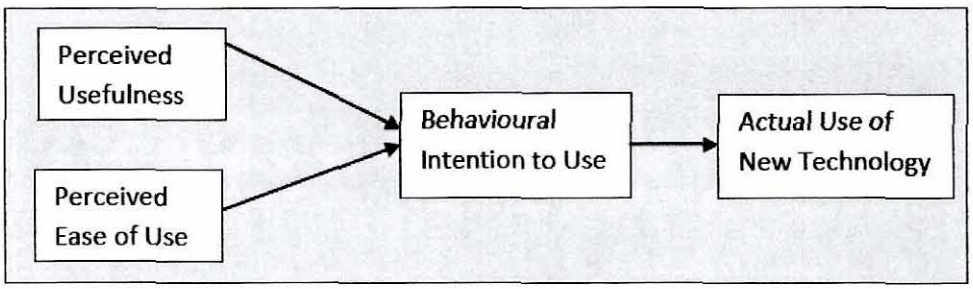

Figure 2.5
Diagram of Technology Acceptance Model TAM
Source: (Davis et.al, 1989)

In a related study, Wang, Meister, and Gray (2013) argued that perceived usefulness, perceived ease of use, and perceived playfulness are the factors that may directly or indirectly affect continuous usage of systems or technology. Hence, the basis of TAM is PU (the degree to which a person believes that using a particular system would enhance individual job performance) and PEOU (the degree to which a person believes that using a specific system would be free of effort) (Davis et al. 1989). TAM, however, 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 use of technology since it lacks consideration of satisfaction of the users of technology.

2.7.4 Theory of Planned Behaviour (TPB)

Ajzen and Fishbein (1985) proposed the theory of planned behaviour due to the limitations found in TRA particularly in determining attitudinal factors. The theory of planned behaviour, on the other hand, considers norms to be subjective norms that account for consumers' perceived social pressure to engage in the behaviour. This theory is hypothesised to contribute to stronger intentions to perform the behaviour (Ajzen, 1991). The addition of the construct Perceived Behavioural Control (PBC) to the Theory of Reason of Action (TRA), therefore, results in the Theory of Planned Behaviour (TPB), which has been widely used and validated by many studies in the prediction of individual intentions and behaviour of technology adoption. Taylor and Todd (1995), however, criticised TPB and TRA as requiring individuals to be motivated to perform an individual behaviour. Therefore, this assumption is vulnerable to many problems in the study of consumer behaviour related research (Taylor & Todd, 1995). The findings show that TPB explained between 21% and 37% variance in technology acceptance and user behaviour.

2.7.4.1 Decomposed Theory of Planned Behaviour (DTPB)

The DTPB theory begins with constructs from the Diffusions of Innovation Theory (DOI) perspective (Taylor & Todd 1995). The DTPB is an improvement of the Theory of Reasoned Action (TRA) in which the DTPB model contains constructs like perceived usefulness, complexity, compatibility, subjective norms, self-efficacy, and facilitating conditions. The study by Taylor and Todd (1995) also examined the appropriateness of TRA, TPB, and DTPB models (depicted in Figure 2.6) to predict consumer behaviour

and concluded that these established and widely-used models are capable of predicting the behaviour (Ho, 2010).

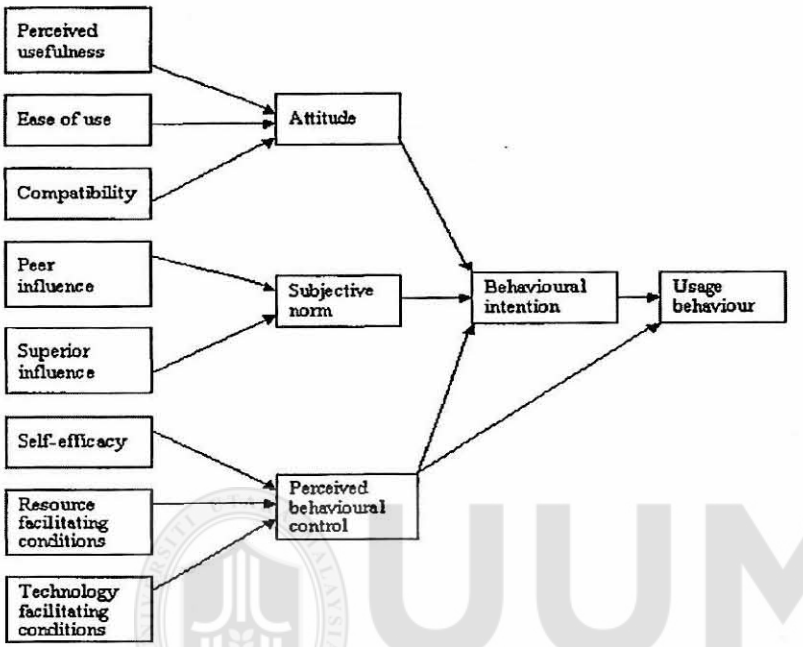

Figure 2.6
Diagram of "The Decomposed Theory of Planned Behaviour"
Source: adapted from Taylor and Todd (1995) and Dviwedi (2005)

This study will focus on the Model of Adoption of Technology in Households (MATH) as a foundation for this research. Deriving from the theory of DTPB, the factors from these three constructs models, other factors that might affect the penetration of broadband are taken into considerations to predict the intention to perform continue intention of broadband services. As mentioned by Dwivedi and Wahab (2008), it was found that constructs such as RA, UO, HO, SQ, PI, SI, SE, PK, FC and related satisfaction variables significantly influenced BI and affected the continuing broadband intention.

The literature review has confirmed limited studies on continuing intention of using broadband, particularly on the topic related to public access computing (PAC) centres users using the theories mentioned. For this research, the four constructs are defined as follows (1) BI is defined as a consumer's intention to subscribe (or intention to continue the current subscription) and make use of broadband internet in the future (Brown & Venkatesh, 2005; Venkatesh & Brown 2001); (2) perceived usefulness (PU) is the extent to which broadband internet usage enhances the effectiveness of household activities, such as undertaking office work at home, children's homework, information or product search and purchase, and home business (Brown and Venkatesh 2005; Venkatesh and Brown 2001; Dwivedi & Wahab, 2008). Along with these theories, the Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) perspectives are also widely supported, particularly in discussing the adoption of technology (Oh et al., 2003).

Understanding the behaviour of individuals has always been a concern for social researchers. The theory of reasoned action and theory of planned behaviour are widely accepted and often used in explaining individuals' behaviour. Compared to previous studies, this study is based on the latest established models available to measure broadband penetration and its use. While UTAUT concerns consumer technologies, UTAUT2 adds hedonic motivation, price value perceptions, and habit strength to the original UTAUT model (Venkatesh, Thong, & Xu, 2012). Tsai and LaRose (2015) proposed that theories such as SCT, DOI, TAM, UTAUT, and MATH be among the most notable theories to study behaviour intention, considering that gender, age and prior experience are proven to be significant moderators in UTAUT research. Age has also

been established as a moderator in both UTAUT and MATH. Technology Acceptance Model (TAM) is one of the most well-known models that has been used to investigate the resistance to new technologies. Therefore, TAM has been recommended for workplace application. In another study, Davis (1989) devised a scale that produced measures on two factors, ease of use, and perceived usefulness–all of which were found to correlate with the user/acceptances of technology, particularly in information systems (Edmunds, Thorpe & Conole, 2012). The scale is widely used to understand the reason behind the acceptance of a new technology by examining the two significant determinants of intention to use (Baek, Park, & Lee, 2011).

Based on the underpinning theories, as emphasised by Sekaran and Bougie (2013), the relationships among several identified factors as relevant to the problems and forms the necessary foundation for other research structures in extending the frontier of the knowledge. The detailed discussion in the next chapter will explain the proposed research framework based on the discussions in the literature review. In this chapter, the researcher developed the research model based on the related theories, particularly the Model of Adoption of Technology in the Household (MATH) and Information System (IS) Continue usage model, focusing on the contributing factors for continuing usage of broadband technology among the users of a public telecentres in Malaysia. The following chapter will explain the research methodology adopted and the proposed research framework.

2.8 Summary

The objective of this chapter is to report findings from the review of litearture pertinent to this study. The literature review encompassed the domains listed below:

(i) Inconsistent household broadband penetration, which provides the initial motivation for this thesis.

(ii) Broadband technology, which provides the current technology for users to acquire knowledge that is important in today's world.

(iii) Behavioural theories, which provides a theoretical lens for the analysis.

(iv) Demographic factors, as the moderator to engage the effect on the profiles of users in determining the behaviour. Several gaps in the literature were addressed in this chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will present the flow chart of research methodology of this study to ensure the research objectives are achieved. This chapter will explain the research paradigm, research design and will be followed by the procedure for sampling. Next, this chapter will discuss the instrument of data collection together with the measurement of it before proceeding with the discussion on the pilot study. After that, the statistical technique and analyses are also elaborated

3.2 Research Framework

Considering the discussions from the previous chapter of literature review this study has developed the research framework based on research model as shown in Figure 3.1. Further to that a research framework based on Model of Adoption of Technology in the Household (MATH) for the contributing factors of the continuous usage of broadband technology among the users of the public telecentre in Malaysia. The following chapter is also explained on the methodology as well as proposed the research framework.

3.2.1 Hypotheses and Proposition Development

Numerous hypotheses that measure the broadband usage have been hypothesized such as Technology Acceptable Model (TAM), Diffusion of Innovation (DOI) model, Theory of Planned Behavior (TPB) and different models that fundamentally concentrate on the first time use (Ajzen, 1991; Davis, 1989; Rogers, 2003). However, researcher agrees with

other study mentioned by Bhattacherjee (2001) that contended the accomplishment of any technology including broadband depend on their progressing and long-term use, as opposed to the underlying use or first-time use. The findings imply that accepting the only first-time use of technology cannot be used as a measure for determining its success and thus calling for continuous usage of technology as the research stream. The proposals of the research hypotheses for this study are formulated based on the research framework in Figure 3.1. The following hypotheses are developed and as such, are expected to be true. The study will try to support all these hypotheses which are formulated as follows:

a. Direct variables to the continue broadband intention

   H1 – There is a positive relationship between the Attitudinal construct of the users and Continue Broadband Intention.

   H2 – There is a positive relationship between the Normative construct of the users and Continue Broadband Intention.

   H3 – There is a positive relationship between Control construct of the users and Continue Broadband Intention.

   H4 – There is a positive relationship between Satisfaction construct of the users and Continue Broadband Intention.

b. Moderating effect to the continue broadband intention

   H5 - Demographic factor of gender will moderate the relationship with Continue Broadband Intention

H5a - Demographic factor of gender will moderate the attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H5b - Demographic factor of gender will moderate the Satisfaction construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H5c - Demographic factor of gender will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H5d - Demographic factor of gender will moderate the normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H6 - Demographic factor of age will moderate the relationship with Continue Broadband Intention

H6a - Demographic factor of age will moderate the attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H6b - Demographic factor of age will moderate the Satisfaction construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H6c - Demographic factor of age will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H6d - Demographic factor of age will moderate the normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H7 - Demographic factor of education will moderate the relationship with Continue Broadband Intention

H7a - Demographic factor of education will moderate the attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H7b - Demographic factor of education will moderate the Satisfaction construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H7c - Demographic factor of education will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

H7d - Demographic factor of education will moderate the normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.

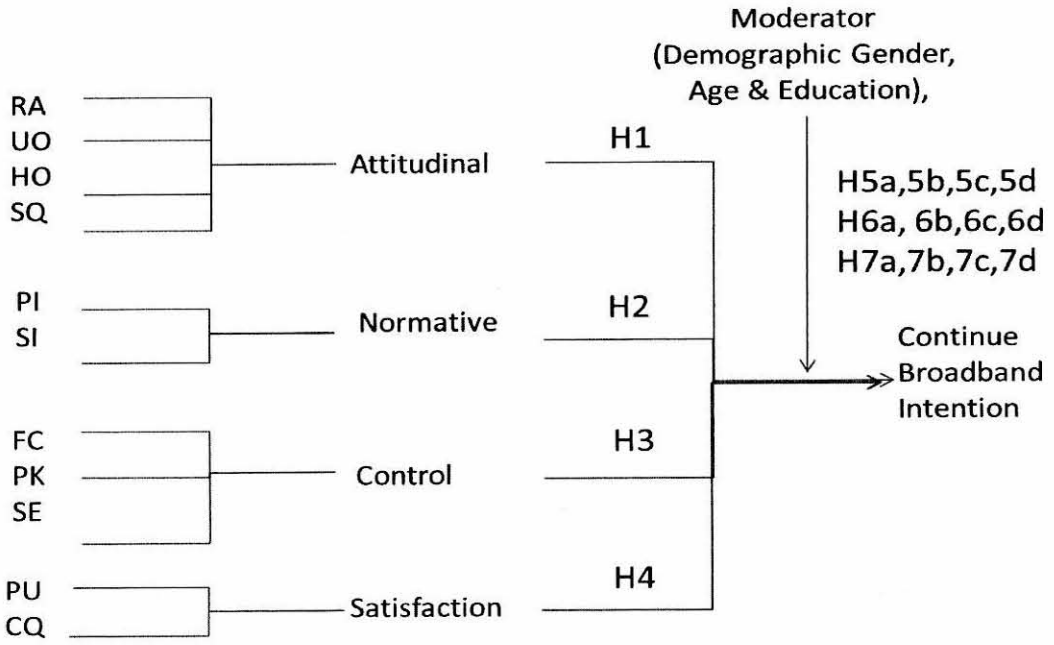

Figure 3.1
Research framework and the hypothesis proposition

3.3 Research Process

The research process is the number of phases that represent the entire activities in the research (Sekaran & Roger, 2011; Sekaran, 2000). In this study, there were three phases of the major activities as shown in Figure 3.2. Phase one of the study involves analysis of literature and preliminary data gathering that was used to formulate research problem which was done through analysis of literature review. Besides that, several discussion and communication with MCMC for approval, the authority and the owner of Pusat Internet 1 Malaysia (Pi1M) and Kampung Tanpa Wayar 1 Malaysia (KTW1M). The researcher had sought MCMC approval to use the telecenter as the distribution and collection of the

instrument for data collection. Data from the distributed questionnaire were collected from users of identified internet centers and KTW1M.

3.4 Research Philosophy and Research Design

The philosophy which influences the technique and method on how research is to be constructed and the explanation of the findings are known as a paradigm (Bryman, 2011). Research paradigms have a significant role in the approach in which the research is conducted. There has been a long-standing epistemological school of thought among scientific philosophers and researchers on how research is designed. There are two schools of thought: The positivist and interpretive (Bryman & Bell, 2011). In the literature these two epistemological paradigms are described as follows:-

Positivist Paradigm: Following Burrel and Morgan (1979) and Lee and Baskerville (2003, p.229) researcher intends to "predict and explain the happening in the world through causal relationship and irregularities searching and among its constituent elements".

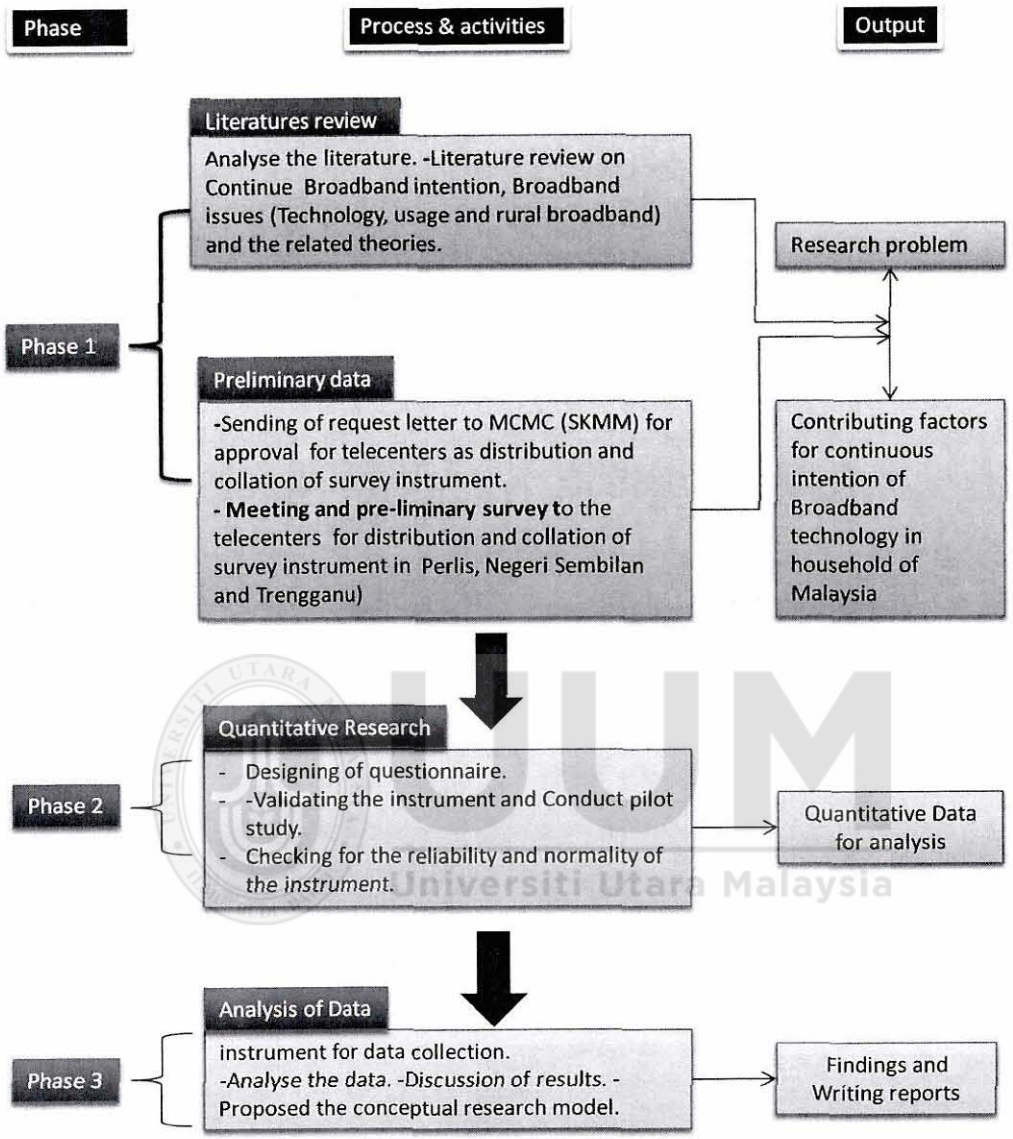

Figure 3.2
End to end research process

As discussed by the underpinning of the positivist paradigm theory in conducting the method used the research questions should interact with the research idea (Punch, 1998). In this study the thesis aims to measure underlying variables, as a measurement of the

variables in the theoretical framework is an integral part of research and an essential aspect of quantitative research design (Cavana, Delahaye, & Sekaran, 2001, p. 186). As defined by Orlikowski and Baroudi (2002) research as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population. At the same time, Straub et al. (2005) described positivism from the statistical point of view to suggest that the objective of statistics (mainly T, F, and Chi-square statistics) employed by the Quantitative Positivist Research (QPR) is to falsify the null hypothesis. It is the assumption that the data in the dependent variable are not affected by the data in the independent variable.

In positivism, as explained by Guba and Lincoln (1994) and Sobhand Perry (2006) the aim of the research is the explanation leading to prediction and finally control of the phenomena being researched. From this point of view in this research, positivism applies the quantitative method to test vague deductive generalizations of the theory. The positivist view of the world is that there are objective, quantifiable facts and explanations which exist independently of any alternative interpretation of the same phenomena by different researchers (Adams, 2011). The interpretive view of the world is that an individual's view of any phenomenon is constructed in their mind and the same event can be interpreted in a range of ways depending on the perspective of the individual involved (Bryman & Bell, 2011; Adams, 2011). While a positivist approach would sample through quantitative means by the principles of statistical validity and generalizability; the case study uses 'purposive, purposeful or criterion-based sampling (Simpson, Daws, & Pini,

2004). Therefore, drawing on the philosophical assumptions discussed above, this study mainly adopts the positivist paradigm, based on objectivism as the underlying ontological and epistemological positions. After all, since the purpose of this study was to test a hypothesized structural model where the model theorized that attitudinal, normative, control and satisfaction factors have a positive relationship while the moderating effect of demographic will give strengthen or weaken effect to it. Household's behaviors among the users of PiIM in this study focusing on were postulated to have a significant influence on continuing broadband intention. Based on the research model developed, the present study focuses on theory testing and verification rather than developing a new theory, thus, employing a deductive research approach. Therefore as the objectives of the study, a total number of 5 research objectives were put forward and 8 of hypotheses has been formulated and tested.

3.4.1 Research Design

In research methodology, different research designs can be used and deployed in doing research. According to Zikmund (2003), there are four research methods for casual and descriptive research; they are a survey, experiment, secondary data, and observation. Sekaran and Bougie (2013) forwarded issues on designing a research strategy including the type of investigation and locations in which the research would be conducted. Other issues are the type of sample used, data collection methods, how variables will be measured and the method of analysis adopted to test the hypotheses. At the same time, fabrication of an appropriate research design is very crucial to determine the type of data, data collection technique, and sampling methodology; to achieve the research objectives.

The survey method can deploy either a survey questionnaire or interview to collect data from respondents through the mail, telephone, internet, or personal by self-administrated questionnaire. The experimental research design is used by the researcher to examine the impact of some variables on the phenomenon, and it is more conducted in a laboratory than in a field. Secondary data research design is a method used by the researcher to study the past or historical data they are related to some variables. The observational research design is a technique of collecting data by the researcher through individual observations and not on the perceptions of the respondents. From the last mentioned methods we can conclude that the research design is entirely dependent on the research context and the research purpose (Zikmund, 2003). However, the qualitative data collection method uses words as the people and situations, description of circumstances, quantitative data collection method in the mathematical description that accurately reported. Thus quantitative research in social science is a method of measuring variables through operational definitions that have identified four different significant categories of research designs such as descriptive, correlational, experimental, and quasi-experimental (Cooper & Schindler, 2008). According to Sekaran (2003), a correlational study is a study that investigates the relationship between various variables, when conducted in organizations, they are called field studies. This study is considered as a correlational due to the primary purpose to provide a reliable and valid framework for the interaction between identified variables to the continue broadband intention (CBI) of Households in Malaysia. By using a cross-sectional method, data was gathered from the individual users of PiIM and KTWIM as unit analysis. The primary data were collected through field

study using structured questionnaire design and Structured Equation Model (SEM) as the primary method of analysis was done. A questionnaire based on the research design is employed in this study because it is the most appropriate way to collect primary data to obtain beliefs, personal and social facts, and attitude. Therefore, this study employed a survey questionnaire research design to gather data concerning the hypothesized relationships and can be categorized as a field with correlational research design or quantitative orientation (Kerlinger & Lee, 2000).

Accordingly, to achieve the objectives of this research, a quantitative survey questionnaire research approach will be conducted through a self-administrated questionnaire to measure the relationships between variables under investigation. Also, rather than a longitudinal study, cross-sectional study was suitable to be utilized in this study for a reason for time limitation. 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, research procedures, and methods for data analysis. The well-known TAM and MATH model will be used as the basis that involves testing the hypotheses based on observation, deducing the implications of the hypotheses, testing the implications, and confirming or disconfirming the hypotheses. The collection of primary data was accomplished using a survey method instrument to answer the study's research questions. The unit of analysis for this study is the individual users in Malaysia who have had experience in using public telecenter service or currently are the public telecenter users. In term of scale, the Likert scale is used since the purpose of the research is to understand about the opinions/perceptions of participants related with single 'latent'

variable (the phenomenon of interest) (Dawes, 2008). This 'latent' variable is expressed by several 'manifested' items in the questionnaire. It was analyzed where all the scores of all items of the questionnaire are combined (sum) to generate a composite score, which logically in the totality measures an uni-dimensional trait.

3.5 Operational Definition

This study examines these prominent related theories in finding the factors towards continuing broadband intention of broadband technology among the people of Malaysia. Table 3.1 is showing the summary of operational definitions. In this study, a questionnaire was adapted from previous studies which consists of for 11 sections as the first-order construct that forming 4-second orders construct that measures the continue broadband intention. As an introduction, the total of eight socio-demographic questions including gender, age, income and academic background and follows by several sections of measurement constructs. Section one consists of four items that measure relative advantage. Section two consists of ten items that measure the utilitarian outcome. Section three consists of five items that measure hedonic outcome while section four that consist of five items represent service quality. Section five that were represented by six-item measure perceive usefulness and section six consist of four items measure content quality. Section seven also consists of consists of eight items that measure primary influence while section eight that measure secondary influence with five items. Section nine consist of six items that measures facilitating condition. Section ten that measure perceive knowledge consist of four items while the last section consists of five items measure self-efficacy.

Table 3.1
Summary of Operational Definition
(Source: Adapted from K. B. Ooi, Sim, Yew, & Lin, 2011; Muraina, 2015)

Constructs Definition Source	Constructs Definition Source	Constructs Definition Source
Continue broadband intention	The likelihood that a new user to use and for an existing user will continue to use broadband internet technology	Ham et al. (2012); Park et al. (2010); Cho et al. (2009); Park et al. (2009), Eriksson and Nilsson (2007); Bhattacherjee (2001a); (Muraina, 2015)
Relative advantage	Degree to which the consumer perceives broadband internet beneficial	Rogers (1995)
Utilitarian outcomes	Degree to which broadband internet is beneficial in enhancing the effectiveness of typical daily activities of the consumer	Brown and Venkatesh (2005); Venkatesh and Brown (2011)
Hedonic outcomes	The degree of pleasure that the consumer derives from the use of broadband internet	Brown and Venkatesh (2005); Venkatesh and Brown (2001)
Service quality	The perceived quality of service of Internet service provider	(DeLone, W. H., and McLean, 1992)
Content Quality	Quality attributes in end to end information systems such as system quality, information quality, and service quality	DeLone and McLean, 1992; McKinney et al., 2002; Liou et al., 2015)
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	Davis (1998); Wu et al., (2010)
Primary influences	Influences from the consumer's family and friends to use or not to use broadband internet	Brown and Venkatesh (2005); Venkatesh and Brown (2001)
Secondary influences	The degree of influence from the secondary sources of information (such as newspapers, advertisement) on consumer's intention of broadband internet	Brown and Venkatesh (2005); Rogers (1995); Venkatesh and Brown (2001)
Facilitating conditions	How resourceful a consumer feels when he or she subscribes to broadband Internet	Venkatesh and Brown (2001)
Perceived knowledge	The consumer's perceived knowledge about the broadband internet	Rogers (1995); Venkatesh and Brown (2001)
Self-efficacy	The consumer's skill to use broadband internet without assistance	Dwivedi (2005)

3.6 Measurement of Variable and Instrumentations

In this study, a questionnaire was adapted from previous studies which consists of for 11 sections as the first-order construct that forming 4-second orders construct that measures the continue broadband intention. As an introduction, the total of eight socio-demographic questions including gender, age, income and academic background and

follows by several sections of measurement constructs. Section one consists of four items that measure relative advantage. Section two consists of ten items that measure the utilitarian outcome. Section three consists of five items that measure hedonic outcome while section four that consist of five items represent service quality. Section five that were represented by six-item measure perceive usefulness and section six consist of four items measure content quality. Section seven also consists of consists of eight items that measure primary influence while section eight that measure secondary influence with five items. Section nine consist of six items that measures facilitating condition. Section ten that measure perceive knowledge consist of four items while the last section consists of five items measure self-efficacy.

3.6.1 Socio-Demographic Variables

Socio-Demographic variables such as gender, age, race, household income, academic background, occupation, types of residency and household size were also incorporated into the questionnaire. Gender was coded using dummy variables with value "1" for male and "2" for female. The participants were asked to indicate their gender, age, household income and highest education level in the checkbox that was then coded with a value of the definite number. The respondent's age was coded as "1"= 18-24 years, "2" = 25-34 years, "3" = 35-44 years, "4" = 45-54years, "5"=55-64 years, "6"=above 65 years. Besides that, the participants also need to indicate their highest academic background was also later using categorical scale variables with "1" = PMR/PT3, "2" = SPM "3" = Certificate, "4"=Diploma "5"= Undergraduate/Higher Diploma and "6"=Postgraduate.

3.6.2 Operationalization of Variables

According to Sekaran (2006) "the relationship between independent and dependent variables can be either positive or negative." Four main independent variables are used in this research, Attitudinal, Satisfaction, Control and Normative construct. At the same time, the crucial demographic factor such as age, gender, and education level was used to measure the continuance of broadband intention. Therefore as explain in the previous section, the list of all adopted measurement and the sources are shown by Appenndixs C:-

3.6.3 Questionnaire design

The study is aimed at establishing the relationship between several factors towards the continuance of broadband intention among the public telecenter user in Malaysia. To present a straightforward and understandable questionnaire that is free of ambiguities the questionnaire is divided into two sections and the questions is arranged according to measurement constructs as per the following:-

I. The cover page is the first page

II. Respondent's general information

III. Attitudinal construct: Measurement information about attitudinal construct consisted of Relative Advantage and Perceived usefulness, Utilitarian Outcomes, Hedonic Outcomes and Service Quality as the dimensions

IV. Satisfaction: Contains information of Perceived Usefulness and Content Quality under the satisfaction construct as the dimensions

V. Normative Construct: Information about the Normative construct as measurement consist of Primary and Secondary influences

VI. Control Construct: Information about the control construct that consist of Perceived knowledge, Self-Efficacy and Facilitation Condition Technology and Resources

VII. Broadband Continue Intention: Information about broadband continue intentions the measurement construct

The necessary verification of questionnaire that was designed as per Table 3.2 was done based on the established validity test.

Table 3.1
Summary of variables and measurement of instruments

Variable & Dimensions	**Scale**	**No. of questions**
Attitudinal Construct		
Relative advantage	5 points	4
Utilitarian Outcome	5 points	10
Hedonic Outcomes	5 points	5
Service Quality	5 points	5
	Subtotal (a)	24
Satisfaction		
Perceive usefulness	5 points	4
Content Quality	5 points	6
	Subtotal (b)	10
Normative Construct		
Primary Influence	5 points	8
Secondary influence	5 points	5
	Subtotal (c)	13
Control Construct		
Facilitating Condition Resources	5 points	6
Perceived knowledge	5 points	4
Self-Efficacy	5 points	6
	Subtotal (d)	16
Continue Broadband Intention	5 points	5
	Subtotal (e)	5
	Total (a+b+c+d+e)	68

3.6.4 Scaling

The Likert (1932) scale is one of the most widely used instruments for measuring opinion, preference, and attitude (Leung, 2011). Interval scale is used when responses to various items that measure a variable can be tapped on a five-point (or seven-point or any other number of points) scale, which can after that be summated across the items (Sekaran, 2003). In this research, researcher chooses five-point Likert scale because it is just as good as the more significant number of scale as it also may reduce confusion to the respondents (Sekaran, 2000). At the same time, there is no clear rule indicating the suitable number that should be used (one to five-point Likert scales or one to seven-point Likert scales).

Moreover, as found by Dawes (2008) none of among three Likert scales 5,7 or 10 formats is less desirable from the viewpoint of obtaining data for that will be used analysis. From the finding, the Kurtosis and skewness were likewise all very similar for each format. Therefore either 5, 7 or 10-point scales are all comparable for analytical tools such as confirmatory factor analysis or structural equation models in this respect. Furthermore, the study by Leung (2011) has proven it is no significant difference for any Likert scale of 5 or 11 in term of construct validity results such as Cronbach's alpha or factor analysis. The same study has proven it passes the threshold of internal consistency as long as the Likert scale posses a neutral point such as 5- and 11-point scales. The overview and summary of variable, scale and the number of questions is shown by Table 3.2. In general, it seems that, previous research has summarized that an increase in points (five to seven to nine) on the rating scale does not improve the reliability of the ratings

(Elmore and Beggs, 1975; Teoh, 2014). Therefore, the scale of 1-5 is chosen for this study and all measures with anchors ranging from "strongly disagree" to "strongly agree" are provided in the Appendix. In this study, a continuous interval scale of 1 to 5 are being used where the value of one (1) as Strongly Disagree and five (5) for Strongly Agree. The questionnaire was reviewed and refined by three business professors to address the face validity. Based on their feedback, some items were reworded to fit the research purpose. The result of the pretest provided a first assurance of the validity of the scale items

3.7 Data Collection Procedure

Many methods of data collection in surveys exist, in this study primary data was collected through random distribution of the questionnaire to the respondents. The questionnaire distribution and collection was done with the help of the public telecenter' Assistant Managers who acted as an agent. This method is chosen because the receipts of the questionnaires are guaranteed. At the same time, the questionnaires were distributed via email to the list of users of public telecenter that were given by the Assistant Managers or randomly via social media such as Facebook or twitters after researcher approach and seek permission from the facebook owner account who befriends with the PiIM facebook page. In this study, field research was done by collecting data to answer the research questions and to achieve the research objectives. Quantitative research seeks cause and facts from external views, or from a worldwide perspective to ensure the study is conducted realistically and the data collection method is the numerical description that is precisely reported and measuring variables through operational definitions (Garud &

Nayyar, 1994). The links to a developed online questionnaire using google documents will be shared. The researcher will approach the Facebook owner of the identified public telecenter before shared the link. The respondent will receive a response to the questionnaire by clicking on the link and automatically submit it only when completed. Many methods of data collection in surveys exist, in this study primary data was collected through random distribution of the questionnaire to the respondents.

3.7.1 Population and Sampling

Pusat Internet 1Malaysia exist all state of Malaysia with the total numbers of 687,000 users (MCMC, 2016). The population of the study refers to the collection of a defined elements (e.g., people, places, objects, and cases) about which a researcher wishes to make some inferences (Cooper & Schindler, 2008). This research work focuses on individuals in households who are also the users of internet center (Pi1M) developed by Malaysia Commission of Multimedia and Communication (MCM) located in the whole Malaysia including Sabah and Sarawak. They were selected for this study because of their role as the users of MCMC projects such as Pi1M, KTW or Netbook1M will directly impact the penetration of broadband (MCMC, 2015). At the same time, based on the spending of MCMC it is crucial to measures the acceptance and continues intention of them as the users versus the government's expenses. The locations for this research study was conducted in whole Malaysia. However this study did not include the users of KTW1M as the number of the users are only estimated based on email identification registered from the access controller and no proper registration performed. The following Table 3.1 is showing the number of registered user for three main USP projects under

MCMC. For this study, the total number of PiIM users of 687,000 as the population was based on MCMC(2016) where the selection of sampling for selecting suitable members among the population for the study (Sekaran & Bougie, 2013)

Table 3.2
Summary of telecenter users that represent the populations

No.	Sources	Projects	Numbers of registered users
1	(MCMC,2016)	Pusat Internet 1Malaysia (PiIM)	687,000
1	(MCMC, 2015)	Pusat Internet 1Malaysia (PiIM)	471,855
2	(MCMC, 2014)	Community Wireless (KTWIM)	622,852 (estimated)

Refer to Table 3.1, as of 2015, the total user of PiIM was at 471,855, as it was increased to 687,000 in quarter two (Q2) of 2016. This study applied the clustered random sampling technique where a clusterization was based on six regions of Malaysia (northern, central, southern, east coast, Sabah, and Sarawak) as representing nationwide's populations.

A nationwide sample is vital as the criticalities of the decision need to represent the users of whole Malaysia. At the same time, it is essential to also get the population in the highest broadband penetration such as Kuala Lumpur and Selangor (in the central region) while Penang (in northern region). For selecting the internet center for each region, the study used a random sample technique by applying Microsoft excel RANDBETWEEN to the list of Pusat internet center. Following Creswell (2003) this is important to make sure each internet center in every region sample has an equal probability of being selected. Therefore, each element in the list of the population has the same chance of

being chosen (Sekaran, 2005). After all, this study is a cross-sectional and no previous studies were done on the public telecenter of whole Malaysia that measures the impact of public telecenter in Malaysia to HBP. The list of PiIM according to the region was provided by MCMC as adviced by the Head of Operation MCMC as attached in appendixes. After all, this study is a cross-sectional and no previous studies were done on the public telecenter of whole Malaysia that measures the impact of public telecenter in Malaysia to HBP. Selection of public telecenter in Malaysia was chosen randomly as the location of the population samples of estimated 470,000 users. As described by Ranjit (2011) sampling in research method as the process of selecting a few (a sample) from a more prominent group (sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation or outcome regarding the more prominent group.

The selection of the public telecentre in the selected states and selection of users will be based on the random probability sampling design since it is preferred method rather than the non-probability sampling for each of the elements in the population. Furthermore, different types of random sampling comprise of simple random sampling, stratified sampling, and cluster sampling, where they all provide independent of selection to every member of the population (Cox et al., 2011; Sekaran & Roger, 2011; Cooper & Schindler, 2003). After all, the most important factor in selecting the internet center, it was subjected the center Manager's approval and their readiness to accept researcher's request.

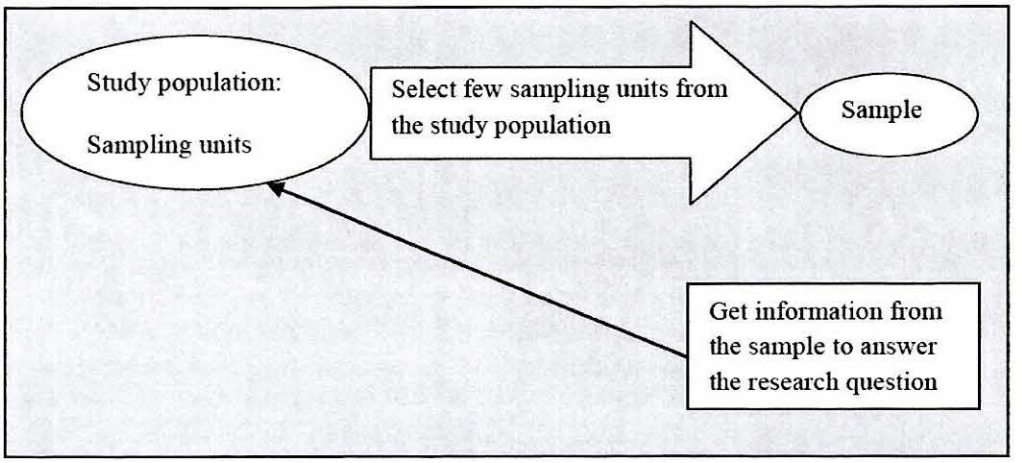

Figure 3.3
The concept of sampling
Source: (Ranjit, 2011) and (Muraina, 2015)

3.7.2 Sampling technique

In categorizing sampling method, there is two type of sampling method: 1) Probability sampling and; 2) Non-probability sampling (Christine, 2010). Probability sampling method gives equal chances of being selected for every member of the population under study, while non-probability allows the researcher to hand-pick the suitable respondents based on the nature of the problem under study. Based on the research objective, this research will further use clustered random sampling in choosing the participants (all users of) due to its simplicity and cost-effective for the data collection especially the rural areas of Malaysia (Ranjit, 2011; Creswell, 2009). This study focuses whole Malaysia based on the geographical distribution covering Peninsular Malaysia which includes the states of Sabah and Sarawak. Secondly, a regional distribution which includes the location in each state and covering the Northern, Central (Klang Valley), Southern

regions, East Coast, Sabah, and Sarawak. For this study, the data from MCMC(2014) were used to represent the distribution of users/member of PiIM as shown in Table 3.3.

3.7.2.1 Sampling technique

Probability sampling methods such as simple random, stratified, and cluster sampling are recommended due to their ability to produce (globally) representative sample (Sarstedt, Bengart, Shaltoni, & Lehmann, 2017). In this study, by using cluster sampling method, data were collected from 6 major regions (Northern, Central, Southern, East Coast, Sabah and Sarawak). The data were collected in the period between October 2016 to March 2017 using area-wise cluster sampling where the areas were selected in a manner of a grouping of states according to the location. The benefits of cluster samplings are due to it is tantamount to the accuracy of the strong to the accuracy of the correlation of characteristics of the population and large volume of the population (Sekaran & Roger, 2011; Cooper & Schindler, 2003). The population from each state were later grouped based on region as per the Table 3.2 and was summarized in Table 3.3. Even though some cluster sampling has been argued to be attributed to geographical proximity, time-consuming and non-cost effective; it is still the best option to represent whole Malaysia population of samples. From the finalized list given by MCMC, the internet center was then randomly contacted for performing the assessment and distribution of questionnaire where simple random sample sampling was applied, so that each sample unit/element had an equal chance of being selected (Andaleeb, 2001; McKerlich, Ives, & McGreal, 2013).

Table 3.3
Distribution of Pi1M users of whole Malaysia

No.	State	No. of Registered Users
1	Perlis	1,710
2	Kedah	31,148
3	Perak	20,029
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
13	Sarawak	40,678
14	Sabah	29,846
15	Labuan	85

Source: (MCMC, 2014)

As for this study, the unit analysis was defined as users or the registered members of internet center (Pi1M) who had experience using the services provided by Pi1M or KTW1M.

Table 3.4
Summary of public telecenters in regions

No.	No. of Registered Users	Regions
1	52.887	Northern
2	130,039	East coast
3	78,869	Southern
4	28,428	Central
5	40,678	Sarawak
6	30,000	Sabah

3.7.2.2 Sampling size

It is impossible and impractical to collect data from every element of the total population in research study due to cost, time and other human resources factors (Sekaran & Bougie, 2013). In survey research, determining appropriate sample size is needed to minimize the total cost of sampling error. As suggested by Krejcie and Morgan's (1970) sample size determination criteria was used to determine the representative sample size because it has taken into account the level of confidence and precision, ensuring that sample error is minimized. As reported by (MCMC, 2016) in September 2016 there were 686,000 users of PiIM in 13 states located in 6 regions of Malaysia including Sabah and Sabah. Therefore referring to the sample size table generated by Krejcie and Morgan (1970), for a given population of 686,600 a sample size of more than 382 respondent were targetted from all the six regions using area-wise cluster sampling required to represent the population of this study. Based on equal distribution, 200 questionnaires was distributed

to all the 6 regions with total of 1200 questionnaires was distributed. Table 3.4 is showing Krejcie and Morgan table for sample size calculation. From each region, the first step is to choose the internet center from each region that was provided by the regional operation of MCMC and was selected randomly based on a simple random method using Microsoft Excel spreadsheet software. The random sampling method was applied so that each sample unit/element had an equal chance of being selected (Andaleeb, 2001; McKerlich et al., 2013).

Table 3.5
Table of Krejcie & Morgan

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
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*

Source: (Sekaran & Roger, 2011)

3.7.2.3 Unit of Analysis

A unit of analysis is who or what that is being studied in research. In the social science research, a unit of analysis is an individual, an organization, a social interaction or a

group of individual/organization. The unit of analysis is the most important entity subjected to investigation in the context of a study. In its most straightforward term, a unit of analysis is what or who is being investigated in given research and the type of unit the research used in measuring the variables (Sekaran, 2000). This study aims to examine the hypothesized relationships on the continue broadband intention among the household in Malaysia. Therefore the unit of analysis of this study is individuals who are using broadband technology. Since the objective of this paper is to develop and validate a theoretical model that attempts to explain which factors are most compelling among individuals to the continuance of broadband intention in Malaysia. As the previous study by Choudrie and Dwivedi (2007) found that continue intention decisions are often made on the households users, hence the study of the continuance of broadband intention among the public telecenter users. Due to that, after all, this study will consider all of the users of the public telecenter in Malaysia as the population of the sample while users and members of PiIM are the unit analysis. At the same time, the unit analysis in the population is for the users determined based on the labor force categories among the broadband users at the age of 18 to 65 years (Mack & Rey, 2014).

3.7.2.4 Response Rate

The percentage of the completed questionnaire that was returned to researcher will be classified by the number of the samples eligible for analysis is referred to as the response rate. However, overall, as a survey of journal editors by Carley-Baxter et al. (2013) and Mellahi & Harris (2016) reveals, editors tend to use unwritten 'rule of thumb' to judge response rate (RR) resulting in 'widely varying response rates (16 to 91 percent)'. In

brief, to date, there is no consensus on what is an acceptable RR. Afterall, to improve the response rate, a few steps were made as per the following:-

A. Online survey:

1) Provide a sincere appeal of the cover letter

2) Deliver the questionnaire to the most appropriate respondent by asking few pre-qualify questions

B. Direct Interview

1) Identify and make contact the regional in charge of the Pusat Internet 1Malaysia

2) Arrange a pre-survey and meeting with the Assistant Manager of the centers

3) Get the list of users of the center from the person in charge and call them randomly and individually before giving out the questionnaire

4) Assistant Manager ask the registers users who has the age above 18 years old to pick up a draw from a fishbowl 'Yes' or 'No' for filling up the questionnaire.

5) Ask the participant of MSOffice training or any training held in the Pi1M to pick the same draw after end of the class. Those participant with age more than 18 years old and got 'yes' will fill up the questionnaire.

3.7.3 Data Analysis technique

After the collection of sufficient data that matched the minimum sample size requirements, the researcher will code, make a summary and analyze the data using PLS-SEM method using Smart-PLS. It is necessary to mention that a recent study conducted by Henseler and Sarstedt (2013) and J. Hair, Gabriel, and Patel (2014) suggests that goodness-of-fit (GoF) index is not suitable for model validation. The quantitative data that gained from the questionnaire are analyzed by using different analytical techniques. The analysis of data in the study was by using the Statistical Package of Social Sciences (SPSS) version 21.0 and the Smart PLS3.2. The methods of data analysis are selected based on the research questions and the variable characteristics (Byrne, 2001; Kamariah, 2007). The purpose of the analysis is to achieve reliability in data analysis and hypothesis testing. Among the various tests, data screening and other preliminary analyses of missing data, normality, a test of non-respondent bias, and outliers were conducted. In addition to that, there are some other factors and reliability analysis to test for reliability and validity of measures, goodness, descriptive statistics and correlation analysis. This research used the combination of both descriptive and inferential statistic method. The smart PLS Structural Equation Model (SEM) will be used to test the relationships between the constructs in its conceptual model. SEM, in which is recognized as a second-generation approach, is a powerful alternative as compared to the first-generation approach such as multiple regressions. SEM is becoming very popular among behavioral science researchers (Gefen et.all., 2000), offers researchers the ability to incorporate latent (unobserved) variables in the analysis and to perform path-analytic modeling with them (Chin, 1998). Latent variables are those concepts that cannot be directly observed

and measured in the study and which need to be approximately by other measures (also called item or indicators) (Chin, 1998). All of the construct in this research are latent, and they need to be measured via their indicators. SEM couples a structural model (also called inner model) with a measurement model (also called an outer model) (Petter et al., 2007, Chin, 1998b). The researcher will identify the allocation of measures to latent constructs, while the structural model incorporates the relationship between dependent and independent latent constructs. In due course, this technique enables the research to measure, explain and predict the degree of interrelationship among latent construct (Chin & Newsted, 1999). There are two types of SEM: Component-based SEM and Covariance-based SEM where the orientation of PLS like this study is prediction based by attempting to obtain the best weighted estimated for each block indicators corresponding to each latent variables (Chin & Newsted, 1999). In PLS, latent variable is defined as the sum of their respective indicators in which the resulting component score for each latent variable, based on the estimated indicator weight, maximizes the variance explained for dependent variables (i.e., latent, observed or both) (Chin & Newstead, 1999). While both PLS and covariance-based SEM has been extensively used in analyzing the SEM model, it is important to choose one approach over the other. It merely depends on the objectives and character of the research. In the light of the recent development about the suitability of PLS path modeling in model validation, the present study adopted a two-step process to evaluate and report the results of PLS-SEM path (Dijkstra & Henseler, 2015).

3.7.3.1 The Rationale behind Choosing PLS SEM for this Study

The purpose of this study is to investigate the relationships among latent variables; therefore the latent analysis technique was the suitable option. There was a choice to use covariance-based SEM technique such as AMOS, but the data must be normally distributed (J. Hair et al., 2014). The following assumptions have been tested in SPSS before choosing the technique of the analysis.

3.7.3.2 Assumption of Normality

The normality employed to show the symmetrical curve that has the most significant frequency of scores towards extremes in the small and middle frequencies (Pallant, 2005). To do so, some researchers such as Kline (1998) and Pallant (2005) suggested assessing the normal distribution of scores for the independent and dependent variables through examining their skewness and kurtosis values. In social sciences, the nature of the constructs has many scales and measures may result skewed positively or negatively (Pallant, 2005). Also, kurtosis is also a score for measuring distribution that represents the degree to which observations around the central mean are gathered.

3.7.3.3 The PLS Path Model

The Partial Least Square (PLS) was proposed by Lohmoller (1987, 1989) in the computational aspects of the LVPLS software. Chin and Newsted (1999) had explained that the theoretical development has been attributed to Wold (1982) whereas the new graphical interface (PLS-Graph) was developed. The PLSX program by Lohmoller for unit x variables is the foundation for the PLS-Graph software and ultimately enables similar options. The PLS modeling is a standard method that used in the estimation of

causal relationships in the field of path models containing latent constructs measured indirectly by several factors. There are two steps for the PLS path model's description, where the first is the analysis of a measurement model and structural model. A measurement model is linking manifest variables (MVs) to their latent variables (LVs), whereas a structural model relates endogenous LVs to LVs. In other words, the structural model is referred to as the inner model while the measurement model referred to as the outer model. The inner model describes the relationship between latent or unobserved variables while outer model illustrates the relationship between the latent variable and its manifest variable. As an example of the inner and outer models of PLS path is in Figure 3.4.

PLS's general design presents a recursive inner model that is exposed to predictor specifications. So, the inner model involves a casual chain system and contains two different of outer models; they are reflective and formative measurement models are represented by A & B Mode respectively. Therefore, the option of a particular outer model is demonstrated by theoretical rationale (Diamantopoulos & Winklhofer, 2001). The reflective mode is a casual relation developed from the latent variable to the manifest variable in the block it is located. Therefore, each manifest variable in a specific measurement model is perceived to be developed as a linear function of the latent variables along with the residual. However, on the other hand, the formative mode develops casual relationships from the manifest variables to the latent factors.

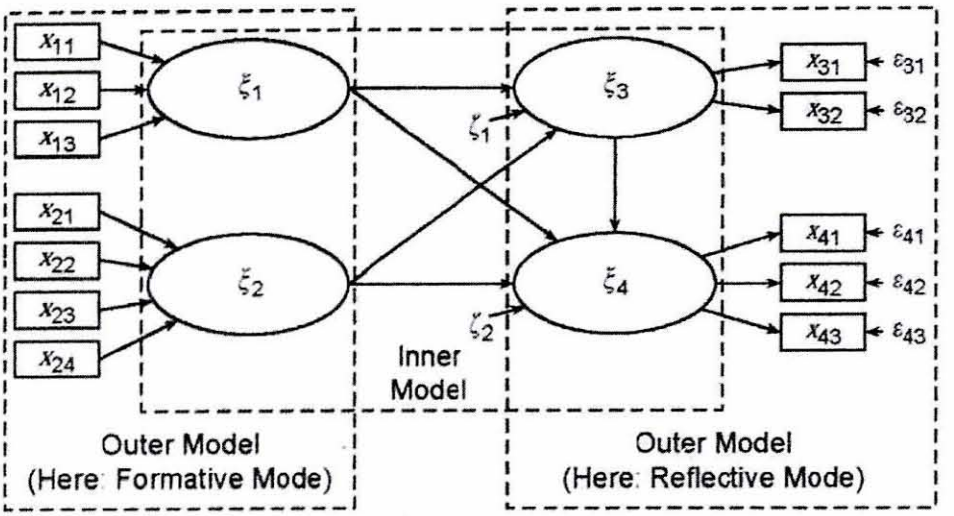

Figure 3.4
Example of PLS Path Model
Sources: (Diamantopoulos & Winklhofer, 2001)

Additionally, it is essential to consider how the terms, reflective and formative, and implication connected with the classification of casual and effect, highlight the variation between the characterizations of the mode of the latent variable measurement models. Despite the initial consideration of the latent variable as an exact linear combination of its indicators, the original term is comprehensive as it considers both in an exact linear combination even the latent variable not determined by the indicators (Bollen & Davis, 2009). This study was used the PLS technique because of the following reasons:

1. PLS path modeling was becoming more appropriate for real-world applications as the research model becoming more challenges and complex (Fornell & Bookstein, 1982; Hulland, 1999). The soft modeling assumptions of PLS technique (i.e., ability to flexibly develop and validate sophisticated models) gives it the advantage of estimating large complex models (Akter et al., 2011). The current study examined relationships among 12

variables where were a group and formed modified MATH model and PLS structural model employing the use of PLS-SEM techniques were appropriate for better prediction. Furthermore, SEM has become the dominant analytical tool for testing cause-effect-relationships models with latent variables. When the goal of the analysis is to gain substantial knowledge about the drivers of, for example, customer satisfaction, brand image or corporate reputation, SEM is the technique of choice (J F. Hair, Sarstedt, Hopkins, & G. Kuppelwieser, 2014).

2. Structural equations models have been demonstrated to be superior models those perform estimations better than regressions for assessing moderation (Brown, 1997; Iacobucci, Saldanha, & Deng, 2007; Mattanah, Hancock, & Brand 2004; Preacher & Hayes, 2004). It has been reported that PLS SEM accounts for measurement error and can provide more accurate estimates of moderating effects (Chin, 1998).

3. PLS-SEM offers more meaningful and valid results, while other methods of analysis such as software package used for statistical analysis (SPSS) often result in less clear conclusions and would require several separate analyses (Bollen, 1989).

4. In most social science studies, data tend to have normality problem (Osborne, 2010) and PLS path modeling does not necessarily require data to be normal (Chin, 1998). In other words, PLS treats non-normal data relatively well. By and large, PLS path modeling was selected for this study to help avoid any normality problem that might arise in the course of data analysis for the current study.

Also, Tabachnick and Fidel (2007) state that SEM is one of the most influential statistical tools in social and behavioral sciences that can test several relationships simultaneously. Regarding this study, SmartPLS path modeling was used to establish measurement and structural models. Measurement model was used to explain or assess constructs'reliability and validity of the current study. Secondly, a structural model was used to conduct bivariate correlation analysis and simultaneous regressions analyses to establish correlations and relationship effects among constructs under investigation. Additionally, using the PLS mechanisms of the algorithm and bootstrapping to examine the moderating effects of demographic factor such as age, gender, and education on the relationships between Attitudinal, Normative, Control, Satisfaction factors to the continue broadband intention. According to Hair *et al.* (2010) stated that partial least squares (PLS) are now well-known as the alternative to SEM method this includes AMOS, LISREL, and other programs. The PLS path modeling is more suited to complex models such as those with hierarchical constructs (with a complete disaggregation method), mediating and moderating impacts (Chin, Marcolin, & Newsted, 2003). The PLS modeling has to be employed in the initial stage of theoretical development to assess and validate exploratory models. Also, one of its powerful features is its suitability for prediction-oriented research where the methodology helps researchers to concentrate on the explanation of endogenous constructs. Another feature of PLS is its vulnerability to multicollinearity. Also, PLS determines measurement models and structural models through multiple regressions, and hence its estimates can be vulnerable to issues of multicollinearity. Lastly, the PLS path modeling can be utilized in reflective as well as

formative measurement models. In literature, many publications highlight the casual modeling applications that using the PLS path and its beneficial features (Falk & Miller, 1992; Fornell & Bookstein, 1982; Joreskog & Wold, 1982; Lohmoller, 1989). The diffuse use of PLS modeling among practitioners and scientists stem from four primary features:- (1) PLS can be used in the estimation of path models where there is a smaller sample size (Chin & Newsted, 1999); (2) PLS path modeling algorithm enables unlimited calculation of the cause-and-effect relationship models utilizing both formative and reflective measurement models (Diamantopoulos & Winklhofer, 2001).

(2) PLS path modeling is regarded as a methodologically beneficial when compared with CBSEM in some cases when non-convergent or improper outcomes are possible (such as Heywood cases; Krijnen, Dijkstra, & Gill, 1998).

(3) PLS path models can turn complex as they include varying latent and manifest variables but never lead to estimation issues (Wold, 1985). In addition to that, the amount of manifest and latent variables may be high in relation to the observation number with increasing of complex models. Moreover, PLS path modeling can be used in highly skewed distributions (Bagozzi, 1994).

3.7.3.4 The First-Order and Second-Order Constructs

Before going further towards examining the conceptual and theoretical aspect of the second order constructs of the model, the differences between the first and second order measurement models have been explained as discussed in the following paragraphs. As illustrated in Figure 3.5, Relative Advantage (RA) as a latent construct was measured by a set of measured variables namely RA1 through RA4. Similarly, as illustrated in Figure

3.5, the Attitudinal construct was measured indirectly by all the first order item consist of RA, UO, HO and SQ that was formed by all 24 items through a second layer of latent constructs.

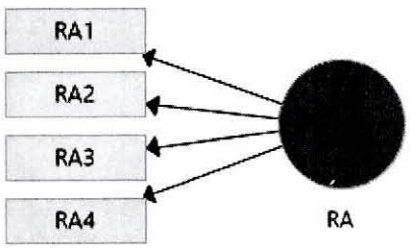

Figure 3.5
First-Order Measurement Model of Relative Advantage (RA)

Therefore, Attitudinal is called a second-order measurement model wherein the second-order factor structure has two layers of latent variables. In this study, Attitudinal (ATT), Satisfaction (SAT), Normative (NORM) and Control (CONT) are called second-order constructs as they caused multiple first order latent factors (Hair et al., 2010). As an example some the path model for second order of attitudinal construct is shown in Figure 3.6.

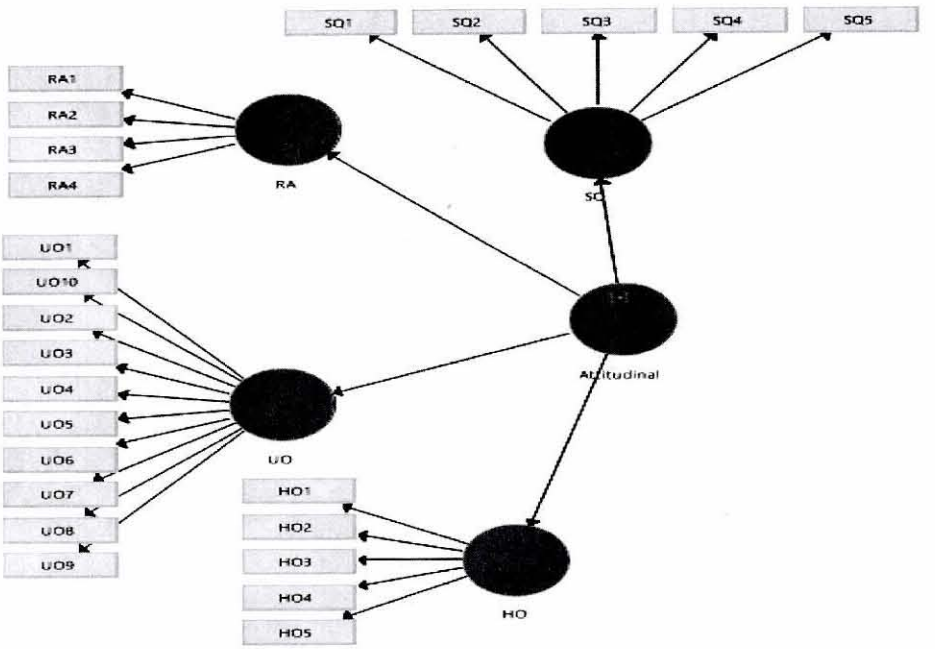

Figure 3.6
Second Order Measurement Model, an example of (ATT)

3.7.3.5 PLS Modelling analysis

After the collection of sufficient data that matched the minimum sample size requirements, the researcher will code, make a summary and analyze the data using PLS-SEM method using Smart-PLS. This two-step process adopted in the present study comprises (1) the assessment of a measurement model, and (2) the assessment of a structural model, as depicted in Figure 3.7 (Hair et al., 2014; Hair et al., 2012; Henseler et al., 2009).

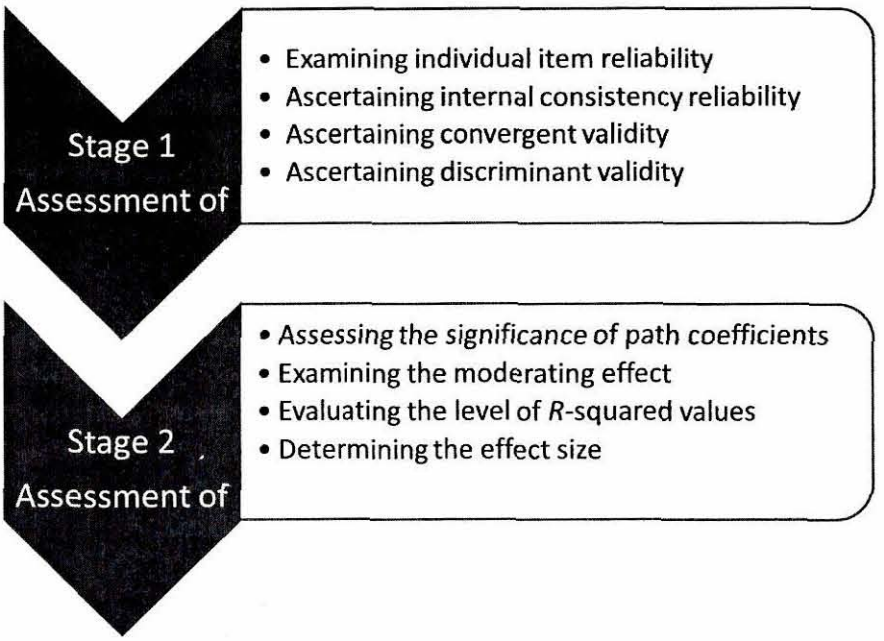

Figure 3.7
A Two-Step Process of PLS Path Model Assessment
Source: Henseler et al., (2009)

Before starting the first stage of data analysis, it will involve descriptive data analysis where an analysis of missing data, removing the outliers and normality test was conducted of all the measurement constructs.In a later stage, the tasks of conducting descriptive statistics with the aim to describe the variances in respondents' characteristics. The first stage involves confirmatory factor analysis (CFA) on the measurement model to confirm convergent validity, discriminant validity and reliability of all multiple-items scale (Fornell & Larcker, 1981; Gefen & Straub, 2004). The measurement model is a sub-model in Structural Equation Modeling (SEM) that specifies the indicators for each construct and assesses the reliability of each construct. The purpose of which is eliminating casual relationships. The second stage involves assessing

the significance of the path model, evaluating the R^2, determining the effect size and examining the moderating factor of demographics on the hypothesized model the entire research hypotheses.

3.8 Reliability and Validity

Any questionnaire needs to be evaluated the reasonable accuracy and consistency of the research instrument, even though the measurements for construct are drawn from the literature. They still need to be tested and be validated in the new research (Hair et al., 2007; Hsu & Lin, 2015). The questionnaire of the study will be tested via a pilot test to ensure the quality of the measurement, (Hair et al., 2007; Awang, 2014; Hsu & Lin, 2015). During the pilot test, the instrument will be evaluated for reliability, face validity, content validity convergent validity and discriminate validity.

3.8.1 Reliability

Reliability means that to get the result that will be obtained; the indicator should not vary because of measurement instrument itself or the process of measurement. It can be elaborated as a statement about the measurement accuracy (Straub, 1989) that is the " extent to which the respondent can answer the same questions or close approximation the same way each time" (Straub et., 2004). The indicators or measurements will be examined by calculating Cronbach's alpha coefficient test to measure the internal consistency reliability. As suggested by Hair et al., (2007) and Hsu and Lin (2015) a Cronbach's alpha value above 0.7 as the recommended level. At the same time, as mention by Compeau et al., (1999) and Hsu and Lin (2015) reliability also can be used as a criterion for selecting or excluding indicators. They also recommended for removing

indicators that have a value less than 0.7 to improve the reliability of a construct. A comparison table of the result of Cronbach's alpha will be produced by research to determine the acceptable level of all the construct.

3.8.2 Validity

In most research, there will be a gap between conceptual and practical indicators. The gaps may result by the construct typically abstract the ideas, whereas indicators are the actual observed result (Awang, 2014). Due to that, it is important to check and validate that this gap is not beyond the acceptable ranges. According to Hair et al.,(2007), Validity means a confirmation whether the indicator measures what it is supposed to measure while Awang (2014) redefined it as how well an empirical indicator fits the conceptual definition. Straub et al. (2004) suggested that researchers need to demonstrate the validity of their network regarding face validity, content validity, convergent validity and discriminant validity. For testing content and face validity, it was done using the qualitative method, while convergent and discriminant validity is evaluated using the statistical technique. Convergent and discriminate validity are two sub-types of convergent validity, which is a type of measurement validity of the construct with multiple indicators. Validity test (face validity, content validity. convergent validity and discriminate validity) can well introduce the criteria and technique for examining them.

3.8.2.1 Face Validity and Content Validity

Face validity and content validity involve a systematic but subjective assessment of an indicator's ability to measure what is supposed to measure. The definition of face validity as "a judgment of the scientific community that the indicator measures the constructs,"

while " the degree to which the content of a construct is represented is the measures" is termed as content (Zainudin, 2014). According to Straub and Gefen (2004), these validities can be reached by; 1) Drawing the questions from a universal pool of indicators available in the literature and; 2) by consulting a small group of experts to pass judgment on the suitability and comprehensiveness of the indicators. Therefore based on the suggestion, the face validity of the questionnaire was thoroughly conducted where it was examined and evaluated by four academicians, two Associate Professor from Universiti Utara Malaysia and two Senior Lecturer from Universiti Utara Malaysia to validate and drawing the indicators from reliable and well-recognized sources in the literature. One practitioner from telecommunication company and another Head of Department from MCMC have examined the quality of the survey instrument for its face validity to ensure that the items used were well-worded and correctly understood (Khatibi, Mohebbi, & Keramati, 2011). Secondly, face validity was performed by asking the participant in the pre-test stage and the experts among senior academician and practitioners to probe into to the contents of the questions. The experts were asked to 1) State whether or not they believe that the indicators fit the construct (Face validity) (Hair et al., 2007) and 2) Single out pointless in term of content validity by on the questions and suggest new areas for inquiry (Straub, 2004). Their judgments were used to refine and improve the questionnaire.

3.8.2.2 Convergence Validity

Convergent validity indicated that multiple indicators of the same construct hang together and act alike or convergence (Khatibi et al., 2011). Content validity is shown "when each

measurement item correlates strongly with its assumed theoretical construct" (Gefen & Straub, 2004). In other technical terms, convergent validity is evidence when each of the measurement item is loaded with signed t-value on its corresponding construct. Gefen and Straub (2004) suggested that this t-value should be significant, at least at the 0.005 alpha protection levels. In other words, the t-value should be equal to or greater than 1.645 for first order or 1.96 for second order to reveal the significance at the alpha level 0.05. Additionally, Fornel and Larcker (1981) asserted that a construct is convergent when it's Average Variance Extracted (AVE) is at least 0.5 and the standardized loading of each individual measure is above 0.5 (Hair et al.,2005).

3.8.2.3 Discriminant Validity

Discriminant validity tests whether measures and construct that are supposed to be theoretically unrelated are in fact unrelated (Awang, 2014; Irani et al., 2009). Discriminant validity is revealed "When each measurement items correlates weakly with all other constructs except for the one with which its theoretically associated" (Gefen & Straub, 2004). In term of statistics, discriminant validity is achieved when the loadings are higher than cross-loadings. In other words, all the loadings of the measurement items on theirs assigned latent variables should be larger than any loading (Gefen, Rigdon, & Straub, 2011). Furthermore the square root of AVE for each construct should be larger than any correlation among any pair of latent constructs (Gefen & Straub, 2004)

3.8.3 Pilot Study

Before distributing the last version of the questionnaire to collect the real data of the study, pre-test evaluation to validate the instruments was conducted through a pilot study.

A pilot study was conducted to ascertain the reliability and validity of measures (Flynn, Sakakibara, Schroeder, Bates, & Flynn, 1990). This is considered necessary, because the original scales that have been adapted in the present study were developed mainly in other countries (Bandura, 1990; 2000; Hansen & Graham, 1991). Following Diamantopoulos and Siguaw's (2012) guidelines, a total of 100 questionnaires were sent to among the users of PiIM in Kuala the Lumpur and Putrajaya area for the pilot survey, and 42 responses were collected that gives a response rate of 42%. It should be noted that the 42 respondents collected in pilot test were not considered in the actual study. The data was then analyzed using Smart PLS 3.0 software to ascertain the convergent and discriminant validity of the constructs used in the pilot study. As recommended by Geladi & Kowalski (1986), using PLS Algorithm in Smart PLS, average variance extracted (AVE) and the composite reliability (CR) coefficients were obtained. Bagozzi and Yi (1988), as well as Hair et al. (2011), suggested that the composite reliability coefficient should be at least .70 or more. However, the composite reliability coefficient estimates of latent to an observed variable should be above 0.50 (Hair et al., 2006; Byrne, 2010).Meanwhile, Fornell and Larcker (1981) suggested that the Average Variance Extracted (AVE) score should be .5 or more. They further stated that to achieve adequate discriminant validity, the square root of the AVE should be higher than the correlations among latent constructs. Table 3.7 presents the convergent validity results that contains the value of average variance extracted and composite reliability coefficients of the four latent constructs.

Table 3.6
Convergent Validity Results of Second-order construct for Pilot Study

Construct	Item	Fact. Loading	Cronbach's Alpha	rho_A	Composite Reliability	AVE
2nd order construct Convergent Validity						
ATTD	RA	0.871	0.955	0.961	0.960	0.504
	UO	0.938				
	HO	0.844				
	SQ	0.865				
SATF	CQ	0.904	0.910	0.915	0.926	0.556
	PU	0.939				
NORM	PI	0.918	0.934	0.937	0.943	0.561
	SI	0.915				
CTRL	FC	0.913	0.941	0.944	0.948	0.534
	PK	0.882				
	SE	0.910				

As indicated in Table 3.6, the composite reliability coefficient of each latent construct ranged from 0.926 to 0.960, each exceeding the minimum acceptable level of 0.700, which also suggests adequate internal consistency reliability of the measures used in the pilot study (Bagozzi & Yi, 1988; Hair et al., 2011). Likewise, as indicated in the same table, the values of the average variances extracted range between .504 and .561, suggesting acceptable values. Regarding the discriminant validity, Table 3.8 compares the correlations among the latent constructs with the square root of AVE. In Table 3.8, the correlations among the latent constructs were compared with the square root of the average variances extracted (values in boldface). It shows that the square root of the average variances extracted were all greater than the correlations among latent constructs, suggesting adequate discriminant validity (Fornell & Larcker, 1981).

Table 3.7
Discriminant Validity: Fornel & Lacker Criterion for Pilot Study

Item	CQ	FC	HO	PI	PK	PU	RA	SE	SI	SQ	UO
CQ	**0.879**										
FC	0.570	**0.870**									
HO	0.607	0.544	**0.750**								
PI	0.643	0.613	0.530	**0.888**							
PK	0.570	0.752	0.681	0.687	**0.787**						
PU	0.732	0.593	0.646	0.550	0.539	**0.791**					
RA	0.591	0.586	0.691	0.535	0.631	0.676	**0.835**				
SE	0.607	0.729	0.614	0.573	0.712	0.612	0.494	**0.764**			
SI	0.626	0.715	0.531	0.763	0.634	0.615	0.658	0.590	**0.810**		
SQ	0.745	0.608	0.704	0.497	0.589	0.685	0.707	0.545	0.571	**0.849**	
UO	0.707	0.513	0.704	0.527	0.510	0.743	0.748	0.629	0.553	0.702	**0.787**

Note: *Diagonals (boldface) represent the square root of the average variance extracted while the other entries represent the correlations.*

Table 3.8
Discriminant Validity: (HTMT) for Pilot Study

Item	CQ	FC	HO	PI	PK	PU	RA	SE	SI	SQ	UO
CQ	1.000										
FC	0.649	1.000									
HO	0.689	0.607	1.000								
PI	0.745	0.694	0.607	1.000							
PK	0.689	0.880	0.807	0.828	1.000						
PU	0.857	0.680	0.728	0.642	0.661	1.000					
RA	0.692	0.667	0.754	0.623	0.765	0.795	1.000				
SE	0.703	0.815	0.671	0.654	0.851	0.712	0.568	1.000			
SI	0.742	0.827	0.594	0.897	0.773	0.732	0.778	0.674	1.000		
SQ	0.844	0.671	0.783	0.551	0.683	0.773	0.796	0.604	0.648	1.000	
UO	0.780	0.556	0.720	0.580	0.590	0.826	0.838	0.692	0.620	0.752	1.000

At the same time, Table 3.9 of the PLS-SEM measurement model results' show that all the relevant criteria of the heterotrait–monotrait ratios (HTMT) are less than $HTMT_{0.90}$ that the test of discriminant validity for the measurements of pilot study are met (Henseler, Ringle, & Sarstedt, 2015).

3.9 Moderating Effect Analysis using categorical data variables

In this study, the moderating effect of demographic was using categorical data that has been proposed on the relationships between the independent variables of attitudinal, satisfaction, normative and control construct towards the continue broadband intention. PLS-SEM software is used as following (Fassot, Henseler, & Coelho, 2016) able to produce a result of all types of variable regardless of whether they have metric, quasi-metric, ordinal, or categorical scales (e.g., binary coded). In categorical data the indicators used for building the interaction term using metric scales using dichotomous indicator it is possible to a dummy code of (0 = category 1, 1 = category 2) or contrast code (-1 = category 1, 1 = category 2) this indicator and use it as a metric variable. As the single effect of the exogenous variable describes the effect when the moderator variable equals zero, a dummy coded moderator variable allows a straightforward interpretation of this single effect. Therefore, dummy coding should be used for a dichotomous (single) indicator variable instead of contrast coding.

3.9.1 Product Indicator approach

For moderating effect analysis, in this study product indicator approach will be used where it involves multiplication of indicator from the exogenous latent variable with each indicator of the moderator variable to form a product indicators. As shown in Figure 3.8

the product of this product indicator will become the indicators of the interaction term of the item that forming the indicator of (Y_1xM) when both Y1 and M are measured by the items of two (reflective) indicators.

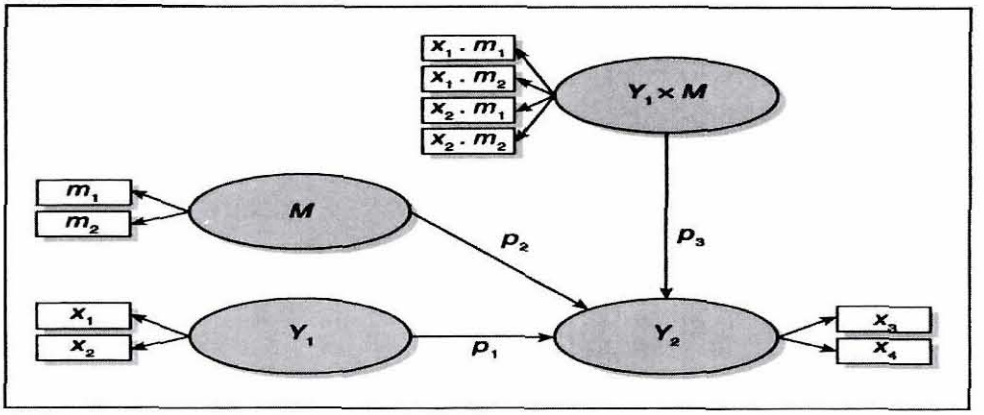

Figure 3.8
Illustration of the interaction term of moderator M
Source: (Chin & Dibbern, 2010)

According to Baron and Kenny (1986) and Fassot et al, (2016) moderating effects are evoked by variables whose variation affects the strength of a relation between an independent and a dependent variable. To develop the moderation model, we first depart from the main effects model, which simply contains the linear effects of X and M on Y based on the Equation (1):

$$Y = \beta 0' + \beta 1' \cdot X + \beta 2' \cdot M + d' \qquad (1)$$

The moderating effect was assessed by comparing the proportion of R^2 of the original path model by Fassot et al., (2016) and later, the effect size (f^2) was then calculated by equation (2).

$$f^2_{X \cdot M} = \frac{R^2_{\text{model with interaction term}} - R^2_{\text{model without interaction term}}}{1 - R^2_{\text{model with interaction term}}} \quad (2)$$

3.10 Summary of the chapter

This chapter has described the methodology comprising the research design, measurement, population, sampling, data collection procedures and techniques of data analysis. The present study also adopts cross-sectional research design in which data collected were analyzed and interpreted statistically. The unit of analysis in this study was the users of Pi1M that representing household in Malaysia. A clustered random sampling technique was used in this study. Measurement scales from the previous studies were adapted to measure the continue broadband of four second-order constructs attitudinal, satisfaction, normative and control constructs with demographics as moderating factor. In the next chapter, results of the analyses are presented.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter reports the results of the data analysis. First, this study examined the distribution of the demographic variables (Gender, Qualifications, and Experiences) for all respondents. Then, this study compares the early and late response from respondents to assess the non-response bias. After that, this study discusses the descriptive analysis of the variables and the normality testing. This study employed the Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the outer measurement model before the inner structural model assessment and hypotheses testing (Lowry & Gaskin, 2014). For PLS, the structural model has to be designed as a causal chain. This model type is known as a recursive type, i.e., there is no loop in the path model. The goodness of the outer model related to the constructs of this study namely Attitudinal Construct, Normative Construct, Control construct and Satisfaction were analyzed. The quality of the structural model was later examined through the construct validity and convergent validity (Ringle, 2009). A standard beta coefficient was measured by resampling method on the model's path coefficients based on the least-squares method or estimation while the t-statistics for the goodness of the path coefficients were also obtained using the same method (Chin & Dibbern, 2010, p.702). Finally, the findings of the hypotheses testing procedures and the moderating effect of demographics were also reported.

4.1.1 Demographic Distribution of the Respondents

The data were collected using the survey questionnaire over the period of four months from October 2016 to February 2017. The final collected data sample from all regions as illustrated in Table 4.1 below:

Table 4.1
Distribution of samples that have been collected from all regions

Region	Questionnaire Distributed (Hardcopy)	Responded	E-Forms	Hardcopy	Percentage
Northern	200	79	39	40	40.0%
Central	200	100	30	70	50.0%
Southern	200	90	30	60	45.0%
East Coast	200	70	30	40	35.0%
Sabah	200	35	13	22	17.5.0%
Sarawak	200	47	22	25	23.5.0%
Total	1200	421	164	257	35.10%
	Remove due to missing data and below 18 years old		0	35	
	Final respondent		164	222	32.2%

The overall response rate from respondents was 35.1% however 35 of them were excluded due to missing data and some due to the respondent are below 18 years old that made a balance of 386 respondent. That makes the ultimate response rate of 32.2% are about the same result as reported in (Chin, Siong, & Kuan, 2009). Furthermore as reported in Nulty (2008), the data that was collected based on face-to-face administration using hardcopy will give a better response rate of 257 as compared to 164 using e-forms. However, the study did not report if the response rates to online form would rise if conducted in a face-to-face way. Therefore this rate is acceptable as this is using the

combination of face to face and self-administration method that has been used to distribute or collect questionnaires (Hunt, Sparkman, & Wilcox, 2011). The participation and support of the center manager and officer from SKMM also help in collecting data. The demographic variables have been categorized into three categories, which are gender, age, and education.

As shown in Table 4.2 and the summarization of respondent's profile is picturized in Figure 4.1, shows there are 151 males which represent 39.1% and female 235 representing 69.1% of the total samples.

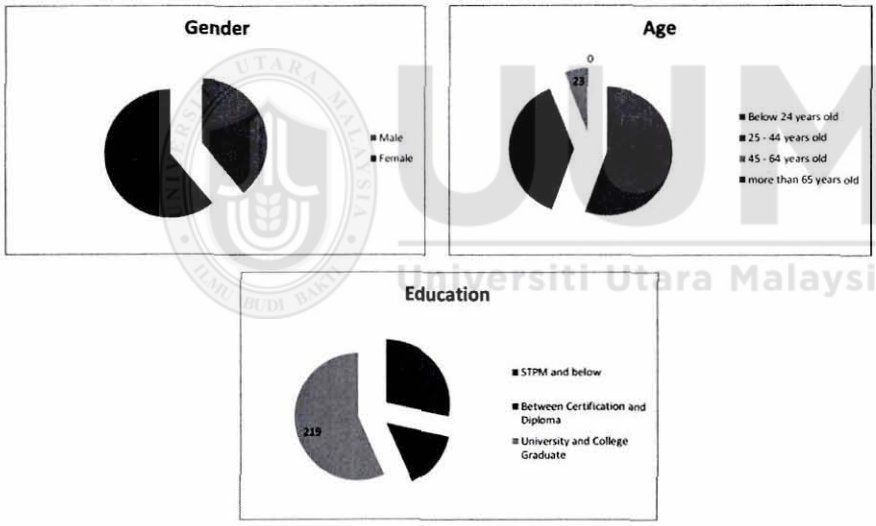

Figure 4.1
The Summary of demographic profile

The majority of the respondents are at the age of below 24 years old which represent 55.4%, responded at the age between 25 to 44 years old are 38.6% while there are 23 respondents with the age of more than 45 years old that represent only 6%. None of the respondents are at the age of 65 and above. As for education level, the majority of them

are among university or college graduates who represent 56.7%, while respondent with certificate and diploma represent 15% of the total sample and 28.2% are among those at secondary school.

4.2 Testing Non-Response Bias

This study employed a survey questionnaire as a tool for data collection. However, as the questionnaire was collected using face to face and self-administrated method, therefore, it was necessary to conduct the non-response bias. During face to face method, some respondents responded only after many calls and reminders, and the data collection period was between October 2016 and February 2017. To compare, assess and eradicate bias response between the response from google-form and hardcopy response multigroup analysis and permutation-test (similar to T-Test in SPSS or AMOS) was conducted (Dijkstra, 2015). Based on the suggestions of Armstrong (1977), if there is a difference between of these different groups responses were found to be significant, they may refer to the underlying differences between non-respondents and respondents. Permutation test has been carried out between the 222 hardcopies questionnaires and the 162 respondents who were using google forms and the results as shown in Table 4.3 where all the constructs of the study were taken into consideration.

Table 4.2
Participants' Demographic Information

Demographic profile	Male	Female	N	Percentage
Gender	151	235	386	
Age				
Below 24 years old	74	140	214	55.4%
25 - 44 years old	54	95	149	38.6%
45 - 64 years old	23	0	23	6.0%
more than 65 years old	0	0	0	0.0%
Education				
Secondary school (STPM and below)	37	72	109	28.2%
between Certification and Diploma	38	20	58	15.0%
Graduate	76	143	219	56.7%
		Total (N)	386	100.0%

In recent development studies, much of the increased usage of PLS-SEM can be credited to the method's ability to handle problematic modeling issues. The problematic model routinely occurs in the social sciences such as unusual data characteristics (e.g., nonnormal data) and highly complex models (J F. Hair et al., 2014). At the same time, in PLS-SEM permutation algorithm is conducted to test if pre-defined data groups have statistically significant differences in their group-specific parameter estimates (e.g., outer weights, outer loadings, and path coefficients). As recommended by Hair et al., (2014) the purpose of using the permutation routine in SmartPLS (1) To allows conducting a PLS-SEM multigroup analysis (Chin and Dibbern, 2010; Hair et al., 2014; Sarstedt, Henseler, and Ringle, 2011). (2) It allows conducting the PLS-SEM measurement invariance assessment as suggested by Henseler, Ringle, and Sarstedt's (2015) MICOM routine. Additionally, it should be considered that the measurement invariance of composite models (MICOM) is a logical and necessary step, before conducting MGA

(Henseler et al.,2016). The MICOM test procedure is designed to establish whether the measurement of the (outer) model is the same between groups. The indicators in the outer model determine the meaning of the constructs in the structural (inner) model so that a lack of measurement invariance would imply that the same constructs had significant differences in the different groups under analysis (Picon-Berjoyo, Ruiz-Moreno, & Castro, 2016). In this study, for bias test, a group-specific estimation of thePLS path-model was conducted to obtain path co-efficient estimates *(d)* for response by Google forms (group 1) and hardcopy (group 2).

$d = p^{(1)} - p^{(2)}$ Equation 4.1

Table 4.3
The permutation value for bias test between hardcopy and Google forms

Constructs/Item	Original Correlation	Correlation Permutation Mean	5.00%	Permutation p-Values
Attitudinal	1.000	1.000	0.999	0.472
CQ	1.000	1.000	1.000	0.064
Control	0.999	1.000	0.999	0.052
FC	1.000	1.000	1.000	0.087
HO	1.000	0.999	0.995	0.851
Normative	0.999	1.000	0.999	0.104
PI	0.999	1.000	0.999	0.063
PK	0.998	0.999	0.997	0.172
PU	0.999	1.000	0.999	0.085
RA	1.000	1.000	0.999	0.184
SE	0.998	0.999	0.999	0.090
SI	0.998	0.999	0.998	0.075
SQ	1.000	1.000	1.000	0.660
Satisfaction	1.000	1.000	1.000	0.095
UO	1.000	1.000	0.999	0.396

As shown in Table 4.4 the result of permutation algorithm test using SmartPLS 3.2 the p-value of permutation algorithm shows the p-value does not fall into the significant differences (p-value > 0.05) between the e-forms and hardcopy response for all the variables. Since the original difference d_u of the group-specific path co-efficient estimates does not fall into the coefficient intervals, it can be concluded the response for the two groups is as significant (Joe F. Hair, Ringle, & Sarstedt, 2011).

4.3 Descriptive Statistics

Based on respondents' perspective, a descriptive analysis was conducted for all data that representing the independent variable in this research framework. As shown in Table 4.4, the mean, standard deviation, minimum and maximum of the constructs were reported. These results showed the implementation level of each factor of RA, UO, HO, SQ, CQ, PU, PI, SI, FC, PK, and SE. These independent variables later reflected the context of continue broadband intention. As tabulated in Table 4.4, the minimum value of all the constructs was 1.000, and the maximum value was 5.00 which represent the Likert scale used in this study. The same data showed that UO has the maximum mean value among other dimensions with the standard deviation 0.857. These results indicated that the users of internet center (Pi1M) value highly on the utilities that was provided by MCMC. The standard deviation value which is in between the range of maximum and minimum standard deviation indicated that there were mixed in their opinion about the utilities provided in the internet center. The next high value is a Secondary influence (SI) with means 4.074 and standard deviation 0.763. The results revealed the users feels the secondary influence such as advertising; government campaign leads them into using the

internet center and broadband. From the Table 4.4 shows Hedonic outcome was reported to have the lowest mean as 3.781 with standard deviation 0.911 which indicate that majority of the respondents does not feel factor of hedonism for them to use the services in internet center. The outcome may be because of the security and content policy that being imposed using a firewall and content filtering the internet center.Furthermore, the majority of the respondent is female, and college student, therefore a hedonic factor that leads to the usage of broadband was very minimum.

Table 4.4
Descriptive Statistics of the constructs

Construct	Mean	Min	Max	Std.Dev
RA	4.034	1.000	5.000	0.865
UO	4.138	1.000	5.000	0.857
HO	3.781	1.000	5.000	0.911
SQ	3.975	1.000	5.000	0.898
PU	4.065	1.000	5.000	0.833
CQ	4.044	1.000	5.000	0.828
PI	4.016	1.000	5.000	0.753
SI	4.074	1.000	5.000	0.763
FC	3.815	1.000	5.000	1.010
PK	3.849	1.000	5.000	0.907
SE	3.898	1.000	5.000	0.878
CBI	4.197	1.000	5.000	0.750

4.4 Normality and Linearity test

The purpose of this study is to investigate the relationships among latent variables; therefore the latent analysis technique was the suitable option. There was a choice to use covariance-based SEM technique such as AMOS, but the data must be normally

distributed (J. Hair et al., 2014). The following assumptions have been tested in SPSS before choosing the technique of the analysis.

4.4.1 The Normality Results

According to Hair et al. (2006), the values of skewness outside the range of +1 to -1 is substantially skewed distribution. However, Kline (1998) suggested the cut off between +3 to -3 will be acceptable. Based on these criteria suggested by many researchers, the skewness values were within the acceptable range suggested by Kline (1998) (+3 to -3) unlike Hair et al. (2006) recommended the values be between +1 to -1. Similarly, the values of kurtosis are suggested by Coakes and Steed (2003) to range from +3 to -3 which are acceptable based on Appendix G. Based on the discussion above, the results show that some of the values in skewness deviate from being normally distributed.

However, as emphasized by Kline et al.(1998) and Cher and Edith (2013), the standard errors of skewness and kurtosis shrink in large sample sizes, which can produce statistically significant skewness and kurtosis values even on a normally distributed data. The univariate skewness and kurtosis have been extended to multivariate data. Multivariate skewness and kurtosis measure the same shape characteristics as in the univariate case. However, in path modeling, instead of making the comparison of the distribution of one variable against a univariate normal distribution, they are comparing the joint distribution of several variables against a multivariate normal distribution(Cain, Zhang, & Yuan, 2016). At the same time in applied research such as this study, for path modeling, multivariate normality is examined using Mardia's normalized multivariate

kurtosis value. After all, for this study, its recommended by Joe F. Hair, Ringle, and Sarstedt (2011), to use PLS-SEM as analysis tools due to:- i) The research goals are predicting key target construct and identifying the critical driver.ii) The research is exploratory and or extension of the existing model theory. iii) This study involves complex model (many construct and items). iv) Data is multivariate nonnormal.

4.4.2 Test of Linearity

Linearity testing locates the association of independent variables with a dependent variable which predicts the hypotheses' right direction; therefore, the positive values indicate the relationship is considered positive. Based on the suggestion of Hair et al. (2006), the partial regression plot was used for each variable when there is more than one independent variable to guarantee the best representation of the equation. Based on the suggestion by Asparouhov and Muthén (2015) the nonlinearity of the skew-SEM model is determined by the skewness and the kurtosis of the data. Therefore theoretically, based on Appendix E it can be assumed that the data is linear for further multicollinearity testing.

4.4.3 Multicollinearity Test (VIF)

The test of multicollinearity among variables is highly recommended before the beginning of testing the proposed model (Hair et al., 2010). It indicates the existence of relapse of in the correlation matrix in which the independent variable is high and significantly correlated with another independent variable. Also, the revelation of multicollinearity can be detected when the correlation value is more than 0.90 (Hair et al.,

2010). The test of multicollinearity is facilitated by examining the variance influence factor (VIF) and the tolerance value. The term VIF is derived from the fact that its square root is the degree to which the standard error has been increased due to multicollinearity. However, there is no precise threshold value for multicollinearity (Chin & Dibbern, 2010). In general, the VIF value should be individually defined, however as guideline and rule of thumb; the VIF value should not above the value of 10 (Chin & Dibbern, 2010; Hair et al., 2010; Gholami, Sulaiman, Ramayah, & Molla, 2013). Moreover, the value of the VIF is the amount of variability of the selected independent variable which is explained by other independent variables whereas the tolerance is the inverse of VIF (Hair et al., 2010; Gholami, Sulaiman, Ramayah, & Molla, 2013). The VIF and tolerance values cut-off points are 10 and 0.10 respectively which indicates that VIF closer to 1.00 represents little or no multicollinearity (Barnes, 2011). Table shows in Appendix F is the multi-collinearity statistics for all independent variables where the VIF values range between 1 and 4.277. Therefore, the results reported that there is no violation of multicollinearity assumption.

4.5.1 Testing the Measurement, Outer, Model Using PLS Approach

Before testing the hypotheses of this study, the measurement model, outer model, was assessed through the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. In this study, "two steps approach" that was suggested by Anderson and Gerbing (1988) as shown in Figure 3.1 picturized the model of this study with structural dimensions.

4.5.1.1 The Second Order Constructs model

In this study, including the four second-order latent constructs namely Attitudinal, Satisfaction, Normative and Control were to examine whether they were qualified to be conceptually explained by the respective research model. Therefore, the first-order and second-order constructs should be explained well by the hypothesized second-order construct, and they should be distinct (Byrne, 2010). For Attitudinal construct, the four first-order constructs namely Relative Advantage (RA), Utilitarian Outcome (UO), Hedonic Outcome (HO) and Service Quality (SQ) are explained well as shown in Figure 4.2 the original path model. It follows by the other three second-order construct of Satisfaction that consists of Perceived Usefulness (PU) and Content Quality. While Normative construct is represented by Primary Influence (PI) and Secondary Influence (SI), Control constructs with Facilitating Condition (FC), Perceived Knowledge (PK) and Self Efficacy (SE) as the reflective factor. Originally, three items from latent variable CQ3, UO9, and PI7 with factor loadings less than 0.5 were removed from the path model. Following Hair et al.(2010) and Lin & Wang, (2006), p.276) and Giovanis, AN, Binioris,

S & George (2012) recommendations, factor loadings greater than 0.50 were considered to be very significant.

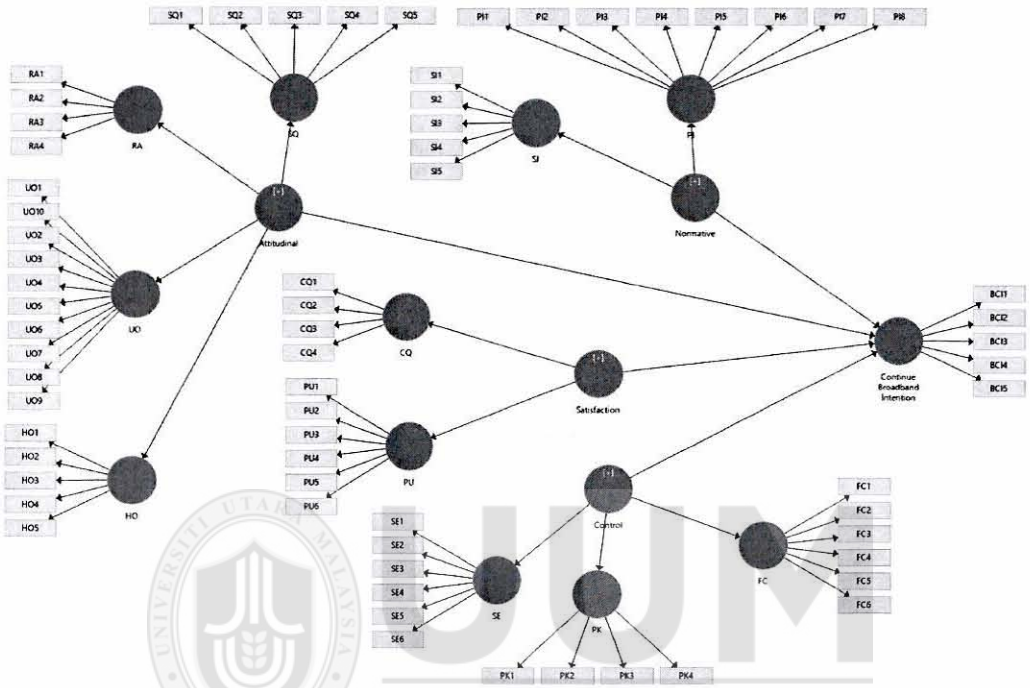

Figure 4.2
Diagram of original path model

At the same time following Hair et al.(2010) and Hsu and Lin (2015) those items whose factor loading are less than 0.5 should be removed after checking the meaning of each item carefully to ensure it was reasonable theoretically. Therefore removal of additional items such as CQ3, PU1, PU2, PI7, FC3, FC1, SI3, SI5, SE4 and SE5 even though with the factor loading above 0.5 was done to meet the convergent and discriminant validity. With the total of 12 items (17.6%) were removed from the original path model with 68 items and this still meet the J. F. Hair, Black, Babin, & Anderson (2010) and Awang

(2014) recommendation of the maximum allowable removal of items of 20% from the original path model. The final modified path analysis as shown in Figure 4.3.

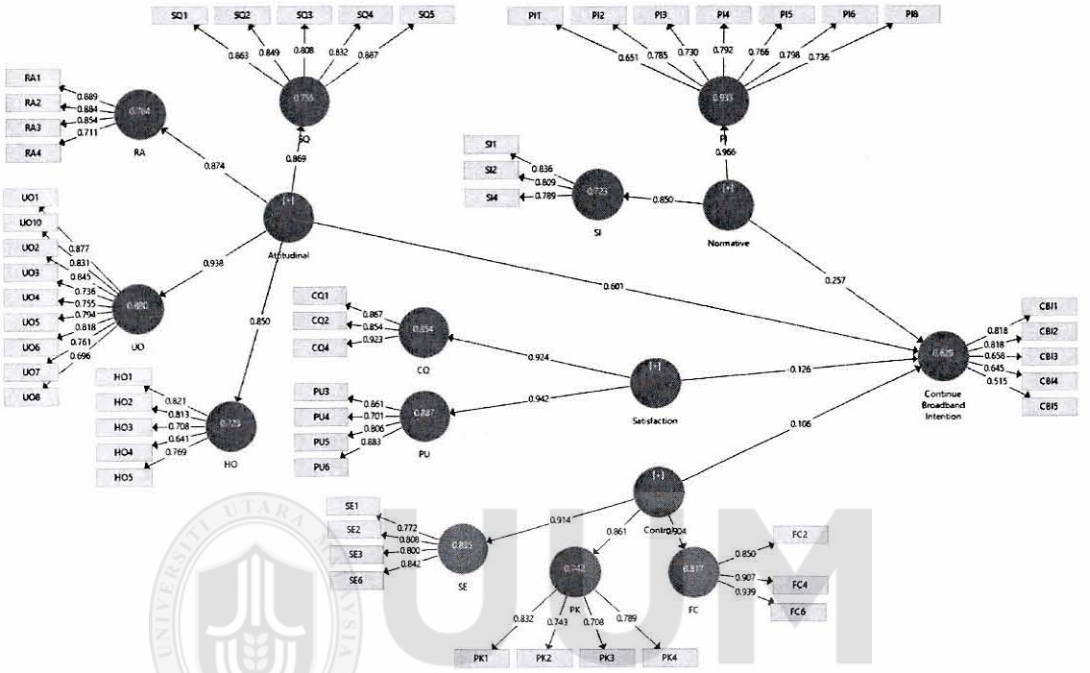

Figure 4.3
Diagram of modified path model analysis

4.5.2 The Construct Validity

According to Hair et al. (2010), the construct validity can be examined through the content validity, convergent validity, and discriminant validity.

4.5.2.1 The Content Validity

The content validity refers to the degree to which the items proposed to measure a construct can suitability measure the concept that designed to be measured (Hair et al., 2010). Therefore, through a comprehensive review of the previous studies in the literature review, this can be ensured of how items were generated and reported in Appendix I.

4.5.2.2 The Convergent Validity Analysis

The convergent validity is the degree to which a group of variables converges in measuring a specific concept (Hair et al., 2010). As suggested by Hair et al. (2010), to establish the convergent validity, three criteria should be tested simultaneously, namely the factor loadings, composite reliability (CR), and average variance extracted (AVE). As shown in Appendix G indicates that all the factors' loading were significant at the 0.05 level of significance. The second criterion to test convergent validity is the composite reliability which refers the degree to which a set of items consistently indicate the latent construct (Hair et al., 2010).

At the same time in this study, the researcher had combined the result of the first and second order analysis of convergent validity where loading of all items was examined. All items have loading that fulfills the Hair et al.(2010) and Lin and Wang (2006). The suggestion that an acceptable level of factor loading according to the multivariate analysis literature is above 0.5. In Table 4.5, the values of Cronbach Alpha and Composite Reliability (CR) were examined for the first-order construct ranged from 0.731 to 0.881 for Cronbach Alpha. The value of Composite Reliability ranged from 0.824 to 0.927 which exceeds the recommended level of minimum value 0.7 (Fornell & Larcker, 1981; Hair et al., 2010) or as used by Akter, D 'Ambra, & Ray (2013) the value of above 0.8. Therefore, these results confirm the convergent validity of the outer model. Furthermore, the values of the average variance extracted (AVE) were examined to confirm the convergent validity of the outer model. AVE reflects the average of variance extracted among a group of items about the variance shared with the errors of

measurement. In other words, AVE measures the variance captured by indicators about the variance assignable to the measurement errors. Hence, if the value of AVE is at least 0.5, so these set of items have an adequate convergence in measuring the concern construct (Barclay et al., 1995). In this study, AVE values for the first-order range between 0.500 and 0.809 As for second order shown in Table 4.6, the Cronbach Alpha and Composite Reliability ranged between 0.893 to 0.954 and 0.913 to 0.959. From the calculation, the AVE value of the second-order ranged between 0.511 to 0.620 that indicates a reasonable level of the construct validity of the measures used (Barclay et al., 1995).

Table 4.5
Result of Convergent validity

Construct	Item	F.Loading	Cronbach's Alpha	rho_A	Comp. Reliability	AVE	R^2
First Order Construct							
Continue Broadband Intention	BCI1	0.869	0.748	0.775	0.843	0.578	0.607
	BCI2	0.840					
	BCI3	0.592					
	BCI4	0.706					
Content Quality	CQ1	0.867	0.857	0.859	0.913	0.778	0.852
	CQ2	0.854					
	CQ4	0.923					
Facilitating Condition	FC2	0.850	0.881	0.895	0.927	0.809	0.818
	FC4	0.907					
	FC6	0.939					
Hedonic Outcome	HO1	0.821	0.815	0.853	0.867	0.568	0.722
	HO2	0.813					
	HO3	0.708					

Table 4.5 *(Continue)*

Construct	Item	F.Loading	Cronbach's Alpha	rho_A	Comp. Reliability	AVE	R^2
	HO4	0.641					
	HO5	0.769					
Primary Influence	PI1	0.651	0.871	0.876	0.901	0.566	0.933
	PI2	0.785					
	PI3	0.730					
	PI4	0.792					
	PI5	0.765					
	PI6	0.798					
	PI8	0.736					
Perceived Knowledge	PK1	0.832	0.769	0.777	0.853	0.592	0.741
	PK2	0.742					
	PK3	0.708					
	PK4	0.789					
Perceived Usefulness	PU3	0.861	0.829	0.835	0.888	0.666	0.889
	PU4	0.701					
	PU5	0.806					
	PU6	0.883					
Relative Advantage	RA1	0.889	0.855	0.855	0.903	0.701	0.765
	RA2	0.884					
	RA3	0.854					
	RA4	0.711					
Self Efficiacy	SE1	0.772	0.82	0.827	0.881	0.649	0.834
	SE2	0.807					
	SE3	0.800					
	SE6	0.842					
Secondary Influence	SI1	0.837	0.741	0.744	0.853	0.659	0.723
	SI2	0.809					
	SI4	0.788					
Service Quality	SQ1	0.863	0.903	0.909	0.928	0.72	0.757
	SQ2	0.849					
	SQ3	0.808					
	SQ4	0.832					
	SQ5	0.887					

Table 4.5 *(Continue)*

Construct	Item	F.Loading	Cronbach's Alpha	rho_A	Comp. Reliability	AVE	R^2
Utilitarian Outcome	UO1	0.877	0.925	0.931	0.938	0.628	0.879
	UO10	*0.830*					
	UO2	0.845					
	UO3	0.737					
	UO4	0.755					
	UO5	0.794					
	UO6	0.819					
	UO7	0.761					
	UO8	0.696					

4.5.2.3 The Discriminant Validity Analysis

For more confirmation about construct validity of the outer model, it is vital to establish the discriminant validity. Therefore, before testing the hypotheses through the path analysis, discriminant validity testing is mandatory. Its measures show the degree to which items differentiate among constructs. In other words, the discriminant validity shows that items used different constructs do not overlap. Also, the discriminant validity of the measures shared variance between each construct and, therefore, should be greater than the variance shared among distinct constructs (Compeau et al., 1999). For this study, the discriminant validity of the measures was confirmed by employing the method of Fornell and Larcker (1981) that shown in Table 4.6.

Table 4.6
Discriminant Validity: Fornel & Lacker Criterion

	CQ	FC	HO	PI	PK	PU	RA	SE	SI	SQ	UO
CQ	**0.882**										
FC	0.485	**0.899**									
HO	0.583	0.511	**0.754**								
PI	0.626	0.577	0.673	**0.752**							
PK	0.517	0.694	0.695	0.678	**0.769**						
PU	0.742	0.527	0.590	0.552	0.454	**0.816**					
RA	0.567	0.536	0.701	0.620	0.64	0.63	**0.837**				
SE	0.594	0.734	0.657	0.631	0.682	0.618	0.544	**0.806**			
SI	0.556	0.441	0.484	0.685	0.533	0.456	0.608	0.531	**0.812**		
SQ	0.742	0.532	0.683	0.639	0.570	0.681	0.703	0.605	0.464	**0.848**	
UO	0.696	0.503	0.726	0.673	0.500	0.777	0.755	0.644	0.528	0.724	**0.792**

Note: *The diagonal values (bolded) are square root of AVE; off-diagonal is correlation among the construct*

As explained in Table 4.6, the square root of AVE for all constructs was replaced at the diagonal elements of the correlation matrix. The discriminant validity of the outer model for this study was confirmed where the diagonal elements in the table were higher than the other elements of the column and row in which they are located. As a result of the above testing for the construct validity of the outer model, it is assumed that the obtained results of the hypotheses testing should be reliable and valid. In the recent development in assessing construct discriminant validity using PLS-SEM, following Henseler (2016) and Becker & Ismail (2016) recommendation that it is important also to apply HeterotraiteMonotrait (HTMT) ration of correlation. . The value of HTM is an addition to the established Fornell Larcker criterion where $HTMT_{.85}$ and $HTMT_{0.9}$ are the two suitable and suggested a threshold for assessing discriminant validity. In this study, $HTMT_{0.9}$ is used as shown in Table 4.7 where an HTMT value < 0.90 indicates that discriminant validity has been established.

Table 4.7
Discriminant Validity: Heterotrait Monotrait Ration (HTMT)

First Order Construct	CQ	FC	HO	PI	PK	PU	RA	SE	SI	SQ	UO
CQ	**1.000**										
FC	0.553	**1.000**									
HO	0.657	0.566	**1.000**								
PI	0.727	0.659	0.760	**1.000**							
PK	0.643	0.824	0.837	0.835	**1.000**						
PU	0.877	0.614	0.666	0.652	0.577	**1.000**					
RA	0.661	0.607	0.757	0.715	0.785	0.750	**1.000**				
SE	0.711	0.844	0.754	0.743	0.846	0.753	0.645	**1.000**			
SI	0.701	0.534	0.554	0.844	0.701	0.585	0.759	0.665	**1.000**		
SQ	0.838	0.587	0.752	0.715	0.676	0.774	0.790	0.699	0.562	**1.000**	
UO	0.771	0.549	0.752	0.746	0.592	0.877	0.846	0.730	0.632	0.775	**1.000**

4.5.3 Second-order analysis

As it is widely known in the literature of multivariate data analysis, R^2 of the endogenous variable accounts for the variance of a particular variable that is explained by the predictor variables. Therefore, the magnitude of the R2 for the endogenous variables was considered as an indicator of the predictive power of the path model using the analysis of second-order construct. As shown in Table 4.8, the Attitudinal construct was hypothesized to be measured through four first-order constructs namely, Relative Advantage, Utilitarian Outcome, Hedonic Outcome and Service Quality (SQ). These constructs were explained well by the Attitudinal construct as shown by the R^2 that ranged from latent variable RA, UO, HO and SQ are between 0.722 and 0.879. In the same way, Control construct was also hypothesized to be measured through the three first-orders namely Facilitating Condition (FC), Perceived Knowledge (PK) and Self Efficacy (SE). These constructs were illustrated well by the R^2 value of 0.741, 0.818 and

0.834 respectively. Additionally, the correlation table of discriminant analysis also confirmed the correlation between constructs of OE and concluded that OE as a second-order construct is explained. As for Normative second-order construct is hypothesized to be explained through Primary Influence and Secondary Influence with the value of the R^2 was 0.723 and 0.933 respectively. At the same time, the discriminant analysis for Normative construct has confirmed the distinction of each one of these constructs. Thus, the second-order nature of Normative factor was established. Finally, Satisfaction factor was hypothesized to be measured through the two first-order namely, Content Quality (CQ) and Perceived Usefulness (PU). These constructs were explained well by Satisfaction as showed by the value of R^2 that were 0.852 and 0.889 respectively. Table 4.8 of the discriminant analysis also confirmed that these constructs are correlated and thus Satisfaction as a second-order construct is explained by the two reflective first-order factor.

Table 4.8
Summary of second-order construct

Construct	Item	F.Loading	R^2	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Second Order Construct							
Attitudinal	RA	0.875	0.765	0.954	0.960	0.959	0.511
	UO	0.937	0.879				
	HO	0.850	0.722				
	SQ	0.870	0.757				
Control	FC	0.905	0.818	0.921	0.928	0.933	0.542
	PK	0.861	0.741				
	SE	0.913	0.834				
Normative	PI	0.966	0.933	0.893	0.896	0.913	0.512
	SI	0.850	0.723				
Satisfaction	CQ	0.923	0.852	0.897	0.900	0.919	0.620
	PU	0.943	0.889				

4.6 Hypotheses Testing of Independent Variables

Once the goodness of the outer model has been confirmed, the next stage was to test the hypothesized relationships among the variables. By running PLS Algorithm using SmartPLS, the hypothesized model was tested.

4.6.1 The Assessment of the Inner Model and Hypotheses Testing Procedures

Once the goodness of the outer model has been confirmed, the next stage was to test the hypothesized relationships among the variables. By running PLS bootstrapping using SmartPLS, the hypothesized model was tested. Therefore, the path coefficients were generated as illustrated in Figure 4.4

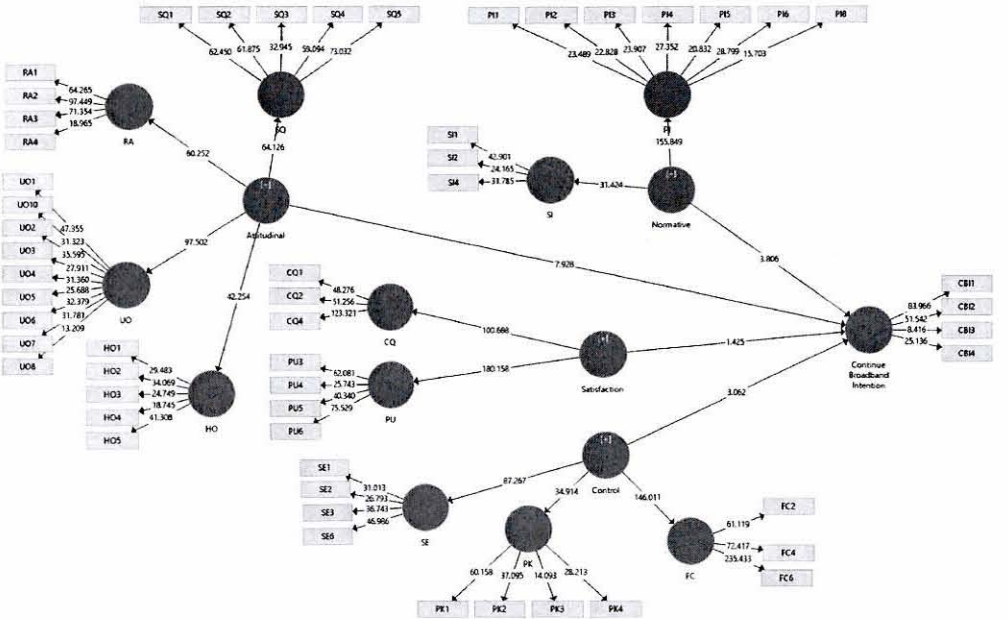

Figure 4.4
The Diagram of Path Model Analysis

To conclude whether the path coefficients are statistically significant or not, bootstrapping techniques were performed in this study with SmartPLS 3.2. As reported in Table 4.9, the T-Values with each path coefficient were generated using bootstrapping technique, and P-Values subsequently were generated. The results showed that Attitudinal has a significant effect on CBI (β= 0.570, t=7.928, p<0.05). Therefore, the hypothesis (H1) of the effect of Attitudinal on Continue Broadband Intention was supported. On the other hand, the effect of Satisfaction on Continue Broadband Intention was examined as alone and through its dimensions. However surprisingly, Satisfaction was found to have negative effect on Continue Broadband Intention (β= -0.094, t=1.425, p=0.07) but insignificant where the t-value < 1.960 and the p-value > 0.05. As for control construct, It is found that it has a significant positive effect on Continue Broadband

Intention with (β=0.159, t=3.062, p<0.005) that makes the hypothesis H3 has been supported. At the same time the effect of Normative construct to Continue Broadband Intention has been found to be positively significant (β= 0.198, t=3.806, p<0.05). Therefore, H4 has also been supported as proposed.

Table 4.9
The Results of the Inner Structural Model Hypothesis

Hypothesis No.	Hypothesis	Path Coefficient	Error (STDEV)	T Value	P Values	Decision
H1	Attitudinal -> CBI	0.570	0.072	7.928	0.000	Supported
	Attitudinal -> HO	0.850	0.020	42.254	0.000	
	Attitudinal -> RA	0.875	0.015	60.252	0.000	
	Attitudinal -> SQ	0.870	0.014	64.126	0.000	
	Attitudinal -> UO	0.937	0.010	97.502	0.000	
H2	Normative -> CBI	0.198	0.052	3.806	0.000	Supported
	Normative -> PI	0.966	0.006	155.849	0.000	
	Normative -> SI	0.850	0.026	32.301	0.000	
H3	Control -> CBI	0.159	0.052	3.062	0.001	Supported
	Control -> FC	0.905	0.006	146.011	0.000	
	Control -> PK	0.861	0.025	34.914	0.000	
	Control -> SE	0.913	0.010	87.267	0.000	
H4	Satisfaction -> CQ	0.923	0.009	100.688	0.000	
	Satisfaction -> CBI	-0.094	0.066	1.425	0.077	Not supported
	Satisfaction -> PU	0.943	0.005	180.158	0.000	
	Satisfaction -> CQ	0.923	0.009	100.688	0.000	

The effect of Normative construct Continue Broadband Intention has been found to be positively significant (β= 0.198, t=3.806, p<0.05). Therefore, H4 has also been supported as proposed.

4.6.2 The Predictive Relevance of the Model

In the literature of multivariate data analysis, R square of the endogenous variable is explained by the predictor variables. Therefore, the R square's magnitude for the endogenous variables was regarded as an indicator of the predictive power of the model. Moreover, the technique of reusing sample was applied as developed by Stone (1975) and Geisser (1975) to confirm the predictive validity of the model. For this purpose, as argued by Wold (1982), PLS is used as very well and fit software for the sample's reuse technique (Gotz, Liehr-Gobbers, & Krafft, 2011).

4.6.2.1 Effect Size

According to Cohen's (1988) criterion, the effect size can be categorized as small, medium and large whenever the f^2 value found as less than 0.02, between 0.15 to 0.35 and more than 0.35, i.e.: (0.02=small, 0.15=medium, 0.35=high).

Table 4.10
Effect Size of Path Model and Continue Broadband Intention

Second order construct	R^2 Included	R^2 Excluded	R^2 Included-R^2Excluded	1-R^2 Included	f^2	Effect (%)
Attitudinal > CBI	0.607	0.527	0.080	0.393	0.203	20.3%
Normative > CBI	0.607	0.592	0.015	0.393	0.039	3.9%
Control > CBI	0.607	0.596	0.011	0.393	0.027	2.7%
Satisfaction > CBI	0.607	0.604	0.003	0.393	0.007	0.7%

From the Table 4.10, all construct has an effect size of ($f^2 > 0.02$) except for satisfaction where the f^2=0.007. The attitudinal construct recorded the highest value of f^2 with medium effect towards Continue Broadband Intention with (f^2 = 0.203 or 20.3%). While control construct has minimal effect of (f^2 = 0.027), In the meantime the effect size of

normative construct fallen in between all other construct with small effect of (f^2=0.039 or 3.9%) towards continuing broadband intention (CBI).

4.6.2.2 Cross-Validated Analysis

The model predictive relevance can be examined by the Stone-Geisser non-parametric test (Chin, 1998; Fornell & Cha, 1994; Geisser, 1975; Stone, 1975). In Smart-PLS package, the blindfolding procedure can be performed to examine the predictive of the model.

Table 4.11
Predictive Quality Indicators of the Model(Q^2)

Construct	Type of Construct	R2	Cross Validated Communality (Q^2)
Attitudinal	Endogenous		0.431
CQ	Exogenous	0.852	0.501
Continue Broadband Intention	Endogenous		0.309
Control	Endogenous		0.432
FC	Exogenous	0.818	0.549
HO	Exogenous	0.722	0.351
Normative	Endogenous		0.376
PI	Exogenous	0.933	0.400
PK	Exogenous	0.741	0.321
PU	Exogenous	0.889	0.429
RA	Exogenous	0.765	0.479
SE	Exogenous	0.834	0.402
SI	Exogenous	0.723	0.319
SQ	Exogenous	0.757	0.547
Satisfaction	Endogenous		0.477
UO	Exogenous	0.879	0.494

Blindfolding step is designed to remove some data while handling them as missing values for parameters estimation. Then, the estimated parameters are used again to reconstruct the raw data that are supposed earlier to be missed. As a result of blindfolding process shown in Table 4.11, a general cross-validating metrics of Q2 were produced. Several forms of Q2 can be gained based on the form of the chosen prediction. A cross-validated communality is obtained when the points of the data are predicted employing the underlying latent variable scores. While, if the prediction of the data points is acquired by the LVs that predict the block in question, a cross-validated redundancy Q2 is the output. For this study, the redundant commonality was found to be larger than 0 for all endogenous variables. Therefore, the model is considered to have predictive validity (Fornell and Cha, 1994).

4.7 Hypothesis Testing of Moderating Variables

The following steps of analysis was performed moderating analysis of the pre-determined moderating factor of gender, age and education.

4.7.1 Testing the Moderating Effect of Gender

Based on Figure 4.5 shows the effect of moderating factor of gender towards CBI. The results of the CBI with moderating factor of gender gives a higher value of path coefficient (R2=0.652) as compared to the non-moderated model is (R2=0.603). The result of moderating effect of gender for each construct is displayed as shown in the same diagram where the path coefficient of attitudinal contract reduced to (β=0.273, t=1.654, p=0.049) from the non-moderated model (β=0.570). At the same time, a lower effect of

gender as a moderating factor on control and normative construct where the path coefficient of the moderated model is lower than non-moderated.

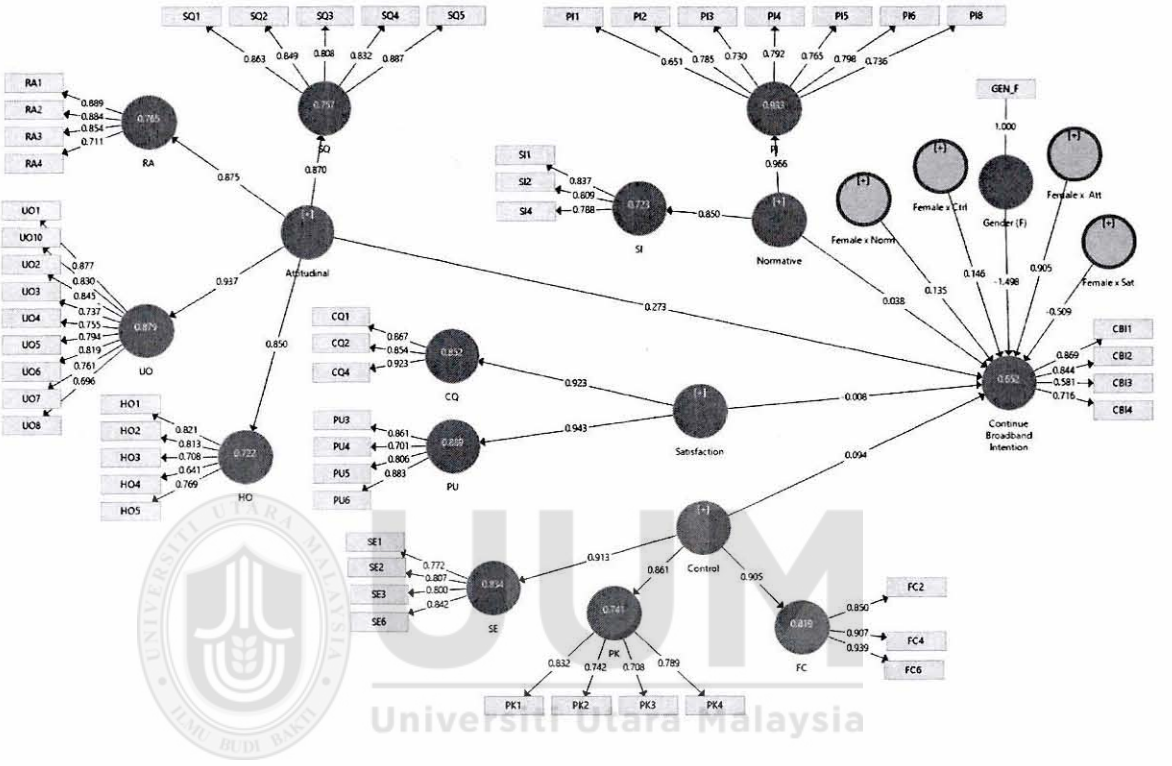

Figure 4.5
Moderating analysis of gender towards continuing broadband intention

There is the insignificant effect (t=0.073, p=0.471) of gender as a moderator of satisfaction event through the moderated model gives higher effect with path coefficient (β = -0.008). The value of f^2 for the moderated model does not meet the minimum threshold for to be considered as affecting (the threshold for small effects, f^2 >0.02) based on (Chin, Marcolin, & Newsted, 2003).

Table 4.12
Summary of Results for Moderating Factor of Gender

Construct	Hypothesis	Non-Moderated			Moderated Model Gender (Female)			Effect
		β	R^2	f^2	β	R^2	f^2	
Attitudinal	H5a	0.570		0.203	0.273		0.010	
Satisfaction	H5b	-0.094	0.603	0.007	-0.008	0.652	0.000	Strengthen
Normative	H5c	0.194		0.039	0.038		0.000	
Control	H5d	0.159		0.027	0.094		0.003	

From Table 4.12, in overall there is moderating effect of gender is strengthening the effect of Attitudinal, Satisfaction, Normative and Control to the continue broadband intention.

4.7.2 Testing the Moderating Effect of Age

Figure 4.6 shows the moderated model analysis of age where it shows the results of R^2 for the moderating effect of age are higher (R2=0.765) as compared to non-moderated

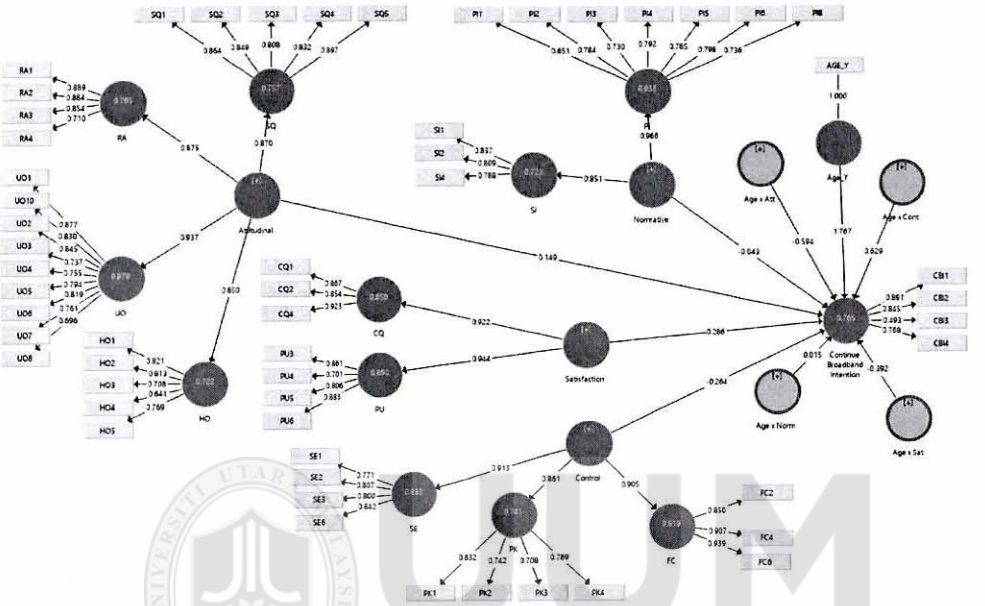

Figure 4.6
Moderated path model of age towards continuing broadband intention

model of (R^2=0.603). The summary table as shown in Table 4.13 where the path coefficient (β=0.286) for moderating factor of age to satisfaction construct significantly gives higher efficiency as compared to non-moderated model (β=-0.094) with (f2=0.066) that is considered as a small effect (Chin et al., 2003).

Table 4.13
Summary of Results for Moderating Factor of Age

Construct	Hypothesis	Non Moderated			Moderated Model Age			Effect
		β	R^2	f^2	β	R^2	f^2	
Attitudinal	H6a	0.570	0.603	0.203	0.149	0.765	0.018	Strengthen
Satisfaction	H6b	-0.094		0.007	0.286		0.066	
Normative	H6c	0.194		0.039	-0.043		0.002	
Control	H6d	0.159		0.027	-0.264		0.051	

While the moderator factor of age negatively impacted the normative and control and turned it into the negative relationship of (β=-0.264) and (β=-0.043). However, while the effect of age as moderating factor to normative is not significant (f^2=0.002), surprisingly there is a significant effect to control even though it is considered small where the value of (f^2=0.051). As for attitudinal a lower efficiency as compared to non-moderated model as the path coefficient (β=0.149) lower than the moderating factor of gender and non-moderated model but insignificant where the effect (f^2 = 0.018) does not meet the minimum requirement of f^2>0.02 (Chin et al., 2003).

4.7.3 Testing the Moderating Effect of Education

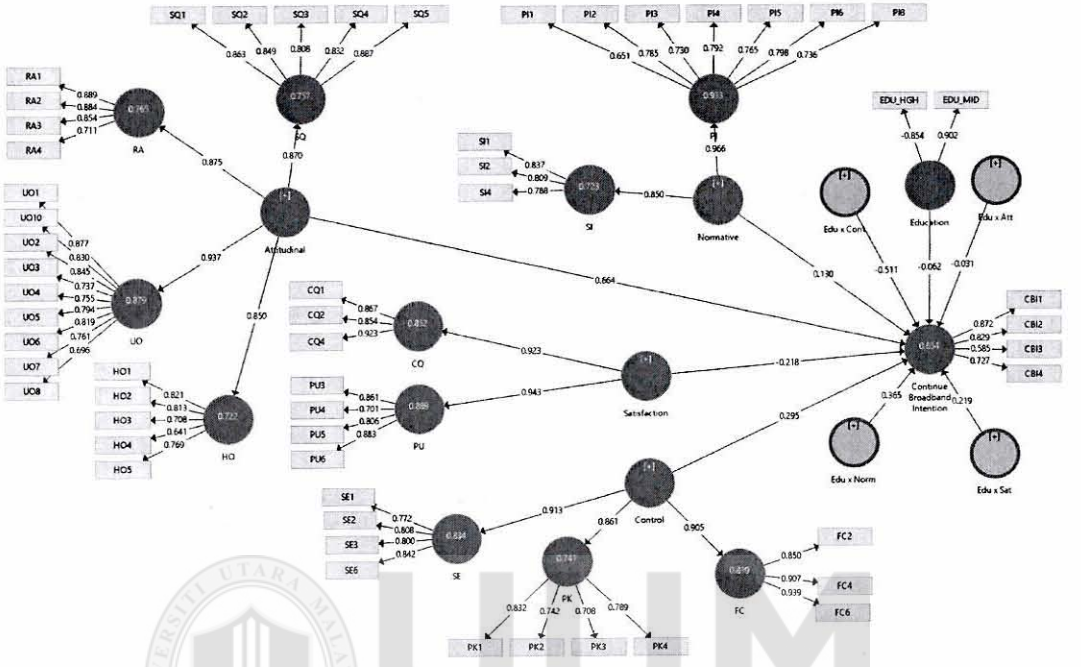

Figure 4.7
Moderated path model of education towards CBI

Based on the analysis shown in Figure 4.7, the R^2 for the moderated model reported in table 4.14 is 0.654 higher as compared to non-moderated (R^2=0.603) The path coefficient for satisfaction profoundly affected as the (β=-0.218) lower from the original path model with the small effect of (f^2=0.02). The path coefficient for habit in the moderated model is 0.156, and non-moderated model is 0.164. The path code-client for personal innovativeness in the moderated model is -0.057 and non-moderated model are -0.0589.

Table 4.14
Summary of Results for Moderating Factor of Education

Construct	Hypothesis	Non Moderated			Moderated Model Education			Effect
		β	R^2	f^2	β	R^2	f^2	
Attitudinal	H7a	0.570		0.203	0.664		0.170	
Satisfaction	H7b	-0.094	0.603	0.007	-0.218	0.654	0.020	Strengthen
Normative	H7c	0.194		0.039	0.130		0.010	
Control	H7d	0.159		0.027	0.295		0.055	

The path code-client for satisfaction and perceived usefulness x habit in the moderated model is -0.0223 (t = 0.9708). The path code-client for satisfaction and perceived usefulness x personal innovativeness in the moderated model is -0.0334 (t = 1.5965). The moderating t-statistics for both moderators indicate that neither moderators are statistically significant and the effect size f2 is 0.0086 which does not meet the threshold to be considered as not affecting the CBI. The conclusion made is based on Chin et al. (2003) suggestion that the threshold for (f2 > 0.02) to have a small effect.

4.8 The Goodness of Fit of the Whole Model

As an opposite of CBSEM approach, PLS Structural Equation Modeling has only one measure of goodness of fit. The simulation by Henseler and Sarstedt (2013) shows that the GoF and the GoFrel are not suitable for model validation. As compared to CBSEM which aims at estimating parameters such that the empirical and the model-implied covariance matrices are as "close" as possible to one another, while PLS path modeling aims at maximizing "explained variability" between variables (manifest or latent) (Henseler & Sarstedt, 2013 p.572). As concluded by Fornell and Bookstein (1982) and Henseler and Sarstedt (2013) that is, whereas CBSEM is the method of choice for theory-

testing while PLS path modeling is primarily prediction-oriented especially with the existence of moderating factor.

4.9 Summary of the Findings

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed as the technique for analysis in this study. In this chapter, an elaborate treatment of the PLS-SEM mechanism analysis technique was given for the reason that PLS is a new analysis technique in construction. Before testing the model of this research, rigorous steps were followed to establish the reliability and validity of the outer model as a standard reporting in SEM data analysis. After proving the validity and reliability of the measurement model, the hypothesized relationships were tested. After examining the hypothesized relationships between constructs, the predictive power of the model was examined and reported followed by testing the goodness of the overall model which was confirmed. The last procedure was examining the structural model, and the results were reported in details as shown in Table 4.15 followed by the summary of effect size by Table 4.16. From the summary, of IPM chart shown by Figure 4.8, it shows the importance of normative and attitudinal construct that need to focus upon, while satisfaction as the second factor; whereby control constructs as the least among the variables towards the continue broadband intention.

Table 4.15
Summary of Results of the Hypothesis

Hypothesis	Hypothesis Path	Decision
H1	There is a positive relationship between the Attitudinal construct of the users and Continue Broadband Intention.	Supported
H2	There is a positive relationship between the Normative construct of the users and Continue Broadband Intention.	Supported
H3	There is a positive relationship between Control construct of the users and Continue Broadband Intention.	Supported
H4	There is a relationship between Satisfaction construct of the users and Continue Broadband Intention.	Not Supported
H5	Demographic factor of gender will moderate the relationship with Continue Broadband Intention	Supported
H6	Demographic factor of age will moderate the relationship with Continue Broadband Intention	Supported
H7	Demographic factor of education will moderate the relationship with Continue Broadband Intention	Supported

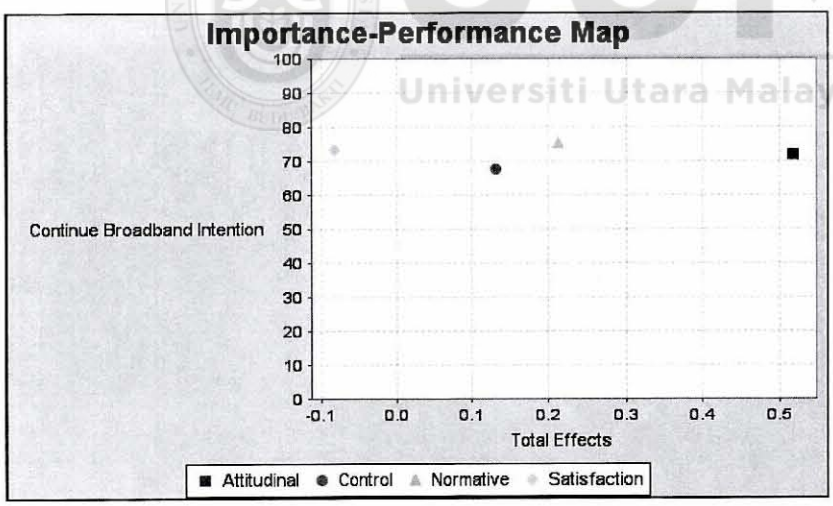

Figure 4.8
Important-Performance Map (IPM)

The summary of effect size (f2) for moderated model as shown by the following Table 4.16.

Table 4.16
Summary of effect size for moderating effect of demographic

Hypothesis	Hypothesis Path	Effect size (f^2)
H5a	Demographic factor of gender will moderate the Attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No Effect
H5b	Demographic factor of gender will moderate the Satisfaction construct and Continue Broadband Intention to use broadband techno logy among the public telecentre users.	No effect
H5c	Demographic factor of gender will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No effect
H5d	Demographic factor of gender will moderate the Normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No effect
H6a	Demographic factor of age will moderate the Attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	Small effect
H6b	The demographic factor of age will moderate the Satisfaction construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No effect
H6c	The demographic factor of age will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	Small effect
H6d	The demographic factor of age will moderate the Normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No effect

Table 4.16 *(Continue)*

Hypothesis	Hypothesis Path	Effect size (f^2)
H7a	The demographic factor of education will moderate the Attitudinal construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	Medium
H7b	The demographic factor of education will moderate the Satisfaction construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	Small
H7c	The demographic factor of education will moderate the Control construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	No effect
H7d	The demographic factor of education will moderate the Normative construct and Continue Broadband Intention to use broadband technology among the public telecentre users.	Small

CHAPTER FIVE

CONCLUSION

5.1 Introduction

This chapter provides a summary of the study. The first part of this chapter summarizes the study beginning with the issues and the motivations behind the research, then followed by evaluating the research objectives, the research design, and ends with the statistical analysis procedures used. It also discusses the results of statistical tests in the previous chapter, and highlights the contribution of the study and explains the results' potential implications. The last parts report the limitations of this study and highlight the possible directions for future research.

5.1.1 Summary of the Study

This study was mainly conducted to determine the contributing factors for continue broadband intention among the users of Internet Center in Malaysia (Pi1M). It is an important aspect to be assessed since previous studies, and the previous report found the household broadband penetration (HBP) is still inconsistent in a particular region or state in Malaysia despite a consistent effort by the government to increase it (MCMC, 2015). Therefore, failure to understand and identify the contributing factors for continuous broadband intention will cause the government to spend something unnecessary that will lead to significant losses regarding human and capital investment. The model that is proposed in this study is about the contributing factors for the continuous broadband intention that will lead to the continued usage of broadband technology among the users

of internet centers. This study had tested all the potentials factor randomly such as RA, UO, HO, SQ, PI, SI, FC, PK, SE, PU and CQ based on the proposed model and previous literature to proposed sample who are representing all Pi1M's users. At the same time three demographic factors such as age, gender and education were used on the determinant factor as the moderating effect was also examined. The summaries of results of the proposed hypotheses are shown in the Table 4.16. The findings of the hypothesized results are discussed in this chapter while findings from the previous researchers are used to support or disprove the significance of this research finding. Hence, the subsequent sections present the discussions of the outcome of hypotheses.

Thus, based on the problem of this study in Chapter 1 and the comprehensive review of the relevant literature in Chapter 2, this study aimed to achieve the following primary objectives:

1. To investigate the relationship between Attitudinal Construct and the continued intention to use broadband among the users of public telecenter in Malaysia.

ii. To investigate the relationship between Normative Construct and the continued intention to use broadband among the users of public telecenter in Malaysia.

iii. To investigate the relationship between Control Construct and the continued intention to use broadband among the users of public Telecenter in Malaysia.

iv. To investigate the relationship between Satisfaction and the continued intention to use broadband among the users of public telecenter in Malaysia

vi. To analyses the moderating effect of demographic onto the continue broadband intention of using broadband among the public telecenter users.

5.2 Discussion of Hypotheses Testing

The discussion of hypotheses testing focuses on the primary and moderating effects which show the interactions between all the contributing factors for continuous broadband intention among the users of internet center in Malaysia.

5.2.1 Discussion of Main Effect Hypotheses

The main effect of hypotheses explaining the relationships between the identified factors such as Attitudinal, Normative, Control and Satisfaction towards the continued intention of using broadband technology. It was then followed by the analysis of demographic factors towards continuing broadband intention.

5.2.1.1 Relationship between Attitudinal Construct and Continue Broadband Intention (H1)

Hypothesis testing H1 supports the relationship between attitudinal construct factors and continue broadband intention. In the context of this study, the attitudinal construct is defined as the degree in which youth in the rural areas believes that using a broadband technology will give benefits in performing some activities (Venkatesh et al., 2012; Venkatesh et al., 2003). Moreover, the measurement of attitudinal towards user continues intention to use broadband technology yielded by four measures such as relative advantage, utilitarian outcome, hedonic outcome and service quality. Therefore, the positive relationship between attitudinal and continuing intention to use broadband in this study shows that the continuance of broadband intention among the users of internet

center in Malaysia would be actualized. Furthermore, the study's result implies that improving the attitude of the users of internet centers by enhancement of their activities would improve and strengthen their behavior towards broadband technology continuous usage. It means that the users of internet center in Malaysia would have positive behavior towards continuous usage of broadband technology once they believe that broadband technology brings positive to the criteria of relative advantage, utilitarian, hedonic and service quality. The statistically significant result of hypothesis H1 on the relationship between an attitudinal factor of the users and their continued intention to use broadband. On the other hand, the result of the hypothesis shows that the attitudinal factor will influence the use of broadband technology in their daily activities once they believe that acquiring the broadband technology will assist in their tasks and as motivating factor towards the use of ICT through their belief that the ICT usage will benefit their daily activities. Thus, this study also reveals that the users will use and continue to subscribe broadband if more focus is given on the of RA, UO, HO, and SQ where their behavior towards buying broadband service will increase and will finally affect their mind towards the continuous usage of broadband technology.

5.3.1.3 Relationship between Normative Construct and Continue Broadband Intention (H2)

The hypothesis testing H3 support the relationship between normative influence and user's behavior towards continuing broadband intention among the household and

internet center users. In this study, the normative construct which contains the primary and secondary influence as the extent to which a user believes that important people believe that he or she should use a broadband technology in their rural areas (Venkatesh et al., 2012; Venkatesh et al., 2003). The obtained result reveals that user behavioral intention of using broadband technology is influenced by the pair groups or specified personalities such as families and friends. This is an indication that behavioral intention grown towards the continuous usage of broadband technology is not a personal decision of individual users especially in an era of social media. This result is supported by the previous researchers Hamari and Koivisto (2015); Ogara, Koh, and Prybutok (2014) that social influence impacted the user behavioral intention of technology like broadband. Research has shown that induction of others personality either from the parent, pair group or respected people in the rural areas to build behavioral intention towards usage of technology. Nowadays as social media usages are at peak, constant developments in technology have revolutionized social media usage among consumers (Kiran & Vasantha, 2016). Social media can be easily adopted and has a huge mass base, and it is there for very important for that marketers, content creators and advertisers consider it as an integral part of communication as it has impacted and transformed the role of the internet in lives of people. At the same time, this study has the same result research by Ooi et al., (2011) on the primary influence the result shown in Table 4.16 emphasize the primary influence as the key driver in increasing the overall penetration rate, especially in developing countries.

5.3.1.4 Relationship between Control Construct and Continue Broadband Intention (H3)

This control constructs factor towards the context of continue broadband intention as the extent to which facilitating condition, perceived knowledge, and self-efficacy is viewed as being the determining factor. One of the factor facilitating condition is defined as the degree to which a user believes that there are technical and infrastructure supports to use broadband technology. The hypothesis testing H4 supports the relationship between control construct and the user continue broadband intention. This result suggests that the better the facilities provided in the internet center, the more broadband technology that they are using for their daily activities. The facilities provided by PiIM will retain the values and as an exposer for the future intention of the users to use broadband. Also, if the user's perception that the knowledge that they have and skills to use computers or internet will make the users have mindset to use broadband by their own in the future (Cho, Cheng, & Hung, 2009). At this level, the interpretation of this result is that the users of internet center, do not require any external support either technically or infrastructural for using broadband internet. Indeed, this could result from the status of our respondent's majorities are having previously using broadband. Furthermore the respondent have SPM as minimum education. In contrast, if the facilities such as low internet provided in the center users find it difficult to transmit large data and cannot enjoy the patronage of the users. Hence, facilitating condition of broadband technology is necessary for the users to determine its long-term usage. Besides that, the empirical result obtained in hypothesis H4 on the relationship between control construct towards continue broadband intention is in line with suggestion of some researchers. There are

studies by Cho et al., (2009) Dwivedi et al., (2009) and Azizi et al., (2014) that found behavior of users of technology towards its long-term usage relies on the self-efficacy of that technology to retain the continue intention. Furthermore, the result obtained in H4 is in line with some researchers, such as (Kok Wai, 2012; Sipior et al., 2011) who confirmed that nowadays youth are so intelligent that they can provide a solution to many of the difficulties they encounter while using new gadgets.

5.3.1.2 Relationship between Satisfaction Construct and Continue Broadband Intention (H4)

Satisfaction is the primary predictor of continued usage intention and can be predicted by many factors (Gumussoy, 2016). In this study the factor of service quality and content quality was measured the Hypothesis testing (H4) however not support the relationship between satisfaction and user's continues broadband intention. The result shows that the satisfaction negatively influences the user behavioral intention towards continuous broadband usage. This result implies that users of PiIM have reverse behavior to continue subscription of broadband technology on the simplicity of having good service and content quality from the internet center. Furthermore, a related study by (Deng et al., 2010) who studied on loyalty proven the results that satisfaction is much related to customer loyalty. Thus by increasing the degree of customer satisfaction through improved service quality and interesting content provided by internet center (PiIM) the dependency of the users to the center will increase that may reduce their intention to pay more or have their broadband services. The findings also may result in the users switching cost as reported in Deng et al., (2010), where switching cost has a significant effect on customer loyalty. This study also, therefore, reveals that the users also

concerned about the benefits they will obtain if they are not using the broadband technology from the internet center.

5.3.1.5 Moderating factor of gender towards the relationship of Continue Broadband Intention (H5)

The fifth hypothesis is moderating effect of gender on the relationship towards continue broadband intention. For that purpose, the causal model analysis was conducted the moderating variable of demographic (gender) to test the moderating effects. The outcome shown in Table 4.16 reveals that the moderating effect of gender had strengthened the effect of satisfaction, normative and control factor towards continuing broadband intention with higher path coefficient but attitudinal reduced to β=0.273 from β=0.570. This suggest that the dimensions is consistent with the literatures on technology adoption by Zhou et. al., (2011) and Kiran & Vasantha (2016) which suggest that demographic of gender is significant in determining attitude for information search especially through social media. In general, this study contributes some insights to the policymakers and broadband service providers in the Malaysia. In a nutshell, the overall findings have proven the association of gender as moderating factor on the relationship of continues broadband intention. The linkage and the result between these variables provide a new empirical contribution to academic knowledge and practitioners.

5.3.1.6 Moderating factor of age towards the relationship of Continue Broadband Intention (H6)

In this hypothesis the moderating effect of age on the relationship towards continue broadband intention. The outcome is shown in Table 4.16 that the moderating effect of age had also strengthened the effect of attitudinal, satisfaction, normative and control

factor towards continue broadband intention. Comparing the variables, the users of the age that we measure are the most satisfied however at the result may be the difference. This may validate the study by Kekolahti et al., (2014) where communications services (can be related to internet or broadband services) such as SMS, e-mail, and Facebook & Twitter are becoming less relevant as the age increases, except for phone call.

5.3.1.7 Moderating factor of education towards the relationship of Continue Broadband Intention (H7)

The 7th hypothesis of this study about moderating effect of age on the relationship towards continues broadband intention had resulted as shown in Table 4.16. This study had confirmed a study by Tsai and LaRose (2015) that education as one of the significant predictors of broadband intentions where this study found education strengthen the effect of attitudinal, satisfaction, normative and control factor towards continue broadband intention. However, from the same table, the study found a negative impact from the users on satisfaction factors where the path coefficient β dropped from (-0.094) to (-0.218). It seems that the user is in this age group has lesser continue broadband intention even though highly satisfied the services provided by Pi1M. This study may be similar to another study by Cruz-Jesus et al., (2016) where the study is found that high or low educated people have different scores on the dimensions of intention. In a nutshell, the overall findings of the moderating factor of demographics have proven the association between gender, age and education have strengthened the relationship between attitudinal, normative and control towards continuing broadband intention. The linkage between these variables provides a new empirical contribution to academic knowledge and practitioners.

5.3 Research Objectives Achieved

The research objectives of this study are to develop and validate a model for continuous usage of broadband technology. The research objective derived in chapter one has been achieved and presented which comprises of four contributing factors. The subsequent sections explain the moderating effect of each demographic factor in details.

5.3.1 Research Objective 1

"To determine the relationship between Attitudinal Construct and the continuing broadband intention of household users in Malaysia."

The objective of this study that was derived from the review of previous works was achieved. To determine the relationship between attitudinal construct and the continuing broadband intention, hypothesis H1 were tested. This study found all the data have supported the hypotheses as shown in Table 4.15. The construct above expressed that both all the four latent variables for attitudinal are significant with utilitarian outcome chalked the highest path coefficient of β=0.937 while hedonic outcome the lowest. The value reveals that the users are thinking the internet is beneficial in enhancing the effectiveness of typical daily activities of the consumer that will determine their continue broadband intention. Hedonic factor has the least profound impacts consequences for the household user because hedonic factor or the degree of pleasure is the least factors among attitudinal construct that derives the consumer from continuing use of broadband internet. After all, from utilitarian construct scores, it suggests that the broadband penetration could be improved by improving the user's experience and their awareness on how broadband technology improve their daily activities either for work or studies.

5.3.2 Research Objective 2

"To determine the relationship between Normative Construct and the continuing broadband intention of household users in Malaysia"

Next objective of this study based on hypothesis H2, the effect of the normative construct and its relationship with continuing broadband intention were examined. As illustrated in same Table 4.15, the relationship between normative construct and continue broadband intention was positive with the significant relationship at the 0.05 significant level, therefore, supporting the hypothesis H3 (β= 0.198, t=3.806, p<0.000). This study found the users of Pi1M have linear and positive relationship towards continuing broadband intention where the primary and secondary influence are also determining their decision to subscribe to broadband internet in line with the previous study by Hong et al., (2008) where the results also highlight the importance of attitude and normative beliefs. In this study, among the two latent variables under normative, the latent variables of primary influence gives higher path coefficient β=0.966. As for a comparison, the primary influence can be translated as higher effect to continue broadband intention as compared to secondary influence. The result is also similar to the study by Gimpel et al., (2016) found users of existing technology like smartphone have a stronger belief that people at their status level with the same career, education, income, age should be using the same.

5.3.3 Research Objective 3

"To determine the relationship between Control Construct and the continuing broadband intention of household users in Malaysia"

The third objective of this study on hypothesis H3, the effect of the control construct and its relationship with continuing broadband intention were examined. As illustrated in the Table 4.15, the relationship between control construct and continue broadband intention was positive with the significant relationship at the 0.05 significant level, therefore, supporting the hypothesis H4 (β= 0.159, t=3.062, p<0.000). This study found the users of PiIM have linear and positive relationship towards the continue broadband intention where the facilitating condition, self-efficacy, and perceived knowledge are also determining their decision to subscribe to broadband internet. In this study, among the three latent variables under control construct, self-efficacy chalked the highest β=0.913 as compared to perceived knowledge which scores the lowest. The scores reveal the importance of individuals beliefs about the benefits of the broadband internet they must first believe that they can use the service provided by internet center to achieve their objectives. However, this study in contrast with the study by Hill et al., (2014) and Stern et al., (2009) that found prior knowledge and self-efficacy do not contribute to broadband penetration. The result may be the indication that for continue broadband intention, the users of internet center expect more than the basic usage of broadband internet for them to subscribe their broadband internet services.

5.3.4 Research Objective 4

"To determine the relationship between Satisfaction and the continuing broadband intention of household users in Malaysia"

Next objective of this study regarding the effect and the relationship between satisfaction and continue broadband intention were examined by hypothesis H2. As illustrated in Table 4.15 in Chapter 4, the relationship between satisfaction and continue broadband intention was found to be negative, but the relationship is not significant at the 0.05 level of significance, therefore, not supporting the hypothesis H4 (β= -0.094, t=1.425, $p<0.05$). This study found the users have opposite reaction towards the continue broadband intention even as oppose with the satisfaction of using services in the internet center. Among the two latent variables under satisfaction construct, the latent variables of perceived usefulness recorded higher path coefficient of β=0.943 as compared to the content quality. The path coefficient value reveals that the users are thinking the service provided by Pi1M is beneficial to them in enhancing the effectiveness of their work and studies. However the higher the satisfaction level of the users to the Pi1M service that will lead to a positive and linear relationship where the level of attachment of the users to the internet center will be higher. This will leads to a lower intention to subscribe broadband services due to very high dependencies to the internet center.

5.3.5 Research Objective 5

"To identify the moderating effect of demographic onto the continuing broadband intention of household users in Malaysia"

Many studies have examined the socio-economic characteristics of broadband adopters. For example, a study on broadband penetration by Hill et al., (2014) finds that there is a correlation between the rate of internet use and consumer age on the one hand, and broadband penetration, on the other. This objective was achieved by analyzing group comparison using PLS-SEM. The moderating effect of demographic and continue broadband intention was established on the proposed hypotheses and supported, where it is in line with the studies by (Dholakia, 2006) whereas the increased of internet access became pervasive, the overall gender bias has narrowed on the relationship towards the continued usage of broadband technology. When examined hypothesis H5, comparing between gender and the result ran using Smart-PLS, this study found females are strengthening the factor to continue broadband intention as compared to males. The result of hypothesis H5 is contradicting with the study by Tsai and LaRose (2015) where the finding on gender which was found as unrelated to broadband intentions but similar with the study by Hill et al., (2014) that find genders significantly related to the intention to use internet technology. As for hypothesis H6, unlike the study by Tsai and LaRose (2015) found that the demographic variables age was inversely related to broadband intentions, that is, younger respondents had stronger intentions than older ones. However, this study finds the users in the specific age group of between 24-34 years old strengthening the relationship of continuing broadband intention as compared to the

younger and older group. In hypothesis H7, the finding in this study is similar to Tsai et al., (2015) where education was positively related to the continue broadband intention which the results qualify these factor as a moderating factor. As recommended by Baron and Kenny (1986) moderator variables are typically introduced when there is an unexpectedly weak or inconsistent relation between a predictor and a criterion variable, p.58.

5.4 Implication of Research

This study is timely in its context and contributes in several ways to enrich existing body of knowledge. Fundamentally, the findings in this study contribute to the body of knowledge in the form of theoretical, practical and methodological connotation. The subsection of this section at this moment focuses on discussing the above mentioned respectively. Finding from this study proved to have valuable consequences policy makers, service providers, solution integrators and future researchers. The proposed research model was tested in the context of internet centers established by MCMC as the assumption arrived from previous literature reviews. This research can be immense importance in telecommunication and service providers in Malaysia as they face an intense competitive challenge in the context of providing solution and broadband services.

5.4.1 Contributions to the Body of Knowledge

In this study, many insights concerning the issues related to continuing broadband intention for household have arisen. The present study, as to date, is one of the very few studies conducted in Malaysia to examine the joint effect of ATT, NRM, CTL and SAT

on a household that represents the users of Pi1M towards CBI. Also, this study is an attempt to expand the boundary of the currently existing knowledge in the literature by examining the moderating effect of demographic factors such as gender, age and education on the continue broadband intention using PLS-SEM analysis. Therefore, by integrating the relationship of ATT, NRM, CTL and SAT and CBI, this study had many contributions to the literature and practice. In the next following sub-sections, some contributions were elaborated of this study.

5.4.2 Contributions to the Literature

This study is conducted to increase the understanding of the relationship between ATT, NRM, CTL and SAT with moderating effect of demographic towards CBI. According to the results of the previous studies, the study's framework was developed and used as an instrument to examine the hypothesized relationships. In Chapter 1, the significance of this study has been discussed that derived the contributions as follows.

First, this study demonstrated the importance of ATT, NRM, and CTL in determining the broadband penetration, particularly for households. Also, it contributed theoretically to the ATT, NRM and CTL literature by reexamining the unresolved matter concerning the relationship between these factors not only to broadband penetration but to continue broadband intention and longtime usage. Even though consistent result among the researchers in the literature regarding of these factors of on broadband penetration, continue intention on broadband subscription was called for further discussion and investigation. Moreover, this study contributed significantly to the literature by integrating the effective ATT, NRM, and CTL as the factors of household's behaviors to

the theoretical model to better explain the variance in the construct of continuing broadband intention.

Second, this study reported an unsupported hypothesis of SAT factor towards continuing broadband intention. However, even though some of the previous studies showed that the effect of SAT on continue intention of technology are expected, but in this study, the result is something that is unexpected which have negative effects and not significant on continuing broadband intention. Hence, this result showed that SAT would be the factor that needs to be considered and to be looked into hence to speed up and positively penetrate the broadband services in the household. One of the reasons for the negative effect of SAT on the continue broadband intention as the users feels very comfortable and highly satisfied with the PiIM services that create dependencies especially to continue subscription to a paid broadband internet services. The study has also provided empirical evidence on the role of demographic factors as a moderator on the relationship between attitudinal, satisfaction, normative and control to continue broadband intention. While most previous studies have mainly focused on investigating the key MATH model factors of ATT, NRM and CTL to broadband continue intention besides demographic and moderating factor. Thus this study incorporated satisfaction from Information System (IS) continuous usage model and three selected demographic factors as a moderator on these relationships for the following reasons. Firstly, this study acknowledges the disciplinary divides and emphasizes the need for a transdisciplinary approach for two reasons including: (i) the complexity of the problem; and (ii) the need to utilize values, theoretical innovations and methodological innovations that surpass discipline-specific

approaches to a problem. Next, the key models and ideas from different disciplines have been combined to form new relationships between the disciplines; together they provide an opportunity to increase household broadband penetration. The theoretical outcome of this research is the identification of the significant factors influencing users to continue their subscription of broadband technology. In turn, this has led to the identification of specific measurement and recommendation to MCMC to advice or makes engagement with the service provider of PiIM to support knowledge and awareness and to enhance the training module for the users. Improving the knowledge of users might promote the opportunity to increase the relative advantage and might increase continue broadband intention.

5.4.3 Methodological Contribution

In examining the developed model, this study employed the Smart PLS technique that permits assessment of the adequacy of the measurement model and the structural model. Smart PLS has been gaining popularity in social studied especially technology adoption related studies, even though only a few studies used that to examine the model with additional variables to explain the e-government service continuance intention. Thus, findings, of this study imply that Smart-PLS can be used to analyze the proposed model to examine household broadband penetration and continue broadband intention related issues in Malaysia. In addition to the hypotheses testing and the model testing, this study conducted a rigorous analysis of the validation instrument. Majority of the previous studies depend on the traditional instrument validation such as factor analysis and Cronbach alpha coefficient. These kinds of instruments are not sufficient in the current

complex needed analysis. More specifically, the present study used Partial Least Squares Structural Equation Modeling (PLS-SEM) approach to validate the measurement model and testing the hypothesized relationships. Thus, this study can be considered as one the very few thesis and studies that employed the approach of PLS-SEM to analyze the measurement model goodness of fit and testing the proposed hypotheses.

5.4.4 Contributions to the Policy-makers

New insights from this study provide a policy with mechanisms to increase, sustain and at the same time to have a balanced growth of household broadband penetration in all state of Malaysia. Specifically, this thesis identified that the education level and gender factor are the useful factors to help increase continue broadband intention and household broadband penetration. In particular, we tested the moderating factor of these two factors could lead the policy-makers to decide what is the attraction for motivating them to continue using the broadband internet. The outcomes of this study could be used to advise policy-makers how to improve and transform PiIM. Instead of being just an internet center, policy-makers could use this study to focus on improving the relative advantage and perceive usefulness. PiIM should become a gateway and transformation center for usage of broadband internet and social media as a tool to achieve their ultimate goal in the study, work or in daily life.

5.4.5 Contributions to Industry

The outcomes of this thesis identify the behaviors and external forces that important factors promoting result in increasing continue broadband intention and household broadband penetration. To support improvement in users daily application, service

provider or telecommunication provider should work together with solution provider for customer-centric applications that close to users' daily activities that increase the relative advantage. Even though nowadays abundance of mobile application available that could be beneficial to the users, PiIM could use their premise as a ground for giving exposure to the users that will increase their dependency on broadband. To do this, service provider, particularly the telecommunication operator, must examine how their users interact with their broadband and their traffic pattern, to provide mechanisms to assist them with their everyday practices by gender, age and education level. For example, a service provider could investigate how the users interact with their broadband internet based on the application that users used most, hence operator could recommend the users through email or pop up of the landing page based on their age, gender or education level. This thesis has indicated several interventions that could play a key role in providing the broadband users and its households this support.

5.5 Limitation and suggestions for Future Research

Despite the fact that, this study provides good insights and several contributions; there are still some limitations that should be considered when discussing the results of the study.

5.5.1 Scope of study

First, the scope of the present study was limited to the users of PiIM but not other private internet center or PPI center developed by state government or Nongovernment Organisation. This limitation can pertain generalizability of the results of the study. It is showed that the present study adopts cross-sectional methods in which all elements other than the questions were not captured. At the same time, cross-sectional method has

limited to which the findings of the study can only be generalized to the population at particular time. Therefore, future research needs to go for longitudinal study research that may take longer period.

5.5.2 Research Method

As the case of quantitative research methods, the respondents were requested to translate their perception based on statement in the survey questionnaire into numbers through Likert scale. These answers may be influenced by the biased perception of the situation (Macinati, 2008). At the same time, the questionnaire findings would have been strengthened if it had been possible to also supplement them using interviews and this supporting tool had to be abandoned due to the limitations of time and resources. The findings would also have been reinforced if the research had been a longitudinal one. The data for this research has been collected over a short period of time and provides a snapshot. However, it could be expanded over a longer period of time to offer a longitudinal study. Further justification for undertaking a longitudinal study is the reasoning that the elimination of any variables could achieve anomalies in the obtained results. From this study also recommends that future research design should consider mixed research design. In other words, quantitative and qualitative research designs to be employed in the future research to complement each other.

5.5.3 Findings of the results

Finally, this study found no significant result for satisfaction and moderating effect of gender on the relationship as per the hypothesis. For moderating effect of gender, possibly some moderating effect of gender could also be supported if the population are

also included private internet center where majority of the users are males. A deeper analysis suggests more complex patterns in use on the relationship of gender where nowadays women who have access to the Internet at work and at home, there appears to be "time competition" that limits their use of the Internet at home but not at work (Dholakia, 2006). For satisfaction in which found has negative relationship to the continue broadband intention, follow Wulandri et al.,(2015) researcher suggest satisfaction to become a mediation factor on to the effect of continue broadband intention. Further to that, this suggestion is supported by another study Hsiao et al.,(2016) where the study found significant effect of satisfaction as mediating factor eventhough the it failed to demonstrate PU as a critical element in consumers' decisions.

5.6 Conclusion

In conclusion, the inconsistent continue broadband intention that motivate subscription and usage among the household will remain one of the main issues related to the development of the country. Therefore, understanding the factors to enhance the willingness to continue subscription has been the attention of all policymakers in the government, decision makers and product owner or service provider the developing countries, including Malaysia. In the literature, it has been widely acknowledged the important of continue broadband intention to overcome low HBP, where normative found as the most effective strategies that can assist in increasing HBP by the usage of social media. Service provider could offer interesting package of social media application such as Facebook, Whatsapp and Wechat to retain these customer's subscription. At the same time increasing the usage of secondary influence of advertisement either online or offline

will attract users to maintain the subscription. The other factor on attitudinal also important as it confirm that it can enhance continue broadband intention and to achieve higher household broadband penetration. As a heart of attitudinal factors, relative advantage plays an important role in enhancing the attitudinal through personal experience using broadband in their daily activities. In this study, further analysis for the moderation of demographic that can explain in a better way the relationship between attitudinal, satisfaction, normative and control as the factors and continue broadband intention from the other side. However the unsupported results of satisfaction due to loyalty and cost issues to use for the users to use broadband especially at home will trigger new implemented strategies and practices.

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APPENDICES

Appendix A: Application Letter to MCMC

Pusat Pengajian Pengurusan Technology dan Logistik
(School of Technology Management and Logistics)
Universiti Utara Malaysia, Sintok 06010 Kedah Darul Aman
Tel: +604-9287001, +604-9287002 Fax:+604928-7070
email: stml@uum.edu.my. http://stmlportal.net

Ketua Jabatan Komuniti Digital Pintar
Suruhanjaya Komunikasi dan Multimedia Malaysia (MCMC)
MCMC Tower 1, Jalan IMPACT, Cyber 6
63000 Cyberjaya,
Selangor Darul Ehsan, Malaysia
U/P: Tuan Haji Mohd Fadhillah Bin Mohd Nor

Melalui;
Prof. Madya Dr Mustakim Bin Melan
Ketua Jabatan, Pusat Pengajian Pengurusan Technology dan Logistik
Universiti Utara Malaysia, Sintok, 06010,
Kedah Darul Aman, Malaysia

Tuan;
Per: Memohon Kebenaran Menjalankan Kaji Selidik di Pusat Internet 1Malaysia (Pil M) dan KTWIM

Dengan segala hormatnya perkara diatas adalah dirujuk. Dengan ini kami kumpulan penyelidik dari Universiti Utara Malaysia (UUM) yang diketuai oleh saya Abdul Rahman Bin Mohamad Saleh, memohon kebenaran dari pihak tuan untuk menjalankan kaji selidik di pusat Pil M bagi projek thesis PhD yang bertajuk "Kajian Hubungan Diantara Pembinaan Sikap dan Penggunaan Berterusan Jalur Lebar di Malaysia dengan faktor Penyederhanaan Demografik ".

2. Soal selidik ini terdiri daripada beberapa soalan yang akan diberikan kepada pengguna Pil M yang akan dipilih secara kaedah "random sampling" di Pil M yang akan ditentukan. Soalan kajiselidik ini akan diedarkan samada dengan secara salinan keras (hardcopy) ataupun melalui online di alamat website yang akan diberikan secara mail elektronik kepada responden.

3. Segala kerjasama dan perhatian dari pihak tuan kami dahului dengan ucapan jutaan terima kasih

Yang Benar

(Abdul Rahman Bin Mohamad Saleh)

Appendix B: Approval Email From MCMC

Abdul Rahman Bin Mohamad Saleh

From:	Noor Hidayah Abd Rahman <noor.hidayah@cmc.gov.my>
Sent:	Tuesday, August 23, 2016 9:57 AM
To:	Abdul Rahman Bin Mohamad Saleh; abdul_rahman_m.saleh@oyagsb.uum.edu.my
Cc:	Mohd Fadhillah Mohd Nor; Sharina Md Deris; Hasniza Idris
Subject:	*RE: Permohonan untuk menjalankan kaji selidik di Pusat Internet 1Malaysia (PI1M)*
Attachments:	Langkah mendapatkan maklumat pegawai PI1M.pdf; Senarai Pusat Internet 1Malaysia_ Julai 2016.xlsx
Follow Up Flag:	Follow up
Flag Status:	Flagged

As Salam En. Abdul Rahman,

Merujuk kepada perbualan kelmarin, disertakan senarai Pusat Internet 1Malaysia (PI1M) di seluruh Negara yang telah dikategorikan mengikut Negeri dan Wilayah, setakat Julai 2016.

Untuk makluman Tuan juga, setiap PI1M mempunyai laman web masing-masing. Sekiranya pihak Tuan memerlukan maklumat Pegawai PI1M untuk dihubungi, pihak Tuan boleh melawati laman web PI1M tersebut, seperti langkah yang diterangkan melalui lampiran yang disertakan.
Walaubagaimanapun, sekiranya maklumat tersebut tidak lengkap/ tidak dapat dihubungi, pihak Tuan boleh memaklumkan kepada saya untuk mendapatkan maklumat tambahan.

Sebarang pertanyaan, pihak Tuan boleh menghubungi saya di talian 03-8688 8241.

Sekian, terima kasih.

Regards,

Noor Hidayah Abd Rahman
Smart Digital Communities Department (SDCD)
Digital Communities & Program Coordination Division
Malaysian Communication & Multimedia Commission (MCMC)
Tel: 03-86888241 Faks: 03-86881005
HP: 019-6003269

From: Abdul Rahman Bin Mohamad Saleh [mailto:SRAHMAN@maxis.com.my]

Appendix C: Summary of Modified Variables

Sources	Codes	Researcher's modifications
Relative Advantage (Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010))	RA1	Broadband internet service in public telecenters has advantage over other access because it offers faster access to Internet
	RA2	Broadband internet services in public telecenters has advantage because it provides faster download of files from Internet
	RA3	Broadband internet services in public telecenter has an advantage because it offers always-on access to Internet
	RA4	Broadband internet services have an advantage because user can use the phone line while connected to the Internet
Utilitarian Outcome (Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	UO1	Broadband internet services in public telecenter can be useful to find educational materials and accessing library resources from anywhere
	UO2	Broadband internet services in public telecenter can be useful for distance learning
	UO3	Broadband internet services in public telecenter is helpful to perform work-related tasks from anywhere
	UO4	Broadband internet services in public telecenters help me communicate better via email, chat, Webcam and social media like WhatsApp or others
	UO5	Broadband internet services in public telecenters help in performing personal and household activities such as online shopping
	UO6	Broadband internet services in public telecenters help in performing personal and household activities such as information search
	UO7	Broadband internet services in public telecenters is helpful to establish and operate a home business
	UO8	Broadband internet service in public telecenter help children to do their homework
	UO9	Subscribing to my broadband internet is compatible with most aspects of my everyday life
	UO10	Overall broadband in public telecenter is useful to other members of the family and me
Hedonic Outcome (Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	HO1	I always enjoy using broadband in public telecenters to listen and download music
	HO2	I always enjoy using broadband in public telecenters to watch real-streaming movies
	HO3	I always enjoy using broadband in public telecenters to download movies using point to point (p2p) (ex. Torrent, LimeWire) application
	HO4	I enjoy using broadband in public telecenters to play online games
	HO5	I enjoy using broadband in public telecenters to connect to social media

Service Quality (Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	SQ1	I am satisfied with the speed of internet access in the public telecenters
	SQ2	I am satisfied with the security measures provided with internet access in the public telecenters
	SQ3	I obtained satisfactory customer support by the staff of public telecenter whenever I needed it
	SQ4	I obtained satisfactory technical support by the staff of public telecenter whenever I needed it
	SQ5	The overall service quality of internet services in public telecenters is satisfactory
Perceived Usefulness	PU1	Using broadband internet in public telecentres will improve my performance in managing my personal life
	PU2	Using broadband internet in public telecentres will improve my performance in performing my work/study
(Davis et al., 1992; Hsiao, Chang, & Tang, 2016)	PU3	Using broadband internet in public telecenter will increase my productivity in managing my personal life.
	PU4	Using broadband internet in public telecenter will increase my productivity in managing my work/study.
	PU5	Using broadband internet in public telecenters will enhance my effectiveness in managing my personal life
	PU6	Using broadband internet in public telecenters will enhance my effectiveness in managing my work/study.
Content Quality	CQ1	Telecenters provides me with various information
	CQ2	Telecenters provides me with various services
Shin, (2009B), Liou, Hsu, & Chih, (2015)	CQ3	The information that I can get from public telecenters are valuable
	CQ4	The services that I can get from public telecenters are valuable
Primary Influence	PI1	After using public telecenter, my friends think that I should subscribe my broadband internet
	PI2	After using public telecenter, my friends think that I should continue my current broadband internet subscription
(Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	PI3	After using public telecenter, my colleagues think that I should subscribe to broadband internet
Primary Influence	PI4	After using public telecenter, my colleagues think that I should continue my current broadband internet subscription
	PI5	My family members (i. e. Parents, spouse, kids or relatives) think that I should subscribe my Broadband internet services
	PI6	My family members (i.e., Parents, spouse, kids) think that I should continue my current broadband internet services
	PI7	People in my community that use telecentre have more prestige
	PI8	In general, my community has supported the use of telecentre

Secondary Influence	SI1	Advertisement in TV encourages me to continue subscribe
Venkatesh, 2003; Dviwedi & Jyoti , 2005;	SI2	Advertisement in Radio encourages me to continue to subscribe broadband internet
Dwivedi, Mustafee, Williams, & Lal, 2010);	SI3	Newspaper advertising encourages me to continue to subscribe broadband internet
(P. T. Chen & Hsieh, 2012)	SI4	Internet advertising encourages me to continue to subscribe broadband internet
	SI5	Government's agencies campaign encourages me to continue to subscribe broadband internet
Facilitating Condition Technology	FC1	Current PC in Public Telecenters is good enough to access the Internet
Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	FC2	There is no problem of broadband internet availability in my locality
	FC3	My annual household income level is enough to afford to subscribe to broadband internet
	FC4	It is not too costly to purchase a new computer or to upgrade my old computer
	FC5	It is not too costly for me to subscribe or to continue my subscription to broadband internet at its current subscription fee
	FC6	I would be able to subscribe to broadband internet if I wanted to
Perceived Knowledge,	PK1	I do not have difficulty in explaining why to continue using broadband internet is beneficial
Venkatesh, 2003; Dviwedi & Jyoti, 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	PK1	I know how broadband internet is different from other broadband internet connection
	PK2	I know the benefits that can be offered from broadband internet services
	PK3	I know the benefits that cannot be obtained if not using broadband internet in public telecenter
	PK4	I would feel comfortable using the broadband internet on my own
	SE1	I would feel comfortable using the broadband internet on my own
	SE2	Learning to operate the broadband internet is easy for me
Self-Efficacy	SE3	I understand how to use broadband internet
	SE4	I can use broadband internet proficiently
	SE5	I can use broadband internet service freely even though those who teach me how to use the service is not around me.
	SE6	If I have manual and handbook explaining making help use broadband internet service, I can use the service without any help

Continue Broadband Intention Venkatesh,2003; Dviwedi & Jyoti , 2005; Dwivedi, Mustafee, Williams, & Lal, 2010)	BCI1	In the future, I will continue using broadband internet services in public telecenter
	BCI2	In the future, I will subscribe (or will add more bandwidth) onto my broadband subscription.
	BCI3	In the future, will stop using the broadband internet in public telecenter.
	BCI4	In the future, I intend to continue using my broadband subscription
	BCI5	I do not plan to continue using the broadband service in the future

Appendix D: Research Questionnaire

Questionnaire

Dear Sir/Madam,

As public telecenter (PilM) users, you are kindly invited to participate in a nationwide survey research. It is being conducted by Mr.Abdul Rahman M Saleh from School of Technology Management and Logistic Universiti Utara Malaysia (UUM) Sintok, Kedah Darul Aman. The aim of this research is to "Investigate The Relationship of Attitudinal Construct Towards Continuance of Broadband Intention in Malaysia". The questionnaire consists of some questions that should take approximately 15 minutes to complete. Please tick all appropriate answers, and if your answer is not displayed, then please state your answer in the "other" option category. Participation is voluntary, and you may omit any questions that you do not wish to answer. If you have any questions about this study, please contact the researcher at the following address: Mr. Abdul Rahman Bin Mohamad Saleh, Ph.D. Student, School of Technology Management and Logistic Northen University of Malaysia (UUMI) Sintok, Kedah Darul Aman email: abdul_rahman_m.saleh@oyagsb.uum.edu.my or msrahman45@gmail.com or handphone: (+6012)-3000370. To confirm the validity of this research, you may contact School of Technology Management and Logistic Universiti Utara Malaysia (UUM), Sintok, Kedah Darul Aman at email:mustakim@uum.edu.my. We would like to take this opportunity to thank you for your time and patience in completing this questionnaire.

Note: In this questionnaire, the term dial-up/narrowband refers to the Internet connection that offers a speed below 1Mbps per second. Broadband refers to a high speed, always on and un-metered Internet connection. The offered speed is above 1Mbps per second. The term un-metered refers to a fixed subscription fee and metered means cost per usage

BROADBAND CONTINUE INTENTION SURVEY

SECTION A (You are willingly and able to answer in English Yes ☐ No ☐)

Please stop here if your answer is NO or you are below 18 years old.

1. Who are you in your family?

☐ Head of household ☐ Wife / Spouse ☐ Son/daughter

☐ Parent ☐ Relative Spouse ☐ Son/daughter-in-law

☐ Relative ☐ Others (Please specify)._____

2.. What age group do you belong to?

☐ Under 16 ☐ 25-34 ☐ 45-54 ☐ above 65

☐ 18-24 ☐ 35-44 ☐ 55-64

3. Gender

☐ Male ☐ Female

4. Highest level of education

☐ PMR/PT3 ☐ Certificate ☐ Undergraduate/ Higher Diploma

☐ SPM/STPM ☐ Diploma ☐ Postgraduate

5. What is your occupation?

☐ Directors, doctors, lawyers, professors

☐ Managers, teachers, computer programmers

☐ Junior managerial, supervisory, cleForemen, shop assistants, office workers)

☐ Electricians, mechanics, plumbers and other crafts)

☐ Machine operators, assembly, cleaning

☐ Pensioners, casual workers, unemployed, students

☐ Others (Please specify) _____

7. Other than accessing broadband internet in public telecenters do you have Internet access at home?

☐ Yes (Please complete all the remaining question)

☐ No (Please go to question 9)

If you have Internet access, what type of service that you are subscribing?

☐ Narrowband or dial-up modem

☐ Broadband with DSL/ADSL

☐ Wireless/Mobile Broadband (Edge/ 3G/ HSDPA/ LTE 4G)

☐ Broadband with CABLE MODEM/UNIFI

☐ Other (Please specify)...

8. How long have you been accessing the Internet for

☐ Less then 12 Month ☐ 25-36 Month ☐ Others (Please state)

☐ 12-24 Month ☐ More than 36 Month

9. If you do not have Internet access at home, then where else do you obtain access it?

☐ University or college ☐ Local library ☐ Internet Cafe

☐ Workplace/ Office/ School ☐ Other (Please specify): _____

10. What are the 3 (three) websites that you like to visit most?

11. Do you have any suggestion how the services in Public telecenter could be improved?

12. **Your Name or email address / hp num (Optional)** : _____ / _____

CONTINUE BROADBAND INTENTION SURVEY

SECTION B

Note: Broadband is the technology that enables fast internet services at minimum speed of 128kbps						
Please indicate the degree to which you agree or disagree with statement base on Likert scale 1 to 5 on the scale of 1=Strongly Disagree and 5 = Strongly agree (SA)						
ATTITUDINAL CONSTRUCT						
	Broadband service in public telecentre has advantage over other access because it offers faster access to Internet	1	2	3	4	5
	Broadband services in public telecentre has an advantage over other access because it provides faster download of files from Internet	1	2	3	4	5
	Broadband services in public telecenter has an advantage over other access because it offers always-on access to Internet	1	2	3	4	5
	Broadband has an advantage over dial-up / narrowband because I can use the phone line while I connected to the Internet	1	2	3	4	5
	Broadband service in public telecenter can be useful to find educational materials and accessing library resources from anywhere	1	2	3	4	5
	Broadband services in public telecenter can be useful for distance learning	1	2	3	4	5
	Broadband services in public telecenter is helpful to perform work-related tasks from anywhere	1	2	3	4	5
	Broadband services in public telecenter help me communicate better via email, chat, Webcam and social media like WhatsApp or others	1	2	3	4	5

	Broadband services in public telecenter help in performing personal and household activities such as online shopping	1	2	3	4	5
	Broadband services in public telecenter help in performing personal and household activities such as information search	1	2	3	4	5
	Broadband services in public telecenter is helpful to establish and operate a home business	1	2	3	4	5
	Broadband service in telecenter help children to do their homework	1	2	3	4	5
	Subscribing to broadband is compatible with most aspects of my everyday life	1	2	3	4	5
	Overall broadband in public telecenter is useful to other members of the family and me	1	2	3	4	5
	I always enjoy using broadband in public telecenter to listen and download music	1	2	3	4	5
	I always enjoy using broadband in public telecenter to watch real-streaming movies	1	2	3	4	5
	I always enjoy using broadband in public telecenter to download movies using p2p application	1	2	3	4	5
	I enjoy using broadband in public telecenter to play online games	1	2	3	4	5
	I enjoy using broadband in public telecenter to connect to social media	1	2	3	4	5
	I am satisfied with the speed of Internet access in the public telecenter	1	2	3	4	5
	1 am satisfied with the security measures provided with Internet access in the public telecenter	1	2	3	4	5
	1 obtained satisfactory customer support by the staff of public telecenter whenever I needed it	1	2	3	4	5

	1 obtained satisfactory technical support by the staff of public telecenter whenever I needed it	1	2	3	4	5
	The overall service quality of internet services in public telecenter is satisfactory	1	2	3	4	5
SATISFACTION						
	Using broadband in public telecenter will improve my performance in managing my personal life	1	2	3	4	5
	Using broadband in public telecenter will improve my performance in performing my work/study	1	2	3	4	5
	Using broadband in public telecenter will increase my productivity in managing my personal life.	1	2	3	4	5
	Using broadband in public telecenter will increase my productivity in performing my work/study.	1	2	3	4	5
	Using broadband in public telecenter will enhance my effectiveness in managing my personal life	1	2	3	4	5
	Using broadband in public telecenter will enhance my effectiveness in managing my work/study.	1	2	3	4	5
	Telecentres provides me with various information	1	2	3	4	5
	Telecentres provides me with various services	1	2	3	4	5
	The information that I can get from a public telecenter is valuable	1	2	3	4	5
	The services that I can get from a public telecenter are valuable	1	2	3	4	5
NORMATIVE CONSTRUCT						
	After using public telecenter, my friends think that I should subscribe my broadband	1	2	3	4	5
	After using public telecenter, my friends think that I should continue my current broadband	1	2	3	4	5

	subscription					
	After using public telecenter, my colleagues think that I should subscribe to broadband	1	2	3	4	5
	After using public telecenter, my colleagues think that I should continue my current broadband subscription	1	2	3	4	5
	My family members (i. e. Parents, spouse, kids or relatives) think that I should subscribe my broadband services	1	2	3	4	5
	My family members (i.e., Parents, spouse, kids) think that I should continue my current broadband services	1	2	3	4	5
	People in my community that use telecentre have more prestige	1	2	3	4	5
	In general, my community has supported the use of telecentre	1	2	3	4	5
	Advertisement in TV encourages me to continue to subscribe broadband	1	2	3	4	5
	Advertisement in Radio encourages me to continue to subscribe broadband	1	2	3	4	5
	Newspaper advertising encourages me to continue to subscribe broadband	1	2	3	4	5
	Internet advertising encourages me to continue to subscribe broadband	1	2	3	4	5
	Government's agencies campaign encourages me to continue to subscribe to broadband	1	2	3	4	5
CONTROL CONSTRUCT						
	Current PC in Public Telecentres is good enough to access the Internet	1	2	3	4	5

	There is no problem of broadband Internet availability in my locality	1	2	3	4	5
	My annual household income level is enough to afford to subscribe to broadband	1	2	3	4	5
	It is not too costly to purchase a new computer or to upgrade my old computer	1	2	3	4	5
	It is not too costly for me to subscribe or to continue my subscription to broadband at its current subscription fee	1	2	3	4	5
	I would be able to subscribe to broadband if I wanted to	1	2	3	4	5
	I do not have difficulty in explaining why to continue using broadband is beneficial	1	2	3	4	5
	I know how broadband is different from dial-up/narrowband internet	1	2	3	4	5
	I know the benefits that can be offered by broadband services	1	2	3	4	5
	I do not know the benefits that cannot be obtained if I am not using broadband services	1	2	3	4	5
	I would not feel comfortable using my broadband Internet	1	2	3	4	5
	Learning to operate the broadband Internet is easy for me	1	2	3	4	5
	I understand how to use broadband Internet	1	2	3	4	5
	I can use broadband internet proficiently	1	2	3	4	5
	I can use broadband internet service freely even though those who teach me how to use the service is not around me	1	2	3	4	5

	If I have manual and handbook explaining making help use broadband internet service, I can use the service without any help	1	2	3	4	5
CONTINUE BROADBAND INTENTION						
	In the future, I will continue using broadband internet services in public telecenters.	1	2	3	4	5
	I intend to subscribe to (or continue my current subscription) broadband in the future	1	2	3	4	5
	I intend to continue using broadband but will use or continue using my broadband	1	2	3	4	5
	I intend to use (or intend to continue use) broadband Internet service in the future	1	2	3	4	5
	I do not plan to continue using the broadband service in the near future	1	2	3	4	5

Appendix E: Skewness and Kurtosis Result

Item	Mean	Std. Deviation	Excess Kurtosis	Skewness
RA1	4.031	0.965	0.989	-1.051
RA2	3.842	0.857	-0.655	-0.261
RA3	4.148	0.759	-1.232	-0.254
RA4	4.114	0.880	1.950	-1.140
UO1	4.352	0.830	4.690	-1.827
UO2	4.262	0.868	3.031	-1.489
UO3	4.197	0.829	0.138	-0.848
UO4	4.047	0.877	-0.307	-0.645
UO5	3.938	0.856	2.276	-1.201
UO6	4.034	0.939	1.226	-1.065
UO7	4.218	0.857	0.417	-1.004
UO8	4.145	0.927	2.039	-1.349
UO9	4.065	0.708	0.416	-0.533
UO10	4.117	0.881	2.842	-1.461
HO1	4.036	0.863	2.460	-1.260
HO2	3.705	1.051	-0.273	-0.704
HO3	3.598	0.828	-0.543	-0.069
HO4	3.469	0.947	0.175	-0.673
HO5	4.096	0.866	2.143	-1.148
SQ1	4.062	0.953	-0.307	-0.792
SQ2	3.956	0.821	0.379	-0.764
SQ3	3.873	0.931	0.718	-0.788
SQ4	3.933	0.858	-0.681	-0.339
SQ5	4.052	0.929	1.528	-1.155
PU1	4.067	0.720	-1.069	-0.102
PU2	4.137	0.836	0.448	-0.904
PU3	3.992	0.853	2.957	-1.292
PU4	4.047	0.800	-0.093	-0.572
PU5	3.816	1.055	-0.074	-0.808

PU6	4.329	0.736	1.372	-1.116
CQ1	4.179	0.926	2.320	-1.445
CQ2	4.016	0.801	-0.107	-0.544
CQ3	3.759	0.796	-0.347	-0.252
CQ4	4.223	0.787	-0.084	-0.737
PI1	3.961	0.702	0.124	-0.261
PI2	3.984	0.751	3.704	-1.262
PI3	4.028	0.699	1.820	-0.861
PI4	3.964	0.794	2.409	-1.087
PI5	4.010	0.723	3.816	-1.253
PI6	4.031	0.826	2.555	-1.219
PI7	3.969	0.761	0.487	-0.655
PI8	4.179	0.766	4.437	-1.496
SI1	4.047	0.797	1.988	-0.978
SI2	4.000	0.741	4.877	-1.534
SI3	4.083	0.817	-0.084	-0.641
SI4	4.132	0.706	0.458	-0.593
SI5	4.106	0.753	0.090	-0.580
FC1	4.132	0.955	1.574	-1.269
FC2	3.624	1.139	-0.478	-0.526
FC3	3.845	0.859	-0.385	-0.434
FC4	3.655	1.155	-0.713	-0.382
FC5	3.769	0.920	-0.732	-0.309
FC6	3.865	1.029	-0.200	-0.600
PK1	3.806	0.920	-0.605	-0.428
PK2	3.793	0.910	-1.208	0.069
PK3	4.008	0.874	2.010	-1.136
PK4	3.790	0.925	0.512	-0.637
SE1	3.873	0.862	-1.190	0.004
SE2	3.775	0.884	1.165	-0.900
SE3	3.860	1.013	0.276	-0.871
SE4	3.865	0.900	-0.846	-0.266
SE5	3.902	0.742	-1.171	0.160

SE6	4.114	0.865	2.249	-1.186
BCI1	4.288	0.816	-0.149	-0.861
BCI2	4.083	0.740	0.059	-0.519
BCI3	4.073	0.827	3.442	-1.433
BCI4	4.262	0.620	-0.619	-0.245
BCI5	4.277	0.747	0.510	-0.876

Appendix F: Multi-collinearity statistic

Construct	VIF	Decision
CQ	1	Meet
FC	1	Meet
HO	1	Meet
PI	1	Meet
PK	1	Meet
PU	1	Meet
RA	1	Meet
SE	1	Meet
SI	1	Meet
SQ	1	Meet
UO	1	Meet
Attitudinal	4.076	Meet
Satisfaction	3.022	Meet
Control	2.369	Meet
Normative	2.561	Meet

Appendix G : Factor loading and standard deviation

Construct	Original Sample (O)	Sample Mean (M)	(STDEV)	T Statistics	P Values
CBI1 <- Continue Broadband Intention	0.818	0.822	0.013	60.615	0.000
CBI2 <- Continue Broadband Intention	0.818	0.818	0.015	52.928	0.000
CBI3 <- Continue Broadband Intention	0.658	0.645	0.067	9.900	0.000
CBI4 <- Continue Broadband Intention	0.645	0.648	0.029	22.104	0.000
CBI5 <- Continue Broadband Intention	0.560	0.499	0.084	6.165	0.000
CQ1 <- CQ	0.867	0.865	0.019	45.661	0.000
CQ1 <- Satisfaction	0.774	0.772	0.025	30.483	0.000
CQ2 <- CQ	0.854	0.853	0.017	51.577	0.000
CQ2 <- Satisfaction	0.815	0.813	0.020	40.196	0.000
CQ4 <- CQ	0.923	0.923	0.007	126.006	0.000
CQ4 <- Satisfaction	0.853	0.853	0.016	52.729	0.000
FC2 <- FC	0.850	0.849	0.014	59.648	0.000
FC2 <- Control	0.748	0.749	0.020	37.074	0.000
FC3 <- Control	0.787	0.787	0.017	45.001	0.000
FC4 <- FC	0.907	0.905	0.012	72.718	0.000
FC4 <- Control	0.764	0.763	0.022	34.277	0.000
FC6 <- Control	0.911	0.911	0.008	114.397	0.000
FC6 <- FC	0.939	0.939	0.004	246.690	0.000
HO1 <- HO	0.821	0.815	0.029	28.280	0.000
HO1 <- Attitudinal	0.616	0.609	0.065	9.427	0.000
HO2 <- HO	0.813	0.811	0.024	34.262	0.000
HO2 <- Attitudinal	0.594	0.590	0.054	11.037	0.000
HO3 <- HO	0.708	0.705	0.029	24.275	0.000
HO3 <- Attitudinal	0.508	0.505	0.041	12.294	0.000
HO4 <- HO	0.641	0.637	0.035	18.541	0.000
HO4 <- Attitudinal	0.407	0.404	0.055	7.388	0.000
HO5 <- HO	0.769	0.771	0.019	41.064	0.000
HO5 <- Attitudinal	0.892	0.891	0.015	61.040	0.000
PI1 <- PI	0.651	0.653	0.028	23.435	0.000
PI1 <- Normative	0.592	0.594	0.032	18.463	0.000
PI2 <- PI	0.785	0.779	0.035	22.580	0.000
PI2 <- Normative	0.755	0.749	0.040	18.671	0.000
PI3 <- PI	0.730	0.729	0.031	23.835	0.000

PI3 <- Normative	0.697	0.696	0.034	20.746	0.000
PI4 <- PI	0.792	0.789	0.031	25.627	0.000
PI4 <- Normative	0.781	0.777	0.032	24.422	0.000
PI5 <- PI	0.766	0.760	0.038	20.347	0.000
PI5 <- Normative	0.755	0.750	0.039	19.546	0.000
PI6 <- PI	0.798	0.794	0.028	28.368	0.000
PI6 <- Normative	0.767	0.763	0.033	22.956	0.000
PI8 <- PI	0.736	0.728	0.044	16.644	0.000
PI8 <- Normative	0.721	0.712	0.048	15.064	0.000
PK1 <- PK	0.832	0.832	0.014	61.085	0.000
PK1 <- Control	0.739	0.739	0.025	29.580	0.000
PK2 <- PK	0.743	0.742	0.021	36.144	0.000
PK2 <- Control	0.669	0.668	0.032	21.188	0.000
PK3 <- PK	0.708	0.703	0.049	14.581	0.000
PK3 <- Control	0.582	0.577	0.060	9.714	0.000
PK4 <- PK	0.789	0.788	0.028	28.328	0.000
PK4 <- Control	0.649	0.646	0.042	15.363	0.000
PU3 <- PU	0.861	0.860	0.014	61.900	0.000
PU3 <- Satisfaction	0.722	0.722	0.020	36.278	0.000
PU4 <- PU	0.701	0.699	0.028	25.140	0.000
PU4 <- Satisfaction	0.712	0.709	0.030	23.607	0.000
PU5 <- PU	0.806	0.805	0.020	39.374	0.000
PU5 <- Satisfaction	0.785	0.783	0.031	25.643	0.000
PU6 <- PU	0.883	0.883	0.012	75.491	0.000
PU6 <- Satisfaction	0.841	0.841	0.011	79.996	0.000
RA1 <- RA	0.889	0.888	0.013	66.820	0.000
RA1 <- Attitudinal	0.754	0.753	0.031	24.264	0.000
RA2 <- RA	0.884	0.884	0.009	93.427	0.000
RA2 <- Attitudinal	0.736	0.736	0.017	42.648	0.000
RA3 <- RA	0.854	0.855	0.012	70.140	0.000
RA3 <- Attitudinal	0.690	0.693	0.021	32.571	0.000
RA4 <- RA	0.711	0.708	0.037	19.159	0.000
RA4 <- Attitudinal	0.734	0.730	0.038	19.427	0.000
PI2 <- Normative	0.755	0.749	0.040	18.671	0.000
SE1 <- SE	0.772	0.770	0.025	30.377	0.000
SE2 <- SE	0.808	0.803	0.032	25.551	0.000
SE2 <- Control	0.667	0.662	0.045	14.850	0.000
SE3 <- SE	0.800	0.799	0.022	36.740	0.000
SE3 <- Control	0.776	0.774	0.024	32.662	0.000

SE6 <- SE	0.842	0.841	0.018	46.450	0.000
SE6 <- Control	0.823	0.821	0.023	35.763	0.000
SI1 <- SI	0.836	0.835	0.020	42.167	0.000
SI1 <- Normative	0.736	0.732	0.035	20.934	0.000
SI2 <- SI	0.809	0.804	0.035	23.029	0.000
SI2 <- Normative	0.677	0.669	0.058	11.587	0.000
SI4 <- SI	0.789	0.786	0.026	30.795	0.000
SI4 <- Normative	0.654	0.649	0.040	16.290	0.000
SQ1 <- SQ	0.863	0.863	0.014	60.465	0.000
SQ1 <- Attitudinal	0.771	0.771	0.020	38.286	0.000
SQ2 <- SQ	0.849	0.848	0.015	58.362	0.000
SQ2 <- Attitudinal	0.689	0.687	0.029	23.519	0.000
SQ3 <- SQ	0.808	0.806	0.024	34.322	0.000
SQ3 <- Attitudinal	0.711	0.709	0.033	21.834	0.000
SQ4 <- SQ	0.832	0.832	0.014	58.702	0.000
SQ4 <- Attitudinal	0.647	0.646	0.025	25.895	0.000
SQ5 <- SQ	0.887	0.885	0.013	69.115	0.000
SQ5 <- Attitudinal	0.843	0.840	0.022	37.690	0.000
UO1 <- UO	0.877	0.876	0.018	47.481	0.000
UO1 <- Attitudinal	0.887	0.885	0.018	50.394	0.000
UO10 <- UO	0.831	0.828	0.027	31.217	0.000
UO10 <- Attitudinal	0.745	0.741	0.039	19.094	0.000
UO2 <- UO	0.845	0.841	0.024	35.421	0.000
UO2 <- Attitudinal	0.805	0.801	0.031	26.204	0.000
UO3 <- UO	0.736	0.736	0.026	28.173	0.000
UO3 <- Attitudinal	0.669	0.667	0.035	19.163	0.000
UO4 <- UO	0.755	0.755	0.025	30.423	0.000
UO4 <- Attitudinal	0.655	0.654	0.036	18.260	0.000
UO5 <- UO	0.794	0.792	0.031	25.955	0.000
UO5 <- Attitudinal	0.755	0.752	0.036	21.031	0.000
UO6 <- UO	0.818	0.817	0.026	31.513	0.000
UO6 <- Attitudinal	0.786	0.785	0.031	25.436	0.000
UO7 <- UO	0.761	0.760	0.024	31.748	0.000
UO7 <- Attitudinal	0.707	0.706	0.028	25.529	0.000
UO8 <- UO	0.696	0.691	0.052	13.478	0.000
UO8 <- Attitudinal	0.639	0.634	0.054	11.796	0.000