A MODIFICATION OF THE UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) FROM USERS' PERSPECTIVES OF TELECENTRE IN NIGERIA

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Abstrak

Telecentre merupakan ruang fizikal yang menyediakan akses maklumat dan teknologi komunikasi kepada golongan dalam masyarakat yang tidak berkemampuan. Kajian terkini menunjukkan bahawa inisiatif seperti ini telah mula dilaksanakan di negara-negara maju. *Telecentre* merupakan kaedah yang kos efektif bagi menghubungkan akses kepada komputer dan Internet. Mengenal pasti faktor yang mempengaruhi penerimaannya merupakan cabaran utama untuk menjayakan pelaksanaannya. Antara faedah penting *telecentre* termasuk literasi digital dan penjanaan pekerjaan. Walaupun *telecentre* dapat memberikan faedah tertentu, kajian yang melihat penerimaannya di Nigeria agak terhad. Tambahan pula, model penerimaan teknologi terdahulu boleh dipertikai penggunaannya dalam menjelaskan secara berkesan penerimaan teknologi. Persoalan juga timbul sama ada terdapat faktor lain yang mempengaruhi penerimaannya. Kajian ini bertujuan untuk menentukan faktor yang mempengaruhi penerimaan *telecentre* berdasarkan Teori Bersepadu Penerimaan dan Penggunaan Teknologi (UTAUT). Model penerimaan *telecentre* yang dicadangkan mengandungi sembilan pemboleh ubah terpendam iaitu tujuh pemboleh ubah eksogen dan dua pemboleh ubah endogen. Sebanyak 375 soal selidik telah diagihkkan melalui satu tinjauan kepada responden di enam buah *telecentre* yang terletak di tiga zon di Nigeria. Daripada jumlah ini, 203 soal selidik telah dikembalikan, mewakili kadar respon sebanyak 54%. Pemodelan Persamaan Berstruktur digunakan untuk menyelidik hubungan penyebab dan penyederhana antara pemboleh ubah terpendam. Dapatan kajian menunjukkan empat penentu teras iaitu Jangkaan Prestasi, Pengaruh Sosial, Keberkesanan Pengurusan, dan Keberkesanan Program mempengaruhi secara signifikan niat menerima *telecentre*. Penentu teras lain iaitu Niat Gelagat dan Keadaan Pemudah didapati menentukan secara signifikan Penggunaan Pengguna. Jantina, umur, dan kaum didapati menyederhana hubungan antara pemboleh ubah terpendam. Berdasarkan dapatan yang diperoleh, satu model penerimaan yang dikenali sebagai model UTAUT yang diubah suai berdasarkan telecentre dicadangkan. Dapatan kajian mempunyai implikasi terhadap kajian akan datang dan praktis dari segi pembangunan dan pelaksanaan *telecentre*.

Kata kunci: Jurang digital, Telekomunikasi, Niat gelagat, Pemodelan persamaan berstruktur

Abstract

Telecentres are physical space that provides public access to information and communication technology to some members of underserved communities. Recent studies have shown that the initiative is spreading among developing countries. A telecentre offers cost-effective means of bridging access to Computer and Internet. Identifying the factors that influence its acceptance represents a fundamental challenge to its successful implementation. Primarily, among numerous benefits of telecentres include digital literacy and employment generation. However, despite these benefits limited studies have been conducted to examine its acceptance in Nigeria. Moreover, it is doubtful whether prior information technology acceptance models can be effectively used to examine its acceptance. Questions also arise if there are other factors that influence its acceptance. The objective of this study was to determine the factors that influence the acceptance of telecentres based on the Unified Theory of Acceptance and the Use of Technology (UTAUT). The proposed model of telecentre acceptance consists of nine latent variables, namely, seven exogenous variables and two endogenous variables. A total of 375 questionnaires were distributed through a survey to respondents in six telecentres located in the three zones in Nigeria, out of which 203 questionnaires were returned, representing 54% response rate. A Structural Equation Modelling was used to investigate the causal and moderating relationships between the latent variables. The results showed four core determinants of Performance Expectancy, Social Influence, Management Effectiveness and Program Effectiveness significantly influence intention towards telecentre acceptance. Two core determinants, Behavioural Intention and Facilitating Conditions, were found to significantly determine User Acceptance. Gender, age and ethnicity were found to moderate the relationships between the latent variables. Based on the result obtained, a model of acceptance known as a modified UTAUT based telecentre model is proposed. The findings have implications both for future research and practice of telecentre development and implementation.

Keywords: Digital divide, Telecommunication, Behavioral intention, Structural equation modeling

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Table of Contents

List of Tables

List of Figures

List of Appendices

Glossary of Terms

Universal Service mean that the entire designated population can privately subscribe to and use a particular telecommunication at a reasonable minimum quality of service at an affordable rate on an individual household or institutional basis (USPF, 2009a).

Universal Access signifies that everyone in the community can gain access to a public telecommunication services although not necessarily at homes basis (USPF, 2009a).

Un-served areas Geographic areas in which universal coverage for a particular basic USPF service cannot be obtained on demand (USPF, 2009a).

Underserved areas Geographic areas, in which there is some coverage of at least 5% for a particular basic USPF service but it cannot be obtained universally (USPF, 2009a).

Community literarily means a group of interacting people who shares common values attribute with social cohesion, living in a common place within a shared geographical area.

Sub-Saharan Africa refers to geographical area of African countries partially situated south of the Sahara, in which the general population is blacks. Arabic commentators in the past referred to this region as *bilâd as-sûdân*, literarily means land of the black (Edward, 1982).

List of Abbreviations

AGFI	Adjusted Goodness-of-Fit Index
AMOS	Analysis of Moment Structure
ANX	Anxiety
AVE	Average Variance Extracted
BI	Behavioral Intention
CDMA	Code Division Multiple Access
CFA	Confirmatory Factor Analysis
CFI	Confirmatory Fit Index
CCC	Community Communication Centre
CVA	Competing Value Approach
DBI	Digital Bridge Institute
DOI	Diffusion of Innovation Theory
DSL	Digital Subscriber Line
EE	Effort Expectancy
EFA	Exploratory Factor Analysis
ENDO	Endogenous Variable
EXO	Exogenous Variable
FC	Facilitating Condition
GOF	Goodness-of-Fit
IFI	Incremental Fit Index
MIS	Management Information System
IT	Information Technology
ITU	International Telecommunication Union
KMO	Kaiser-Meyer-Olkin
MEF	Management Effectiveness
NITEL	Nigeria Telecommunication Limited
NPOs	Non-Profit-Organizations
PE	Performance Expectancy
PHCN	Power Holding Company of Nigeria
RMSEA	Root Mean Square Error Approximation
SEM	Structural Equation Modeling
SI	Social Influence
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
TLI	Tucker-Lewis-Index
TRA	Theory of Reasoned Action
UA	User Acceptance
UTAUT	Unified Theory of Acceptance and Use
VOIP	Voice Over Internet Protocols
VSAT	Very Small Aperture Terminal
X^2/DF	Chi-square per degree of freedom

CHAPTER ONE
INTRODUCTION

This chapter presents a brief introduction on Nigeria, the geographical settings and the compositions of its major ethnic groups. The research begins by highlighting the background of the study, the problem statement and the research questions with the research objectives including the scope of the research. The discussions on the rationale of the research and the research structure are presented.

1.1 Background of the Study Context

Nigeria occupies a unique position among African countries located within the West Coast of Africa; it occupies a landmass of about 923,768 square km. The country is bordered by Benin Republic in the West, Gulf of Guinea which forms part of the Atlantic Ocean in the South West, Niger Republic in the North, Chad Republic in the North East and Cameroon Republic in the East. Nigeria is the most populous, multi religious and ethnically diverse country in Africa, endowed with more than 250 ethnic groups (Aborishade & Munt, 1999). The population of Nigeria was estimated at above 150 million people, most of whom are rural dwellers (Salawu, 2010; Muganda, Bankole & Brown, 2008). The three major zones of Nigeia (North, South West and South East) are divided into 36 states; the states are further sub-divided under six geopolitical zones with a total of 774 local government areas (LGAs). The three main ethnic groups in Nigeria and their compositions include: Hausa/Fulani constituting 29% in the North, the Yoruba's mainly in the South West constitutes 21%, while the Igbo's in the South East represent 18%. Other minorities groups constituting about 32% could be found

throughout the country (Aborishade & Munt, 1999). Nigeria is a member of the Commonwealth Countries, and English is the official language.

Nigeria is not an exception of the trend in most of the developing countries, which had to face the wave of telecommunication liberalization. The consequence of the scenario led to privatization of the state own telecommunication company, resulting to absolute infringement on the monopoly of government in the telecommunication sector (Marc, 2006). The phenomenon has facilitated the penetrations of information and communication technology (ICT) in the urban areas and cities across the country. Until now, most of the developing nations have challenges of access to good road and limited access to telecommunications infrastructure. Further, the disparity in terms of infrastructural deployments between urban and rural communities is alarming (Kari, 2007). On the basis of this, communities that are located far away from major urban and semi-urban areas remain at disadvantage from socio-economic including the opportunities for development offered by new ICT. Whilst, those communities that are in proximity to major cities and towns have the prospect to develop socially and economically (Paolo, 2009).

Rural area face challenges in terms of ICT penetration and adoption (Kari, 2007). For instance, despite the liberalization of telecommunication sub-sector in Nigeria in 1990's, the rate of Internet diffusion is slow compared to spread of mobile telephone. Recent report has shown that only 28.7% of Nigerians used Internet (IWS, 2011). Kari (2007) found that rural populations in Nigeria are at disadvantage position in term of access to "Info-structure" such as fixed telephone line or Internet connection. This is contrary to

the Universal Service Obligation charter in which basic ICT should be available, accessible and affordable to all on nondiscriminatory basis, irrespective of the status of the citizens. It is in line with the apparent absence of extending ICT to rural areas in Nigeria that the effect of this inequality as reported by Universal Service Provision Fund from the following perspectives:

1. A geographic ICT divide resulting in unequal access between and among states and their commercial, urban and rural areas (the most prominent of the geographic ICT divides is among different rural areas).

2. A service/technology ICT divide that differentiate Nigerians by the type of ICT services available to them; only a small percentage of the population enjoy access to advanced services like voice over internet protocols (VOIP), broadband Internet access, and internet-based e-commerce services.

3. A usage and usage quality divide which differentiate on the level of ICT adoption; usage and application; and knowledge building.

The inequality of access, distribution and use of information and communication technologies (ICTs) among two or more populations are called Digital divide (Wilson, 2006). These termed was originally coined in the mid-1990s, focusing on the worrying disparities in terms of access to information technology (Castells, 2002). Van Dijk (2006) defines the digital divide as "the gap between those who do and those who do not have access to computers and internet. The problem of digital divide as described by former UN's Secretary General Koffi Annan (2002) as follows:

> *The new information and communication technologies are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, the gap between information 'haves' and 'have-nots' is widening, and there is real danger that the world poor will be excluded from the emerging Knowledge-based global economy.*

The uneven gap between information haves and have-not is a barrier to the entire world. Van Dijk and Hacker (2003) identified four types of barriers to computer and internet access prevalence in most developing countries namely: Lack of 'material access'' showing lack of ownership of computers and network. Lack of ''mental access'' referring to a shortage of basic digital experience. Shortages of ''skill access'' and ''usage access'' implying dearth of meaningful usage opportunities. Van Dijk (2006) disclosed that with respect to physical access to computers and the internet, while the digital divide is closing in developed world, in the developing countries the gap is still widening. Moreover, In terms of skill access and usage access, the disparity is both escalating and worsening. The author contends that both skills in terms of information and strategic are unevenly divided between the population of both developing and developed societies (Van Dijk, 2006).

Regarding usage access, Van Dijk (2006) argued that people with high income and high levels of education tends to use ICTs more than those with low levels of income and education. Material and mental access besides skills and usage access invariable contributed to the widespread gap. Norris (2001) cited in Fuchs and Horak (2008) describes the digital divide as multidimensional phenomena. The dimension of the divide was distinguished among global digital divide, social divide, and the democratic

divide. The digital divide could be demonstrated by comparing the penetration rates of internet amongst Nigeria, Africa and the rest of the world as shown in Table 1.1

Table 1.1: Internet Usage in Africa and on the Globe 2011

Country/ Region	**Population (2011 EST).**	**Pop. % of World**	**Internet User latest data March, 2011**	**Penetration (% Pop.)**	**% User in world**	**Face book Subscribers**
Nigeria	155,215,573	2.3	43,982,200	28.3	2.1	3, 377, 300
Africa	1,037,524,058	15.0	118, 848,060	11.5	5.6	30,665,460
Rest of the world	5,892,531,096	85.0	1,991,917,750	33.8	94.4	680,063,260
World Total	6,930,055,154	100.0	2,110,765,810	30.5	100	710,728,7202

Source: IWS (2011).

An actual internet usage statistic for Africa (Africa Internet Usage and Population Statistics data as of 2011) as in Table 1.1. Though, Africa makes up 15% of the world population only 5.6% of all internet users live in Africa, precisely 37% of African Internet users was in Nigeria. This confirms that the digital divide is a crucial problem in Africa and indeed Nigeria, necessitating urgent solution. Most of the population is excluded from the information society. For the information society to be a global reality, the need to integrate the un-served population becomes paramount in justify the need of transforming the world into an inclusive global village (Fuchs & Horak, 2008).

In view of the aforementioned situations, one major constraint to the accomplishment of ICTs in rural areas in Sub-Saharan Africa (SSA) is basically lack of access (Mayanja, 2002). The most viable solution to this problem is the establishment of telecommunication centre (telecentre); (Gurstein, 2007; Fuchs & Horak, 2008; Zulkhairi et al., 2009). Telecentre provide wired, wireless or satellite connectivity and quality

assured portals to the global network, usually equipped with networked of computers, internet access, program and application software including common accessories like printers, scanners, photocopiers and telephones (Latchem, 2001). Since the goals of providing access to individual or household for most people of the world could not be realized, shared access became cost effective way towards an inclusive information society. Research has shown that the deployment of telecentre is proven as an essential tool for addressing the prevalence of digital divide (Gurstein, 2007; Zulkhairi et al., 2009; Clark & Gomez, 2011). Provision of shared access to ICT becomes possible mainly with the rapid growth of telecommunication technology in developing countries (James, 2011).

In recent times, some developing countries are implementing telecentre through the support of Universal Service Provision Fund (USPF). For instance, the USPF in Nigeria supported School based telecentres and Community telecentres. These are established to facilitate widespread availability and accessibility of ICTs throughout the country (USPF, 2009a). Presently, the USPF has roll-out 12 Community telecentres (CTCs), two centres in each of the six geopolitical zones of Nigeria with the aim of serving as a pilot project. In the second phase, CTCs were also established in each of the 109 senatorial zones of the country. It is envisaged that by the end of 2011, Community telecentre would be established in the entire 774 local governments' areas of Nigeria (USPF, 2009a). Primarily telecentre are meant to promote digital literacy, alleviate digital divide, poverty alleviation, employment generation as well as an improvement in e-governance and e-commerce initiatives (Sheriff, Dina & Mohammed, 2009). Despite the

benefits of telecentre highlighted, in contrast to other shared access platform such as Cybercafé and Information kiosks. Telecentre research has received little academic attention. Specifically, on the success factor of its acceptance and use (Wang & Shih, 2008; Side, Zany & Nil far, 2009).

1.2 Problem Statement

The background of the research presented lately, highlighted the issues on the prevalence of digital divide and the importance of bridging the effect of the divide. The present day globalization has necessitated the significance of internet. However, access to internet is a far away a dream to majority of people in developing countries most especially the rural inhabitants. The cost of connecting to the internet is still high with most access to the internet being through Cybercafés, which are located mostly in urban areas (Kari, 2007). Internet access requires telecommunication links and information technologies particularly networks and computer terminals (Latchem, 2001).

Ani (2010) revealed that the used of internet was hindered by 'lack of skills on the parts of the users" and the "high cost of access time" which invariably contributed to low level of internet usage in Nigeria. The finding further confirmed the low level of acceptance and utilization of information and communication technology in Nigeria, as reported by Ani et al. (2007) that few people use internet due to either lack of computer skills or lack of access to ICTs. Grace and Lenny (2008) argued that internet access in Sub-Sahara Africa is largely in the capital cities through Cybercafés, leaving people in semi -urban and remote area at disadvantage position.

Presently in Nigeria, the gap in access to computers and internet is apparently greater than the gap in access to telephone (USPF, 2009b). The cost and low internet penetration into rural areas are alarming and the density of personal computers (PC) is low, just 6.6 per 1000 was reported (Oyeyinka & Lal, 2005; ITU, 2009). Obviously, in this circumstance, the aspiration of Universal Service is unfeasible. Therefore, the Nigerian government under the sponsorship of USPF has been investing considerable funds in promoting the use of community telecentre throughout underserved and unserved areas. The purpose of telecentre deployments is to serve as a cost effective means of cushioning the effects of digital divide among its population. However, the successful implementation of telecentre depends largely on whether or not the users are willing to accept and use the information technology platform (Wang & Shih, 2008). Previous researches suggested that despite the availability of the telecentres in far more developing countries of India and Taiwan the citizens were not using them (Pal, 2007; Wang & Shih, 2008). Thus, the continued investment on the deployments of telecentre throughout Nigeria has necessitated the needs of determining the factors that significantly influence end-user acceptance. Considering the costly investment of this IT initiative, its failure could be considered as an expensive failure.

Reviews of previous research revealed limited studies regarding the acceptance of telecentre in various communities where this initiative commenced, particularly research in telecentre is still emerging (Ellen, 2003; James, 2011). The scarcity of theoretical framework to help understand the influencing factors and limited empirical researches has call for the needs for the model of telecentre acceptance. An empirical support to

show that IT acceptance can be explained by various technology acceptance models have been reported in technology acceptance literature. The most prominent of these models was the original technology acceptance model (TAM) and its extension (TAM2) developed by Davis (1989) and Davis and Venkatesh (2000).

The original TAM and its successors' were validated by researchers, but the results showed that the models were capable of predicting at most 40% of variances, in some cases, only 25% variances were reported (Sun & Zhang, 2006; Holden & Karsh, 2010). Researchers had suggested for a better technology acceptance model that can generate a higher prediction of success through additional variables, so as to provide a more comprehensive model of acceptance (Legris, Ingham & Collerette, 2003). The suggestion had led to the improvement of TAM and finally, Unified Theory of Acceptance and Use of Technology (UTAUT) model, was developed to explain a more complete picture of acceptance of technology (Venkatesh et al., 2003; Venkatesh, Sykes & Zhang, 2011). Venkatesh et al. (2011) and Bankole, Omolola & Irwin (2011) reported that even though TAM is the most widely cited adoption model, yet it is contained within UTAUT model.

The UTAUT model covers both organizational and individual factors; and it combined elements from the several prominent technology acceptance models (Venkatesh, et al., 2003). Also, the model has been credited of having larger proportion of explanatory power than all the previous technology acceptance models (Al-Gahtani, Hubona & Wang, 2007; Wang & Shih, 2008; Venkatesh, et al., 2011). The UTAUT model could be applied to the challenges of telecentre implementation (Wang & Shish, 2008). Thus,

it became appropriate and comprehensive starting point to understand telecentre acceptance (Venkatesh, et al., 2011; Wang & Shih, 2008). Consequently, this research adapted UTAUT model as a theoretical framework. An overview of telecentre context revealed a slight difference from the conventional IT context. Telecentre, despite providing physical access of ICTs to some members of underserved community; it also has an orientation toward Socio-economic development of the people in the communities it's intended to serve. And for telecentre to meet the purpose of its implementation it has to be effective (Gurstein, 2007). Effectiveness is viewed as a value-based judgment concerning performance of an organization (Balduck & Buelens, 2008). Thus, UTAUTs' fundamental constructs may not completely reveal specific influences in the context that may affect user acceptance of telecentre. Since the model do not address organizational factors except for Facilitating Conditions. A critical problem is on the need to have further understanding of organizational factors that contribute to acceptance and usage of telecentre (Balduck & Buelens, 2008; Venkatesh et al., 2003). Sowa, Selden and Sandfort (2004) proposed two levels competing value approach to measure effectiveness of non-profit initiatives like telecentre. The two levels were conceptualized as constructs measuring effectiveness of the telecentre at program and management levels (Sowa et al., 2004). These constructs have theoretical foundation from Competing Value Approach (CVA) originated by (Quinn & Rohrbaugh, 1983; Balduck & Buelens, 2008).

The UTAUT model is adapted to include individual factors (Performance Expectancy, Effort Expectancy and Social Influence) and organizational factors (Management

Effectiveness, Program Effectiveness and Facilitating Conditions) which could influence users' acceptance of telecentre (Venkatesh, et al., 2003; Balduck & Buelens, 2008; Venkatesh, et al., 2011). These constructs could be the main influencing factors of intention of users towards telecentre acceptance in Nigeria. Theoretically, these claims have not been tested empirically. Another problem is related to the apprehension of individual about using technology. Previous studies suggested variance in technology usage from one context to another (Venkatesh & Brown, 2001). Thus, the inclusion of anxiety in measuring behavior of individual interaction with technology was proposed by Venkatesh et al. (2003). The relationships obtained until now between Anxiety and Behavioral Intention is inconclusive (Loo, Yeow & Chong, 2009; lm, Hong & Kang, 2011).

Furthermore, studies on moderating effects in telecentres acceptance setting are limited. Some studies only suggested the moderating effect of gender, age, experience and voluntariness on the determinants of Behavioral Intention (Venkatesh et al., 2011). The findings of moderating effects obtained from the relationships between the determinants of Behavioral Intention are unclear (Venkatesh et al., 2011; Wang & Shish, 2008). Though, Sun and Zhang (2006) and Srite and Karahanna (2006) suggested the inclusion of location and ethnic identity intensity as a moderator of the technology acceptance model. But few empirical tests were conducted to test the effect of these on the determinants of intention.

Finally, most theories and models of technology acceptance have been developed and extensively tested in developed world but few studies are reported in context of

developing countries (Al-Somali, Gholami & Clegg, 2009; Bankole et al., 2011). Therefore, the need to adapt these theories and models in the context of developing countries like Nigeria became necessary. To fill this gap, this study intends to adapt UTAUT model in Nigeria.

1.3 Research Questions

To address the problem statement highlighted, a number of specific research questions required to be addressed:

1. What are the factors that determine the user acceptance of telecentre?

2. Are these factors sufficiently related to form a basis for the basic model of user acceptance of telecentre?

3. Do gender, age, ethnicity and location moderate the relationship between the determinants of intention and user acceptance of telecentre?

4. Of what significance are Perceived Anxiety, Management Effectiveness and Program Effectiveness in measuring users' behavioral intention to acceptance of telecentre?

5. Can the underpinning theory of UTAUT be used to explain telecentre acceptance in Nigeria?

1.4 Research Objectives

To answer the research questions the following objectives were formulated:

1. To determine the factors that lead to the user acceptance of telecentre.

2. To examine the relationships among the identified factors.

3. To examine the moderating effects of gender, age, ethnicity and location on the relationship between the determinants of intention and user acceptance of telecentre.

4. To determine the significance of Perceived Anxiety, Management Effectiveness and Program Effectiveness in measuring users Behavioral intention to acceptance of telecentre.

5. To evaluate the applicability of UTAUT (underpinning theory) in explaining the determinants of user acceptance of telecentre in Nigeria.

To justify the contribution of the underpinning theory in identifying the success factors of user acceptance of telecentre consequently, the 4^{th} and the 5^{th} objectives are formulated. Further, the need to evaluate the model with and without the added constructs became necessary to justify the modification of the underpinning theory.

1.5 The Scope of the Research

The scope of this research is to increase the understanding of the acceptance of community based telecentre as an initiative of information and communication technology for development (ICT4D). The scope of this research is guided by several major concerns as follow:

1. This study focus on Community based telecentre as it provides a more viable model for accessibility to the citizen than the School based telecentre where the core clients are the students (Mayanja, 2001);

2. The field of research is limited to the Nigeria cultural context. Only 12 telecentres were identified for this study. Hence the outcome of this study is applicable to Nigeria in particular and then similar developing countries having the same socio-economic situation as Nigeria;

3. The field study was conducted in year 2011. Therefore, the findings of the study are applicable from the initial inception 2007 until 2011;

4. The research was analyzed based on respondent perspectives. Most studies on telecentre have started with supply–side (Pal, 2007). However, this study intends to focus on the perspective of the demand side (end- users) on how individual user, perceive and use the telecentre. The reason for the focus on the demand side is that extensive study of the implementation from the demand side has received little attention (Pal, 2007);

5. The unit of analysis is individual; the study seeks to determine individual response. Thus the data were collected at one shot (cross-sectional), since among the objectives of the study is on determining factors affecting user acceptance of telecentre;

6. The constructs of Management Effectiveness and Program Effectiveness was assessed from the perspective of individual, with purpose of measuring how telecentre users perceived the Management and Program Effectiveness of telecentres as an effective tool of bridging the digital divide;

7. The issue of financial sustainability of telecentre in Nigeria was not much emphasized compared to most studies related to telecentre across the world (Mayanja, 2001; Ibrahim, Yasin & Zulkhairi, 2010). The telecentre are not donor funded like in most African countries (Galpaya, Sumarajiva & Soysa, 2007; Pade, Mallinson & Sewry, 2006). Government of Nigeria acknowledges the willingness to support services that has benefits to the poor and under privilege. Just as it does with services that have benefit to society such as libraries, health care and education. The Community Communication Centre (CCC-Telecentre), although being operated through franchise, enjoyed a smart subsidy maximum amount for each of the CCC location is 80% of the CCC cost (USPF, 2009b). Rather than financial viability, the government is aiming on how to strengthen features that will enhances replication of telecentre; and

8. The Community telecentres under investigation cover the first phase of telecentres carried out in Nigeria. The telecentres are: six in the Northern zone, four in the Southern zone and two in the South Western zone. The sampling of this study was selected from six telecentres (three in the North, two from the South and one from the South West) see page (103) in chapter three.

1.6 Significance of the study

The focus of this study is on determining the user acceptance of Community telecentre based on UTAUT model (Venkatesh et al., 2003) as theoretical framework. Till today, there is a scarcity of comprehensive research on telecentre implementations from the perspective of end-users in Nigeria. Thus, the model advance could enhance the

development and implementation of telecentre throughout Nigeria. The study is significant to aforementioned groups: the academics world, the practitioners and the governments.

1. The findings of this research are expected to make contributions to management information system (MIS) discipline particularly, the technology acceptance and community informatics literatures. It is expected that the finding of study would advance a comprehensive model on user acceptance of telecentre;

2. The study has contributed to the underpinning theory UTAUT model, in perspective of non-profit initiatives. The hypothesized relationships between the determinants of Behavioral Intention and use in UTAUT model (Performance Expectancy, Social Influence and Facilitating Conditions) which are supported further validate the reliability of the dimension in technology acceptance research;

3. This makes the study to have significant contribution being among the pioneering work that assesses user acceptance factors of telecentre thus, opens room for future research using the UTAUT model;

4. The impact of the modification did to the original UTAUT model by incorporating Anxiety, Management and Program Effectiveness presents a better measure of Behavioral Intention. This is justified by increase in variance (SMC^2) from the modified model compared with original UTAUT model;

5. The academicians and researchers could use the model for further research and discourse in the area of nonprofit initiatives akin to telecentre;

6. The findings of this study would help in maintaining the existing projects and as well serve as a guiding principle for further implementation of telecentre throughout the un-served and underserved areas in Nigeria and other developing countries;

7. To the managers, based on the findings the research could equip the management with crucial information about the factors that influence user behavior about telecentre acceptance in Nigeria. Base on this factors the telecentre management could work on developing and improving the acceptance of telecentre; and

8. The findings of the study are expected to form a basis of supporting concrete policy in the increase and the diffusion of ICT within the country. The study also, fills the vacuüm in the dearth of studies on ICT initiatives implementations in Nigeria. The finding could be generalized to other countries in Sub-Saharan African and other parts of the world having same peculiarities with Nigeria.

1.7 The Thesis Structure

The thesis is divided into six chapters; chapter one presents the background of the study, the problem statement, research questions, research objectives and the scope of the study. The discussions on the rationale of the research and the thesis structure were stated. Chapter two is divided into three sections; the first section presents literature review focusing on previous researches and issues on telecentre implementation in some selected developing countries. The second section highlights on ICTs status and the current development in Telecommunication sector in Nigeria. The third section presents literature review on prior theories on technology acceptance models, to gain an in depth understanding of the UTAUT model as guideline to develop research framework.

Chapter three highlights the research method in which the proposed model is investigated through field study. Aspect regarding the research strategy in which the quantitative research was undertaken by identifying methods of data collection techniques, population and determining appropriate sampling frame. Chapter four presents data analysis and hypotheses testing in detail; the result is presented in tables and figures. Chapter five presents discussion on the hypotheses including the moderating effects hypotheses. The last Chapter provides summary of the research relative to research questions and research objectives with the contributions to the existing body of knowledge, limitations and suggestion for further study. The structure of the thesis is shown in Figure 1.1.

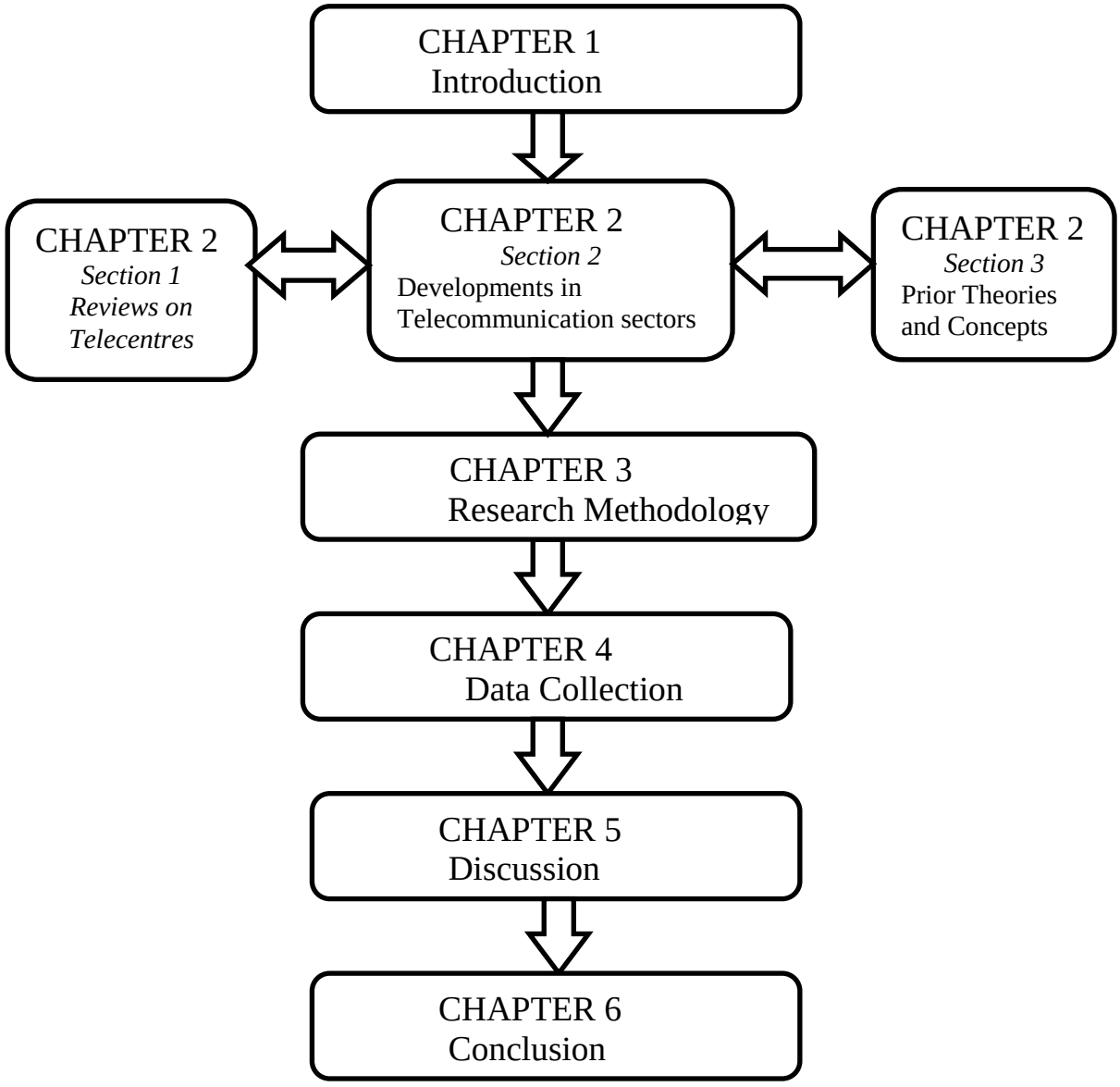

Figure 1.1: The Thesis Structure

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is divided into three sections; the first section discussed on the role of telecentre as an effective means of bridging the digital divide. Methods adopted along the developing countries in providing access to ICTs through telecentre were reviewed. The second section presents an overview of ICT policies highlighting the current developments in Telecommunication sector in Nigeria. Telecommunication has been identified as a key factor in sustainable growth and fundamental tools in rural development and integration (Thomas, 2000). The growth of the sector relative to the policy needed for successful IT accomplishment was elaborated. In the third section, literatures on the technology acceptance models were explored to gain understanding of the model of Unified Theory of Technology Acceptance and Use (UTAUT), which formed the underpinning theory for this research.

2.2 Role of Telecentre in Community Access

The advancement in technological innovation has not yet conveyed any remarkable transformation in the living standard of most rural communities in the developing world (Haseloff, 2005; Kari, 2007; Syed et al., 2009). Even though majority of people lives in the rural areas, these class of people usually are lacking in the capability to benefits from the new ICTs (Kari, 2007).

The lack of access to ICTs may have implication on their socio-economic development. The major barriers to ICT deployments in rural communities include limited infrastructures, lack of IT literacy, low rates of personal computer ownership and high cost of internet (Haseloff, 2005; Paolo, 2009). Limited or under-developed telecommunications infrastructure, served as a main barrier to the expansion and use of ICTs in the rural areas along the developing world. The disparity in distribution of the basic info-structure among urban and rural areas, with associated cost of connecting to internet by the rural population is still considered to be expensive (Zulkefli et al., 2009). Where the info-structure exists, another contending issue is reflected by users' low "willingness to pay" (Faziharudean & Hitoshi, 2006). Current ITU report has shown that only 26.6% of the world population has the internet access on home basis, with most of this access in developed world (Clark & Gomez, 2011). Very low internet penetration in most developing countries has been an issue to various Governments, NGOs' and ITU (Sey & Fellows, 2009; Wan Rozaini et al., 2010; Clark & Gomez, 2011).

In view of the aforementioned, Governments, NGOs' and ITU are sponsoring telecentres in most of the developing countries (Sey & Fellows, 2009; Wan Rozaini et al., 2010; Clark & Gomez, 2011). Gurstein (2007) stress the important of application of ICTs for community practice to improve their socio-economic well-being. The conception of telecentre served as the primary source of using ICTs to respond to issues that are significant in the daily lives of individuals within an unserved community (Gurstein, 2007). Telecentre prominence is argued on the premise of limited technological infrastructure and the high cost of individual access to computer and

internet. Shared access to ICTs remains effective means towards an inclusive information society (Salawu, 2008).

Research has shown that the deployment of telecentre is proven as an essential tool for addressing the prevalence of digital divide (Gurstein, 2007; Zulkhairi et al., 2009; Clark & Gomez, 2011). In developing nations telecentre is adopted as one strategy for bridging the digital divides within a nation. Though, Cybercafé is a competitor with telecentre in some communities or may offer the only Internet access. The Cybercafés are simply sites for individual to interact with internet, but telecentre rather than just providing access to internet it served as avenue of serving other sets of goals, or targeted programs undertaken in support of community (Gurstein, 2007). The prospect of providing access to ICTs is achieved through implementation of telecentre, thus the barriers of location and distance are minimized. The potential of fostering social cohesion and interaction among the underserved communities is strengthen with telecentre implementation (Zulkefli & Ainin, 2009). However, previous study has shown that providing access through telecentre is not enough, rather the values created as a result of gain from adoption and access by the community that makes ICT meaningful (Gurstein, 2007; Zulkhairi et al., 2010).

The next section focuses on previous research works and issues on telecentre implementations in some selected developing countries. It's sufficed to prelude the section with the following quotations, as stated by a contender of ICT4D:

"…Given that providing widespread internet access will also be complex and expensive, this suggest that the goal of closing the digital divide by attempting to reach ubiquitous internet use in less developing countries (LDC) might be a costly mistake" (Kenny,2002, p. 4).

2.3 Reviews on Telecentres

The advent of telecentre in Sub-Saharan Africa to some extend has proven wrong the antagonist of information and communication technology for development (ICT4D). Studies have shown that investment in ICTs for rural development is worthwhile (Mayanja, 2001; Esselina, 2002). The telecentre projects are deployed in an attempt to provide accessibility to telephony and other ICTs infrastructure to areas that are hitherto un-served or under-served. Limited access to telecommunication facilities had left communities in remote and rural areas at disadvantage positions in terms of socio-economic development. Qvortrub (1994) described telecentre as a focal point where modern IT facilities are shared by the citizen of underserved or unserved area. Enabling the communal used of the ICTs facilities by members of community. Base on this definition it is obvious that the central theme of telecentre was to support local community social and economic development. Telecentre provide public access to computers and other IT facilities, skills, training and support other services that are beneficial to communities (Bailey, 2009; Sey & Fellow, 2009).

The origin of telecentre project in Africa can be traced to the conference held in Addis-Ababa in 1996 by African Information Society Initiatives (AISI). The first conference on ICT4D held in a Sub-Saharan Africa. Among the recommendations agreed on was

that international agencies should support developing countries with ICT arena to enhance their developmental activities (Esselina, 2002). The International Development Research Council (IDRC) Canada, International Telecommunication Union (ITU) and UNESCO with assistance from Danish aid agency (DANIDA) responded immediately. The international agencies embarked on experimentation on Multi-Purpose Community Telecentre (MCT). Countries like Benin, Mali, Mozambique, Tanzania and Uganda were recommended for pilot projects. The general concept behind the initiatives was to provide in face of scarce resource, a centre where the rural community could access telecommunication and IT resources. As reported earlier, some barriers that hinder computer and internet access by people in most developing countries; include low income level and dearth of infrastructures (Haseloff, 2005; Syed et al., 2009). Other obstacles include lack of computer literacy and low rates of personal computer ownership including high cost of internet (Haseloff, 2005). Telecentres are geared towards experimentation of ICT as a catalyst for rural development through empowering the rural communities. The IDRC launched a program called Acacia been part of Canada's contribution to the goals of the African Information Society. Fortunately, the initiative was endorsed by African Government. Also, an action framework was set up in 1996 to build up African Information and Communication Infrastructure. Acacia project aimed at increasing the value of local knowledge and understanding in community based decision-making.

Whilst the word telecentre is often used in this literature the concept of this term is too broad; it has been given different names both in developed and developing world.

Notably of which include: Information Kiosk, Tele-cottage, Multipurpose Community Telecentre, Virtual Village Hall etcetera (Mahmood, 2005). Proenza (2001) described telecentre as a public space where individual can access information and communication technology such as computers, facsimiles and telephone services. The description forwarded by Proenza (2001) was too narrow considering the potentials that telecentre could offer. The description is unable to portray the social dimension that telecentre might provide despite access to IT facilities. Telecentres do provide training, IT skills and serve as an avenue where individuals come together to produce contents relevant to their needs. Telecentre also provides an avenue for social cohesion to the community it intend to serve (Zulkhairi et al., 2009). Various model of telecentre exist and can differ with one another on several diverse dimensions. The varieties of telecentres could be profit versus service orientated, provision of narrowly-focused services versus multipurpose services, commercial versus free and rural versus urban (Colle, 2005; Galpaya et al., 2007). Irrespective of the classifications, the general idea behind telecentre is to provide accesses to people that are hitherto marginalized. Whyte (2001) identified four distinct models of telecentre in Africa: Cyber-cafes, basic telecentre, private telephone shops and Multi-Purpose Community Centre (MCC).

Among the MCC earlier started in Africa, the Nakaseke Multipurpose Community Centre (NMCC) in Uganda has received attention by researchers (Mayanja, 2001; Jellema & Westerveld, 2001). The telecentre project which became operational in 1999 was funded by IDRC, ITU, UNESCO and DANIDA. The donor agencies provided the 60% operating cost, while the remaining 40% was given by the local government to

cater for salaries of the local staff and maintenance. The NMCC serves two communities, within these communities 33 institutions were served including Nakaseke hospital. These institutions were hitherto unserved; with the implementation of NMCC all the institutions were later served with ICTs facilities (Mayanja, 2001). Thus, the initiatives enable members of the served communities' opportunity of communicating with outside world. Mayanja (2001) substantiated that for the first time demystification of computers is achieved through accessibility to information and communication technology.

The successes reported by NMCC implementation include: The local leadership interests in the sustainability of MCC were stated, even though the modalities were not well elaborated. Another success story is the partnership that has been forged at local and international levels Mayanja (2001). This collaboration brought in a lot of useful experiences and support. Several challenges encountered by NMCC comprise unreliable power supply, poor telecommunication infrastructure, high rate of illiteracy and restricted accommodation facilities. Multipurpose centres generally aimed at providing computers, telecommunication facilities and support for local communities in remote and rural regions including low income settlement (Mayanja, 2001).

Jensen and Esterhuysen (2001) reported that in Egypt and South African telecentres are supported by national or provincial government through Technology Access Community Centre (TACC) and Universal Service Agency Telecentre (USAT). Community based telecentre has attracted attention from international donor, agencies, governments and NGOs. Communal access to IT facilities indeed serves the members of

community thereby contributing to the realization of universal access in rural and remote areas where majority of people reside (Kari, 2007). Study by Benjamin (2000) appraising the progress of universal access to telephony and other information technology project in South Africa, found that compelling operators to deliver reasonable quality of service to unprofitable areas has been a challenge. Whyte (2001) observed that most of the externally funded telecentre in South Africa runs a top down projects within the stipulated guidelines of the external donors. Problems were encountered more than anticipated. Those problems include frequent power cuts, computer crashes, and pervasiveness of the networks, extreme weather and sometimes occasional theft of equipment.

Chikowore-Kabwato and Ajiferuke (2002) reported that main reason for non-utilization of MCC in Zimbabwe was due to lack of awareness of the services offered by the telecentres. Falch and Anyimadu (2003) studies on telecentres in Ghana found that only few telecentres have been established through international grants. A substantial number of the telecentres were Cybercafés, generally the cafés are purely meant for commercial venture. Further study by Haseloff (2005) contended that the ability of Cafes to function as social development tools within commercial context present a better solution. Cybercafé has less financial viability problems than most non-commercial telecentres. Despite telecentres shortcomings, it provides access particularly to those areas that are unserved and underserved with telecommunication and ICT facilities.

The model of telecentre adopted in Africa is in accordance with various models that have been in used in Scandinavian countries' such as North America, Australia and

Sweden where telecentre originated in the 1980's (Ojo, 2005). The initial idea behind telecentre was aimed at minimizing rural–urban migration as well as creating IT expertise. Ojo (2005) argued that in some European countries and in the USA, telecentres are meant for creating new job opportunities and supporting the workforce. While in the UK and France most centres function as tele-work centre providing facilities for tele-workers. Along the second largest populated country in the world telecentres implementation in India had received a lot of relevance by researchers.

Pal (2007) investigated the extent of e-literacy in Kerala through Akshaya project. The initiatives of a Kerala state government in India. At the commencement of the project, about 630 telecentres were deployed to ensure geographically that no household is located more than three km walking distance away from an Akshaya e-centre. While about two-thirds of the e-centres were newly established, about a third was pre-existing Cyber cafés or computer training institutes. Pal (2007) conducted the research from two sides: firstly, the community (demand side) and later entrepreneurs (supply side). The justification of the studies was that most scholarly work on kiosk and telecentres has started with supply side. The study used a random household survey of families living around kiosks. By using household data of actual usage; the main research question was to verify: the extent by which Akshaya project fulfilled the projected goal of providing widespread access to computer literacy.

Though, the awareness of Akshaya was 88.6%, but only 49.1% of the population sample had heard of e-literacy training. The entrepreneurs' claimed that 90% of at least one member of each household had participated in the e-literacy training modules covering

15 hours. Also the entrepreneurs claimed 100% attendance, whereas Pal (2007) findings show that only 29.7% of the households had a member enrolled in the e-literacy. Among the 1240 respondents of Malappuram only 385 were aware of the e-literacy program but choose not to attend due to some reasons. Such as: computers are of no use to them, too busy to go for training session, e-centre is too far and neighborhood where e-centre is located is not convenient.

The issue of deceit on the part of entrepreneurs was apparent. The wide gap between what they reported as their e-literacy achievement in terms of enrolment and the data obtained from research was alarming. The differences between the proportions of local house hold trained and got paid; vis-à-vis corresponding data from households clearly show ineffectiveness on the part of entrepreneurs. Data on the profile of users that patronize the e-literacy training suggested that the school children and young adults are the most likely users of computers in rural areas and not adults. The finding was not encouraging since the goal of the project is to reach the most excluded citizens. Overall, it's clear that even though the users were primarily youngsters, they nonetheless had fairly low computer skills to begin with. The e-literacy serves as foundation of computers for them as it would perhaps be for the seniors (Pal, 2007). The findings concluded that if e-literacy is the main goal for the government delivery, through newly established e-centre, it is unnecessary, expensive and self-defeating. Funds could have been saved by using other models like use of school building with makeshift computer centres.

The challenges for open market competition were clearly demonstrated. Most of the best performing e-literacy tend to be those that were already independent computer centres or training schools before the Akshaya project (Pal, 2007). Predictably, very few of those Akshaya centre's that survive were pre-existing computer centres. Showing that, many of casualties were those that were unable to compete at the end of e-literacy training. The open market competition avails the opportunity to already independent computer centres before Akshaya project to thrive, while the incompetence ones pack up. On the issue of sustainability many locations are unlikely to be economically viable given the lack of local capacity to support them. Consequently the state government in the subsequent project in 2007, scale down to about one centre to 3000 families instead of one centre to 1000 families in the initial project. The phasing out of unproductive telecentres reduces cost and expands the horizon of extension to other district and additional services, like computer training; *e-vidya* and e-payment were added to e-literacy program.

Despite these challenges an undisputed benefit of the Akshaya project is that most of the respondents at Akshaya would otherwise never have had close access to computer (Pal, 2007). Akshaya plays a critical role as first access for a sizeable population in Malappuram. Another social goal of the Akshaya project was job creation by encouraging youth and unemployed returnee from abroad to set up and manage e-centre. The majority of the entrepreneurs interviewed were fairly new to computers; nevertheless in most of the villages they were the first person to learn the use of computers (Pal, 2007). The Akshaya project has accorded pride to most of the

entrepreneurs in the community (Pal, 2007). Malaysia is among the most progressive developing countries in the world that accorded priority in the diffusion of ICTs to its entire citizenry. In Malaysia, telecentres implementation has received a lot of recognition and accomplishment. Through the support by the government policies and programs, Malaysia has the widest Networks of telecentre. Establish by Federal and various State Governments and Agencies. Several telecentres were established by private companies under their corporate and social responsibility programs (Zulkefli & Ainin, 2009). Based on information from the K-Economy Section, Economics Planning Unit (EPU) in Prime Minister's Office, there are more than 2400 telecentres in Malaysia (Yusop et al., 2010). Various models of telecentre initiatives were carried out all have the basic principle of providing at least either free or minimal fee access to the internet. They are aimed at empowering rural dwellers in access and using information to improve their economic and social well-being (Zulkhairi et al., 2009).

The notable models of telecentre are: Rural Internet Centres (*Pusat Internet Desa*), *Medan Info Desa*, Community Broadband Centre and Community Broadband Library, the computer literacy classes and various State governments telecentres. Rural Internet Centre established by Ministry of Information, Communication and Culture are spread all over the thirteen states in Malaysia (Alias et al., 2010). The *Pusat Internet Desa* (PID) is located near post office buildings. The idea behind location is that post office is an outreach to remote places and a secured place that is frequently visited by the members of the community. It also served as a one-stop centre for transactions and settlements of utility bills. The *Medan InfoDesa telecentres* (MIDs) literally means

Village Information Kiosks, is a project started by the Ministry of Rural and Regional Development (MRRD). The telecentres are housed in buildings belonging to MRRD. Malaysian Communication and Multimedia Commissions (MCMC) rolls out two models of telecentres: Community Broadband Centre (CBC) and Community Broadband Library (CBL), funded under the Universal Service Provision Fund (USPF). By 2013, MCMC planned target of at least one CBC and CBL per selected underserved area. The CBC's implementations involve a smart partnership between telecommunication companies (Telco's) and MCMC. Telecommunication service provider is appointed by MCMC to build and operate the centre in a space or building provided by the local authority.

A significant stride in projecting telecentre as an impetus for bridging the digital divide was achieved by Malaysia. International recognition is accorded to some of the initiatives of digital divide notable of which is e-Bario project, in the state of Sarawak. The potentials of Malaysia's effective strategies of diffusion of ICTs to all its citizenry is well acclaimed in Asia Pacific Region (Zulkefli et al., 2009). The next section highlights the levels of telecentre implementation in Nigeria.

2.4 Telecentre Implementation in Nigeria

There are two models of telecentres in Nigeria these are: Community Communication Centres (CCC-Telecentres) and School Based Telecentre (SBT). The 2 models are implemented by Universal Service Provision Fund (USPF) a subsidiary of Nigerian Communication Commissions (USPF, 2009a). Each CCC provides public calling centre,

Internet, ICT training and other services to underserved communities. The partnerships were formed between the USPF and Internet Service Providers (ISP) in implementing the CCCs and SBT (USPF, 2009a). The funding of this initiative comes entirely from the Universal Service Provision (USP), funds allocated by the Nigerian government to support ICT development for underserved communities in the country. Presently, the USPF has roll-out 12 Community Communication Centres (CCC-Telecentre), 2 centres in each of the 6 geopolitical zones of Nigeria to served as a pilot project as in Table 2.1.

Table 2.1: Community Communication Centre (CCC-Telecentre) in Nigeria

Geopolitical Zone	**States**	**L.G.A**
1. North East,	Adamawa	Mubi
	Bauchi	Azare
2. North Central	Niger	Izom
	Benue	Ugba
3. North West	Jigawa	Gumel
	Kebbi	Kamba
4. South East	Enugu	Ishi-Ozalla
	Imo	Ihiteowerri
5. South-South	Bayelsa	Amarata
	Cross rivers	Itigidi
6. South West	Ogun	Igbogun
	Ekiti	Ido
Total		12

Source: (USPF, 2009a)

The CCCs charge minimal fee for internet access and computer usage to the registered members and provide basic computer training. The trainings offered include: Internet, Microsoft Word, Excel, Power point and Basic computer hardware leading to the award of certificates at the end of each course usually up to duration of three months. The centres also offer services that include photocopying, typing, printing and telephoning. The operation hours of the CCCs are from 9.00 am to 6.00 pm week days and extended

to 8.00 pm on weekends and public holidays. The CCCs are at a secure ready to move in building, but in some remote areas USPF had to build the centre. Research has shown that locality of telecentre plays a crucial role in attracting community participation (Ibrahim et al., 2010).

In conformity with public ICT access arena, there are stringent rules on inappropriate use of the resources like gaining access to phonographic web sites, but consistent with studies on IT public access centres social networks like twitter and face books are allowed (Ibrahim et al., 2010). Usually, rules and regulation on the use of the CCCs are posted on the walls in the reception to ensure users are aware of the rules governing the usage. The centres are usually managed by three staff, a Manager, an Assistant Manager and an Attendant. In most centres the Manager and Assistant Managers are holders of degree in Information Technology and diploma in Computer Science. The utilization of the facilities is closely monitored by the staff.

The operation of the centre is run by committee members, including the representative of registered users, local governments' officials and opinion leaders within the community. The Managers are also members of the committee. The inclusions of the representative of users as member of a committee, afford the opportunity to most of the users to be aware with state of affairs in the centre in terms of funding and administration of the centres. The running of the centres is monitored by representative from the USPF headquarters in Abuja, the federal capital of Nigeria; the Managers usually send monthly reports to the headquarters.

The full utilization of the telecentre is however affected by inadequate and unreliable electric power supply (Dode, 2007). Due to the in ability of providing an un-interrupted power supply by Power Holding Company of Nigeria (PHCN). The sole provider of electricity, the operations of the telecentre had to rely on diesel generators most often to offer service. This limits the full accessibility of the facilities in the telecentre. Notwithstanding, the initial CCCs have shown some degree of successes in an attempt to minimize the effects of digital divide in the country. The next section presents an overview on ICTs policies towards rural integration and regional development in Nigeria, highlighting the status of telecommunication sector.

2.5 Development of Information and Communication Technology in Nigeria

Nigeria, like most countries in the Sub-Sahara Africa, Information and Communication Technology (ICT) is emerging rapidly driven by combination of factors. The penetration of ICTs can be credited to the increase levels of investment in telecommunications, government policies and private sectors participations in the ICT sectors. Nigeria government has been pursuing policies programmes and reforms to improve on the development of ICT. The liberalization of telecommunication sector started in the 1990s' by allowing private participation to supplements the activities of Nigeria Telecommunications Limited (NITEL), being a monopolized company fully owned by the federal government. Previously, the performance of NITEL was not impressive because it was able to provide only 450 000 functional telephones line to a population of 120 million (Akinsola & Jacobs, 2005). The Telephone penetration remained inadequate, resulting to one telephone line per 440 inhabitants; this ratio is far below the

International Telecommunication Union (ITU) standard of 1 telephone to 100 inhabitants recommended for developing countries (Ndukwe, 2004). Among the challenges NITEL faced include: mismanagement, abuse of monopoly, inappropriate capital structure, and excessive interference in decision-making by the government. Other unfavorable factors include: poorly motivated workforce, lack of maintenance of existing infrastructure and lack of competition (Akinsola & Jacobs, 2005). The consequences of this trend are technical and economic inefficiencies which resulted in inadequate and inefficient service delivery. The effect of this lead to the inability for widespread coverage and inefficient service delivery as the customers demand could not be accomplished.

To correct the anomaly market oriented reforms were ushered in under the supervision of Nigeria Communication Commissions. The liberalization of the telecommunication sector and roll out of Global System for Communication (GSM), resulted to an improved coverage of telecommunication networks. Most urban areas were covered within the shortest time but service to growing number of under-served, semi urban and rural areas are much lower. The diffusion rate of mobile telephony is much more appreciable compare to internet diffusion, mobile cellular subscription was 55.10 per 100 (ITU, 2010). This is a positive impact on mobile cellular penetration in the most populous country in Africa. The telecommunication operators have developed different approaches to meet the unique situation of Nigerians and boost mobile adoption and diffusion through employing some innovative strategies. Prepaid customers accounted for 95% of telephone subscriptions in Nigeria. To enhance the affordability of access,

low denomination recharges cards and billing per seconds were adopted. Text message or SMS have become a common means of communication; some operators allow free text message and accessibility almost free GSM line to attract customers and enhance customer satisfaction.

The telecom operators are providing and extending service using several technology platforms. The notable technologies used include: Code Division Multiple Access (CDMA) consist of 6.91%, Global System for Mobile (GSM), comprise 92% and fixed wired and wireless about 1.2%. The private mobile operators and the national carriers had double their efforts in ensuring network capacity is spread to different part of the country including rural areas. The rapid growth is however hindered by inadequate and unreliable electric power supply (Dode, 2007). The major digital operators depend on diesel generators to power their base station. The implication of this is additional cost of doing business and reduction in expansion to rural and remote areas. The universality of access is also threatened by the unreliable network services.

2.6 Status of Telecommunication Infrastructure and Access

Telecommunication Infrastructure is one basic component used in accessing e-readiness of any nation. The Infrastructure has a significance influence on the rate of Internet adoption and diffusion (Dimitrova & Beilock 2005). Positive correlation between infrastructure and internet penetration were established by Arnum and Conti (1998). Further, studies by Wolcott et al. (2001) found that external conditions such as legal, economic, political and social conditions associated with internet usage also affect the

level of adoption. Presently, there are two national multiservice operators the incumbent NITEL and Globacom, the latter is wholly owned by the local investors. In an effort to encourage indigenous private enterprise, Globacom was accorded the status of a second national carrier in 2003. Other operators include: five digital mobile cellular and five Code Division Multiple Access (CDMA) mobile cellular service providers and 16 fixed wired and wireless telecommunication companies operating in Nigeria.

Telecommunication industries has witness a tremendous growth in the last decade with teledensity raise from 0.4% in 2000 to 64.9% in 2011. As of March, 2011, 100 million active subscribers were reported (National Communication Commission of Nigeria, March, 2011). The bulk of subscribers comprise 88.14% GSM Cellular, 9.94% CDMA and 1.91% fixed wired wireless subscribers.

Study by the World Bank Energy Sector Management Assistance Program (ESMAP) in 2005, on the potentials for Telecoms service in Nigeria found that the entire zones are reachable and the potentials of good market exist. The ranking among zones showed that Northern States are the most challenged in terms of infrastructure, low revenue profiles and high cost of telecommunication deployments. The states in the Southern zones have relatively lesser challenges because of their proximity to one another. The Southern states are much smaller in size compared to the widespread rural areas of the Northern states. Despite these challenges, the telecoms operators have the potentials of recouping their investment and have the good chances of making a profit.

2.7 Internet Services

Until recently, utilization of Internet services had been the preserve of private sector in Nigeria (Adenike & Osunade, 2005). The earliest services offered was electronic mail (e-mail) using dial up. But with development recorded in the technology internet services flourished to other sectors such that some organization and individuals get access. The services are provided through various means to end users. Some of the technology use presently includes VSAT, DSL, and Broadband. The VSAT option is mostly used by organizations and institutions in order to ease deployment and adoption of ICTs. Internet service providers are allowed access directly to the internet backbone through VSATs. Recently some fixed wireless operators and GSM operators employed the use of fiber optics in deployments of internet to customers. Accessibility to internet is largely through Cybercafés. Inadequate backbone access and capacity are the major obstacles to network growth, accessibility and quality of service. Most of the internet connection backbones are set on VSAT with few internet broadband services. All major cities in the six geopolitical zones have been partially covered with internet accessibility. The internet penetration rate in year 2000 was just 0.06 per 100 inhabitants; this ratio has increased to 28.43 per 100 inhabitants (National Communication Commission of Nigeria, March, 2011). The summary of the telecommunication operators and internet service providers are shown in Table 2.2.

Table 2.2: Summary of Telephone Operators and Internet Service Providers

NO.	Service Category	No. of License Service Providers
1.	National carriers	2
2.	GSM Cellular Network	5
3.	CDMA Mobile Cellular Network	4
4.	Fixed telephony / wireless Network	16
5.	Internet Service Providers	331
6.	VSAT Data Operators	95

Source: Nigerian Communication Commissions, As at December, 2009

Until now, the widespread access to the internet is through Cybercafés. The emergence of the Cafés mostly in urban areas comes to public access rescue in provision of ICTs. The cybercafés are usually run as a commercial venture. Members of the public can have access to the internet for a fee usually paid per hour. Generally, bandwidth, quality of serviced offered and the location determines the price of patronage always, a fee not less than a dollar is paid. The Cyber café are faced with daunting challenges of inadequacy of electric power supply usually this has affected on the wider usage. Even with the proliferation of Cybercafé in the urban areas that provide public access, the issue of universal access regardless of physical location and economic status remains unresolved. The cost of establishing a Café and getting reliable internet service provider and associated demands served as an obstacle in extending this facility to the rural areas. Moreover, Cybercafés are privately funded and meant for profit and cannot be considered as community based IT initiatives.

Though, Cybercafés serves as the main point of entry to the Internet access, this development had adversely created more marginalization between the rural and urban populace in Nigeria. Subsequently, the emergence of telecentre aimed at closing this

gap. Prior to the deregulation of telecommunication sub-sector in Nigeria, the telecommunication infrastructures and policy were purely dictated by administrative and bureaucratic procedures. The success of deregulation around the developed world has given impetus to series of telecommunication reforms resulting to enactment of National Telecom Policy, the Wireless Telegraphy Act and the Nigerian Communication Act 2003. The reforms enable the full accomplishment of liberalization through support of private and foreign investment as well as proactive regulatory regime (Ahmad, 2009). The major outcome of the reform was the establishment of Nigerian Communications Commission (NCC). The NCC is mandated with full autonomy relating to issues of licenses and renewal of licenses.

2.8 Nigeria Communication Commissions

The Nigerian Communication Commission (NCC) is the independent National Regulatory Authority for the Telecommunication industries in Nigeria. The commission was established by decree no.75 in 1992 during the administration of the President Ibrahim Babangida. Amendment was later made to the degree by an Act of parliament in 2003. The commission is saddle with responsibility for creating an enabling environment among various operators in the industry. Further, they are mandated to ensure the provision of qualitative and efficient telecommunication services from the operators throughout the country. Over the years NCC has earned a reputation as a leading telecom regulatory agency in Africa (Ndukwe, 2004). The mission and vision of NCC are thus presented with the detail objectives as in Appendix B.

2.8.1 National Information Technology Development Agency

The National Information Technology Development Agency (NITDA) is statutorily empowered in implementing information technology policies in Nigeria. The agency was established by an Act of parliament in 2007. The body is vested with authority to go in to strategic alliances and work in partnership with private sector. The visions of ensuring Nigeria as an IT capable country in Africa and a key player in Information society is among the mandate of NITDA. In addition among the mandate of NITDA is using, IT as the engine for sustainable development and global competitiveness (Salawu, 2008). Objectives of Nigeria IT policy are stated in Appendix B. The NITDA saddle with the responsibility of implementation the National IT policy and ensures that the entire citizenry are empowered with information technology. The empowerment of citizens could only be achieved with good policies on information technology in the entire educational settings of the country. Educational settings are predominantly the first stage of acquiring general knowledge and skills, including digital literacy.

2.8.2 Information Technology Policies in Nigerian Education System

Although computer was introduced into educational system in the late 1970's and early 1980's, there was no concrete policy started for its implementation and adoption into the nation's educational system (Zuofa, 2009). However, the enactment of the National Policy on Computer Education in 1988 spurs the diffusion of ICT. The 1988 document provides information on the application of computer at various levels of the country's education. The issues related to basic objectives, hardware and software requirements were also elaborated. The document also comments on teacher training specifically at

the secondary school level. The implementation of the policy was kick started with a training programme conducted for 197 teachers across the country (Yusuf, 2005). Additionally computer systems were introduced into federal unity schools and the armed forces secondary schools. Yusuf (2005) argued that the initial enthusiasm gave way because little was achieved about the set objectives.

Additional drive for IT incorporation in the Nigerian school system came with the 2001 National Policy on Information Technology, tagged "Use IT". It was a key step in the incorporation of ICT in all aspect of the Nigerian's plan (Yusuf, 2005). The Nigerian National Policy on IT has by its documents the vision, mission, general objectives and strategies for the implementation of the policy and application for all sectors such as: agriculture, health and tourism. Ironically, IT policy on education was placed under human resource development sector. IT policy on education as stipulated in the document is shown in Appendix B.

Although, the document was a right step in the leapfrogged of IT, until now little emphasis is place on the real integration and diffusion of IT in the country's educational system. It must be emphasized however, that little or no efforts have been made to implement the ideas set out in the 2001 policy on information technology. To ensure successful execution of the National Policy on Information Technology, (NPIT) the NITDA and the Digital Bridge Institute was established. The aim is to facilitate the promotions of IT in Nigeria.

Despite all these policies, IT has not made significant impact on the Nigerian School System especially the rural schools. The impact of ICT is to a greater extent noticeable in the business sector of the country.

2.8.3 Digital Bridge Institute

The Digital Bridge Institute (DBI) was established in 2004 by the NCC following the success in liberalization of Telecommunication Sector in Nigeria. The successful auctioning of Digital mobile licensing by the NCC resulted to the raise in teledensity and the increase in the number of mobile operators. This scenario has created a gap in trained and suitably qualified human resource to partake in this emerging development (Salawu, 2008). Responding to the need of addressing the vacuüm created in managerial personnel, DBI was established. Currently, the DBI is the only high-level specialist telecoms and IT training institute in Nigeria and the entire West African region. The Institute has branches across three campuses in Abuja the federal capital, Lagos the economic hub of Nigeria and Kano the most populous state in Nigeria. Through its strategic planning, it intends to expand its professional training and educational services to the rapidly growing ICT industries in Nigeria and the entire African sub-continent. The details of vision and mission of the Digital Bridge Institute is shown in the Appendix B.

2.8.4 Universal Service Provision Fund

The important aspect of the NCC Act 2003, most relevant to this study has to do with the one related to the universal access and universal service. The act specifies the establishment of an agency which shall facilitate rapid development of national policies and goals for universal access to telecommunications and ICT. Section 114 of NCC Act 2003, established the Universal Service Provision Fund (USPF). The USPF is determined to contribute to national, economic and social development by facilitating the universal accessibility and availability of ICTs infrastructure. Ensuring services to all areas particularly to underserved areas or un-served groups within a community is saddle by USPF. The main policy objectives of the USPF include:

1. To make underserved and un-served areas more attractive to private investors and service providers;

2. To increase access on a shared basis to voice and data services through bottom-up or top-down projects;

3. To promote the provision of local access network for voice, data and multimedia services in all the Local government headquarters in the federation; and

4. To create an incentive that will encourages existing service providers to extend their services and application to underserved and un-served areas.

2.8.5 USPF Board and Sources of Fund

The Universal Service Provision Board (USPB) has the mandate of making policies and all key decisions regarding USPF. The board has 11 members with the Minister of Communication as chairperson. While the Head of NCC as vice-chair, representative of Ministry of Finance and Chairperson of National Planning Commission and four representatives from the private sector (USPF, 2009a). The management of the USPF is carried out by the USPF secretariat. The USPF is usually financed through funds received from various sources not limited to the followings:

1. Fund appropriate to USPF by National Assembly;

2. Contribution from NCC based on a portion of the annual levies paid to commissions through licensees; and

3. Gifts, loans, aids and other assets that may from time to time accrue to the USPF.

Detail organizational chart of USPF secretariat in Nigeria is shown in the Appendix B.

2.9 Effectiveness of Telecentre

Researchers from developed and developing nations often relate the effectiveness of telecentres to empirical measurement of the number of people benefitted from training and facilities available (Eastin & Larose, 2000; Gumucio-Dagron, 2003; Gurstein, 2003; Pal 2007; Rodriguez & Garcia, 2002). However, other researchers have extended the description of effectiveness beyond this aforementioned typical measurement to include the human development and well-being of the users. Some researchers reported on self-

sustaining infrastructure that adds value to the community as a whole (Garside, 2009; Rothenberg-Aalami & Pal, 2005). Several researchers deliberated on the sustainability of telecentre (Ibrahim et al., 2010; Pade et al., 2006; Bailey, 2009). Galpaya et al. (2007) reported that government sponsored telecentre are less effective when compared to private entrepreneur operated shared access like Cybercafés. The failure in public telecentres is often attributed to ineffectiveness on both the planning and implementation stage (Pal, 2007). In context of this research, effectiveness in a literal sense is a degree to which objectives of establishing telecentre is realized and the extent to which the targeted problems of digital divides are being resolved.

Previous research has shown that effectiveness is one of the basic constructs in management and organizational theory (Baruh & Ramalho, 2006). Uncovering distinctive features between effective and ineffective organization is a major problem for scholars. But the unique issue is that scholars agreed that effectiveness is central in the study of organizational analysis. And that the theory of organization should consist of effectiveness constructs (Balduck & Buelens, 2008). Establishing a construct in nonprofit setting is difficult due to different nature of nonprofit organization. Until now, Sowa, et al. (2004), reported that study of organizational effectiveness in nonprofit organizations has gain little attention. Sowa et al. (2004) proposed two prominent dimension of measuring effectiveness in nonprofit organization. The indicators aim at measuring management effectiveness and program effectiveness. The researchers base their support on theory of Competing Value Approach (CVA) originated by Quinn and

Rohrbaugh (1981; 1983). The comprehensive description of CVA is presented in section 2.12.

Individual case studies that list achievement aspect for telecentres exist in the literature (Benjamin, 2000; Pade et al., 2006). Among these studies, only a few of them address the issue on effectiveness of telecentres (Pal, 2007). A broad study on effectiveness of telecentre from the demand side (users) using the two identified levels of effectiveness is scarce, specifically in nonprofit settings like telecentre. This study is an attempt to assess the acceptance of telecentre using these measures from the perspectives of users by incorporating the two levels of effectiveness identified in the literature Balduck and Buelens (2008) and Sowa et al. (2004) with the Unified Theory of Acceptance and Use of Technology (UTAUT) constructs. The UTAUT model is adapted due to the resemblance of its determinants with the telecentre variables of acceptance and its robustness. Before reviewing the primary theory (UTAUT), it's sufficed to have an overview of some selected theories used in information technology domain.

2.10 Information Technology Acceptance

IT acceptance is a submission by an individual or group to use new IT in the operation it's intended to support. Davis (1999) defined acceptance as user's decision about how and when to use technology. Technology acceptance models were developed by researchers to help in measuring and determining IT acceptance or rejection (Raid, 2009). Rationale behind measuring IT acceptance has been described as the most mature area of research in contemporary information system literature (Davis, 1999). Its enable

the researchers to develop adoption metrics that determines probability of successful implementation of IT initiatives (Raid, 2009; Venkatesh et al., 2011).

User acceptance is a regularly yardstick of Information Technology implementation. Understanding what motivate users to adopt and use technology has been researched all over the world specifically in the US (Davis, 1989; Davis, Bagozzi & Warshaw, 1992; Venkatesh et al., 2003), in Asia (Wang & Shih, 2008; Park, Yang, & Lehto, 2007) and Middle East (Al-Gahtani, Hubona & Wang, 2007; Al-Somali et al., 2009).

2.10.1 Models of Technology Acceptance

A substantial number of models have been developed to investigate and understand factors affecting the acceptance of information technology. Notably, among these include: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), Theory of Planned Behavior (TPB) (Ajzen, 1985, 1991), and Diffusion of Innovation Theory (DOI) (Rogers, 2003) and the Technology Acceptance Model (TAM) (Davis, 1989). TAM is explained in detail, being one of the most cited theories in technology acceptance literature (Lee, Kozar & Larsen, 2003; Venkatesh et al., 2011). These models have been extensively applied in the domain of technology acceptance research. The models described subsequently form the basis of general theories adopted in this study.

2.10.2 The Theory of Reasoned Action (TRA)

The Theory of Reason Action (TRA) has it origin in the social psychology domain proposed by Fishbein and Ajzen (1975). The theory seeks to predict the behavior of an individual in a specific condition (Fishbein & Ajzen, 1975). TRA seeks to explain the relationship among Beliefs, Attitudes, Subjective Norm, Behavioral Intentions and Behavior. Technology acceptance or rejection by individual is measured by Intention to perform behavior. TRA model (Fishbein & Ajzen, 1975) showed that intention is the direct determinant of behavior. An individual believes to reflect his/her attitude towards the behavior and subjective norm. The two determinants of Behavioral Intention are Influence by Beliefs. The Figure 2.1 illustrates the Theory of Reasoned Action (TRA).

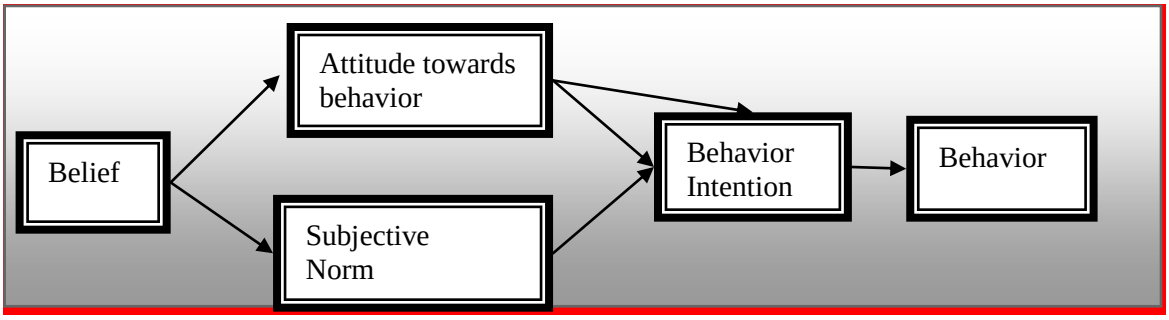

Figure 2.1: Theory of Reasoned Action (TRA)

Source: Fishbein and Ajzen (1975)

The TRA has been used widely in several researches; it was reported to measure success in the prediction and explanation of human behavior in a variety of disciplines (Davis, Bagozzi & Warshaw, 1992).

2.10.3 The Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) was developed by Ajzen (1991), to supplement the TRA. Also the theory is grounded on sociology. TRA is used to explain social behavior and information technology use (Ajzen, 1991; Dillon & Morris, 1996). The additional construct combined to measure intention in TPB is Perceived Behavioral Control (Dillon & Morris, 1996). Particularly, in TPB intention is theorize as the direct determining factor of behavior. Moreover, Attitude, Subjective norm and Perceived Behavioral Control (PBC) are determined by Intention. Ajzen (1991) defined PBC as "the perceived ease or difficulty of performing a behavior" (Ajzen 1991, p.188). The TPB posited that the control people have over their behavior varies from behavior that can be done easily to those requiring effort and resources. Figure 2.2 shows the description of the Theory of Planned Behavior (TPB).

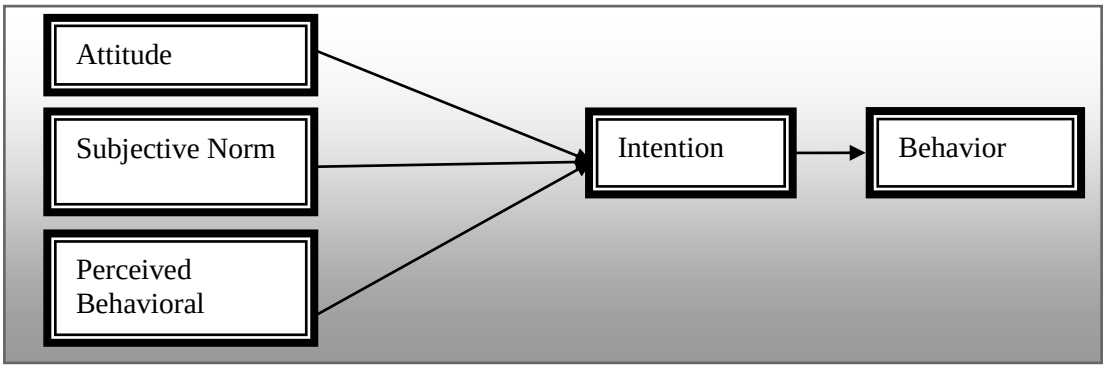

Figure 2.2: Theory of Planned Behavior (TPB)

Source: Ajzen (1991)

2.10.4 Diffusion of Innovation Theory (DOI)

The Diffusion of Innovation Theory (DOI) (Rogers, 2003), is another well-established theory also grounded on social psychology that has been widely used in IT researches (Chen, Gillenson & Sherrell, 2002). The theory comprises of five innovation characteristics: Relative Advantage, Compatibility, Complexity, Triability and Observability. These characteristics provide a basis in which prediction could be made about user adoption and decision making process and the prediction of implementation of a new technological innovation. The main concept of DOI is that technological innovation is communicated through particular channels among the members of social system. The stages involved in the communication channel include: knowledge, persuasion, decisions, implementation and confirmation (Rogers, 2003). Chen et al. (2002) however suggested among the five stated characteristics of innovation only Relative Advantage, Compatibility and Complexity are related to innovation adoption. Relative Advantage and Complexity are synonymous to Perceived Usefulness and Perceived Ease of Use (Davis, 1989). Compatibility is the degree in which the innovation is perceived to be consistent with potential users existing values, experience and needs (Wu & Wang, 2005).

2.10.5 Technology Acceptance Model (TAM)

The success of any information system implementation depends on a combination of user acceptance and used (Raid, 2009). Technology Acceptance Model (TAM) was proposed by Davis (1989) to explain and predict user acceptance of Information

technology. The TAM was adapted from the Theory of Reasoned Action (TRA); a psychological theory that tries to explain an individual's action / intention to perform behavior (Fishbein & Ajzen, 1975). Taylor and Todd (1995) argued that TAM can be considered as TRA but applied to explain the specific model that is adopted by information technology. TAM model theorizes that system use is determined directly by Behavioral Intention and the Intention is influenced by the user's attitude towards using the system and the Perceived Usefulness of the system. The two constructs Attitude and Behavioral Intentions are as well affected by Perceived Ease of Use (Davis, 1989; Yi, Jackson, Park & Probst, 2006). These two constructs are described as belief constructs (Davis, 1989). Perceived Usefulness is the degree in which an individual believe that using a particular system would enhance his/her jobs performance (Davis, 1989). Usefulness is quantified into three; job performance, productivity and time saving. Accordingly, using IT enhances job performance, productivity and makes jobs to be accomplished on time (that is, by reducing the time to carry out a task or providing timely information).

Perceived Usefulness construct corresponds with Rogers (2003) attribute of Relative Advantage (Davis, 1989; Karahanna, Straub & Chervany, 1999). Perceived Usefulness has been found to be the most important element of IT perception (Lee, 2010). Perceived Ease of Use has been defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989; Taylor & Todd, 1995). This construct corresponded with Rogers (2003) innovation attributes of complexity (Davis et al., 1989; Karahanna et al., 1999). According to Davis (1989) actual use of IT

is influence directly or indirectly by users Behavioral Intentions, Attitude, Perceived Usefulness and Perceived Ease of Use of technology. External factors affect intention and actual use through intervening effect of the behavioral construct of Perceived Usefulness and Perceived Ease of Use, as shown in Figure 2.3.

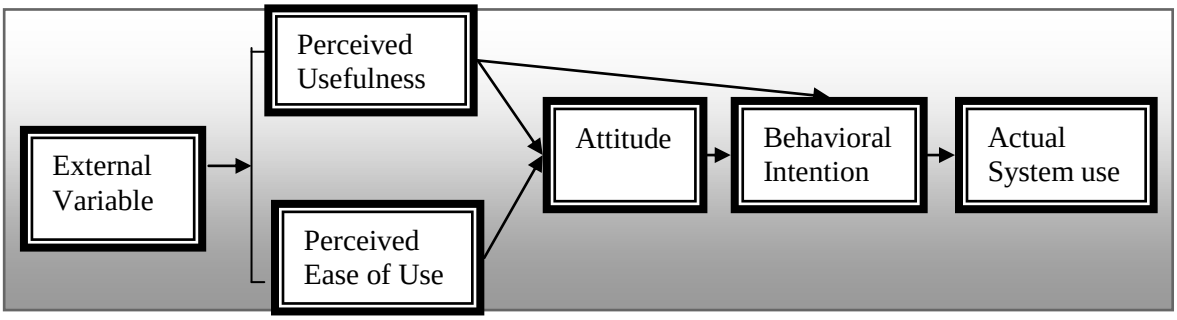

Figure 2.3: Technology Acceptance Model (TAM)

Source: Davis (1989)

Generally, TAM provides community of IT researchers with a parsimonious model that examines factors leading to IT acceptance. The two constructs of Perceived Usefulness and Perceived Ease of Use were conceptualized as important variables leading attitude towards intention in adopting a new system. These determinants are also easy to be understood by system developers and can be considered specifically during system requirement analysis and other system development (Taylor & Todd, 1995). Venkatesh and Davis (2000) proposed an updated TAM because of the theoretical and empirical advances that had taken place over the previous decades in TAM researches. They presented a study that developed and validated a theoretical extension of TAM, referred to as TAM2. Base on the suggestion that TAM has to be integrated into broader ranges which include variables related to both social and cognitive process.

2.10.6 Extended Technology Acceptance Model (TAM 2)

Venkatesh and Davis (2000) scrutinized prior efforts of TAM and implement the request of model's expansion by developing TAM2. The model clearly defined the external variables of Perceive Usefulness and Perceive Ease of Use to comprise Social Influence and Cognitive instruments (Venkatesh & Davis, 2000). The external variables of Perceive Usefulness are Social Influence (subjective norms) and Cognitive Instruments such as: Image, Job Relevance, Output Quality and Result Demonstrability. All the enumerated variables have a direct effect on Perceived Usefulness further Subjective norm has effect on User Intention with moderation of Experience and Voluntariness. TAM 2 is shown in Figure 2.4.

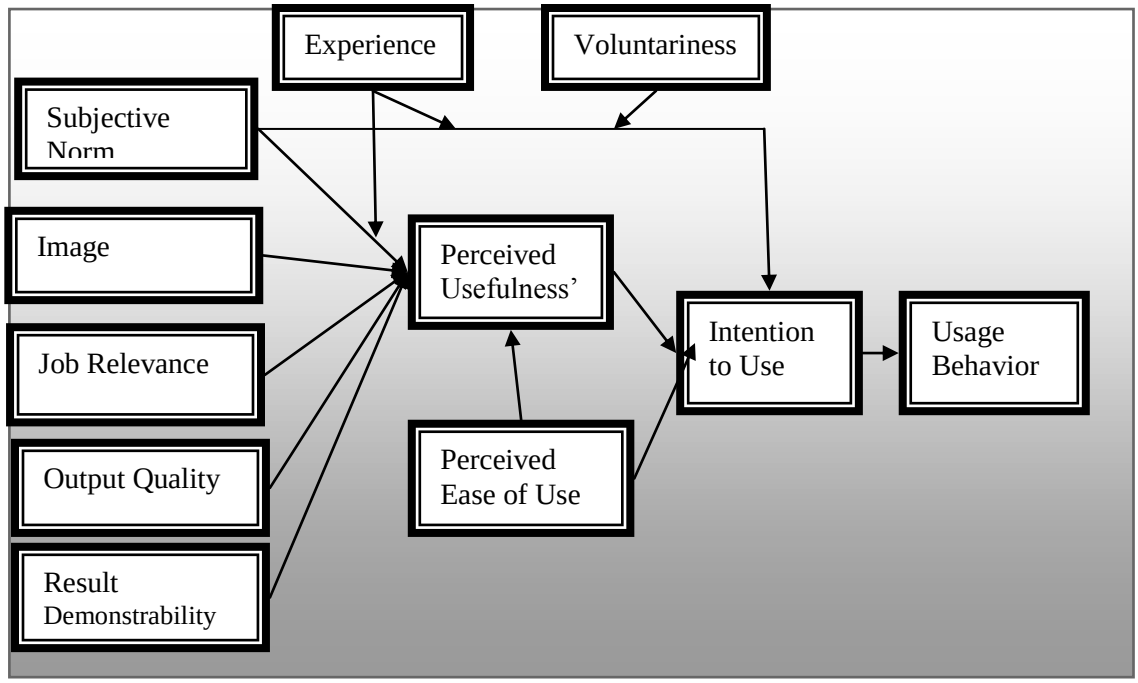

Figure 2.4.: *Technology Acceptance Model (TAM2)*

Source: Venkatesh and Davis (2000)

Previous research established that social influence processes, such as Subjective norm, Image and Voluntariness, besides cognitive instrumental processes, such as Job Relevance, Output Quality, Result Demonstrability and Perceived Ease of Use were theorizes as success factors of new technologies **(**Venkatesh & Davis, 2000).

2.10.7 Limitations of TAM Research

A meta-analysis of TAM by Legris et al. (2003) identifies some shortcomings in TAM researches. Among the identified limitations: most of the studies used to examine only one IT with a regular group of subject in a particular task. More often, perform in a single point of time thereby making a problem of generalization. Secondly, most studies measure self-reported use rather than actual usage. Whereas, self-reported use only served as an indicator, because it is susceptible to bias which may alter or overstates the casual relationship between independent and dependent variables (Agarwal & Karahana, 2000; Lee, Kozar, Larsen, 2003). The prevalence of cross-sectional study is also a limitation of TAM research (Lee et al., 2003). The fact that user intention and perception are not constant over time research has shown that the need to measure this concept at numerous point of time (Venkatesh & Davis 2000; Venkatesh & Morris, 2000). Finally low explanatory power of variance is major limitation of TAM studies (Sun & Zhang, 2006). Analysis of 101 articles using TAM in the leading management information systems (MIS) journals and conferences were examined by Lee et al. (2003). About 36 articles adopt self-reported use. The finding also shows that 41 studies use students as sample while 60 studies employed the used of knowledge workers. The research yielded only 13 longitudinal studies out of the 101 TAM papers studied (Lee et

al., 2003). Most studies used cross sectional method after exposing subjects to the new IT, usually through hands-on session or training. Majority of studies adopted a quantitative approach. Only three studies used qualitative data and laboratory experiments were mainly conducted on students in the university environment. Data analysis was done through regression in most of the study using SPSS software. Few studies adopted structural equation modeling with Partial Least Square (PLS), LISREL, and Amos (Lee et al., 2003). Table 2.3 shows the list of researchers that validated TAM and the corresponding methodological details.

Table 2.3: Methodological Details of TAM Validation

	Methodology	**No. of Papers**	**Details**
Usage	Self-reported use	36	Venkatesh and Davis(2000);
Students	Undergraduate	28	Mathieson (1991); Taylor and Todd(1995)
	MBA or Graduate	13	Davis et al.(1989)
Knowledge workers		60	Venkatesh and Davis(2000); Venkatesh and Morris (2000)
	Longitudinal Study	13	Venkatesh (2000); Venkatesh and Morris(2000)
	Cross sectional	88	Straub (1994); Taylor and Todd (1995)
Methodology	Field study	86	Igbaria et al. (1995); Agarwal and Prasad (1999)
	Lab experiment	12	Mathieson(1991); Doll et al.(1998)
	Qualitative study	3	Briggs et al.,(1999) De Verde et al.,(1999)
Analysis	PLS	18	Sambamuthy and Chin (1994); Agarwal and Karahanna(2000)
	Lisrel	30	Taylor and Todd(1995) Karahanna and Limayem (2000)
	Amos	7	Chin and Todd(1995); Fenech(1998)
	Regression	32	Lucas and Spitler1999) Venkatesh[(999)
	Others (Discriminate and Conjoint Analysis)	14	Szajna (1994);Chin and Gopal (1995)

Source: Lee et al. (2003).

The original TAM and its successors were validated by researchers, but the results showed that the models were capable of predicting 30%- 40% of variances, sometimes only 25% of variance was reported (Sun & Zhang, 2006; Holden & Karsh, 2010). Researchers had suggested for a better technology acceptance model that can generates a higher prediction of success. Legris et al. (2003) recommended that other variables should be included to TAM, to provide a more comprehensive model, which can integrates both human and social variables. The call had led to the improvement on TAM and finally, Unified Theory of Acceptance and Use of Technology (UTAUT) model, which was developed to explain a more complete picture of acceptance of technology by Venkatesh et al. (2003).

2.11 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT was proposed by Venkatesh et al. (2003) through the incorporation of eight famous models in the diverse discipline. The models were integrated in terms of their conceptual differences as well as empirical resemblances (Yi et al., 2006). The idea behind the amalgamation of these models was to arrive at the unified view of user acceptance of IT (Venkatesh et al., 2003). The eight models used, include the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Technology Acceptance Model (TAM), (Davis, 1989), the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), the Diffusion of Innovation Theorem (DOI) (Rogers,2003), the Social Cognitive Theory (SCT), (Bandura, 1986) the Motivational Model (MM) (Davis, et al.,1992), the Model of PC Utilization (MPCU) (Thompson, Higgins, Howell, 1991). Four constructs were

classified as the determinants of Behavioral Intention and Usage Behavior. The determinants include: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. Venkatesh et al. (2003) incorporated four moderating variables, gender, age, experience and voluntariness of use.

The moderating variables attempt to explain the influence of individual differences in technology use (Sun & Zhang, 2006). For instance, the effect of Performance Expectancy on Behavior Intention is moderated by gender and age such that it is more significant for male and younger employees. The effect of Effort Expectancy on Behavior Intention is also moderated by gender, age and experience such that it is more significant for female and older employees. The effect of Social Influence on Behavior is moderated by all variables, while the effect of Facilitating Conditions on actual Use is moderated by age and experience. The detail descriptions of the eight theories/models used in developing the UTAUT model and its determinants are shown in (Appendix B, Table 2A). Table 2.4 shows the UTAUT determinants and the sub-determinants showing the models/ theory from which each determinant originated.

Table 2.4: *Sub-Determinants and Sources of UTAUT External Variables*

UTAUT determinants	**The sub-determinants**	**The sources of integrated model**
Performance Expectancy (PE)	Perceived usefulness	TAM/TAM2/C-TAM-TPB
	Extrinsic motivation	MM
	Job-fit	MPCU
	Relative advantage	DOI
	Outcome expectation	SCT
Effort Expectancy (EE)	Perceived ease of use	TAM/TAM2
	Complexity	MPCU
	Ease of use	DOI
Social Influence (SI)	Subjective norm	TRA, TAM2,TPB/DPTB, C-TAM-TPB
	Social factors	MPCU
	Image	DOI
Facilitating Conditions (FC)	Perceived behavioural control	TPB/DPTB, C-TAM-TPB
	Facilitating conditions	MPCU
	Compatibility	DOI

Source: Venkatesh et al. (2003).

Venkatesh et al. (2003) formulated a unified theory of acceptance and use of technology by reviewing and empirical comparing the eight competing models. Seven constructs were initially identified to have a significant and direct relation with Behavioral Intention or Usage. But only four constructs were theorized to have a significant role as direct determinants of User Acceptance and Usage Behavior as shown in (Figure 2.5). The other three constructs, Attitude using technology, Self-efficacy and Anxiety were theorized not to be direct determinants of Intention/use (Venkatesh et al., 2003).

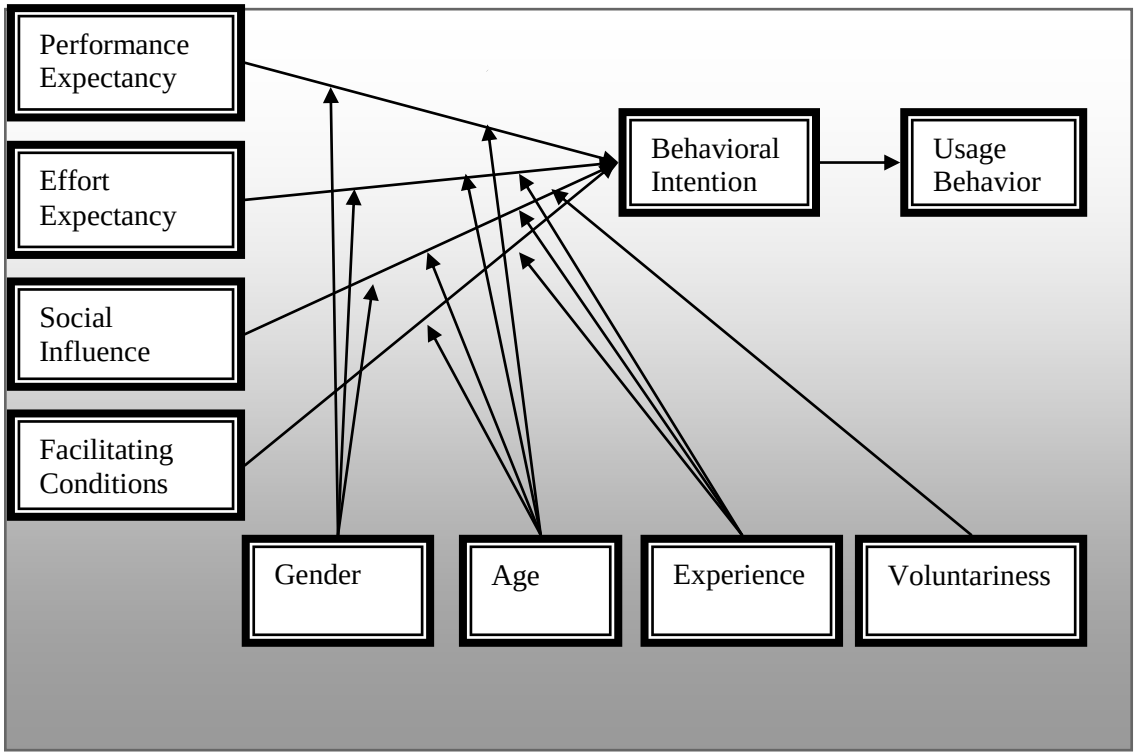

Figure 2.5: The UTAUT Model

Source: Venkatesh et al. (2003)

The rationale behind UTAUT model is to offer the managers with a parsimonious tool to weigh the introduction of new technology and predict user's Behavioral Intention in accepting information technology implementation (Venkatesh et al., 2003). Empirical results of this model revealed it was able to account for 70% of variance in Usage intention (Schaper & Pervan, 2007). This result to a large extent perform better than any of the original eight models/theories and their extensions (Venkatesh et al., 2003). The use of UTAUT model has become more prevalent in recent years. It is no longer confined to the research on the acceptance and use of information technology, but applied to various disciplines (Hennington & Janz, 2007).

Research by Wang and Shih (2008) investigating the determinants of user acceptance of information Kiosk implementation in Taiwan adapted the UTAUT model. The study validated the moderating affects of gender and age using a convenience sample with 244 respondents. The finding revealed gender differences in explaining the acceptance of IT initiatives. The model explained 63.9% of variance in Behavioral Intention and 15.9% of the variance in Usage Behavior in male. While, for the females the model accounted for 70.3% and 14.1% of the variance in Behavioral Intention and Usage. Overall, for both gender the model explained 64.5% of the variance in Behavioral Intention and 14.4% of the variance in Use Behavior. The finding suggested that the model support the applicability of the UTAUT model in the context of information kiosks. The limitation of the studies was the use of convenience sampling method. In view of that, generalization could not be made to the entire population. Consequently, results may not be applicable in other cultural setting. Wang and Shih (2008) called for additional research to validate the model in other cultural settings.

Al-Gahtani et al. (2007) conducted research on acceptance and use of Information Technology (IT) employing cultural difference between Saudi Arabia and North America. A Survey of 722 knowledge workers was conducted. UTAUT model was adapted to explain the acceptance of computer application using a desktop on voluntary basis. In the model, the construct of Social Influence was replaced with Subjective Norms. Hofstadter's cultural dimensions were used in the study, but only four out of five Hofstadter's cultural dimensions was used. The score for long term orientation dimension (terms as confusionist effect) was discarded. On the premise that confutionist

has no place in Saudi Arabia, where the entire citizenry adhere to Islamic religion. The finding shows that Subjective Norms positively influence Intention but diminishes by both increases in age and experience. The results obtained also show significant imbalance in gender representations where 82% of the responses were male. Such result was inevitable due to preponderance of working male in Saudi Arabia (Al-Gahtani et al., 2007). The model explained the relative power of modified version of UTAUT, the variance accounted by Behavioral Intention was 42.1% while Usage Behavior accounted for 39.1%.

Park et al. (2007) carry out research on mobile technology acceptance in China based on a modified UTAUT model. The study investigated the effect of original UTAUT determinants on Attitude using mobile technology. Among the specific interest of the research was to investigate the influence of culturally driven moderating variables of gender, education and past experience of the Internet. The survey was administered to 221 Chinese nationals using simple random. Findings, found that the main determinant of Chinese user's attitudes towards mobile technology acceptance was Social Influence. The result obtained from multi-group analysis has shown that though gender and education levels are significant moderating factors, internet usage experience does not exhibits any moderating effect. The findings required the needs to take cultural background and atmosphere into technology acceptance research.

Loo et al. (2009) conducted a research to explore the extent of acceptance of embedded multipurpose smart card (Mykad) application in Malaysia based on a modified UTAUT model. Additional constructs added to the model was Perceived Credibility and Anxiety

to suit the context of the research. Two hundred questionnaires were randomly distributed among the respondents. The main significant finding of the research was that the users' acceptance of Mykad application was based on its cultural attributes and that the intention of using the initiatives was moderate.

Wang, Wu and Wang (2009) employed a modified UTAUT model in investigating the determinants of Behavioral Intention including differences in gender and age in the acceptance of mobile learning in Taiwan. The constructs of Perceived Playfulness and Self-management of learning were introduced to the UTAUT constructs. Performance Expectancy, Effort Expectancy, Social Influence, Perceived Playfulness and Self-management of learning were found to be significant determinants of Behavioral Intention to use m-learning. Gender moderates effects of Social Influence and Self-management of learning on Behavioral Intention, while age moderates the effects of Effort Expectancy and Social Influence on Behavioral Intention.

To investigate the determinants of the adoption of social media for public relations by non-profit organization, Curtis et al. (2010) adapted UTAUT model by adding Self-efficacy, Credibility and Anxiety. The findings showed that the UTAUT provides a basis for future technology acceptance research regarding social media in non-profit settings. The results obtained suggested that female consider social media to be beneficial, whereas male demonstrate more confidence in actively using social media. Positive correlation between Behavioral Intention and Credibility showed a greater likelihood to adopt social media.

Venkatesh et al. (2011) adapted a revised UTAUT model in context of electronic medical records systems (EMR) adoption and use by doctors in U.S.A using longitudinal field study. The study employed random sampling with 141 respondents. Positive correlations between UTAUT determinants with Behavioral Intention and Usage were established. The results of moderating effects showed that only age was the key moderator in the context of EMR. The findings of age as the only moderator in the UTAUT model resulted in the increase in its predicting power more than the original UTAUT model. The model explained predictive power of 44% in both Behavioral Intention and Use behavior. Venkatesh et al. (2011) suggested the integration of different other theories in other to enriched UTAUT and its applicability in different context. The researchers not only call for empirical work in different context but also call for work that theorizes about its uniqueness to adopt and extend existing theories to the new context. The summary of previous research that adapted UTAUT model on various technologies is shown in (Appendix B, Table 2B). The next section presents the secondary theory in the context of this study.

2.12 Competing Value Approach (CVA)

A two-level competing value approach to measure telecentre effectiveness as suggested by Balduck and Buelens (2008) is integrated in the proposed model. The two levels analysis are effectiveness of the telecentre at program and management levels, which were proposed by Sowa et al. (2004) using multidimensional and integrated model of nonprofit organizational effectiveness (MIMNOE). The two constructs have a theoretical foundation from Competing Value Approach (CVA) originated by Quinn

and Rohrbaugh (1981; 1983). Balduck and Buelens (2008) have reported extensively on the effectiveness models and theoretical approaches developed with their relating criteria. Base on reflecting on different values and preference of school of thought concerning effectiveness. Balduck and Buelens (2008) identified the best known models as the goal models (Price, 1972; Scott, 1977), the system resource model (Yuchtman & Seashore, 1967), the internal process approach (Steers, 1977), the multiple constituency model (Tsui, 1990) and Competing Value Approach (CVA) (Quinn & Rohrbaugh, 1981, 1983). The CVA is acknowledged as the most comprehensive and influential multidimensional organizational effectiveness theory (Balduck & Buelens, 2008).

CVA postulated that individual assess organizational effectiveness based on three super ordinate value continua (Balduck & Buelens 2008). The first dimension is organizational focus: an internal versus external focus (development of people in the organization versus development of organization itself). The second dimension is related to organizational structure: concern for flexibility versus concern for control. The third dimension is related to organizational outcome: a concern for means versus end (important process versus final outcomes). Further, Balduck and Buelens (2008) reported that each dimension corresponds to values that influenced the criteria used in assessing effectiveness. Such as through organizational focus and organizational structure produced the four cells of CVA. A combination with the third axis, mean, and end, reveals that eight cells represent four basic models : (that is, Human relations, Open system, Internal process and Relational goal models) of organizational effectiveness as in Figure 2.6.

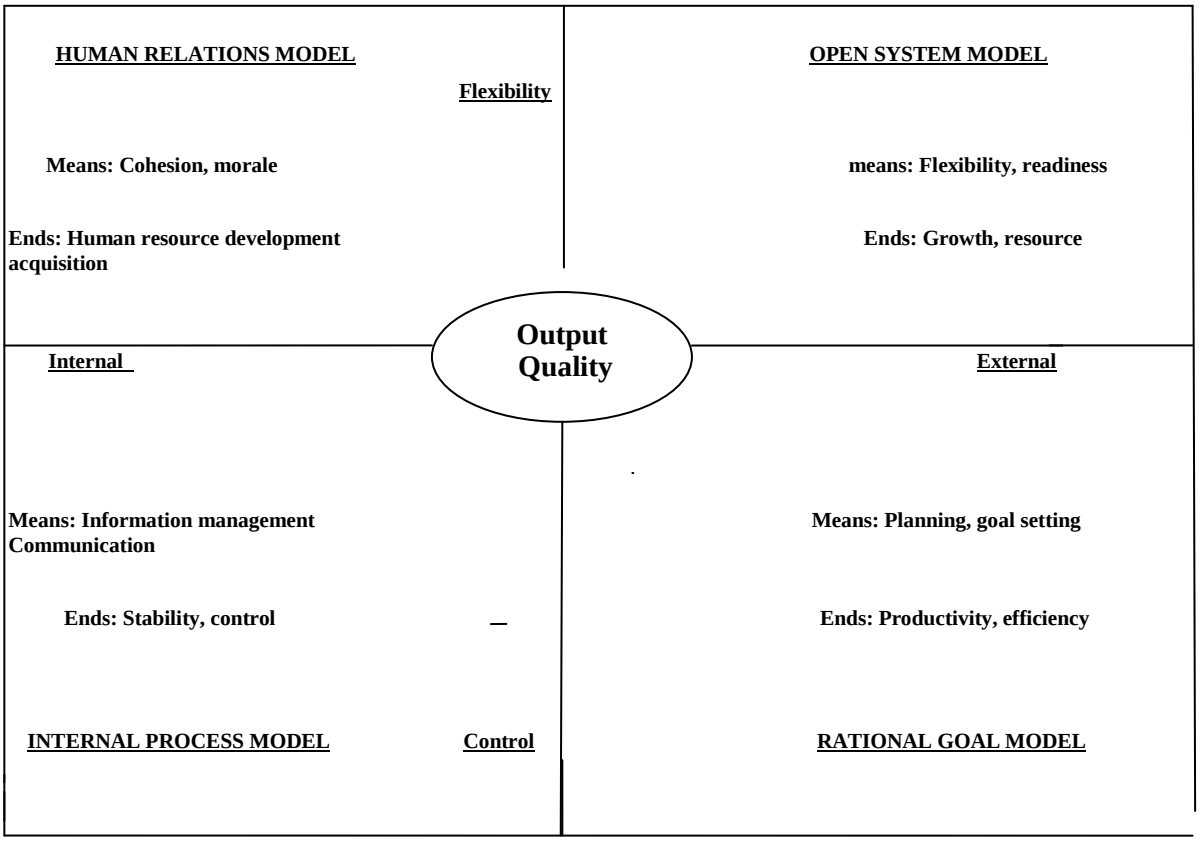

Figure 2.6: Competing Value Approach Model (CVA)
Source: Quinn and Rohrbaugh (1983)

Balduck and Buelens (2008) suggested that the two-level competing values model that can be applied to different types of non-profit organizations (NPOs). Distinction should be made between management and program level and then apply the CVA at each level, appropriate criteria at each level within the four domain of CVA. This study, intend to extend the UTAUT model, by incorporating the UTAUT constructs with Management Effectiveness, Program Effectiveness and Anxiety. The construct of Anxiety was introduced to IT by Compeau and Higgins (1985). Finding by Venkatesh et al. (2003) suggested that, there was no evidence to support relationships between Computer

Anxiety with Behavioral Intention. Hence the need to re-examine this construct in different context and culture required further attention.

2.13 Review on the Conceptual Model Variables

2.13.1 Performance Expectancy

Performance Expectancy is the degree to which an individual believes that using a system will help his/her better attain significant reward (Venkatesh et al., 2003). Findings by Venkatesh et al. (2003) showed that Performance Expectancy had a positive effect on Behavioral Intention. Other researchers like Al-Gahtani et al. (2007) found that performance Expectancy had the positive effect on Intention. Gender and age does not moderate the relationships between Performance Expectancy and Intention. In a study by Wang and Shih (2008) established that Performance Expectancy had the strongest effect on Behavioral Intention among all the determinants of User intention in context of information kiosk acceptance in Taiwan. Showing that citizen with high Performance Expectancy is more likely to use information kiosk than ones with lower Performance Expectancy.

2.13.2 Effort Expectancy

Effort Expectancy is the degree of ease associated with the use of the IT (Venkatesh et al., 2003). Al- Gahtani et al. (2007) found that effect of Effort Expectancy on Behavioral Intention was not significant. Moreover gender, age and experience do not moderate the relationship between Effort Expectancy and Behavioral Intention. The

findings concluded that with experience, computers ease of use becomes less important in predicting Saudi Arabia's users' Behavioral Intention. The finding of Wang and Shih (2008) is at variance with that of Al-Gahtani et al. (2007) in that Effort Expectancy had a significant influence on Intention in context of their studies. The findings stress the importance of user friendliness as prerequisite to information kiosk acceptance. To attract more citizens to use kiosks, kiosk developers should lessen out the complexity of hardware and software and by introducing user friendly interface (such as touch screen menus).

2.13.3 Social Influence

Social Influence is the degree to which an individual perceives that important others believe he or she should use the new information technology (Venkatesh et al., 2011). Finding on the effect of Social Influence on Behavioral Intention has been inconclusive. This is because the concept of Social Influence is subject to either the adoption of technology is mandatory or non-mandatory settings. In another perspective either the adoption is organizational base or individual base (Park et al., 2007). Findings by Wang and Shih (2008) in the context of information kiosk in Taiwan showed that Social Influence is a significant determinant of Behavioral Intention. Therefore, it is recommended that policy makers can take advantage of Social Influence in promoting the use of information kiosks. Once users became acquainted with kiosk system, they may persuade their colleagues and friends to adopt the systems. Consequently kiosk system can be promoted by the authorities to potential early adopters who are identified by Rogers (2003) of having higher level of personal innovation than others. Wang et al.

(2009) found that Social Influence has a significant effect on intention of m-learning in the context of Taiwanese citizens. Gender moderates the relationships between Social Influence and Behavioral Intention, which was significant for male and insignificant for female.

2.13.4 Anxiety

Literary an intense dread, apprehension or nagging is referred to as anxiety. Howard, Murphy and Thomas (1986) define computer anxiety as the fear of impending interaction with a computer that is inconsistent to the actual threat presented by computer. Anxious users may experience fear of the unknown, feeling of failure and disappointment, possible embarrassment and feeling of frustration. The literatures on computer Anxiety yields conflicting results. Studies on relationship between computer usage and computer related attitude and behavior by Necessary and Parish (1997) found that, users with little or no computer experience have more anxiety than those that has experience. The results conclude that, increased level of computer experience and balance computer usage was both connected with reduced levels of computer associated anxiety. Anxiety is reported to have significant effect on Behavioral Intention to use technology (Loo et al., 2009). Whereas, Venkatesh et al. (2003) found the construct as insignificant being that it can be explained by Perceived Ease of Use.

2.13.5 Management Effectiveness

Management effectiveness is defined as the assessment of how well the non-profit organization (NPOs) is being managed – primarily as perceived by users in achieving

the objectives by which NPOs is established (Balduck & Buelens, 2008). Management structures are remarkable important in NPOs, since staff plays a vital role in translating mission of NPOs in to reality (Sowa et al., 2004). Management Effectiveness consists of variables that exploit capacity (structure and process), as well as those that exemplify the outcomes of those management systems and activities. Capacity refers to how the well the NPOs operate the structure in place whereas, outcomes are the results produced by management and program activities (Sowa et al., 2004).

2.13.6 Program Effectiveness

The Program Effectiveness refers to the characteristics that deal with the services or programs provided by the NPOs (Balduck & Buelens, 2008). It represents the specific service or intervention provided by the NPOs. This concept is in conformity with the vision behind telecentre initiative and accomplishment. The idea behind telecentre is intended to create demonstrable change in the lives of those expected to benefit from the services it rendered. Capacity therefore involved the extent of program design, operation and the degree perceived by the user as being designed and operated appropriately. In context of telecentre which is primarily targeted towards bridging the digital divide in underserved and unserved areas. Users are in position of evaluating the extent of IT services like training program that is roll out to increase IT skills of the users are adequate and satisfactory. Program outcome is the degree to which the program achieves its purpose.

2.13.7 Facilitating Conditions

Facilitating Conditions are necessary, unless for volitional behavior, resources and supports are vital for people to perform behavior. Facilitating Conditions is the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of new information technology (Venkatesh et al., 2003; Venkatesh et al., 2011). Facilitating Conditions serve as an environment of helping users overcome external barriers and hurdles to use a new IT. An individual may have the intention of using a technology platform but due to geographical barriers or poor enabling environments, such intention could not be realized. Hence a construct called Facilitating Conditions to predict behavior was introduced by Triandis (1980).

Previous studies on the relationship between Facilitating Conditions and Behavioral Intention or usage yielded mixed results. Studies by Loo et al. (2009) on user acceptance of Malaysian Government Multi-purpose Smart card application found that Facilitating Conditions has a positive relation with Behavioral Intention. And that Facilitating Conditions support users' in using Mykad. Loo et al. (2009) called for adequate measure to intensify in facilitating Mykad holders particularly the inexperience and the older users. By provision of user manual about Mykad in the three major languages; Malay, Chinese and Tamil languages at the initial stage such measure would resolve the threat of language barriers. Finding by Thompson et al. (1991) does not support positive relationship between Facilitating Conditions and Computer utilization, while Al-Gahtani et al. (2007) reported that the effect of Facilitating Conditions on Usage was not supported. Wang and Shih (2008) found a positive relationship between Facilitating

Conditions and Usage. Thompson et al. (1991) concluded that the negative relationship obtained between Facilitating Conditions and Usage could be attributed to the fact that only one dimension of Facilitating Conditions was measure in their study such as technical support. The study suggested that other aspect of Facilitating Conditions such as network access should be included in the measurement.

Adhering to this suggestion; accessibility to network is included in the measurements of the proposed model in the current study. Facilitating Conditions refers to easy access to technological resources and infrastructure (Thompson et al., 1991). In the context of this research, Facilitating Conditions include the info structure (internet connection and supporting facilities like power) as well as support provided by government through USPF to ease the use of the telecentre.

2.13.8 Behavioral Intention

The Behavioral Intention (BI) construct was originated from the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975). The construct is defined as "a measure of the strength of one's intention to perform a specified behavior (Davis et al., 1989, p. 984). Research has shown that Behavioral Intention has a direct impact on the individual actual use of a given technology (Davis, 1989). Davis (1986) introduced the Behavioral Intention construct to the MIS discipline through the technology acceptance model. An extremely important construct in the technology acceptance research (Igbaria et al., 1997; Jackson et al., 1997). Due to its importance, it is referred to "as a key criterion in

User Acceptance research" (Venkatesh et al., 2003, p 470). Figure 2.7, shows the conceptual model of the current study.

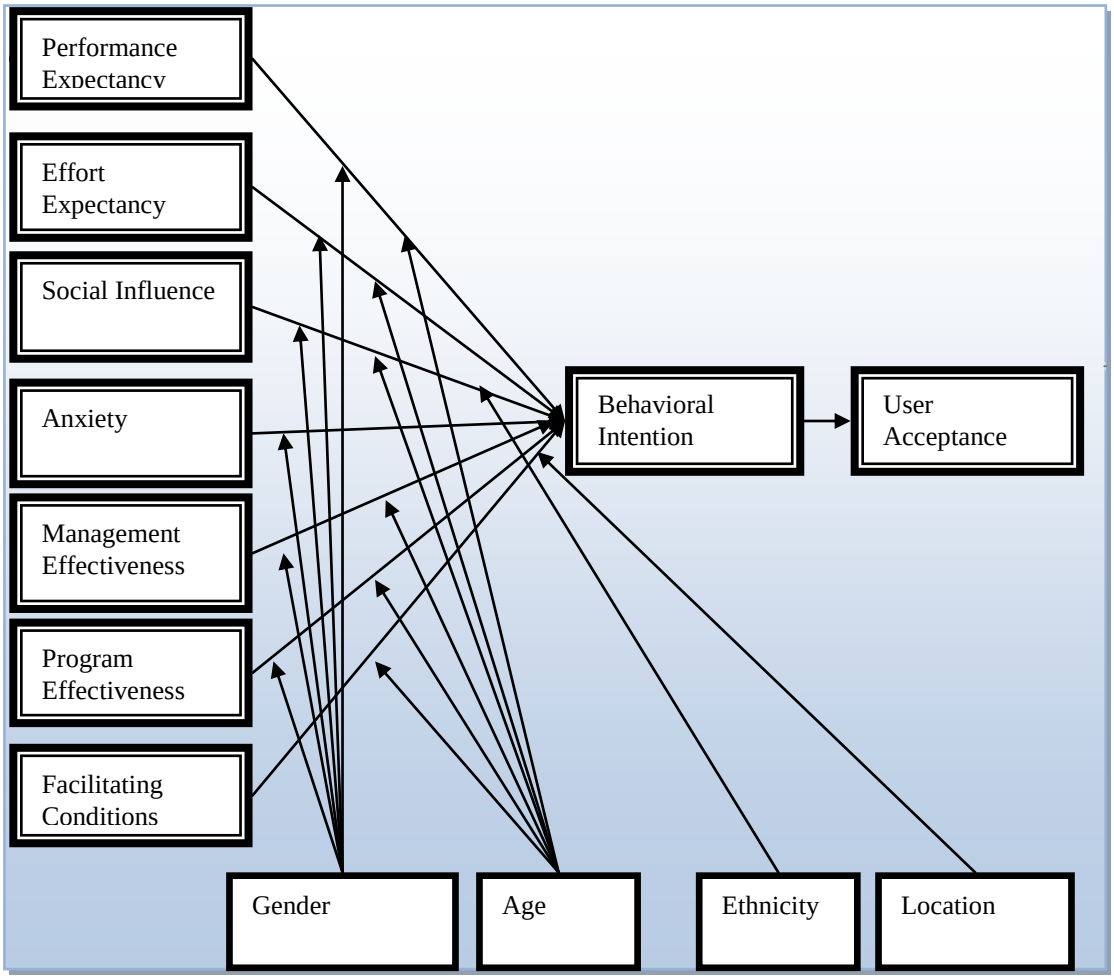

Figure 2.7: Conceptual model of Telecentre Acceptance

2.14 Summary

The literature review was divided into three main sections. The first section presents review on telecentre implementation along some selected developing countries. The second section introduced the status of ICT in Nigeria and policies of government initiatives towards provision of ICT to all. The last section of the literature review

elaborated on prior theories of technology acceptance model classified as general theories including TRA, TPB, DOI and TAM. The primary theory in context of this research is UTAUT model and the secondary theory is CVA. Those theories formed the foundation for the conceptual framework of user acceptance of telecentre.

The chapter also presents studies that adapted UTAUT model on various technologies (Appendix B, Table 2B) to justify the need of using UTAUT model on explaining the acceptance of telecentre. An overview of the UTAUT shows that the model does not address organizational factors except for Facilitating Conditions. Hence the need to have further understanding of organizational factors contribution such as: Management Effectiveness and Program Effectiveness to acceptance and usage of telecentre as suggested by (Balduck & Buelens, 2008; Sowa et al., 2004; Venkatesh, et al., 2003). The UTAUT model was adapted to include individual factors (Performance Expectancy, Effort Expectancy and Social Influence) and organizational factors (Management Effectiveness, Program Effectiveness and Facilitating Conditions) to formulate the proposed research model (Venkatesh, et al., 2003; Balduck & Buelens, 2008; Venkatesh, et al., 2011). The study also found that there are limited studies conducted to determine the acceptance of telecentre from users' perspective in Nigeria. The next chapter presents in detail research methodology and hypotheses development.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter provides a detailed discussion on the research methodology used in the current study. Research design, operational definitions of constructs, population and sampling and research instrumentation are presented. Information about the data collection process and data analysis strategies, including reliability and the validity of the survey instruments are elaborated. The justifications for choosing structural equation modeling (SEM) to test the validity of the measurement and hypothesized model are discussed in detail.

3.2 Research Strategies and Approaches

A research strategy can be viewed as a roadmap for conducting a research systematically rather than haphazardly. Sekaran and Bougie (2010) forwarded issues on designing a research strategy including 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. A research approach is the technique of deliberate scientific reasoning used in paradigms of conducting a research (Kovács & Spens, 2005). Three approaches are forwarded by the literature namely: deductive, inductive and abductive. Deductive research follows a deliberate course of moving from general law/ theories to a specific. The inductive research approach is based on the premise of moving from a collection of

specific observations to extensive generalizations and theories. Abductive approach paradigms stem from the view that majority of advance in science neither followed the guideline of pure deductive nor of pure inductive (Kovács & Spens, 2005). The detailed descriptions of the three approaches are enunciated.

Deductive approach scrutinizes theory through literature reviews to derive at logical conclusions from the theory. Deductive usually presented as hypotheses that are subjected to test in an empirical setting. The conclusion is based on the validation or falsification of the generated hypotheses. Conversely, inductive is a direct opposite of the deductive approach in the sense that not even the literature reviews or the knowledge of general frame is necessary. Abductive approach highlights the explorations of appropriate theories to an empirical observation referred as "theory matching" or "systematic combining" (Kovács & Spens, 2005). Data is collected simultaneously to theory building (Taylor, Fisher & Dufresne, 2002). The selection of research approach is subject to the objectives of research, which is either explanatory or exploratory or both. The purpose of selecting any approach is to contribute to an empirical knowledge or the development of the theory (Creswell & Plano-Clark, 2006).

The approach selected by a researcher depends on the objectives of the study, the research design and availability of resources and time. Since, the study aimed at modifying a theory through an empirical research. Deductive approach is considered to be more appropriates in identifying factors that influence user acceptance of telecentre in Nigeria through hypotheses testing. In the study, also the relationships among the factors are examined. The roles of moderating variables on those relationships are also

examined (Baron & Kenny, 1986; Sekaran & Bougie, 2010). A survey method was employed using a structured questionnaire to collect data from many respondents. The purpose of which is to assess the variables under investigation and to test the multiple hypotheses. This research conforms to studies on technology acceptance model such as Haslina and Mohamad (2005); Wu, Tao and Yang (2008).The research strategy adopted in achieving the set objectives of the study is illustrated in Figure 3.1.

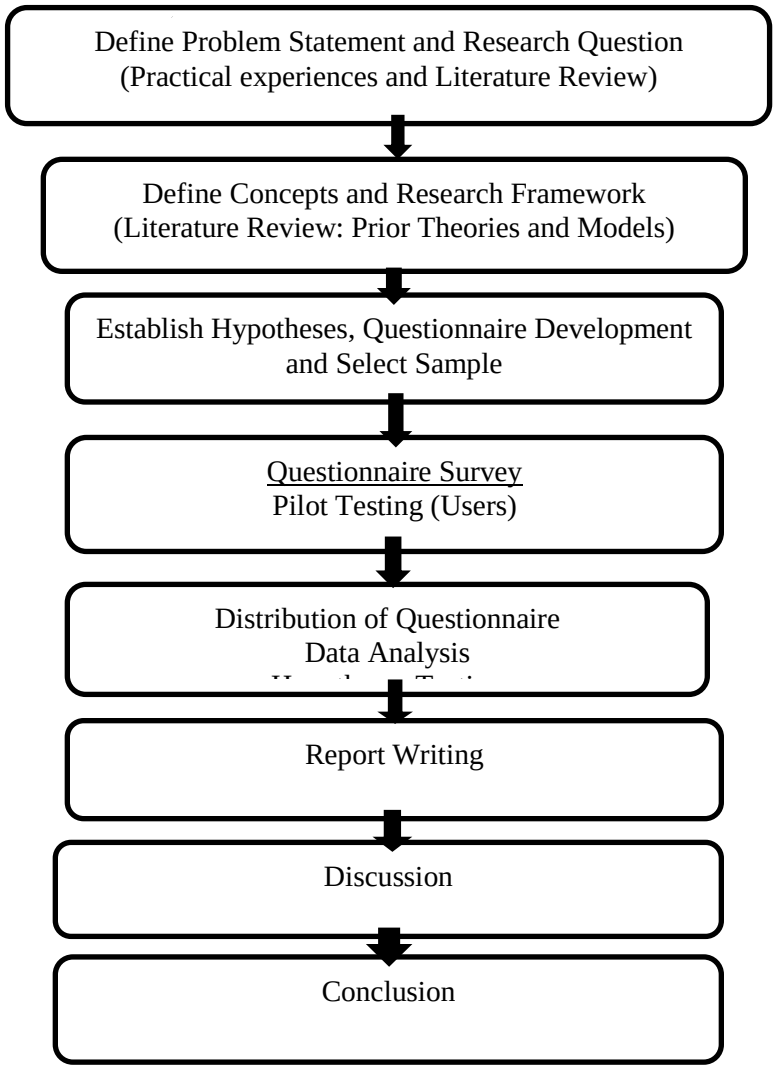

Figure 3.1: Research Strategy

3.3 Research Model

This study adapted UTAUT model as a theoretical framework (Venkatesh et al., 2003). As reported earlier, the model posits that four constructs are the determinants of Behavioral Intention and Use of Information Technology. The constructs include Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. They are moderated through irregular degree by gender, age, experience and voluntariness. Since UTAUT model is relatively new, further development and validation of the model was suggested in different context and culture (Wang & Shih, 2008; Venkatesh et al., 2003; Venkatesh et al., 2011).

An overview of UTAUT model reveals its limitations about incorporation of organizational effectiveness as a critical success factor in perspective of individual acceptance of telecentre. Since the model address only organizational factor of Facilitating Conditions. A critical problem is on the need to have further understanding of other organizational factors that contribute to acceptance and usage of telecentre (Balduck & Buelens, 2008; Venkatesh, et al., 2003).

This study introduced new factors into UTAUT model; these factors include Management Effectiveness and Program Effectiveness. The two constructs measured the effectiveness of the telecentre at program and management levels, as proposed by Sowa et al. (2004). The empirical support on the relationship between Management Effectiveness and Program Effectiveness with the Behavioral Intention were established in this study based on the suggestion by Venkatesh et al. (2003) and Balduck and

Buelens (2008). Earlier studies in the literature that examined this relationship in the context of telecentre to the best of researcher knowledge are limited. And that research focusing on measuring the two levels of effectiveness in telecentre from the perspective of users is scarce.

To determine the beta value in order to measure the strengths of relationships among the factors, the research model is constructed by depicting Behavioral Intention and User acceptance as the dependent variables. The determinants of Behavioral Intentions are the Performance Expectancy, Effort expectancy, Social Influence, Anxiety, Management Effectiveness and Program Effectiveness. Facilitating Conditions and Behavioral Intention collectively determines User acceptance. Gender, age, ethnicity, and location moderate the relationship to some degree. Venkatesh et al. (2003) in their analysis of eight models/theories of technology acceptance found that except for Social Cognitive Theory (SCT) and Motivational Model (MM), the predictive validity of the models increased after including the moderating variables. The research model shows the independent variables and the dependent variables with moderating variables. Figure 3.2 presents the possible relationships between the independents and dependents variables with moderating effects of gender, age, ethnicity and location.

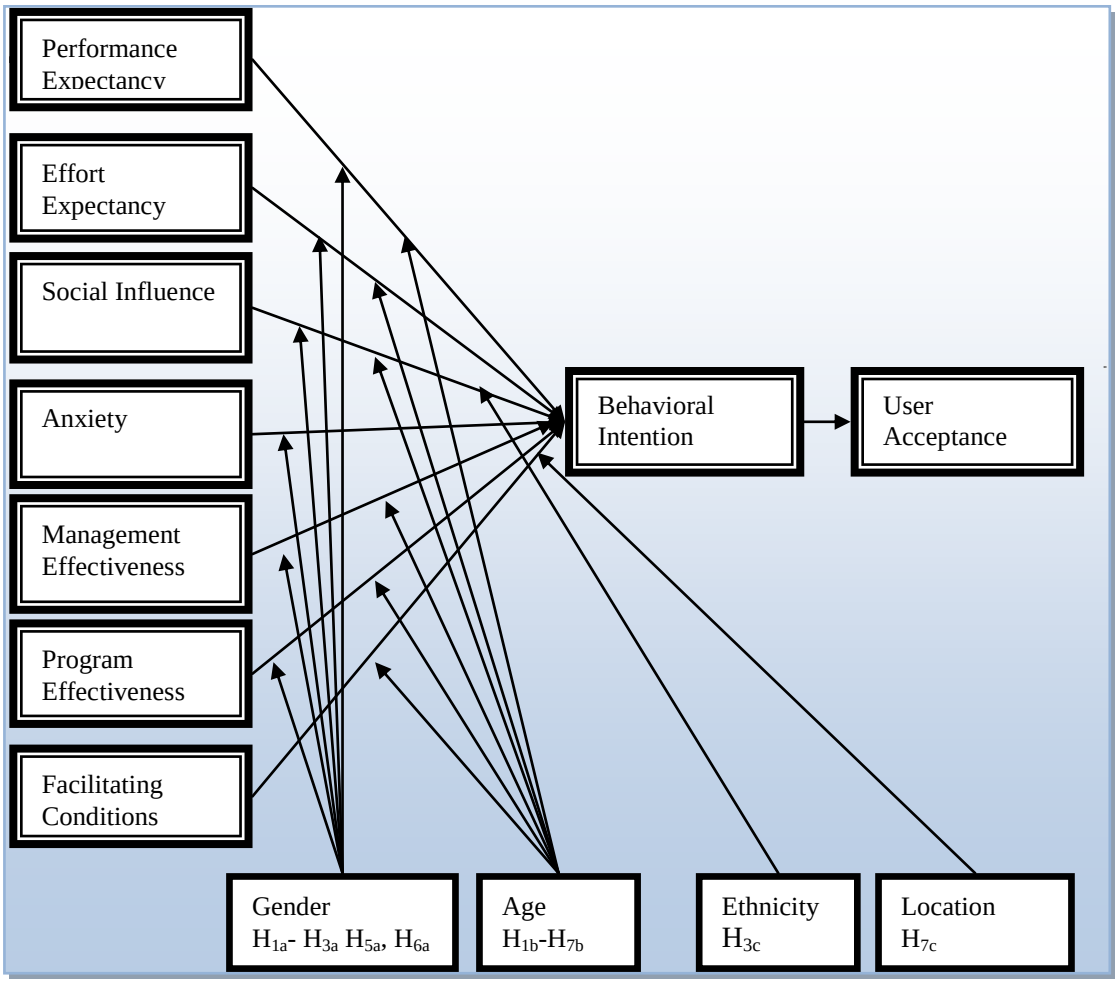

Figure 3.2: Research Model

3.4 Justifications of Adapting UTAUT Model

Many competing models to predict information technology acceptance and usage emerged in technology acceptance literature. Venkatesh et al. (2003) and Venkatesh et al. (2011) developed the UTAUT model to provide a unified view of technology acceptance models. The theory advanced that four key constructs (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) are direct determinants of Behavioral Intention and Usage behavior. These constructs are moderated to some degree by gender, age, experience and voluntariness (Venkatesh et

al., 2003). In this research, UTAUT model was adapted as an underpinning theory to investigate the determinants of user acceptance of telecentre due to the advantages that can be derived from the model.

The UTAUT model is considered most appropriate compared to other models and theories being the only theory that scrutinizes technology acceptance from general perspective (unified) (Venkatesh et al., 2011). Reflecting on this, UTAUT model is considered more suitable, since it address both organizational and individual factors in IT acceptance than other models of technology acceptance (Venkatesh et al., 2003; 2011). In addition, the constructs of UTAUT originated from eight prominent technology adoption theories and models (Venkatesh et al., 2003). More recently, Venkatesh et al. (2011) and Bankole et al. (2011) reported that even though TAM is the most widely cited adoption model, yet it is contained within UTAUT model. Moreover, the UTAUT model was able to account for 70% and 50% of the variance in intention and use respectively (Venkatesh et al., 2011). While other models could only predicts acceptance of technology in about 40% of cases (Venkatesh et al., 2003; Schaper & Pervan., 2007). These aforementioned advantages make the researcher to adapt UTAUT as suitable and extensive model to understand user acceptance in context of telecentre.

3.5 Operationalization of Constructs

3.5.1 Independent Variables

3.5.1.1 Performance Expectancy

Performance Expectancy (PE) is defined as "the degrees to which an individual believes that using an IT will help him/her better attain significant reward (Venkatesh et al., 2011)". This construct was reported as the most influential among the four constructs by Venkatesh et al. (2003) in predicting Behavioral Intention. It remains significant at all point of measurement regardless of environmental settings and was supported by other studies (Al-Gahtani et al., 2007; Wang & Shih, 2008). The theoretical foundation of Performance Expectancy has a basis from five theories/models used by Venkatesh et al. (2003). Recent studies have established that the construct may have a gender bias (Al-Gahtani et al., 2007; Wang & Shih, 2008). Venkatesh et al. (2003) posit that the effect of Performance Expectancy by gender such that it was stronger for male than female.

The measurement of Performance Expectancy is slightly modified to conform to most prominent studies dealing with UTAUT model. Performance Expectancy is measured using five questions that focus on job fulfillment adapted from Venkatesh et al. (2003) and Al-Gahtani et al. (2007). (1) Using telecentre enhances job performance (2) Using telecentre help in accomplishment of job more quickly (3) Using telecentre can increase productivity (4) Using telecentre enhances job efficiency and (5) Frequent use of telecentre can contribute to increase in user's value in terms of competency. The next determinant of Behavioral Intention is Effort Expectancy.

3.5.1.2 Effort Expectancy

Effort Expectancy (EE) is defined as "the degree of ease associated with the use of the IT (Venkatesh et al., 2011)". This construct has a theoretical foundation from the three constructs based on different models that relate to Effort Expectancy. These are Perceived Ease of Use (TAM/TAM2), Complexity (MPCU), and Ease of Use (DOI) (Rogers, 2003). In most studies conducted using UTAUT model, Effort Expectancy was found to positively influence Behavioral Intention to Use information system platform (Wang et al., 2006; Park, et al., 2007; Wang et al., 2009; lm et al., 2011). The degree by which Effort Expectancy influences Behavioral Intention is moderated by gender and age: such that the effect is stronger for female and mainly for younger female. The construct is measured by five questions adapted from Venkatesh et al. (2003): (1) My interaction with telecentre will be clear and understandable (2) I find using facilities in telecentre easy (3) I find using facilities in telecentre to be flexible (4) Using telecentre frequently makes one easy to be skillful and (5) Over all, I find facilities in telecentre easy to use.

3.5.1.3 Social Influence

Social Influence (SI) is defined as "the degree to which an individual perceives that important others believe he or she should use the new IT (Venkatesh et al., 2011)". Three constructs from the six models capture the concept of Social Influence (Venkatesh et al., 2003). The constructs are: Social Factors (MPCU), Subjective Norm (TRA, TAM2, TPB and C-TAM-TPB) and Image (DOI). Social Influence was suggested as a significant factor in influencing individual Behavioral Intention to

Acceptance of new IT (Venkatesh & Davis, 2000; Shaper & Pervan, 2007). The degree by which Social Influence has Effect on Behavioral Intention is moderated by gender, age, and ethnicity, such that the effect is more strongly for female, mainly elderly female. Based on the UTAUT model this research considers Social Influence as a significant determinant of Behavioral Intention to Use telecentre. The construct is measured by five questions adapted from Venkatesh et al. (2003). (1) Important people in my community thinks I should use telecentre (2) People who are important to me would want me to use the telecentre (3) People in my community who use the telecentre have more prestige than those who do not (4) Using telecentre has enhanced my knowledge about my environment and (5) In general, my community has supported the use of the telecentre.

3.5.1.4 *Anxiety*

Anxiety (AX) towards use of technology is described as evolving anxious or emotional reactions when it comes to performing a behavior (example, using a computer). It is related to apprehension or even the fear an individual has toward the possibility to use a technology (Venkatesh et al., 2003). Anxiety as a construct has the foundation from the Social Cognitive Theory (SCT) introduced to MIS by Compeau and Higgins (1995) as an extended SCT in the context of computer utilization. Anxiety influence Behavioral Intention on User acceptance of telecentre. The construct is moderated by age such that the effect is more strongly for younger people. Anxiety is measured using four questions adapted from Compeau and Higgins (1995): (1) I feel nervous using the facilities in telecentre (2) It scares me to think that I could make mistakes by using the facilities in

telecentre (3) The facilities in telecentre are somehow intimidating to me and (4) It scares me to use the facilities in telecentre because I lack adequate skills.

3.5.1.5 Management Effectiveness

Management Effectiveness (MEF) is defined as the assessment of how well the non-profit organization (NPOs) is being managed – primarily as perceived by users in achieving the objectives by which NPOs is established (Balduck & Buelens, 2008). Management structures are remarkable important in NPOs, since staff plays a vital role in translating mission of NPO's in to reality (Sowa et al., 2004). Management Effectiveness influences Behavioral Intention on User Acceptance of telecentre (Venkatesh et al., 2003; Balduck & Buelens, 2008). The construct is moderated by gender and age, such that the effect is stronger for female mainly elderly. Measure of management encompasses variables that tap capacity (structure and process) as well as those represent the outcomes of these management systems and activities (Sowa et al., 2004). This construct has the basis from the four quadrants of CVA (section 2.12). Management Effectiveness measurement is adapted from Balduck and Buelens (2008). The measure of Management Effectiveness are: (1) I have the confidence that this telecentre will be durable (2) The management receives assistance to render efficient service (3) The management and staff of this telecentre are accommodative (4) I observe team spirit and motivated staff within the telecentre staff and (5) Capable hands are available to impart knowledge in the telecentre.

3.5.1.6 Program Effectiveness

Sowa et al. (2004) refers to program as the "specific service or intervention provide by an organizations". Going by this definition telecentre as an intervention to underserved folks, suitably fit into this definition. Further Sowa et al. (2004) argue that the program has a variable that relates to the capacity (structure and process) as well as outcomes created by the intervention. The Program Effectiveness (PEF) refers to the characteristics that deal with the services or programs provided by the non-profit organizations (Balduck & Buelens, 2008). Users are viewed as important source of information regarding the contents of services rendered by NPOs. Knowing the degree of satisfaction of service offered by NPO's would form the basis for comparison with the objectives for which the NPO's is established (Balduck & Buelens, 2008).

Program Effectiveness influences on Behavioral Intention on User Acceptance of telecentre is moderated by gender and age, such that the effect is stronger for men and mainly younger male. Program Effectiveness constructs has the same theoretical support from the four quadrants of CVA (section 2.12). The operationalization of Program Effectiveness in context of telecentre are: (1) Using telecentre help in socio-economic development of my community (2) ICT facilities in the telecentre are always accessible to me within the operating hours (3) Telecentre staff are competent enough in discharging their work (4) There is a cooperation between telecentre staff and the users, and (5) Over all, the likelihood of replicating this program in our neighborhood is clear.

3.5.1.7 Facilitating Conditions

Facilitating Conditions (FC) is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of new IT (Venkatesh et al., 2011)". The theoretical foundation of Facilitating Conditions is derived from four theories/models used by Venkatesh et al. (2003). The constructs include: Perceived Behavioral Control (TPB/DTPB, C-TAM-TPB) and the initial Facilitating Conditions (MPCU) by Thompson et al. (1991). Facilitating Conditions was found to have positively influenced usage of information technology platform (Venkatesh et al., 2003; Wang et al., 2006). Facilitating Conditions influences Behavioral Intention on User Acceptance of telecentre is moderated by age and location such that the effect will be stronger for older people. In this research, Facilitating Conditions is measured using six questions that focus on resources and infrastructure adapted from Venkatesh et al. (2003): (1) I have the resources and knowledge to use ICT facilities in telecentre (2) Detail instruction about telecentre use is available to me (3) Sufficient electricity and internet service to use ICT in telecentre (4) Adequate ICT facilities in telecentre are available for access (5) A central support is available to help with technical problems (6) A specified person (or group) is available in case of difficulty.

3.5.2 Dependent Variables

3.5.2.1 Behavioral Intention

The Behavioral Intention (BI) construct as in Figure 3.2 was derived from the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975). Behavioral Intention is defined as "a measure of the strength of one's intention to perform a specified behavior (Davis et al., 1989, p. 984)". Previous research has shown that Behavioral Intention has a positive impact on the individuals' actual use of a given technology (Davis, 1989). The construct of Behavioral Intention was introduced to the MIS literature through the technology acceptance model (Davis, 1986). Behavioral Intention is reported as an extremely important construct in the MIS researches (Jackson & Leitch, 1997). Due to its importance, it is referred to "as a key criterion in user acceptance research" (Venkatesh et al., 2003, p. 470). The measurement of Behavioral Intention was vividly described as "extensively used in much of the previous individual acceptance research" (Venkatesh et al., 2003, p. 438). In this research, the existing measurement of Behavioral Intention is adapted to suit telecentre context. Behavioral Intention is measured using four questions that focus on: (1) I intend to use ICT facilities of the telecentre in the future (2) I predict I would use ICT facilities of the telecentre in the future (3) I plan to use ICT facilities of telecentre in the future and (4) I do not plan to use the ICT facilities in the near future.

3.5.2.2 User Acceptance

User Acceptance is synonymous to Use Behavior adopted as the indicator of Usage (Venkatesh et al., 2003, p.447). Study by Venkatesh et al. (2003) focuses on individual acceptance of technology by using intention or usage as a dependent variable. The operationalization of User Acceptance is adapted based on Wang and Shish (2008)

using the interval scale as in Appendix A. Table 3.1, summarizes the sources of variables used in the research model with corresponding definitions.

Table 3.1: Summary of Factors Utilize in the Research Model

Sources	**Factors**	**Definition**
Venkatesh et al. (2003)	1. Performance Expectancy	The degree in which an individual believes that using the telecentre will helps attain gains in task performance
	2. Effort Expectancy	The degree of ease associated with the use of telecentre facilities
	3. Social influence	The degree in which an individual believes that important others believes he/she should use the telecentre facilities.
Compeau & Higgins (1995)	4. Anxiety	The anxiety is an emotional response that an individual has, when performance is involved
Balduck & Buelens (2008)	5. Management Effectiveness	Management Effectiveness (MEF) is defined as the assessment of how well the non-profit organization (NPO's) is being managed – primarily as perceived by users in achieving the objectives by which NPO's is established.
	6. Program Effectiveness	Refers to the characteristics that deal with the service or programs provided by the organization.
Venkatesh et al. (2003)	7. Facilitating conditions	The degree in which an individual believes that an organizational and technical infrastructure exist to support the use of a telecentre.
	8. Behavioural Intention	A measure of one's strength to perform a specific behaviour.
Wang & Shih (2008)	9. User Acceptance	A submission by an individual or group to utilize IT in an act it is intended to support. Technology acceptance models are often used by researchers to assist in measuring IT acceptance or otherwise

The research model is exploited in examining the relationships between the Independent variables with the Behavioral Intention and the relationship between Behavioral Intention and the User Acceptance. Previous studies have established the relationships

between Performance expectancy, Effort Expectancy and Social Influence with Behavioral Intention (Wang & Shih, 2008; Wu et al., 2008; Venkatesh et al., 2011). On the other hand relationships between Facilitating Conditions and Behavioral Intention with Usage Behavior (Al-Gahtani et al.,2007; Wang & Shih, 2008; Venkatesh et al., 2011). The variables used in research model are operationalized and categorized into independent, dependent and moderating variables. Table 3.2 represents the codes and description of Behavioral Intention. The measurement was adapted from Venkatesh et al. (2003) and Venkatesh et al. (2011).

Table 3.2: Codes and Description of Dependent Variable

Sources	**Codes**	**Variables Description**
Behavioral Intention (Venkatesh et al., 2003)	B1	I intend to use the ICT facilities in telecentre in the future.
	B2	I predict I would use the ICT facilities in telecentre in the future
	B3	I plan to use the ICT facilities in telecentre in the future
	B4	I do not plan to use the ICT facilities in the near future.

Table 3.3 illustrates the codes and descriptions of the independents variables. Also, the measures were adapted from (Venkatesh et al., 2003; Compeau & Higgins, 1995; Balduck & Buelens, 2008).

Table 3.3: Codes and Descriptions of Independents Variables

Factors & Sources	Codes	Variables Description
Performance Expectancy Venkatesh et al. (2003)	PE1	Using telecentre enhances job performance
	PE2	Using telecentre help in the completion of the job more quickly
	PE3	Using telecentre can increase productivity
	PE4	Using telecentre enhances job efficiency
	PE5	Frequent use of telecentre can contribute to increase in user's value in terms of competency
Effort Expectancy Venkatesh et al. (2003)	EE1	My interaction with telecentre will be clear and understandable
	EE2	I find using the facilities in telecentre easy
	EE3	I find using the facilities in telecentre to be flexible
	EE4	Using telecentre frequently makes one easy to be skillful
	EE5	Overall, I find the facilities in telecentre easy to use
Social Influence Venkatesh et al. (2003)	SI1	Important people in my community think I should use the telecentre
	SI2	People who are important to me will want me to use the telecentre
	SI3	People in my community that use the telecentre have more prestige
	SI4	Using telecentre has enhanced my knowledge about the environment
	SI5	In general, my community has supported the use of a telecentre
Anxiety Compeau & Higgins (1995)	ANX1	I feel nervous in using the facilities in telecentre
	ANX2	It scares me to think I will make mistakes using the facilities in Telecentre
	ANX3	The facilities in telecentre are somehow intimidating to me
	ANX4	It scares me to use the facilities in telecentre because I lack adequate skills
Management Effectiveness Balduck & Buelens (2008)	MEF1	I have confidence that this telecentre will be durable
	MEF2	The manager receives assistance to render efficient service
	MEF3	The management & staff of this telecentre are accommodative
	MEF4	I observed team spirit and motivated staff within the telecentre staff
	MEF5	Capable hands are available to impart knowledge in the telecentre
Program Effectiveness Balduck & Buelens (2008)	PEF1	Using telecentre help in socioeconomic development
	PEF2	*ICT* facilities in telecentre are always accessible during the operation hours
	PEF3	Telecentre staff are competent enough in discharging their work
	PEF4	There is cooperation between telecentre staff and the users
	PEF5	Overall, the likelihood of replicating this program is clear
Facilitating Conditions Venkatesh et al. (2003)	FC1	A specified person (or group) is available in case of difficulty
	FC2	I have the resources and knowledge to use *ICT facilities in* telecentre
	FC3	Detail instruction about telecentre use is available to me
	FC4	Sufficient Electricity and Internet service are available to use *ICT*
	FC5	Adequate *ICT* facilities in telecentre are available for access
	FC6	A central support is available to help with technical problems

3.6 Research Hypothesis

The research variables presented in the research model as in Figure 3.2. Behavioral Intention (BI) and Facilitating Conditions (FC) are the determinants of User Acceptance (UA). The independent variables are: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Anxiety (ANX), Management Effectiveness (MEF) and Program Effectiveness (PEF) are the determinants of Behavioral Intention. This study hypothesized that the relationships between the determinants of Behavioral Intention/Acceptance are moderated by gender, age, ethnicity and location as suggested by Sun and Zhang (2006) and Venkatesh et al. (2003). All the hypotheses as in the research model with the exception of additional constructs introduced were proposed based on the original UTAUT model. The relationships among the independents and dependents variables were examined. The influences of moderating variables of gender, age, ethnicity and location in the hypotheses were evaluated. The two symbols H_{Ai} and H_{ni} show the indications of main and moderating variables hypotheses respectively. A null hypothesis H_0 is returned when there is no significant influence between the variables in the stated hypotheses. Otherwise, the hypotheses remain valid. The research hypotheses are formulated as follows:

3.6.1 Main Hypotheses

H_{A1}: Performance Expectancy has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A2}: Effort Expectancy has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A3}: Social Influence has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A4}: Anxiety has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A5}: Management Effectiveness has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A6}: Program Effectiveness has a significant influence on Behavioral Intention on User Acceptance of telecentre;

H_{A7}: Facilitating Conditions has a significant influence on User Acceptance of telecentre; and

H_{A8}: Behavioral Intention has a significant influence on User Acceptance of telecentre.

3.6.2 Hypotheses for Moderating Variables

Previous research established the significant influence associated with the roles of gender and age on IT acceptance (Venkatesh & Morris 2000; Venkatesh et al., 2003; Al-Gahtani et al.,2007; Wang & Shih, 2008; Wang et al., 2009; Venkatesh et al., 2011). Venkatesh et al. (2003) argued that it would be misleading to study gender difference without making reference to age. Therefore, it became necessary to assess the variation of gender and age in studying human behavior towards IT platform. Scholars in the field of psychology suggested that the variation of gender and age in terms of individual behavior relative to the role of gender on socialization (Twenge, 1997; Kirchmeyer, 2002). In the current research, social variations are important in context of telecentre, being an avenue for public access to computer and internet. Also, Srite and Karahanna (2006) and Sun and Zhang (2006) stress the potential of moderating effect of location and ethnic identity on IT acceptance. In view of aforementioned, gender, age, ethnicity and location moderating effects on Behavioral Intention to acceptance of telecentre

requires further investigation. This lead to the formulation of the following hypotheses based on the underpinning theory:

H_{1a}: Performance Expectancy influences Behavioral Intention on User Acceptance of a telecentre more strongly for male than for female;

H_{1b}: Performance Expectancy influences Behavioral Intention on User Acceptance of a telecentre more strongly for younger than for older people;

H_{2a}: Effort Expectancy influences Behavioral Intention on User Acceptance of telecentre more strongly for female than for male;

$H_{2:}$ Effort Expectancy influences Behavioral Intention on User Acceptance of telecentre more strongly for older than for the young people;

H_{3a}: Social Influence has effect on Behavioral Intention on User Acceptance of telecentre strongly for female than for male;

H_{3b}: Social Influence has effect on Behavioral Intention on User acceptance of telecentre more strongly for older than for younger people;

H_{3c}: Social Influence has an effect on Behavioral Intention on User Acceptance of telecentre more strongly on ethnicity such that the major ethnic groups utilize the telecentre more than minor ethnic group;

H_{4a}: Anxiety influences Behavioral Intention on User Acceptance of telecentre more strongly for younger than for older people;

H_{5a}: Management Effectiveness influences Behavioral Intention on User Acceptance of a telecentre more strongly for female than for male people;

H_{5b}: Management Effectiveness influences Behavioral Intention on User acceptance of a telecentre more strongly for older than for younger people;

H_{6a}: Program Effectiveness influences Behavioral Intention on User Acceptance of a telecentre more strongly for male than for female;

H_{6b}: Program Effectiveness influences Behavioral Intention on User Acceptance of a telecentre more strongly for younger than for older people;

H_{7b}: Facilitating Conditions influences User Acceptance of telecentre on Location more strongly on older than younger people; and

H_{7c}: Facilitating Conditions influences User Acceptance of telecentre more strongly for older than for younger people. Hence, Tables 3.4 summarized the main hypotheses in tabular form.

Table 3.4: Research Hypotheses between Independents and Dependents Variables

	Hypotheses	**Independent Variable**	**Dependent Variable**
H_{A1}	PE significantly influence BI on user acceptance of a telecentre	PE	BI
H_{A2}	EE significantly influence BI on user acceptance of a telecentre	EE	BI
H_{A3}	SI significantly influence BI on user acceptance of a telecentre	SI	BI
H_{A4}	ANX significantly influence BI on user acceptance of a telecentre	ANX	BI
H_{A5}	MEF significantly influence on BI on user acceptance of a telecentre	MEF	BI
H_{A6}	PEF significantly influence BI on user acceptance of a telecentre	PEF	BI
H_{A7}	FC significantly influence User acceptance of a telecentre	FC	UA
H_{A8}	BI significantly influence User acceptance of a telecentre	BI	UA

Table 3.5, presents moderating hypotheses of gender, age, ethnicity and location:

Table 3.5: Research Hypotheses among the Moderating Variables

		Gender Male/ Female		**Age Young /Old**		**Ethnicity Major/ Others**		**Location Younger/ Older**	
Code	**Hypotheses**	M	F	Y	O	M	O	Y	O
H_{1a}	PE influence BI to use telecentre more	√							
H_{1b}	PE influence BI to use telecentre more			√					
H_{2a}	EE influence BI to use telecentre more		√						
H_{2b}	EE influence BI to use telecentre more				√				
H_{3a}	SI influence BI to use telecentre more		√						
H_{3b}	SI influence BI to use telecentre more				√				
H_{3c}	SI influence BI to use telecentre more					√			
H_{4a}	ANX influence BI to use telecentre more			√					
H_{5a}	MEF influence BI to use telecentre more		√						
H_{5b}	MEF influence BI to use telecentre more				√				
H_{6a}	PEF influence BI to use telecentre more	√							
H_{6b}	PEF influence BI to use telecentre more		√						
H_{7b}	FC influence BI to use the telecentre more				√				
H_{7c}	FC influence BI to use the telecentre more								√

Key: Independent variable influences dependent variable in acceptance of the telecentre more strongly on any of moderating variable.

The next section presents population and sampling including pilot study to test the reliability and validity of the survey instruments.

3.7 Population and Sampling Method

The selection of sampling starts with the identification of the population, a sample is a subset of a larger population. The population refers to a whole group of people or organization that is of interest to a researcher (Sekaran & Bougie, 2010). A fundamental aspect of survey involves the computation of sample size. By determining an appropriate sample a conclusion can be drawn that would be generalized to the population of interest (Sekaran & Bougie, 2010). A sample is taken because looking at the entire population may not be realistic. The unrealistic tendency is usually attributed to the cost, or the difficulty, or both in sampling every member of a population. Thus, determining sample size is vital in research because it avail the researcher in the following ways:

1. Lower cost;
2. Greater accuracy in results;
3. Greater speed of data collection; and
4. Availability of population elements.

The size of sample depends on the accuracy required, the number of variables in the study and the appropriate statistical tools to be used.

3.7.1 Sampling Frame

The population of this study comprises the users of 12 community telecentres (CCC-Telecentre). The lists of users were obtained from the USPF office in the headquarters

(USPF, 2009a). The telecentre are spread across the three zones of Nigeria as shown in Table 3.6.

Table 3.6: Distribution of Community Telecentres in Nigeria

Geopolitical Zone	Community Telecentre	Number of Telecentre
Northern (North East, North Central, North West)	Izom Ugba Mubi Azare Gumel Kamba	6
South (South East, South - South)	Ishi-ozalla Ihiteowerri Amarata Itigidi	4
South West (South West)	Igbogun Ido	2
Total		12

Source: USPF (2009a)

Base on the data collected from USPF office at Abuja, there are 12000 registered telecentre users divided among the 12 community telecentres as shown in Table 3.7

Table 3.7: Number of Registered Users of Community Telecentre in Nigeria

	Location of Telecentre	Number Users
1. Northern Zone	Izom	906
2	Ugba	880
3	Mubi	995
4	Azare	1300
5	Gumel	859
6	Kamba	860
7. Southern Zone	Ishi-ozalla	970
8	Ihiteowerri	850
9	Amarata	975
10	Itigidi	875
11. South Western Zone	Igbogun	1350
12	Ido	1180
Total		12000

Source: USPF (2009a)

Then the list of community telecentre and number of users from each telecentre was divided in to three major grouping based on the geographic zones (North, South and South West) shown in Table 3.8. The type of grouping is called stratified sampling considered as the most appropriate sampling design in the current study. Stratification affords the researcher more information within a given sample size (Sekaran, 2006).

Table 3.8: Number of Telecentre from each Geographical Zone

Zones	**No. of Telecentre**	**No. of users**
North (Izom, Ugba, Mubi, Azare, Gumel, Kamba)	6	5800
South (Ishi-ozalla, Ihiteowerri, Amarata, Itigidi)	4	3670
South West (Igbogun, Ido)	2	2530
Total	12	12000

Source: USPF (2009a)

Subsequently, proportionate random sampling was used to determine the number of telecentres and number of users that formed the sample scope for the current study as in (Table 3.9). The number of telecentres from the Northern zone forms the largest number of users with about 48% of the total number of telecentre users. The South zone has about 31% and finally the South West zone has the least telecentre users constituting only 21%.

Table 3.9: Proportion of Telecentre Sample with the Corresponding Percentage

Zone	**Number of Telecentre**	**Probability sampling of telecentre**	**Number of users**	**% of sampling**
North	6	3	5800	48
South	4	2	3670	31
South west	2	1	2530	21
Total	12	6	12000	100

Source: USPF (2009a)

From the Table 3.9, the probability sampling of the Northern zone is three out of six, as for the Southern zone the probability sampling is two out of four. The South West zone has a probability of one out of two telecentres. Simple random sampling was conducted in selecting the names of telecentre base on the zones. Consequently, the results of selected telecentres in which the questionnaire was administered base on random sampling from Northern zone are: Izom, Azare and Kamba. In the Southern zones are Ihiteowerri and Itigidi telecentres and lastly from the South West, Ido telecentre was selected.

3.7.2 Sample Size

The study adopted Bartlett, Kotrlik and Higgins (2001) Table in determining the appropriate sample size of a given population. Alternatively, Cochran (1977) cited in Bartlett et al. (2001) gave a sample size formula for continuous data, assuming alpha level at 0.05, using 7- point scales, where the standard deviation of scale is estimated at 1.167 with a level of acceptable error at 3%. The Cochran's sample size formula applicable in the context of this research is shown in the following formula:

$$\underline{n}_0 = \frac{(t)^2 * (s)^2}{(d)} \qquad (3.1)$$

$$= \frac{(1.96)^2 * (1.167)^2}{(7 * .03)^2} = \frac{3.8416 * (1.361889}{0.0441} = \mathbf{118.64}$$

Where $\underline{t}$ *= value for selected alpha level of .025 in each tail is 1.96*

$\underline{s}$ *= estimate of standard deviation of the population is 1.167*

$\underline{d}$ *= acceptable margin of error for mean being estimated .03*

The sample size could also be determined using the table considering the confidence level (Bartlett et al., 2001, p.48). With alpha level 0.05 tolerating 3% error consecutively, the minimum number of samples for the population of 12000 as suggested by Bartlett et al. (2001) was 119. Based on Krecjcie and Morgan (1970), the researcher decided to use 375 sample sizes on anticipation of low response rate from the respondents (refer to Appendix B). Then, 375 questionnaires were distributed to six telecentre users in the three zones (North: Izom, Azare and Kamba, South: Ihiteowerri and Itigidi; lastly from the South West: Ido). The probability sampling was computed using the following formulation:

Probability sampling of users = $NP * NS/T$

NP = Number of telecentre users in each zone

NS= Number of sample to be distributed

T= Total number of telecentre users

Table 3.10: The Probability Sampling of Users from each Zone

Zone	**Number of Users**	**% of sampling**	**Probability sampling of users**
North	3066	51	193
South	1725	29	108
South west	1180	20	74
Total	5971	100	375

Source: USPF (2009a)

Base on Table 3.10, the number of questionnaires distributed for each zone is shown. In the Northern zone, 193 questionnaires were distributed in three telecentres: Izom, Azare and Kamba. The number of users in Izom, Azare and Kamba were 906, 1300 and 860 respectively, in view of these 57, 82 and 54 questionnaires were distributed in the three

northern zone. While the South zone, Ihiteowerri and Itigidi with population of 850 and 875 the questionnaires distributed were 54 and 53 respectively. While Ido telecentre in South West, 74 questionnaires were distributed to the respondents. Table 3.11 shows the modality used in distributing the questionnaires.

Table 3.11: *Number of Questionnaire Distributed for each Telecentre*

Name of telecentre	**Population of users**	**No. of respondents**	**Systematic random sampling**
Izom	906	57	16
Azare	1300	82	15
Kamba	860	54	14
Ihiteowerri	850	53	13
Itigidi	875	55	8
Ido	1180	74	16
Total	5971	375	

Source: USPF (2009a)

3.7.3 Systematic Sampling Design

The researcher chooses a random sample by which 375 respondents were systematically identified from the six telecentres in the three zones of Nigeria as represented in Table 3.11. The list of users from each telecentre was used to ensure randomness. Every 16^{th} user at Izom was chosen every 15^{th} at Azare and every 14^{th} user at Kamba was also chosen as respondents in the Northern zone. In addition every 13^{th} user at Ihiteowerri and every 8^{th} at Itigidi in the South were chosen. Finally, every 16^{th} user at Ido in South West zone was selected as respondents in the study.

3.7.4 Unit of Analysis

The unit of analysis is the most important entity subjected to investigation in the context of a study. In its simplest term, a unit of analysis is what or who is being investigated in a given research and the type of unit the research used in measuring the variables (Sekaran, 2006). The research adopted self-assessment technique in which individual user is requested to give a level of his/her agreement or disagreement with the statement in the questionnaire. Unit of analysis consists of any of the following:

- Individual;
- Social interactions (divorces, dyadic relations, arrests);
- Groups;
- Organizations (Industries, Banks);
- Geographic entities (Cities, Villages, states); and
- Artefacts (antiquities, photos, books).

The unit of analysis for this study is individual; this is justifiable based on the stated reasons: Firstly, the individual is seen as the most suitable respondent of this research, being the end users of a telecentre. There is empirical evidence by previous researchers that have used individual as their main respondents (Wang & Shih, 2008; Wang et al., 2009; Loo et al., 2009; Venkatesh et al., 2011). Secondly, data is expected to be available for the variables of interest at individual level in this study. Thirdly, the variables under analysis is within the whim and control of the individual concerned based on theoretical grounds of the Behavioural Intention and User Acceptance of UTAUT Model (Venkatesh et al., 2003; Wang & Shih, 2008; Venkatesh et al., 2011).

3.7.5 Time Dimension of the Study

Two choices concerning time-frame in conducting research are reported in the literature. These are longitudinal and cross-sectional survey. In longitudinal survey, the collection of data spans over an extended period of time while in cross-sectional survey the data are collected at once, representing the issue at a specific time (Cooper & Schindler, 2006). These study collected data using a cross-sectional approaches because it limits casual inferences. Moreover, prior studies in the area of technology acceptance used cross-sectional studies such as Al-Gahtani et al. (2007), Wang and Shish (2008) and Loo et al. (2009). Though, many methods of data collection in surveys exist, in this study primary data was collected through random distribution of the questionnaire to the respondents. Questionnaire designs offer the researcher's opportunity to capture several targeted respondents.

3.8 Types of Questionnaire

Literally a set of questions specified to represent information on a certain variables based on the feeling of a respondent is called questionnaire. A questionnaire could be dichotomous, close ended and/or open ended. In this study the questionnaires are close ended. The respondents are restricted in selecting their choice within the set of alternatives answers in measuring their objective and subjective impression on each variable. The questionnaire used in this study was adapted from previous researches based on the identified variables (Venkatesh et al., 2003; Compeau & Higgins, 1995; Balduck & Buelens, 2008; Wang & Shih, 2008).

The questionnaire comprises of 43 items, except for demographic characteristics measurements. The instruments include 35 items measuring the independent variables; eight items measured the dependent variables. While the remaining moderating variables of gender, age, ethnicity and location were measured by nominal scales. The questionnaire was prepared in English language; there was no need of translating the questionnaire to any of the local languages, since the respondents can comprehend English being the official language in Nigeria.

3.8.1 Rating Scales for the Response

The researcher used the common rating scales for measuring the latent construct in MIS (Zainudin, 2010). The questionnaire was developed using a 7- point interval scale in measuring the constructs, including independent and dependent variables. An individual chooses a scale from the ranges of seven scales starting from "strongly disagree" to "strongly agree". The interval scale was selected because it can measure the extent of the difference in the preference among the individual (Sekaran, 2006). Though, some literatures have suggested a 5-point scale due to its inherent benefits. The 7- point Likert scale is reported to provide lucid feedback also being prepared for not subjecting the respondents into undue cognitive burden (Cavana et al., 2001; Hair et al., 2010).

3.8.2 Validity and Reliability of the Research Instruments

The design of the survey instruments cannot be divorced from a set of inadequacy in the format, wording, content of the questions and the way in which the questionnaire was formulated and distributed. Adcock and David (2001) describe validity as "the degree to

which construct measured is unbiased and ensures consistent measurement across time and across various items in the instrument". Therefore, validity could be summed as the degree in which an instrument measures what it is intended to measure. Below are some criteria of instruments validity as described by Fink (2006).

1. Content validity implies the extent of accuracy the questions represent the structures its' examine; and
2. Construct validity indicating certainty that the instrument measures what it is intended to measure.

3.8.3 Content Validity

The researcher presented the questionnaire to the three classes of reviewers for validation. The first reviewer was a senior lecturer from Universiti Utara Malaysia and the second reviewer, an associate professor from the Open University in Nigeria. The third reviewers were three academics whom the researcher was opportune to meet in two conferences in Perak and Kuching. For detail profiles of the reviewers involved in the content validity refer to appendix A. The questionnaire was thoroughly reviewed by each of the five academics to ensure adequacy, comprehensibility and reliability of the measured used. The reviewers also examined the extent to which each item portrays the proposed constructs and whether the itemized statement and the scale chose were appropriate. The suggestions from the academics have given the researcher the opportunity to affect changes in terms of arrangement of survey questions to improve

the general flow and sequencing of the questionnaire. The questionnaire was then used for subsequent pilot study.

3.8.4 Pilot Study and Construct Validity

To determine the reliability of the measurement instruments before the main empirical study, a pilot test was conducted by distributing questionnaires to the respondents in Azare community telecentre. Swenson and Wretman (1992) argued that two to ten percent of a population is sufficient to pilot- test questionnaires on the basis of this, 53 questionnaires were distributed using a convenience sampling. A pilot test is called a dress rehearsal in which a small scale of study is conducted before the full scale research. The purpose of which is to test the validity and reliability of the instruments of the study. Fink (2006) suggested that self-administered questionnaire should be subjected to considerable advanced preparation and editing as pilot test.

Based on the result of pilot data, the reliability for each of the measurement instruments was calculated. A major standard for adopting prior instrument is their unique internal consistency base on the computation of Cronbach alpha reliability coefficients (Hair et al., 2010; Byrne 2010). Cronbach's alpha is an index of reliability for quantitative data, its point out how well the items in a set are positively correlated to one another (Coakes, Steed & Ong, 2010). The nearer value of the Cronbach's alpha to one the higher the internal consistency reliability. Detail list of Cronbach alpha reliability obtained from the pilot study is shown in Table 3.12. Except for constructs on Voluntariness, the reliability estimates obtained from the pilot study ranges from 0.737 to 0.805. The

values obtained are more than the required 0.7 threshold that is deemed sufficient for conducting empirical research (Hair et al., 2010; Byrne, 2010; Sekaran & Bougie, 2010).

Table 3.12: Results of Cronbach Alpha base on Pilot Study

Constructs	Items	Cronbach Alpha (α) Pilot Study (n=53)
1. Performance Expectancy	5	0.763
2. Effort Expectancy	5	0.793
3. Social Influence	5	0.813
4. Anxiety	4	0.814
5. Management Effectiveness	5	0.766
6. Program Effectiveness	5	0.796
7. Facilitating Condition	6	0.761
8. Behavioral Intention	4	0.730
9. User Acceptance	4	0.805
10. Voluntariness	4	0.409

Generally, a rule of thumb on assessing Cronbach alpha was presented by George and Mallery (2003, p.231) "… > 0.9 – Excellent, > 0.8 – Good, > 0.7 – Acceptable, > 0.6 – Questionable, > 0.5 – Poor, and < 0.5 – Unacceptable". The reliability of Voluntariness construct was 0.409 based on the suggestion by George and Mallery (2003) further use of the construct of Voluntariness is unacceptable. Also during the pilot test, some likely problems related to the contents and times taken to fill the questionnaire were identified. Necessary corrections were done before embarking on the main study. For detail authentication of the research questionnaire, refer to Appendix A.

3.9 Data Analysis Strategy

Three stages of data analyses were performed in analyzing the data. The first stage involves descriptive data analysis. Amongst the tasks in descriptive analysis conducted

were: assessing the missing data, outliers and normality tests of all measurement constructs. Other tasks conducted are descriptive statistics to describe the variances in respondents' characteristics. The second 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, 2005). 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 third stage involves assessing path analysis on hypothesized model, to examine the entire research hypotheses. In accomplishing the enumerated tasks, SPSS version 18 and the Analysis of Moment Structures (AMOS) version 16 Software were used in conducting data analyses.

3.9.1 Structural Equation Modeling

Structural equation modeling (SEM) is a second generation technique of conducting statistical analysis. SEM was developed to serve a function similar to multiple regression but in some exclusive manner. The purpose of choosing SEM is that it has the capability of analyzing multiple relationships between independent and dependent variables compared to other generation models (such as: linear regression, MANOVA and ANOVA). Further, SEM allows for correlation among measurement errors, realize by capturing the modeling of interactions, correlated independent variables, and measurement error. In addition each measured by multiple indicators, specifically, examines a set of relationships among one or more dependent variables either

continuous or discrete (Hair et al., 2010). SEM has the capability of accommodating the latent dependent and independent variables relationship that cannot be measured directly. In summary, SEM was chosen as a statistical technique for model testing due to the following reasons:

1. SEM does not need assumption for perfect measurement of indicators. It explains the errors in observed variables. In a manner that more precise estimation of unobserved theoretical construct can be obtained using the observed variables that are measured through specific items in a questionnaire. A study has shown that from practical and theoretical point of view, there are always some degrees of measurement error (Hair et al., 2010). SEM tolerates measurement error usually as a result of response to a more abstract or theoretical concept response to an abstract question for example on a Facilitating Condition. It can estimate an error term or unique variance component for each indicator variable;

2. SEM has the capabilities of testing a series of interrelated causal relationships simultaneously as well as incorporating the measurement data (Hair et al., 2006), thus estimating the size of the total effects of each independent variable on the dependent variable;

3. The ability of SEM to measure the relationships between variables broadly provide a transition from exploratory to confirmatory analysis; and

4. SEM has the capabilities of identifying moderating variables, multiplicative multiple regression (MMR) and multi-group analysis. Multi-group analysis is frequently used by MIS researchers (Hair et al., 2006). In view of the enumerated advantages, the researcher found that SEM is appropriate for estimating the parameters and testing the research model. The fact that it can account for measurement error is an added advantage.

3.10 Summary

The chapter starts by explaining the research design and operationalization of the constructs. The research model with the corresponding hypotheses to be tested was presented. To test the research model entails knowing the population and sampling frame (section 3.7) to be used. Detailed process in identifying the sample was discussed also a pilot study was conducted to test the reliability of the survey instruments (section 3.8.4). The next chapter (that is, Chapter four) presents the research findings including detail data analyses strategies using SPSS and AMOS (software's) in testing the proposed hypotheses.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents the result of analysis which was done through the application of SPSS 18.0 and AMOS 16.0 statistical packages. The chapter starts with the description of the analysis related with respondents' profile and test of non-respondents bias. The results of data screening and cleaning include missing data; outliers, normality, multicollinearity and homoscedasticity were done for the purpose of obtaining a reliable data. Additionally, the chapter presents the result of confirmatory factor analysis, measurement and structural model. The hypothesized structural model was presented to test the proposed research model and the extent of how the research model fits with the data. Lastly, the chapter discusses on the findings of the hypotheses testing with the impact of the moderators.

4.2 Analysis of Survey Response

4.2.1 Response Rate

The data collection was undertaken for the duration of 24 weeks (from August 30th 2010 until February 7th, 2011). In compliance with data collection requirements, 375 questionnaires were distributed to the respondents. This type of data collection is consistent with the existing literatures in technology acceptance researches (Wang & Shih, 2008; Loo et al., 2009; Park et al., 2007). From the number, only 205 were

retrieved out of which two were discarded because they were incomplete. The total usable responses that remained for further analysis was 203, representing 54%. The treatment of outliers (yields 12 cases that were identified and deleted through a threshold of mahalanobis distance value of more than the x^2 value (x^2=59.3; n=43, p=0.05). Outliers are any observations which are numerically distant compared to the rest of data set (Byrne, 2010). The outliers could be attributed to erroneous responses to the filling of questionnaire by the respondents (Tabachnick & Fidell, 2007; Hair et al., 2010). At the end a total of 191 samples were left for further analysis. The obtained sample size appeared to be adequate and the response rate is also comparable to many studies that have adopted users of information technology initiatives as sample (Park et al., 2007; Wang & Shih, 2008; Loo et al., 2009; Venkatesh et al., 2011). The socio-economic characteristics of the respondents include: gender, age, ethnicity, income, educational attainment and access to telecentre as shown in Table 4.1.

Table 4.1: Characteristics of the Respondents (N=191)

Characteristics	Number	Percentage
1. Gender		
Male	122	63.9
Female	69	36.1
2. Age		
≤ 20	39	20.4
21-25	73	38.2
26-30	7	3.7
31-35	13	6.8
36-40	45	23.6
41-45	9	4.7
≥ 46	5	2.6
3. Ethnicity		
Major (Hausa, Yoruba, Igbo)	126	66.0
Minor	65	34.0
4. Income		
Low	127	66.5
Middle	59	30.9
High	5	2.6
5. Educational attainment		
Primary	6	3.1
Secondary	83	43.5
Diploma	38	19.9
Bachelor	49	25.7
Masters/Doctorate	3	1.6
Others	12	6.2
6. Occupation		
Student	142	74.3
Government employee	28	14.7
Unemployed	15	7.9
Others	6	3.1
7. Computer and Internet access		
Home access	72	37.7
Lack of home access	119	63.3
8. Location of telecentre		
Convenient	85	44.5
Not convenient	106	55.5

Analyzed result from the demographic characteristics of the respondents revealed that male constituted 63.9% of the responses. The ages of the respondent's ranged from 20 to 50 years with a higher percentage in the ages among 21-25 and 36-40 (38.2% and

23.6%), respectively. The average age of all the respondents was 28 years. Ethnic groups or sub-culture of the respondent is an important demographic variables used in the survey. The range of respondent's ethnic background 66.0% were from the major ethnic groups (Hausa/Fulani, Yoruba & Ibo) while 34.0% were from minority groups. In terms of income, the respondents were unevenly distributed among the groups: 66.5% were lower income; 30.9% were middle income and only 2.6% falls into category of high income. Most respondents about 43.5% had at least a secondary certificate. The level of educational attainments could be a reflection of the respondents' occupations. The findings show that most of the respondents were students 74.3%, only 14.7% were governments' employee, and 7.9% were unemployed.

Although, most of the respondents were students, yet they have an income as a result of allowances provided by Local and State Governments. On the ownership of personal computer, only 37.7% have access to a computer at home and 62.3% have no home access to computers and internet. This result justifies the need of having communal access to computer and internet. Location of telecentre might contribute or hinder the acceptance and used of IT initiatives, of the respondent only 44.5% were comfortable with the telecentre location while 55.5% were uncomfortable.

4.2.2 Descriptive Statistics

Table 4.2 shows that the demographic variables of gender and income have the lowest mean 1.36; whereas, educational attainments have the highest mean 2.98 and standard deviations 1.2050. However, the standard errors of the demographic variables range

from 0.03400 to 0.08700. Conversely, the construct of Anxiety (ANX) has the lowest mean with 3.7890, while the Behavioral Intention (BI) has the highest mean with 5.6300. However, the standard deviation of the collective constructs fall in the ranges of 1.3574 to 1.9110, suggesting the existence of significant acceptability within the data set.

Table 4.2: *Descriptive Statistics for all Constructs and Variables used in the Study*

Research Variables	Code	No. items	Mean	SD. Error	S.D	Min	Max
1. Gender	GENDER	1	1.36	.03500	.48200	1	2
2. Age group	AG. GRP	1	1.38	.03500	.48700	1	2
3. Ethnicity	ETHN	1	1.34	.03400	.47500	1	2
4. Income	INCOME	1	1.36	.03900	.53300	1	3
5. Educational Attainments	QUAL	1	2.98	.08700	1.2050	1	6
6. Occupation	OCCUP	1	1.40	.05500	.76700	1	4
7. Computer and Internet Access	INT.ACC	1	1.62	.03500	.48600	1	2
8. Location of Telecentre	LOC	1	1.55	.03600	.49800	1	2
9. Performance Expectancy	PE	5	5.4158	.1161	1.6041	1	7
10. Effort Expectancy	EE	5	5.0822	.1187	1.6399	1	7
11. Social Influence	SI	5	5.1767	.1159	1.6019	1	7
12. Anxiety	ANX	4	3.7890	.1380	1.9110	1	7
13. Management Effectiveness	MEF	5	5.4654	.0982	1.3574	1	7
14. Program Effectiveness	PEF	5	5.1328	.1107	1.5303	1	7
15. Facilitating Condition	FC	6	4.8910	.1178	1.6285	1	7
16. Behavioural Intention	BI	4	5.6300	.1020	1.4100	1	7
17. User Acceptance	UA	4	4.970	.1190	1.6490	1	7

4.2.3 Test of Non-Response Bias

Previous studies have established that the non-respondents occasionally differ systematically from the respondents both in behaviors, attitudes, perceptions and demographics. Any of these or all might affect the results of the study (Malhotra, Hall, Shaw & Oppenheim, 2006). In this research, non-response and the response bias has been tested using the t-test to compare the similarities between the mean, standard deviation and standard error mean. The comparison is done between the early and late

responses in variables such as: gender, age, ethnicity, qualifications, income and home ownership of the computer. Findings from Churchill and Brown (2004) and Malhotra et al. (2006) have empirically contended that late respondents could be used in place of non-respondents. Primarily, because they would not have perhaps responded if not that they had been largely given followed up approach. Malhotra et al. (2006) argue that the non-respondents are presumed as having similar characteristics like the late respondents. To normalize this procedure, this study has divided the sample into two (early responses and late responses). The respondent that returned the questionnaires within two weeks after the distribution were termed as early response. The late responses were those respondents that returned the questionnaires after two weeks from the date of distribution. Therefore, the study has classified 103 respondents as early responses and 88 respondents as late responses. Both descriptive tests and Levene's test for equality of variance were conducted on the demographic and continuous variables. For the demographic variables, the researcher conducted a descriptive test to compare the means, standard deviation and standard error means between the early and late respondents.

The results of the descriptive test showed that there were no much significant statistical differences between (early and late) respondents' demographic variables. Except for early respondents that exhibits home computer ownership (Access versus Non-access). An indication that shows that user who lacks computer ownership at home tends to responds to the questionnaires' than those who possess the computer at home. The independent samples test reveals that there is no difference between the early

respondents and the late respondents on the basis of age and computer access (t= -1.303, p =.018) and (2.997, p = .000). Based on the descriptive statistics in Table 4.3, it can be deduced that there is virtually no difference between the early respondents and the late respondents. Therefore no problem of response bias could be attributed to the data collection. For detail verification for independence sample test for equality of variance and means refer to Appendix C.

Table 4.3: Test of Non- Respondent Bias

Variable	Response	No.	Mean	Std. Deviation	Std. Error Mean
Gender	Early Response	103	1.39	. 490	. 048
	Late Response	88	1.33	. 473	. 050
Age grouping	Early Response	103	1.34	. 476	. 047
	Late Response	88	1.43	. 498	. 053
Ethnicity	Early Response	103	1.34	. 476	. 047
	Late Response	88	1.34	. 477	. 051
Qualification	Early Response	103	2.95	1.248	. 123
	Late Response	88	3.01	1.160	. 124
Income	Early Response	103	1.34	. 534	. 053
	Late Response	88	1.39	. 535	. 057
Computer	Early Response	103	1.72	. 452	. 045
Access	Late Response	88	1.51	. 503	. 054

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In view of these, this study tends to conclude that there is non-response bias that could significantly have an effect on the study's ability to generalize its findings. The result presented lately, has given this study impetus to use the entire 191 responses in the data analysis.

4.3 Data Screening and Preliminary Analysis

4.3.1 An Overview

Data screening and cleaning were performed to fulfill the requirement of performing multivariate analysis. Consequently, assessment of missing data, outliers, multi-

collinearity and normality were carried out. This became necessary, because the data distribution and selected sample size have direct impact on whatever choice of data analysis techniques and test that is selected (Byrne, 2010). Hence, assumption of psychometric property is essential before applying any necessary data analysis techniques.

4.3.2 Missing Data

Examining missing data is very crucial, as it might reduce the sample size offered for analysis (Cavana et al., 2001). Tolerating missing data might invariably have effect on the generalization of the result of the study (Hair et al., 2010). In view of the negative effects of missing data in conducting analyses, a preventive measure was taken from the field in an attempt to reduce their occurrences. The researcher checked the questionnaires submitted to ensure that the questionnaire is completed appropriately. After capturing the data into SPSS, a preliminary descriptive statistics were run to identify the prevalence of a missing data. The missing data obtained in this study was less than 5% (see Appendix C). To remedy it, mean substitution was used in treating the missing data. The method is adopted because it is easy to be executed and is time effective. Checking and replacement of missing data is important because SEM is very sensitive to missing data and would not run if there is any missing value (Hair et al., 2010; Coakes et al., 2010). An additional step of data screening is the assessment and treatment of outliers.

4.3.3 Assessment and Treatment of Outliers

Different methods of detecting outliers within a given research have been forwarded in the literature. The notable of which is the classification of data points based on an observed Mahalanobis distance (D2) on the research expected values (Hair et al., 2010). Arguments in favour of outlier treatment based on Mahalanobis distance are of a view that the method serves as an effective mean of detecting outliers. The Mahalanobis distance is done through the settings of some predetermined threshold that will guide whether or not a point could be categorized as outliers (Hair et al., 2010). This study used the table Chi-square statistics to determine the optimal value as a threshold. The treatment of outliers as reported earlier resulted to identification of 12 cases that were appropriately deleted due to the Mahalanobis distance value of more than the x^2 value ($x^2 = 59.3$; n=43, p = 0.05). The number of data set remaining for further analysis was 191. Consequently the observations farthest from the centroid (Mahalanobis distance) were further confirmed from the SEM output. The Mahalanobis distance obtained was far below the criterion of 59.3 as shown in Appendix C.

4.3.4 Assumption of Normality

In any multivariate analysis normality is the most important assumption; being a prerequisite for making inferences in a research (Hair et al., 2010; Coakes et al., 2010). A non-normally distributed variable will be highly skewed and could distort the relationship between the variables of interest and the significant of the test results obtained (Hulland, 1999). If the ultimate aim of research is to make an inference, then

screening for normality is an important step in almost all multivariate analysis (Tabachnick & Fidell, 2007).

The preliminary test of normality shows that there was a sign of non-normal data. This was revealed through visual inspections of the data via stem and leaf plots, normal Q-Q Plot, box plot to determine the data skewness and kurtosis as shown in Appendix C. To curtail the occurrences of abnormal data in the current study the researcher decided that the data be transformed through cdfnorm (Tabachnick & Fidell 2007; Coakes et al., 2010). As a result after the transformation, the skewness and kurtosis of all the items were within the acceptable range of < 2 and < 7 respectively. For example the skewness values were all less than 1; similarly, the kurtosis values were less than 2, an indication that the data is normal as shown in Appendix C.

4.3.5 Multicollinearity

Multicollinearity occurs if any of the squared multiple correlations between variables are near or closed to 1, specifically if the correlation values between constructs exceed 0.90 (Tabachnick & Fidell 2007; Coakes et al., 2010). When two or more variables are too correlated they contain redundant information that is not required in the same analysis. This unnecessary information tends to increase or inflate the size of error terms and hence undermined the analysis. Thus, Coakes et al. (2010) suggested that inclusion of these offending variables need to be reconsidered. To screen for multicollinearity in this study, both standardized correlations from SEM output and Pearson correlation of SPSS were employed as shown in Table 4.4.

Table 4.4: Correlations among the Variables

Factors	BI	UA	MEF	FC	PEF	AX	SI	EE	PE
Behavioural Intention (BI)	1								
User Acceptance (UA)	.526	1							
Management Effectiveness (MEF)	.152	.102	1						
Facilitating Condition (FC)	.229	.267	.282	1					
Program Effectiveness (PEF)	.312	.318	.504	.228	1				
Anxiety (ANX)	-.132	-.034	.075	-.103	-.091	1			
Social Influence (SI)	.553	.313	.355	.316	.311	.025	1		
Effort Expectancy (EE)	.338	.206	.382	.471	.420	-.134	.562	1	
Performance Expectancy (PE)	.436	.305	.307	.125	.225	-.092	.394	.376	1

From the Table 4.4, it is obvious that none of the variable is highly correlated with any other variable based on the SEM (AMOS) output. Given that all the correlation values are well below the threshold of 0.9. The researcher could then conclude that there is no problem of multicollinearity between the variables under investigation.

4.3.6 Assumption of Linear Relationship

As argued by Hau and Marsh (2004) for any standard multiple regression analysis to be perfect in the estimates of the relationships between the dependent and independent variables, such association must be linear. The instances of non-linearity have been argued to increase the chances of committing a Type I or Type II error (Krecjcie & Morgan 1970). Nunnally and Bernstein (1994) forwarded methods of detecting non-linearity one of which is the used of items from existing theory or relevant previous studies. In the current study, there is linearity between independent and dependent variables since all items were adapted from an existing theories and related studies (Wang & Shih, 2008; Venkatesh et al., 2003). Even though, these studies were not

conducted within the unit of telecentres, nevertheless problem of non-linearity in this study is minimal.

4.3.7 Assumption of Homoscedasticity

The presence of homoscedasticity in a research implies that the variance of errors in such analysis is the same across all its levels in the independent variables (Hair et al., 2006). In the current study, there is no homoscedasticity as shown in the estimates of the correlation between the exogenous variables. Detail information on the correlation results as obtained in structural analysis is shown in Table 4.5. None of the exogenous variables have offending estimates, therefore confirming the nonexistence of any distortions or probability of committing Type I error.

Table 4.5: Correlations between Exogenous Variables

Path	Standardized Estimate
PE <--> MEF	0.253
PE<--> EE	0.436
EE<--> SI	0.497
SI <--> ANX	0.034
ANX <--> FC	-0.099
MEF <--> PEF	0.561
PEF <--> FC	0.451
PE <--> SI	0.417
PE <--> ANX	-0.108
PE <--> PEF	0.337
PE <--> FC	0.273
EE<--> ANX	-0.088
EE<--> MEF	0.443
EE<--> PEF	0.571
EE <--> FC	0.568
SI <--> MEF	0.408
SI <--> PEF	0.327
SI <--> FC	0.528
ANX <--> MEF	0.026
ANX <--> PEF	-0.054
MEF <--> FC	0.437

4.4 Measurement Refinement

Conforming to the literatures on structural equation modeling and scholarly recommendations, this study weighs it necessary to adopt a two-step model building method as reported by Roland and Werner (2005) and Yim, Anderson and Swaminathan (2005). The first step involved the exploratory factor analysis (EFA) to purify and validate measurement scales within the inbound unit of a telecentre. The second step involved performing confirmatory factor analysis (CFA) meant to validate pre-existing measure scales within the context of the current study (Byrne, 2010; Hair et al., 2006). Hair et al. (2006) argue that exploratory factor analysis (EFA) approach differs from confirmatory factor analysis approach, the former extract factors on the basis of statistical results not based on theory. The extraction can be done without previous

knowledge of the number of factors or the sources of the items. While in CFA, the researcher is aware of both the number of factors within a set of variables and the extent of loading on each item. The objective of conducting EFA as argued by Hair et al. (2006) is to prepare the data for any bivariate or multivariate analysis. CFA was used to confirm and reduced the numbers of the items from the constructs. In the subsequent report, the results of EFA's and the CFA's of exogenous (independent) and endogenous (dependent) variables is presented separately.

4.4.1 Exploratory Factor Analysis for Exogenous Variables

Exploratory factor analysis (EFA) is designed primarily to explore the data set to be used in a research from the existing theoretical point of view. Essentially, such data are allowed to load statistically on factors that are independent of theory and any priori assumptions that are related to the measurement instruments (Hair et al., 2006; Cavana et al., 2001). In this study, all the items constituting the exogenous variables (independent) were subjected to principal component analysis (PCA) using SPSS software. However, before running the PCA suitability of data for factor analysis was examined. Visual inspection of correlation matrix shows that several coefficients have values of 0.3 and above, therefore satisfying the first requirement for conducting PCA. Still in the correlation matrix, there was no value above 0.9, meaning that the data was free from problems of singularity or multicollinearity (Nunnally & Bernstein, 1999).

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed. Kaiser (1974) forwarded a rule of thumb for assessing KMO in which any value that falls

between 0.5 and 0.7 could be referred to as mediocre. The values that are between 0.7 and 0.8 are good, values between 0.8 and 0.9 are categorized as great. Finally, those values above 0.9 are classified as superb. The value of 0.821 was obtained as KMO for the exogenous variables, this value is above the minimum threshold of 0.6 (Kaiser, 1974). Similarly, the Bartlett's Test of Sphericity was found as 2614.39, significant at $P < 0.001$, the factorability of the correlation matrix are supported. PCA reveals the presence of nine components with eigenvalues of above one explaining the cumulative variance of 51.4%. Communalities symbolize the amount of the variance in the original variables that are accounted for by the factor solution. The factor solution should explain at least half of each original variable's variance, so the communality value for each variable should be 0.50 or higher (Hair et al., 2010). As expected, all the items have the communality value of 0.5 or higher except for “PE5” which has 0.437. Most of the items show simple structures by loading highly on only one component. However, few items have a complex structures which cross-loaded on more than one components.

The items that have the communality below 0.5 and those that cross-loaded on more than one component have been considered for deletion during confirmatory factor analysis (CFA). Table 4.6 shows the factor loadings and communality values for each item.

Table 4.6: Factor Loadings and Communalities for Exogenous Variables

Code	Factor Loading	Communality
PE1	0.752	0.655
PE2	0.816	0.772
PE3	0.713	0.660
PE4	0.667	0.607
PE5	0.619	0.437
EE1	0.739	0.650
EE2	0.685	0.640
EE3	0.709	0.593
EE4	0.610	0.509
EE5	0.678	0.599
SI1	0.748	0.686
SI2	0.753	0.704
SI3	0.759	0.619
SI4	0.679	0.620
SI5	0.658	0.567
ANX1	0.828	0.737
ANX2	0.885	0.796
ANX3	0.885	0.801
ANX4	0.779	0.660
MEF1	0.702	0.638
MEF2	0.676	0.531
MEF3	0.692	0.661
MEF4	0.696	0.560
MEF5	0.732	0.635
PEF1	0.665	0.707
PEF2	0.682	0.580
PEF3	0.727	0.699
PEF4	0.709	0.621
PEF5	0.543	0.600
FC1	0.773	0.666
FC2	0.762	0.658
FC3	0.451	0.511
FC4	0.713	0.661
FC5	0.617	0.655
FC6	0.627	0.530
Extraction method principal component analysis		

4.4.2 EFA for Endogenous Variables

The endogenous (dependent) variables were also subjected to principal component analysis with the aid of SPSS software. The preliminary analysis shows that the data are appropriate for factor analysis. For instance, a clear inspection of the correlation matrix

reveals that several coefficients have values of 0.3 and above, satisfying the first requirement. Moreover, checking the correlation matrix showed that no value was found to be 0.9 or above, thereby confirming that the data was free from the multicollinearity problem. Similarly, the result of Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.837 which is above the recommended 0.6 and could be classified as great (Kaiser, 1974). In addition the Bartlett's Test of Sphericity 664.139 significant at P < 0.001 which supports the factorability of correlation matrix. The initial PCA shows the presence of two components with eigenvalues of 2 and explaining 31% and 26% of the variance respectively. The cumulative total variance explained by the components was 56% which is reasonable. With regards to communality all the items except one have values of 0.5 and above. So, the only variable (BI4) that has the value of 0.475 a little less than the recommended 0.5 was marked for deletion in the subsequent analysis. The deletion became necessary, otherwise low factor loading will affect convergent and discriminant validity of the subsequent model. Table 4.7 presents the factor loadings and communalities for each item of the endogenous variables.

Table 4.7: *Factor Loadings and Communality for Endogenous Variables*

Code	**Factor Loading**	**Communality**
BI1	0.821	0.717
BI2	0.833	0.732
BI3	0.769	0.610
BI4	0.584	0.475
UA1	0.833	0.720
UA2	0.872	0.798
UA3	0.819	0.727
UA4	0.684	0.533
Extraction method principal component analysis		

The preliminary analysis on both exogenous and endogenous variables, have shown that all the items are suitable for conducting the subsequent multivariate analysis. Detail results on the EFA's are shown in the Appendix E. The next section discusses the measurement model assessment and confirmatory factor analysis (CFA).

4.4.3 Confirmatory Factor Analysis (CFA) and the Measurement Model

The measurement model is estimated before evaluation of the structural model using a two-step approach recommended by Hair et al. (2010). The measures were validated using confirmatory factor analysis (CFA). The CFA was performed in an attempt to establish the extent of the proposed measurement model fit with the data set. Through some model fit indices as recommended by previous researchers (Hu & Bentler, 1995).

The five common goodness of fit (GOF) index that cut across the three fit indices include: absolute, incremental and parsimony the following indices were adopted (CMIN/DF, AGFI, CFI, TLI and RMSEA). The thresholds of these fit indices are: The value of CMIN/DF should be less than three (Bagozzi & Yi, 1988). CFI and TLI should be equal to or greater than 0.90 (Bagozzi & Yi, 1988; Bentler & Bonnet, 1980). The AGFI should be greater or equal to 0.80 (Chau & Hu, 2001). The root mean square error of approximation (RMSEA) should be less than 0.08 (Brown & Cudeck, 1993). Model modification became crucial if the fit indices obtained from the implied theoretical model are within the recommended thresholds. Analyzing measurement model is a necessary and sufficient condition before developing structural model (Byrne, 2010; Hair et al., 2006).

4.4.4 Exogenous Constructs Measurement Model

The exogenous construct measurement model is used to assess the psychometric properties and unidimentionality of the measure (Byrne, 2010). The sufficiency of the measurement model can be examined subject to the fulfillment of requirements of convergent validity, discriminant validity, composite reliability and overall model fit of the data. In this study, the exogenous construct measurement model fit was achieved with 26 measures from 7 latent constructs, each constructs was allowed to correlate with each other as in Figure 4.1.

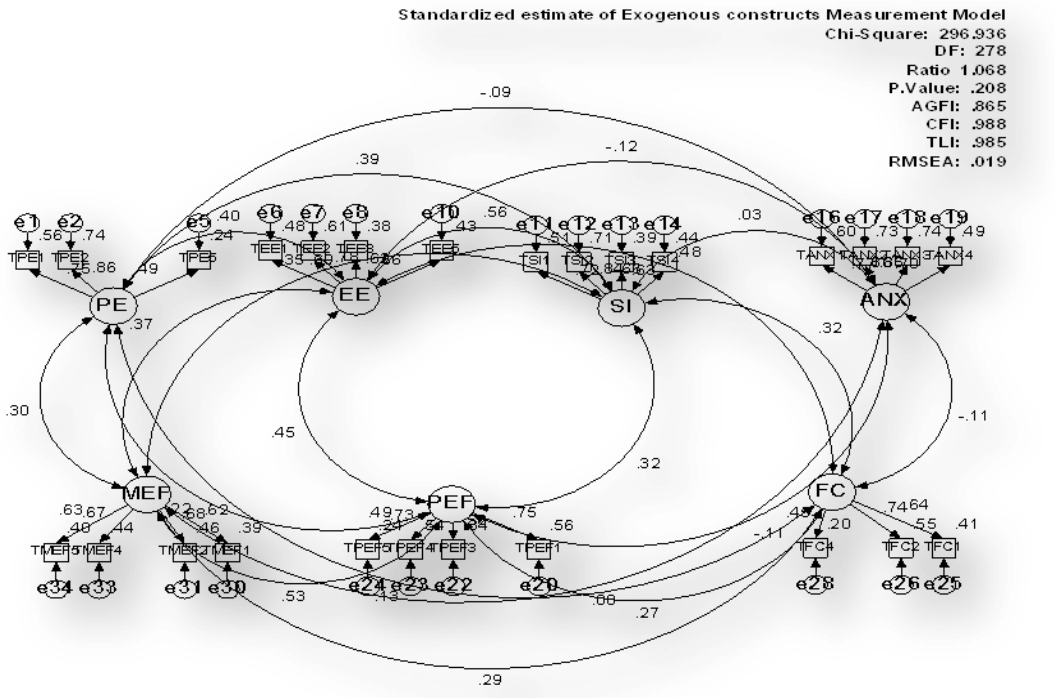


Figure 4.1: CFA Measurement Model for Exogenous Variables

The procedure on model modification entails the identification of low standardized factor loadings, high standard residuals and a high modification index. The

abnormalities identified were deleted to build an acceptable measurement model. In view of these, to achieve a significant model fit, the following items were deleted base on low factor loadings (PE3, PE4, EE4, SI5, MEF3, PEF2, FC3, FC5, and FC6). Table 4.8, shows the goodness of fit index (GOF) of the exogenous measurement model.

Table 4.8: Goodness of Fit (GOF) index for the Exogenous Variables

GOF Indicators	**Accepted Value**	**Results**
Chi-square (x^2)	-	296.936
DF	-	278
Ratio	< 3	1.068
P Value	P > .05	0.208
AGFI	< 0.80	0.865
CFI	0.900	0.988
TLI	0.900	0.985
RMSEA	0.080	0.019

The GOF of overall model has shown that the index (CMIN/DF = 1.068, p = 0. 208, CFI= 0. 998 and RMSEA= 0.019) of the measurement model is within the acceptable threshold, indicating the sound fit of the data to the model.

4.4.5 Endogenous Construct Measurement Model

An endogenous constructs measurement was built to assess the psychometric properties of the constructs. The measurement was conducted with eight items to assess the endogenous constructs of Behavioral Intention and User Acceptance. The measure yields a relatively good fit as shown by goodness of fit index (CMINDF = 1.205, p = 0. 268, CFI= 0. 995 and RMSEA= 0.033) as indicated in Figure 4.2.

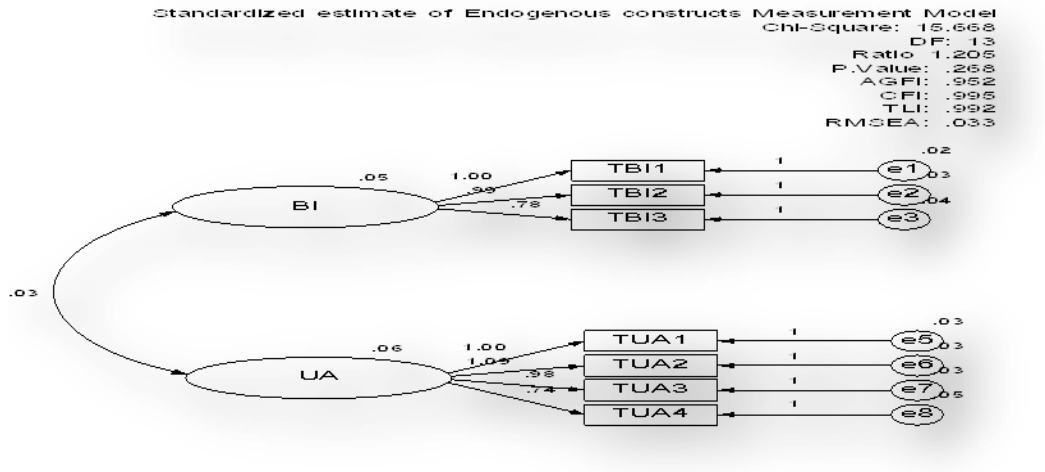


Figure 4.2 CFA Measurement Model for Endogenous Variables

The model fit indices were achieved with the deletion of item TBI4 due to low factor loadings. The remaining items loadings fit perfectly, the (CMIN/DF ratio < 3); p-value > 0.05; AGFI > 0.900 and root mean square (RMSEA) of less than 0.08. The comprehensive model fit index is shown in the Table 4.9.

Table 4.9: Goodness of Fit (GOF) index for the Endogenous Variables

GOF Indicators	**Accepted Value**	**Results**
Chi-square (x^2)	-	15.668
DF	-	13
Ratio	< 3.00	1.205
P Value	> 0.05	0.268
AGFI	> 0.8	0.952
CFI	> 0.9	0.995
TLI	> 0.9	0.992
RMSEA	< 0.08	0.033

The Goodness of fit indices (GOF) of overall model (CMIN/DF = 1.205, p = 0. 268, AGFI = 0.952 and RMSEA = 0.033) for the measurement model is within the acceptable threshold. The endogenous measurement model has a good fit with the data

based on assessment criteria such as AGFI, CFI, TLI, and RMSEA as suggested by Bagozzi and Yi (1998) and Anderson and Gerbing (1988).

4.4.6 Combine Exogenous and Endogenous Constructs Measurement Model

Specifying the measurement based on the combination of exogenous and endogenous models are critical step in developing an acceptable structural model (Hair et al., 2010). Figure 4.3 appropriately depicts the measurement model.

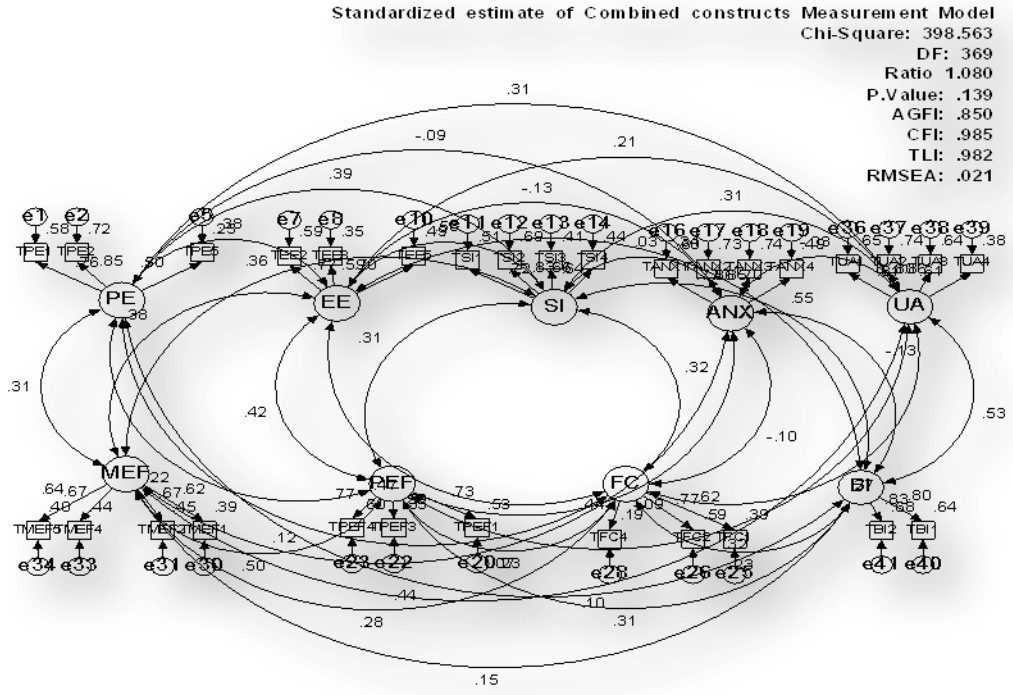


Figure 4.3: Combined CFA Measurement Models (generated by SEM)

Items deletions were effectively guided through appropriate suggestions on their loadings and modification indices (Hair et al., 2006). As observed from the Figure 4.3, the items (PE3, PE4, EE1, EE4,SI5, MEF3, PEF2, PEF5, FC3, FC5, FC6, BI3, BI4) were deleted due to either high modification index of their covariance or their loadings

are less than the suggested 0.50 cut off criterion (Byrne, 2010; Hair et al., 2006). Initially 43 items were conceptualized as the items measuring model of user acceptance of telecentre but only 30 were statistically reliable for constructing the structural model as in Figure 4.3. The model fit statistics of the combined measurement model is shown in Table 4.10

Table 4.10: Goodness of Fit (GOF) index for the (Exogenous and Endogenous)

GOF Indicators	**Accepted Value**	**Results**
Chi-square (x^2)	-	398.563
DF	-	369
Ratio	< 3.00	1.080
P Value	> 0.05	0.139
AGFI	> 0.8	0.850
CFI	> 0.9	0.985
TLI	> 0.9	0.932
RMSEA	< 0.08	0.021

Thus, the GOF index of overall model yields (CMIN/DF = 1.080, AGFI = 0.850 and RMSEA= 0.021) of the measurement model is within the acceptable threshold. The measurement model has a good fit with the data based on assessment criteria such as CFI, TLI, and RMSEA as suggested by previous researches (Bagozzi & Yi, 1998; Bentler & Bonnet, 1980; Brown & Cudeck, 1993). Table 4.11 shows the summary of Goodness of fit analysis of measurement models of exogenous, endogenous and combination of the two.

Table 4.11: Summary of Goodness of Fit (GOF) index for Measurement Models (N=191)

Indices	Recommended Value	Measurement Model (Exogenous)	Measurement Model (Endogenous)	Measurement Model (Combined)
Initial Items	-	35	8	43
Items Remain	-	26	7	30
CMIN	-	296.936	15.668	398.563
DF	-	278	13	369
CMIN/DF	< 3.00	1.068	1.205	1.080
P-Value	> 0.05	0.208	0.268	0.139
AGFI	> 0.80	0.865	0.952	0.850
CFI	> 0.90	0.988	0.995	0.985
TLI	> 0.90	0.985	0.992	0.982
RMSEA	< 0.08	0.019	0.033	0.021

The next stage is aimed at establishing validity and reliability of the model.

4.5 Convergent Validity Result

In this research convergent validity has been measured through the factor loadings. Previous researches have statistically recommended a loading of above 0.50 as the cut off criterion (Byrne, 2010; Hair et al., 2006; John & Reve, 1982). Other's are of the opinion that any item that is above 0.40 should be given a trial provided that they have been tested theoretically as a valid instrument for measuring the construct of interest (Hu & Bentler, 1995; Kaiser, 1974). A critical view of the result in Table 4.12 has shown that the larger percentages of items were above the 0.50 cut-off criteria, with the majority being above 0.60. This confirmed that the hypothesized items are truly having a strong relationship with the conceptualized model (Hair et al., 2006).

Table 4.12: Convergent Validity on Dimensions

Factors	Code	Items	Factor Loadings
Performance Expectancy	PE1	Using telecentre enhances job performance	0.758
	PE2	Using telecentre help in the accomplishment of the job more quickly	0.846
	PE5	My frequent use of a telecentre, will earn me valuable as being competent	0.500
Effort Expectancy	EE2	I find using the facilities in telecentre easy	0.768
	EE3	I find using the facilities in telecentre to be flexible	0.589
	EE5	Overall, I find the facilities in telecentre easy to use	0.702
Social influence	SI1	Important people in my community think I should use the telecentre	0.717
	SI2	People who are important to me will want me to use the telecentre	0.832
	SI3	People in my community that use the telecentre have more prestige	0.639
	SI4	Using telecentre has enhanced my knowledge about the environment	0.663
Anxiety	AX1	I feel nervous in using the facilities in telecentre	0.772
	AX2	It scares me to think I will make mistakes using Telecentre	0.852
	AX3	The facilities in telecentre are somehow intimidating to me	0.861
	AX4	It scares me to use in telecentre because I lack adequate skills	0.702
Management effectiveness	MEF1	I have confidence that this telecentre will be durable	0.625
	MEF2	The manager receives assistance to render efficient service	0.674
	MEF4	I observed team spirit and motivated staff within the telecentre staff	0.667
	MEF5	Capable hands are available to impart knowledge in the telecentre	0.636
Program Effectiveness	PEF1	Using telecentre help in socioeconomic development	0.725
	PEF3	Telecentre staffs are competent enough in discharging their work	0.589
	PEF4	There is mutual cooperation between telecentre staff and the users	0.774
Facilitating Condition	FC1	A specified person (or group) is available in case of difficulty	0.624
	FC2	I have the resources and knowledge to use *ICT facilities in* telecentre	0.768
	FC4	Sufficient Electricity and Internet service are available to use *ICT*	0.437
Behavioural Intention	BI1	I intend to use the ICT facilities in Telecentre in the future.	0.801
	BI2	I predict I would use the ICT facilities in Telecentre in the future	0.827

Consequently the factor loadings of the survey results were all above the threshold of 0.40 (Anderson & Gerbing, 1988; Hu & Bentler, 1995; Kaiser, 1974).

4.5.1 Composite Reliability

This study has evaluated the construct reliability using Cronbach's alpha for each construct and their composite reliability score as suggested by Fornell and Larcker (1981) and Hair et al. (2006). The fundamental measure of construct reliability is the index of composite reliability, which is reported as more robust than Cronbach's alpha (Fornell & Larcker, 1981). Composite reliability of a construct is argued at 0.70 or higher to show adequate convergence or internal consistency (Hair et al., 2006; Gefen & Straub, 2005). To compute composite reliability this study adopted the formula suggested by previous researches (Fornell & Larcker, 1981; Hair et al., 2010).

$$\text{Composite reliability} = \frac{(\Sigma_{i=1}^{n} L_i)^2}{(\Sigma_{i=1}^{n} L_i)^2 + (\Sigma_{i=1}^{n} e_i)} \quad (4.1)$$

Computed from square sum of factor loadings for each construct and sum of the error variance terms for a construct e_i.

Table 4.13: Composite Reliability and Cronbach Alpha of Items Remaining

Factors	Code	Factor Loadings	Composite Reliability	Cronbach Alpha
Performance	PE1	0.758	0.752	0.723
Expectancy	PE2	0.846		
	PE5	0.500		
Effort Expectancy	EE2	0.768	0.730	0.730
	EE3	0.589		
	EE5	0.702		
Social Influence	SI1	0.717	0.807	0.803
	SI2	0.832		
	SI3	0.639		
	SI4	0.663		
Anxiety	AX1	0.772	0.876	0.874
	AX2	0.852		
	AX3	0.861		
	AX4	0.702		
Management	MEF1	0.625	0.746	0.745
Effectiveness	MEF2	0.674		
	MEF4	0.667		
	MEF5	0.636		
Program	PEF1	0.725	0.740	0.733
Effectiveness	PEF3	0.589		
	PEF4	0.774		
Facilitating	FC1	0.624	0.646	0.619
Condition	FC2	0.768		
	FC4	0.437		
Behavioural	BI1	0.801	0.797	0.796
Intention	BI2	0.827		
	UA1	0.827	0.857	0.853
	UA2	0.807		
	UA3	0.862		
	UA4	0.802		

Except for construct measuring Facilitating Conditions with value (CR= 0.646). Composite reliability of the remaining constructs ranges from 0.730 to 0.876. As in Table 4.13, the reliability obtained is above the recommended threshold of 0.70 (Fornell & Larcker, 1981).

4.5.2 Discriminant Validity

Discriminant validity is the degree by which a construct is established as truly being different with the other constructs in the model (Byrne, 2010). The review of extant literature has reported two main methods through which researchers can statistically measure the discriminant validity of their data set, these are: average variance extracted (AVE) as recommended by Fornell and Larcker (1981). The second method is through comparing chi-square of a model through its nested model (Hair et al., 2006). This study used AVE procedures to assess the discriminant validity of the data set as suggested by Fornell & Larcker (1981). The average variances extracted is calculated using standardized loadings by the formula:

$$\text{AVE} = \frac{\sum_{i=1}^{n} \text{Li}^2}{n} \qquad (4.2)$$

L_i - Represent standard factor loading
i - Number of items

Discriminant validity was measured by comparing the square root of AVE obtains for a given construct with the correlation among all other constructs. Table 4.14 shows the correlation matrix of the constructs. The diagonal elements have been replaced by square root of the average variance extracted. For the discriminant validity to be confirmed sufficient, the diagonal element should be greater than the off-diagonal element in the corresponding rows and columns (Chin, 2010; Fornell & Larcker, 1981).

Table 4.14: Correlation Matrix and Square Roots of the AVEs (shown in diagonal)

Factors	BI	UA	MEF	FC	PEF	ANX	SI	EE	PE
Behavioural Intention (BI)	**.814**								
User Acceptance (UA)	.526	**.777**							
Management Effectiveness (MEF)	.152	.102	**.651**						
Facilitating Condition (FC)	.229	.267	.282	**.624**					
Program Effectiveness (PEF)	.312	.318	.504	.228	**.701**				
Anxiety (ANX)	-.132	-.034	.075	-103	-.091	**.799**			
Social Influence (SI)	.553	.313	.355	.316	.311	.025	**.717**		
Effort Expectancy (EE)	.338	.206	.382	.471	.420	-.134	.562	**.691**	
Performance Expectancy (PE)	.436	.305	.307	.125	.225	-.092	.394	.376	**.777**

Discriminate validity appears to be adequate for all the constructs. The implication of which each construct shared more variances with each items than it does with other constructs (Chin, 2010; Fornell & Larcker, 1981). In summary, all the nine constructs that formed the model in this study passed the test of convergence validity and discriminant validity. The implication of this is that the final modified measurement model possessed constructs validity and reliability. A final step to be followed, after measurement model testing and model modification is testing hypothesized structural model with the entire group of samples (N = 191) which is discussed in the next section.

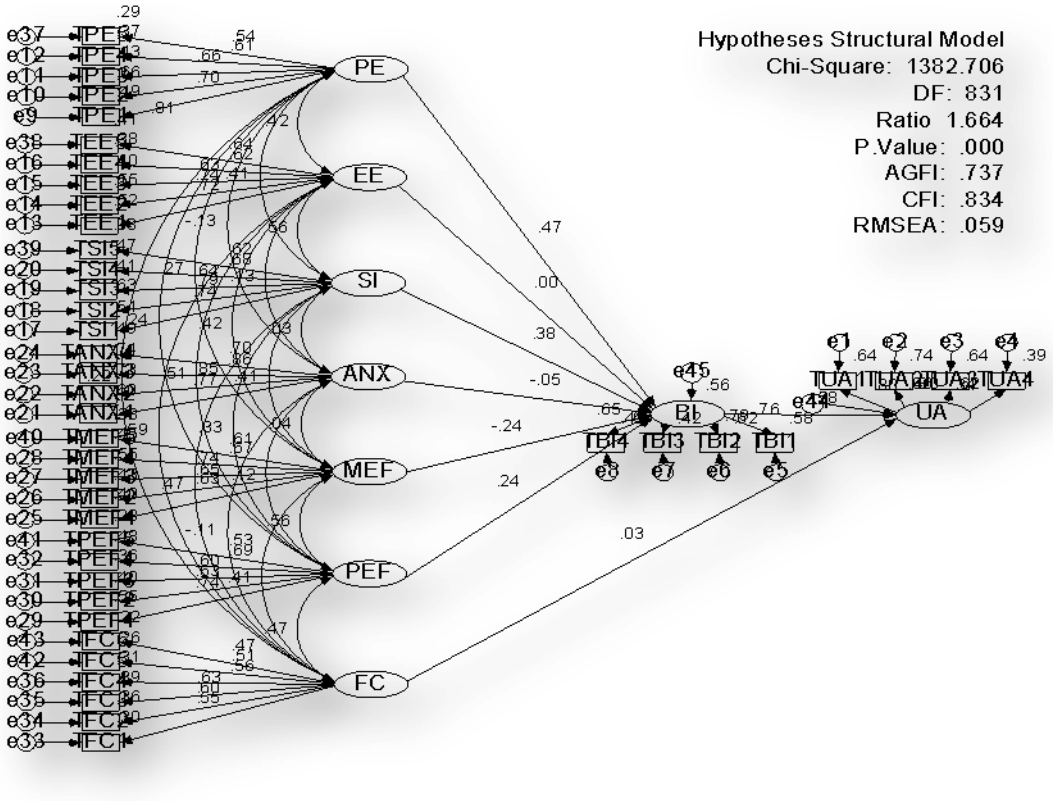


Figure 4.4: The Hypothesized Structural Model with Path Analyses

A clear inspection of the hypothesized structural model in Figure 4.4 has shown that the model is succinctly defiant in terms of acceptable goodness of fit indices (GOF) Statistics. Hence the need for a model that meets the requirements of an acceptable fit base on items that depict the measurement model. The explanation of an acceptable model is based on re-specified model (Figure 4.5). The validity of measurement model has required the need to formulate the alternate model by first converting the items from measurement model (Hair et al., 2010).

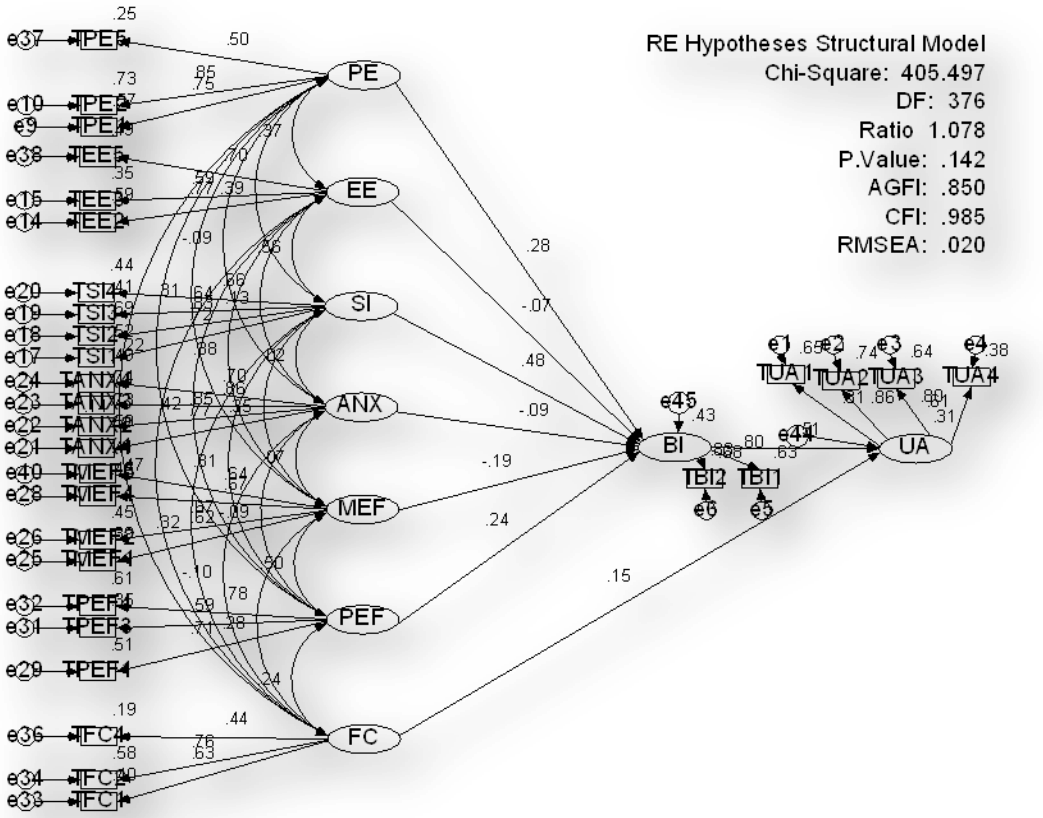


Figure 4.5: Alternate Model (Re-specified base on items from measurement specifications)

The Re-specified model produced relatively better GOF index: (CMIN/DF < 3; p-value > 0.05 and RMSEA < 0.08). Thus, the model has a good fit with the data based on assessment criteria such as CFI, TLI, AGFI and RMSEA (Bagozzi & Yi, 1988; Anderson & Gerbing, 1988). A summary of the overall GOF statistics of measurement, hypothesized, alternate model and original UTAUT model with only four constructs are thus presented in Table 4.15.

Table 4.15: *Summary of GOF Index for Hypothesized, Alternate and Original UTAUT Models*

Indices	**Recommended Value**	**Measurement Model**	**Hypothesized Model**	**Alternate Model**	**Original Model (UTAUT)**
Items Remaining	-	30	43	30	15
CMIN	-	398.563	1382.706	405.497	153.330
DF	-	369	831	376	141
CMIN/DF	< 3.00	1.080	1.660	1.078	1.102
P-Value	> 0.05	0.139	0.000	0.142	0.193
AGFI	> 0.8	0.850	0.737	0.850	0.896
CFI	> 0.9	0.985	0.834	0.985	0.988
TLI	> 0.9	0.982	0.819	0.983	0.985
RMSEA	< 0.08	0.021	0.059	0.020	0.230

The Alternate model yields a better fit compared to the other models. Brown and Cudeck (1993) recommended the CMIN/DF value of less than 3. The CMIN/DF obtained was 1.078, showing an acceptable fit. All other goodness of fit (GOF) index is within an acceptable range. Overall, the model explained 43% of the variance in Behavioral Intention and 32% variance in User Acceptance compared to 37% variance in Behavioral Intention and 30% variance in User Acceptance based on the original UTAUT as shown in Table 4.16.

Table 4.16: *Results of SMC^2 between Original UTAUT and Modified UTAUT Model*

	Behavioural intention (SMC^2)	**User acceptance (SMC^2)**
Original UTAUT model	37%	30%
Modified UTAUT model	43%	32%

The next section presents the results of hypotheses testing based on modified model.

4.6 Main Hypotheses Results

Structural equation modeling technique was used to test the eight main hypotheses among the latent variables identified from the two theories, path analysis and hypotheses testing are presented. The eight main hypotheses were tested to examine the hypothesized direct relationship using AMOS. The results of the hypotheses are shown in Table 4.17.

Table 4.17: *Results of Main the Hypotheses*

Exo.	Path	Endo.	B	S.E	C.R	P	Status	Results
H_{A1} PE	⇨	BI	.280	.100	2.981	.003	Sig	Supported
H_{A2} EE	⇨	BI	-.073	.110	-0.608	.543	Insig	Unsupported
H_{A3} SI	⇨	BI	.480	.117	4.184	***	Sig	Supported
H_{A4} ANX	⇨	BI	-.085	.070	-1.070	.285	Insig	Unsupported
H_{A5} MEF	⇨	BI	-.191	.130	-1.935	.043	Sig	Supported
H_{A6} PEF	⇨	BI	.240	.117	2.192	.028	Sig	Supported
H_{A7} FC	⇨	UA	.154	.102	1.987	.047	Sig	Supported
H_{A8} BI	⇨	UA	.505	.111	5.705	***	Sig	Supported

P- significant at < 0.05

The findings from the hypotheses depict the connecting relationships between the constructs denoted by (β estimated path coefficient) and (C.R-values standard errors) (Hair et al., 2010; Zainudin, 2010). The results of the eight main hypotheses based on significant (P-value< 0.05) or insignificant (P-value > 0.05) are presented. A null hypothesis $\boldsymbol{H_0}$ is accepted when there is no significant influence between the variables in the stated hypotheses.

H_{A1}: Performance Expectancy has a significant influence on Behavioral Intention.

The SEM analysis has shown that the estimated path coefficient from Performance Expectancy to Behavioral Intention (Performance Expectancy —> Behavioral Intention) was statistically significant with a relation (β = 0.280, t= 2.981; p = 0.003). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Performance Expectancy has a significant influence on Behavioral Intention. (For detailed discussion in the context of the study refer to section 5.3.1).

H_{A2}: Effort Expectancy has a significant influence on Behavioral Intention.

The SEM analysis has revealed that the estimated path coefficient from Effort Expectancy to Behavioral Intention (Effort Expectancy —> Behavioral Intention) was insignificant with a weak relation (β = -0.073, t= -0.608; p = 0.543). Since the P-value is higher than 0.05, the null hypothesis is not rejected. Hence the above hypothesis is unsupported. The study concludes that Effort Expectancy does not have a significant influence on Behavioral Intention (refer to section 5.3.2).

H_{A3}: Social Influence has a significant influence on Behavioral Intention.

The SEM analysis has shown that the estimated path coefficient from Social Influence to Behavioral Intention (Social Influence —> Behavioral Intention) was statistically significant with a relation (β = 0.480, t= 4.184; p = 0.000). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Social Influence has a significant Effect on Behavioral Intention (detailed discussion in the context of the study is shown in section 5.3.3).

H_{A4}: Anxiety has a significant influence on Behavioral Intention.

The SEM analysis has shown that the estimated path coefficient from Anxiety to Behavioral Intention (Anxiety —> Behavioral Intention) was statistically insignificant with a weak relation (β = -0.085, t= -1.07; p= 0.285). Since the P-value is higher than 0.05, the null hypothesis is not rejected. Hence the above hypothesis is not supported. The study concludes that Anxiety does not have a significant influence on Behavioral Intention (for detail discussions on this result refer to section 5.3.4).

H_{A5}: Management Effectiveness has a significant influence on Behavioral Intention.

The SEM analysis has shown that the estimated path coefficient from Management Effectiveness to Behavioral Intention (Management Effectiveness —> Behavioral Intention) was statistically significant with a relation (β = -0.191, t= -1.935; p = 0.043). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Management Effectiveness has a significant effect on Behavioral Intention (refer to section 5.3.5 for detailed discussion in the context of the study).

H_{A6}: Program Effectiveness has a significant influence on Behavioral Intention.

The SEM analysis has shown that the estimated path coefficient from Program Effectiveness to Behavioral Intention (Program Effectiveness —> Behavioral Intention) was statistically significant with a relation (β = 0.240, t= 2.192; p = 0.028). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Program Effectiveness has a significant Effect on

Behavioral Intention (for detailed discussions in the context of the study refer to section 5.3.6).

H_{A7}: Facilitating conditions has a significant influence on User Acceptance.

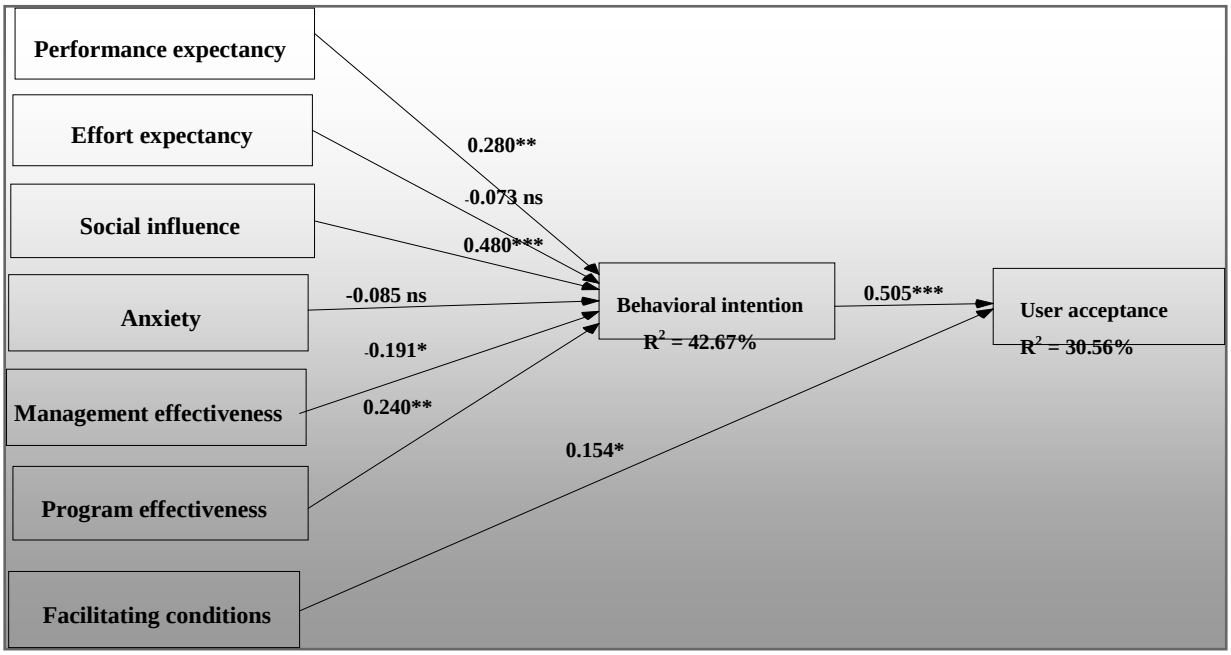
The SEM analysis has shown that the estimated path coefficient from Facilitating Conditions to User Acceptance (Facilitating Conditions —> User Acceptance) was statistically significant with a relation ($\beta = 0.154$, $t = 1.787$; $p = 0.047$). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Facilitating Conditions has a significant effect on User Acceptance (for detailed discussions in the context of the study refer to section 5.3.7).

H_{A8}: Behavioral Intention has a significant influence on User Acceptance.

The SEM analysis has shown that the estimated path coefficient from Behavioral Intention to User Acceptance (Behavioral Intention —> User Acceptance) was statistically significant with a relation ($\beta = 0.505$, $t = 1.787$; $p = 0.000$). Since the P-value is lower than 0.05, the null hypothesis is rejected. Hence the above hypothesis is supported. The study concludes that Behavioral Intention has a significant effect on User Acceptance (refer to section 5.3.8 for detailed discussion in the context of the study).

Of the eight hypotheses proposed, six were supported with a positive or moderate relationship (most values of $\beta \leq 0.505$). Except the path coefficient of the relation between Management Effectiveness and Behavioral Intention yielding negative beta (β

= -0.191). While the two hypotheses were rejected, the graphical representation of the path coefficients from the resulting structural model is represented in Figure 4.6



*P < 0.10; **P < 0.05; *** P < 0.01, ns = *Not Significant*

Figure 4.6: Estimated Structural Model

Prior to examining the impact of the four demographic moderators (gender, age, ethnicity and location), suffice to briefly present the moderators structural model. The data set for the moderating variables is divided into two groups using the split approach to accomplish the stipulated tasks (Hair et al., 2010). The structural details are shown in Appendix G.

4.6.1 Gender Grouping Models

The gender group is distributed into 122 males and 69 females. This is in conformity with (Byrne, 2010; Hair et al., 2010). The male GOF indexes as obtained from the

structural model were: CMIN = 408.436 with DF. = 376 and CMIN/DF = 1.086; CFI = .974 and RMSEA = .027. The females group GOF index: CMIN = 473.4740 with DF. = 376 and CMIN/DF = 1.260; CFI = .877 and RMSEA = .062. The gender model shows a good fits in terms of these aforementioned indicators. The study also investigates the gender variances for males; the model explained 34% of the variance in Behavioral Intention and 30% of the variance in User Acceptance. While for the female, the model explained 69% of the variance in Behavioral Intention and 38% of the variance in User Acceptance. Showing that female model has better variance compared to the male model. The path coefficients for males and females group are shown in Figure 4.7.

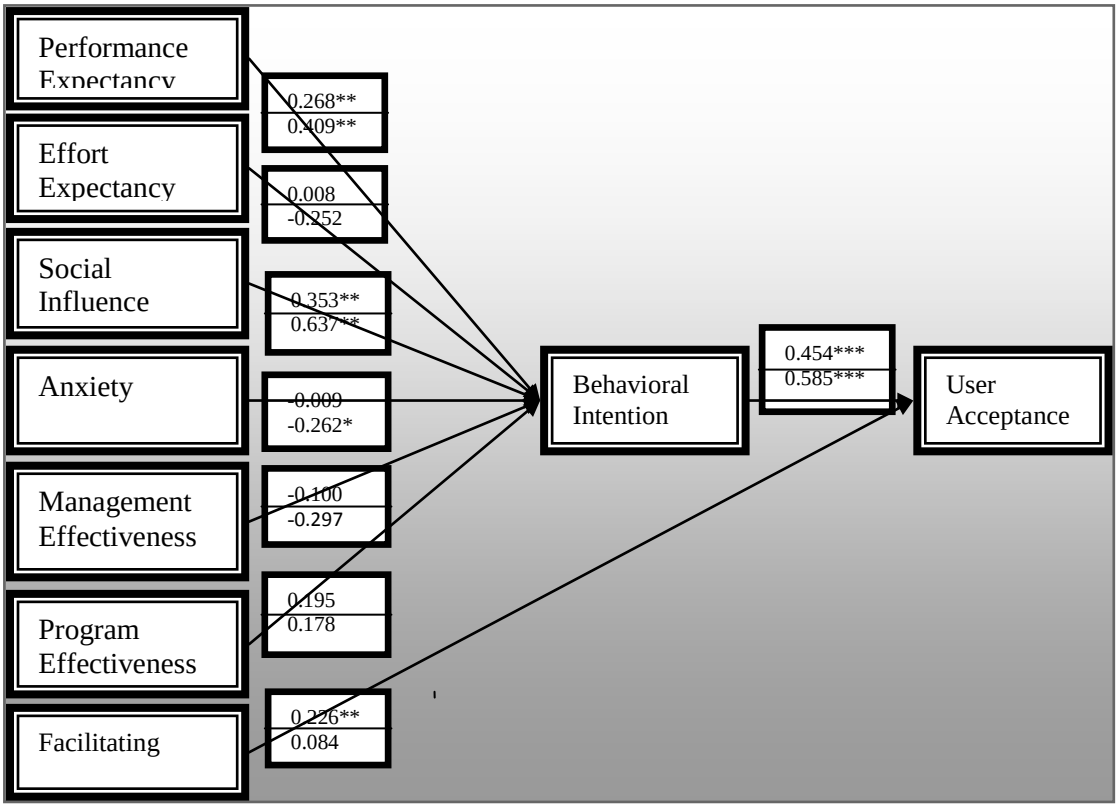
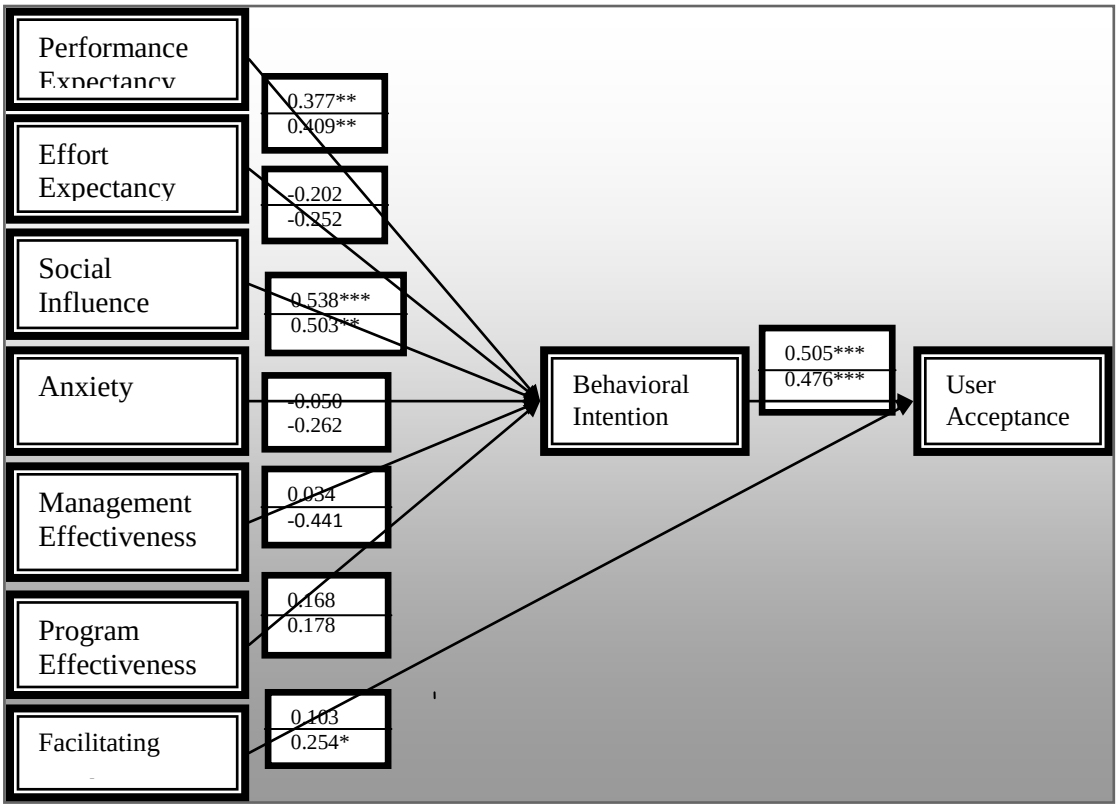


Figure 4.7: Gender Models with Path Coefficient (Male and Female)

4.6.2 Age Grouping Models

The age group model was classified in to two; the younger group with ages less than or equal to 30 years and the older group with ages above 30 years. This classification is comparable with suggestion by (Wang et al., 2009). Thus, 118 respondents were categorized as younger and 73 as older. The younger group GOF index obtained from the structural model include: CMIN = 434.946 with DF. = 376 and CMIN/DF = 1.157; CFI = .950 and RMSEA = 0.037. The older group GOF is: CMIN = 472.136 with DF. = 376 and CMIN/DF = 1.256; CFI = .894 and RMSEA = .060. The age group model shows a good fits in terms of the abovementioned indicators. The study also investigates the age variances for younger group, the model explained 54% of the variance in Behavioral Intention and 29% of the variance in User Acceptance. While for the older group, the model explained 43% of the variance in Behavioral Intention and 31% of the variance in User Acceptance. The younger people model exhibit more explanatory power than the older people model. Path coefficients for the younger and older group are shown in Figure 4.8.



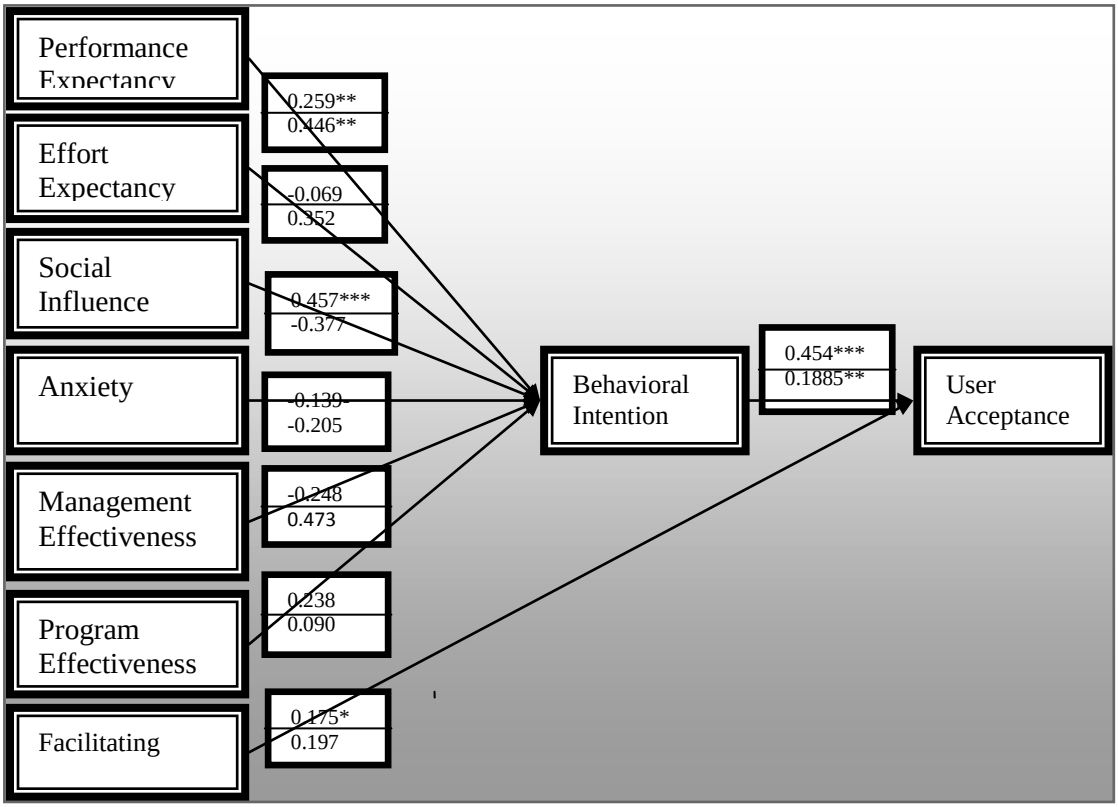
***P** < 0.10; ****P** < 0.05; *** **P** < 0.01, **Sig** = Significant; **ns** = Not Significant

Figure 4.8: Age Group Models with Path coefficient (Younger and Older)

4.6.3 Ethnicity Grouping Models

The ethnicity grouping was distributed into 126 major and 65 minor. This is in compliance with (Wang, Wu & Wang., 2009; Hair et al., 2010). The GOF index for major ethnic group obtained from the structural model: CMIN = 384.835 with DF. = 376 and CMIN/DF = 1.023; CFI = .993 and RMSEA = .014. The minority group GOF: CMIN = 533.442 with DF. = 376 and CMIN/DF = 1.419; CFI = .799 and RMSEA = .080. The ethnicity model shows a good fits in term of the stated indicators. The study also investigates the variances for the two groups. The models explained 41% of the variance in Behavioral Intention and 39% of the variance in User Acceptance for majority. While for the minority, the model explained 50% of the variance in Behavioral

Intention and 9% of the variance in User Acceptance. Even though, minority group model SMC^2 has 50%, the majority group model is more sophisticated since the model has a relatively balanced SMC^2.The path coefficients between ethnics grouping are shown in Figure 4.9

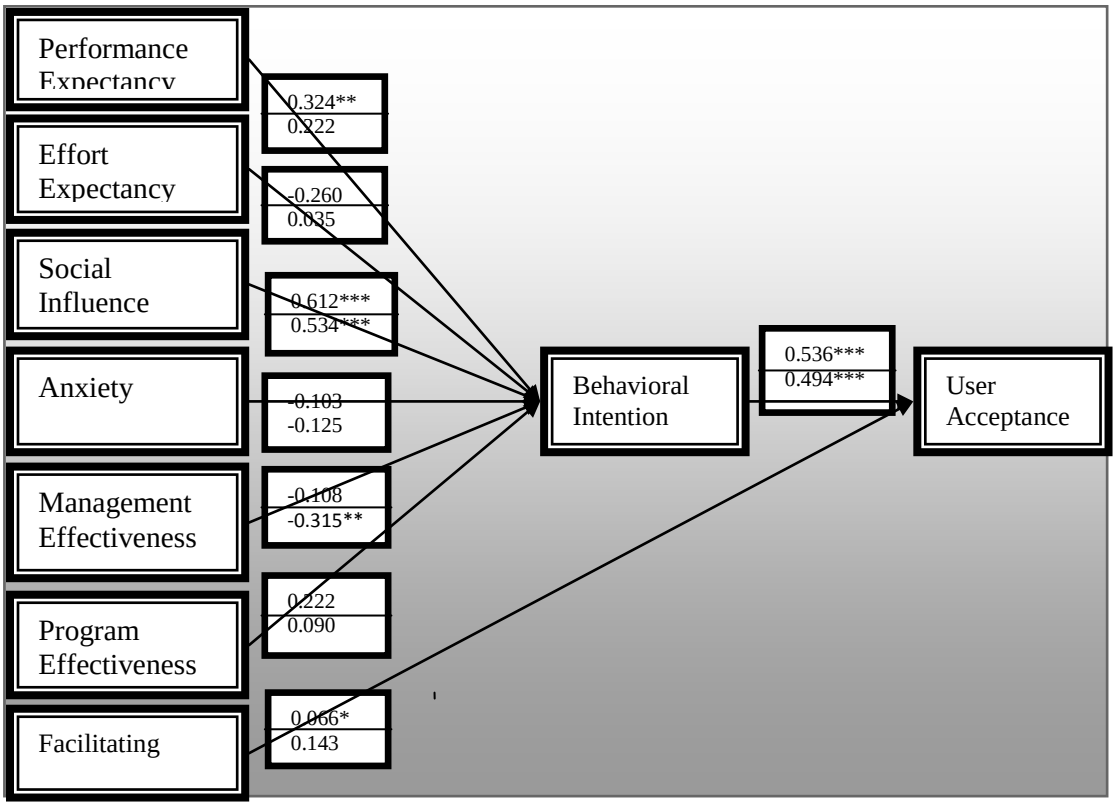


***P** < 0.10; ****P** < 0.05; *** **P** < 0.01, **Sig** = Significant; **ns** = Not Significant
Figure 4.9: Ethnicity Models with Path Coefficient (Majority& Minority)

4.6.4 Location Grouping Models

The location grouping was distributed into convenient and non-convenient (location) respectively. Those respondents that agree that telecentre location affect acceptance were 85 and location does not affect were 106. The convenient group GOF index obtained from the structural model for former are: CMIN = 437.844 with DF. = 376 and

CMIN/DF = 1.164; CFI = .918 and RMSEA = .044. The non-convenient group sample GOF indexes include: CMIN = 539.752 with DF. = 376 and CMIN/DF = 1.436; CFI = 0.883 and RMSEA = 0.064. The model shows a good fits in terms of these aforementioned indicators. The study also investigated the variances, for the two groups. The models explained 52% of the variance in Behavioral Intention and 32% of the variance in User Acceptance for convenience. While for those that feel location is not convenience the model explained 50% of the variance in Behavioral Intention and 29% of the variance in User Acceptance. Convenient model explained variance better than the Not-convenient model. The path coefficients between locations grouping are in Figure 4.10.



P** < 0.10; ****P** < 0.05; ** **P** < 0.01, **Sig** = Significant; **ns** = Not Significant

Figure 4.10: Location Models with Path Coefficient (Conv. and Not Conv.)

4.7 Group Invariance

4.7.1 Multi Group Invariance

Having established satisfactory fit indices for the moderating variables, the next stage is to evaluate the measurement and structural model invariance through multi group analysis. Measurement invariance analysis is meant to assess factor invariance of the measurement prior to comparisons between the groups. Because there is reason to believe that the structure of the compared construct is not equal across groups (Hair et al., 2010).

4.7.2 Gender Invariance

A multiple group analysis was used to evaluate the effect of moderating variables of gender, age, ethnicity and location by comparing the two groups (such as: male versus female, younger versus older etcetera). The examination of the moderating effect was conducted using a two-step approach suggested by Li (2006) and lm et al. (2011). Two structural models for the group were created for comparison. The first model was an unconstrained model in which path coefficients were allowed to vary across two subgroups (such as, male versus female). The second model was a constrained model in which path coefficients were constraint to be equal across the two subgroups. The next step was to test the difference in terms of chi-square value (x^2) and degree of freedom between the unconstrained and constrained models. The unconstrained model must have less degree of freedom than the constrained model. Also, the (x^2) value should be lower for the unconstrained model than the constrained model. The significant increase of (x^2)

from unconstrained model to constrained model signifies the testing of moderating variable has a discrepancy result on the tested causal path and could be confirmed as a moderator. Thus, the criterion of establishing moderating effect is given by these conditions: If the $\Delta \chi 2 >$ CR (CR- Table value at α=0.05), then the moderating variable has statistical significance on the baseline model. Hence, moderating effect is established. Otherwise, moderating variable has no statistical significance on the baseline model if the $\Delta \chi 2 <$ CR, at α=0.05 (Byrne, 2010). The result of gender invariance is shown in Table 4.18.

Table 4.18: Results of Multiple Group Modeling (Gender)

	Unconstrained	**Constrained**	**$\Delta \chi^2$**	**P_n**	**Moderating effect**
χ^2	883.173	898.488	15.315	0.001	Supported
DF	752	758	6		
CFI	0.936	0.939			
TLI	0.926	0.939			
RMSEA	0.030	0.029			

χ^2 (DF = 6) = 12.592, p < 0.05

The chi - square tests for differences reveal that the model was invariant between the two groups: male and female. The result obtained in Table 4.18 shows that $X^2(6) = 15.315$, $p < 0.05$. The corresponding DF values between the unconstrained and constrained model vary. The differences obtained were 15.315 and 6; this value is significant at ($p < 0.05$). The result of chi - square difference comparison between the pairs of specified models suggested evidence that there is significant difference between the constrained and unconstrained model for both gender groups. Thus, multi group result shows that gender has moderating effects on the structural model. The next stage is to compare the path coefficient between the gender groups as in Table 4.19

Table 4.19: Results of Comparative Path Coefficient Gender (Male and Female)

	Path		Male		Female		Hypotheses
	Exo.	Endo.	Estimate(β)	CR (t)	Estimate(β)	CR (t)	
H1a	PE ⇨	BI	.195**	2.278	.409**	2.139	Male > Female
H2a	EE ⇨	BI	.268	.043	-.252	-1.495	Female > Male
H3a	SI ⇨	BI	.454**	2.337	.637**	3.036	Female > Male
	-		-		-		-
H5a	MEF ⇨	BI	-.009	- .683	-.297*	-1.650	Female > Male
H6a	PEF ⇨	BI	-.100	1.249	.178	1.126	Male > Female

The result obtained shows that the effect of Performance Expectancy on Behavioral Intention was stronger in female group ($\beta_{Female} = 0.409$, t-value=2.139) than male ($\beta_{male} = 0.195$, t-value = 2.278), which is contrary to the hypothesized relationship. The effect of effort expectancy on Behavioral Intention is not significant for both gender, thus H_{1a} and H_{2a} are not supported. The effect of Social Influence on Behavioral Intention was stronger for female than male ($\beta_{Female} = 0.637$, t-value=3.036). Management Effectiveness influence on Behavioral Intention is stronger for female than male ($\beta_{Female} = -0.297$, t-value = -1.650) affirming hypothesis H_{3a} and H_{5a}. Program Effectiveness influence on Behavioral Intention is not significant for both gender consequently, H_{6a} is rejected.

4.7.3 Age Multi Group Invariance

The same procedure was adopted to assess the moderating effect of age using (x^2) and (Df.) differences between the constrained and unconstrained structural model as in Table 4.20.

Table 4.20: Results of Multi Group Modeling (Age)

	Unconstrained	**Constrained**	**$\Delta \chi^2$**	**P_n**	**Moderating effect**
χ^2	907.752	929.424	21.672	0.001	Supported
Df	752	763	11		
CFI	0.925	0.925			
TLI	0.914	0.916			
RMSEA	0.033	0.033			

χ^2 (DF = 11) = 19.675 significant at, $p < 0.05$

The chi - square tests for differences reveal that the model was invariant between the two groups: younger and older groups. The result from Table 4.20 shows that $X^2(11) = 21.672$, $p < 0.05$. The corresponding DF values between the unconstrained and constrained model show a discrepancy. The differences obtained were 21.672 and 11; this value is significant at ($p < 0.05$). The result of chi - square difference comparison between the pairs of specified models suggested evidence that there is significant difference between the constrained and unconstrained model for both age groups. Thus, multi group result indicates age has moderating effects on the structural model. The next stage is to compare the path coefficient between age group as in Table 4.21.

Table 4.21: Results of Comparative Path coefficient Age group (Younger and Older)

	Path		**Younger**		**Older**		**Hypotheses**
	Exo.	Endo.	Estimate(β)	CR (t)	Estimate(β)	CR (t)	
H1b	PE ⇨	BI	.377**	3.129	.036	.181	Younger > Older
H2b	EE ⇨	BI	- .202	-1.304	.039	.196	Older > Younger
H3b	SI ⇨	BI	.538***	3.747	.503**	2.560	Younger > Older
H4b	ANX ⇨	BI	-.059	- .617	-.063	-.507	Younger> Older
H5b	MEF ⇨	BI	.034	.248	-.441**	-2.377	Older > Younger
H6b	PEF ⇨	BI	.168	1.285	.355	1.578	Younger > Older
H7b	FC ⇨	UA	.103	.908	.254**	1.887	Older > Younger

Table 4.21, indicates that the effect of Performance Expectancy on Behavioral Intention was stronger for younger than older; (β_{young} = 0.377, t-value=-3.129) thus, H_{1b} is supported. The effect of Efforts Expectancy on Behavioral Intention has no impact on both groups refuting H_{2b}. The effect of Social Influence on Behavioral Intention was stronger in younger than older (β_{young} = 0.538, t-value=3.747) hence, H_{3b} is supported. Anxiety has no influence on Behavioral Intention for both age groups. Management Effectiveness influence on Behavioral Intention was found to be stronger on older than younger (β_{old} = -441, t-value=-2.377), asserting H_{5b}. Program Effectiveness influence on Behavioral Intention is not significant for both age groups, consequently H_{6a} is rejected. The effect of age on Facilitating Conditions on User Acceptance of was stronger on older than younger (β_{old} = 0.254, t-value=-1.887). Thus, H_{7b} is supported.

4.7.4 Ethnicity Multi Group Invariance

The third moderating variable is ethnicity using same procedure to assess the moderating effect of this variable using (x^2) and (Df.) differences between the constrained and unconstrained structural model as shown in Table 4.22.

Table 4.22: Results of Multi Group Modeling Ethnicity

	Unconstrained	**Constrained**	**$\Delta\chi^2$**	**P_n**	**Moderating effect**
χ^2	919.956	933.507	13.551	0.000	Supported
Df	752	758	6		
CFI	0.920	0.923			
TLI	0.907	0.914			
RMSEA	0.034	0.033			

χ^2 (DF = 6) 12.592, significant at, $p < 0.05$

The chi - square tests for differences disclose that the model was invariant between the two ethnic groups: Major and Minor ethnic groups. The result from Table 4.22 illustrates that $X^2(6) = 13.551$, $p < 0.05$. The corresponding DF values between the unconstrained and constrained model show a variation. The variation obtained was 13.551 and 6; this value is significant at ($p < 0.05$). The result of chi - square difference comparison between the pairs of specified models suggested evidence that there is significant difference between the constrained and unconstrained model for both ethnic groups. Thus, multi group result suggested that ethnicity has moderating effects on the structural model. The next stage is to compare the path coefficient between the ethnicity groups.

Table 4.23: Results of Comparative Path Coefficient Ethnicity

	Path			Ethnicity (Major)		Ethnicity (Minor)		Hypothesis
	Exo.		Endo.	Estimate(β)	CR (t)	Estimate(β)	CR (t)	
H3c	SI	⇨	BI	.475***	3.510	-.377	-.897	Major > Minor

The comparative results obtained has shown that Social Influence effects on Behavioral Intention was stronger on major ethnic groups than minority ($\beta_{major} = 0.475$, t-value=3.510), consequently, H_{3c} is supported.

4.7.5 Location Multi Group Invariance

The last moderating variable in the current study is location, to assess the moderating effect of this variable using (x^2) and (Df.) differences between the constrained and unconstrained structural models the result is shown in Table 4.24.

Table 4.24: Results of Multi group Modeling (Location)

	Unconstrained	**Constrained**	**$\Delta \chi^2$**	**P_n**	**Moderating effect**
χ^2	977.604	100.727	23.123	0.000	Unsupported
Df	752	773	21		
CFI	0.895	0.894			
TLI	0.879	0.881			
RMSEA	0.040	0.039			

χ^2 (DF = 21) = 32.671 at $\alpha = 0.05$, $p < 0.05$

The chi - square tests for differences show that the model was not invariant between the two Location groups: Convenient and Not Convenient ethnic group. The result from Table 4.24 indicate that $X^2(21) = 23.123$, ($\Delta \chi^2 <$ CR). The result of chi - square difference comparison between the pairs of specified models suggested evidence that there is insignificant difference between the constrained and unconstrained model for both location group. Thus, multi group result indicates that location has no moderating effects on the structural model. The result obtained suggested that Location is not a moderator in context of the study. The comparison between the path coefficient of location show non- significant effect for both location grouping as shown in Table 4.25.

Table 4.25: Results of Comparative Path Analysis Location

	Path		**Location (Convenient)**		**(Not convenient)**		**Hypothesis**
	Exo.	Endo	Estimate(β)	CR (t)	Estimate(β)	CR (t)	
H7c	FC ⟹	UA	.066	.451	.143	1.396	Conv.> Not Conv.

The moderating effect of location could not be established base on the multi group analysis from Table 4.25, consequently H_{7c} is not supported. The hypotheses listed in the research model covered the theoretical relationships between the researches exogenous (Independent variables) and endogenous (dependent variables). The effects

of moderating variables on the exogenous variables were also examined. Table 4.26 summarizes the detail results of the hypotheses as conceptualized in chapter three.

Table 4.26: Summary of the Hypothesized Results Tested

Hypothesized Paths				Hypotheses	Results
Main effect					
H_{A1}	PE	⇨	BI	Significant	Supported
H_{A2}	EE	⇨	BI	Not significant	Unsupported
H_{A3}	SI	⇨	BI	Significant	Supported
H_{A4}	ANX	⇨	BI	Not significant	Unsupported
H_{A5}	MEF	⇨	BI	Significant	Supported
H_{A6}	PEF	⇨	BI	Significant	Supported
H_{A7}	FC	⇨	UA	Significant	Supported
H_{A8}	BI	⇨	UA	Significant	Supported
Gender difference					
H_{1a}	PE	⇨	BI	Male > Female	Unsupported
H_{2a}	EE	⇨	BI	Female > Male	Unsupported
H_{3a}	SI	⇨	BI	Female > Male	Supported
-	-			-	-
H_{5a}	MEF	⇨	BI	Female > Male	Supported
H_{6a}	PEF	⇨	BI	Male > Female	Unsupported
Age difference					
H_{1b}	PE	⇨	BI	Younger > Older	Supported
H_{2b}	EE	⇨	BI	Older > Younger	Unsupported
H_{3b}	SI	⇨	BI	Younger > Older	Supported
H_{4b}	ANX	⇨	BI	Younger > Older	Unsupported
H_{5b}	MEF	⇨	BI	Older > Younger	Supported
H_{6b}	PEF	⇨	BI	Younger > Older	Unsupported
H_{7b}	FC	⇨	UA	Older > Younger	Supported
Ethnicity difference					
H_{3c}	SI	⇨	BI	Major > Minor	Supported
Location difference					
H_{7c}	FC	⇨	UA	Conv. > Not Conv.	Unsupported

4.8 Summary

Data collection and analysis of the results obtained were discussed. The chapter begins with description of respondents profile and the test of non-respondents bias. Data screening and cleaning were performed to fulfill the requirement of performing multivariate analysis. Accordingly, assessment of missing data, outliers, multicollinearity and normality were carried out. Moreover, exploratory factor analysis (EFA) was performed through principal components analysis (PCA). The subsequent sections present the results of confirmatory factor analysis, measurement model and structural model. The alternate structural model was presented to test the proposed research model and the extent of how the research model fits with the data. Lastly, the chapter reports on the hypotheses testing, with the impact of the moderators. The results of the hypotheses test as shown in Table 4.24 suggested a significant relationship between exogenous and endogenous variables as earlier hypothesized, gender, age, and ethnicity moderates these relationships. Finally, SEM results showed that the underpinning theory, the Unified Theory of Acceptance and Use of Technology (UTAUT) is a robust theory to test the determinants of telecentre acceptance in Nigeria. The next chapter elaborates in details the discussions of the findings.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter presents the discussion on the findings base on the result obtained in the previous chapters. Firstly, an overview of the research is presented. Discussions on the hypotheses testing for both main and moderating hypotheses based on the output generated from SEM are discussed. The revised model of user acceptance of telecentre based on the significant result obtained from the main hypotheses is presented.

5.2 An Overview of the Research

The research was conducted mainly to determine the important factors that influenced the user acceptance of telecentre in some communities where the initiatives commenced. Assessing the user acceptance of telecentre become necessary, because review of the extant studies have revealed that despite the availability of telecentres in far more developing countries, the telecentres have not been fully accepted. Failure to understand the influencing factors of telecentre acceptance will not in small measure cause the government a significant lost in terms of human and capital investment. Therefore, the user acceptance model is developed with view of identifying those factors that influence end users to accept and use the telecentres. Literature review has suggested that the potentials factor influencing user acceptance of telecentre include: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Anxiety (ANX), Management Effectiveness (MEF) and Program Effectiveness (PEF), Facilitating

Conditions (FC) and Behavioral Intention (BI). Based on these factors, the researcher developed a user acceptance model that depicts the relationships among the significant factors. Consequently, a modified Unified Theory of Acceptance and Use of technology in context of telecentre was proposed. The research model was tested in some selected telecentres across Nigeria. As presented lately in chapter three, eight main hypotheses were proposed. A survey was conducted in some selected telecentres in an attempt to identify the success factors. The extent of the relationships was identified by the beta value that shows the intensity of each determinant (PE, EE, SI, AX, MEF, PEF and FC) influenced on Behavioral Intention or User Acceptance (Wang & Shih, 2008). The moderating effects of gender, age, ethnicity and location of telecentre on the relationships among those factors were also examined.

Path analysis with structural equation modeling using AMOS 16 software was used to test all the hypothesized relationships in the structural model. The results of the proposed hypotheses were shown in Table 4.26. The findings of the hypothesized results were discussed; also findings from the previous researches were used to support or disprove the significance of the current research findings. The subsequent sections present the discussions on the outcome of hypotheses testing.

5.3 Discussion on Hypotheses Testing

5.3.1 Effect of Performance Expectancy on Behavioral Intention (H_{1A})

The hypothesis testing supports the relationship between Performance Expectancy and Behavioral Intention. Performance Expectancy (PE) is defined as "the degrees an individual user believes that using the telecentre will help in enhancing his/her own performance (Venkatesh et al., 2011)". In this model, the variables measuring Performance Expectancy in context of telecentre acceptance yielded three measures. These measures are related to enhancement of job performance, speed in accomplishment of task and competency. Performance Expectancy is a positive determinant of Behavioral Intention towards telecentre acceptance. The finding suggested that individual performances in terms of job performances and accomplishments of task can be improved when the individual use the telecentre. The implication of this, is the more the telecentre is used the higher the performances of the users. This finding justified the implementation of telecentre as an effective means of bridging digital divide in underserved and unserved areas in Nigeria. The result obtained on the positive relationship concurs with the findings of previous studies proposing a direct positive relationship between Performance Expectancy and Behavioral Intention (Al-Gahtani et al., 2007; Wang & Shih, 2008; Wang et al., 2009).

5.3.2 Effect of Effort Expectancy on Behavioral Intention (H_{2A})

The hypothesis testing did not support the relationship between Effort Expectancy and Behavioral Intention. Effort expectancy (EE) is defined as "the degree of ease user feel

with respect to the use of facilities in telecentres (Venkatesh et al., 2011)". The finding suggests that Effort Expectancy had non- significant influence on Behavioral Intention in telecentre acceptance. The implication of this result shows that ease of use becomes less important in predicting user's Behavioral Intention in context of this research. Possibly, most of the respondents are youth, educated and comfortable with interface use in the telecentre. Moreover, the younger users tend to have more confidence and well experienced in using the telecentres; consequently effort expectancy does not influence their decision making in terms of telecentre acceptance. This finding is consistent with the results of obtained by Venkatesh et al. (2011) and Al-Gahtani et al. (2007) who reported that ease of use ceases to be important in studies related to technology acceptance after just few months of IT implementation. In the context of this research, perhaps the users are well experience in using the telecentre, this possible suggested the non-support of the relationship between Effort Expectancy and Behavioral Intention.

5.3.3 Effect of Social Influence on Behavioral Intention (H_{3A})

The hypothesis testing supports the relationship between Social Influence and Behavioral Intention. Social Influence (SI) is defined as "the degree to which an individual user perceives that important others believe he or she should use facilities in telecentre (Venkatesh et al., 2011)". Social Influence was found to be the strongest predictor of Behavioral Intention in context of this research. The study suggests that, the telecentre users have strong influence from their pair group in influencing their intention towards its acceptance. The finding further validates the significance of maintaining

Social Influence in assessing technology acceptance more so, in technologies that are prone to the public as revealed by Biljon and Kotze (2007). Thus, the implication of Social Influences as the most important determinant of Behavioral Intention in the context of telecentre showed that the stakeholders should use the advantage of important others (peer groups) in propagating the acceptance and use of telecentre. This finding is consistent with most prior research in technology acceptance (Wang & Shih, 2008; Park et al., 2007; lm et al., 2011).

5.3.4 Effect of Anxiety on Behavioral Intention (H_{4A})

The hypothesis testing did not support the relationship between Anxiety and Behavioral Intention. Anxiety (ANX) is described as evolving anxious or emotional reactions when it comes to performing a behavior (for example, using a computer). Venkatesh et al. (2003) defined "Anxiety as the apprehension or even the fear an individual has toward the possibility to use a technology". The finding suggests that Anxiety had insignificant influence on Behavioral Intention in telecentre acceptance. Alternatively, there is no evidence from the finding suggesting that Anxiety can influence user behavior towards telecentre acceptance. Possibly, most the respondents are young, educated and comfortable having previous encounter with IT devices. Moreover, less anxiety towards interaction with technology could be attributed to familiarity with the technology. Confidence in the usage of telecentre could be attributed to favorable environment surrounding the technology. This finding is consistent with the results obtained by Venkatesh et al. (2003) suggesting that Anxiety influence on IT acceptance with inconsequential relationship.

5.3.5 Effect of Management Effective on Behavioral Intention (H_{5A})

Management Effectiveness (MEF) is defined as the assessment of how well the non-profit organization (NPOs) is being managed – primarily as perceived by users in achieving the objectives by which NPOs is established (Balduck & Buelens, 2008). In connection with the results obtained from the study, the effect of Management Effectiveness on Behavioral Intention is significant. Hence, the hypothesis testing supports relationships between Management Effectiveness and Behavioral Intention. Management Effectiveness negatively affects Behavioral Intention of User in the acceptance of telecentre. The finding shows the more effective the management of the telecentre, the less the user intends to use the telecentre. Users would be encouraged to use the telecentre if less control from the management of the telecentre. This finding appears interesting in the sense that user perception of stricter rule and regulation at telecentre compared to cybercafé where there is less stringent rule on surfacing internet. This could be because only positive usage of telecentre is allowed. Compared to other public access platform where most of the youth usually engaged in surfacing phonographic which is highly restricted in telecentre. This finding concurs with Ibrahim et al. (2010) who reported that without enough supervision and monitoring, youth can misuse public IT platform thereby contributing to various ethical problems.

The second perception of Management Effectiveness could be attributed to the majority of managements staffs of the telecentres are from the South West of the country. There was no equal representation of other nationalities in the managements of telecentres, possible due to the favoritisms from the USPF in the headquarters. Given that the use of

telecentre is completely voluntary and that user comprises number of people with diverse background. Having uniform representation of the management staff in telecentre would make it more attractive to the diverse ethnic groups.

5.3.6 Effect of Program Effective on Behavioral Intention (H_{6A})

Program Effectiveness (PEF) is defined as the "characteristics that deal with the services or programs provided by the telecentre as perceived by end users (Balduck & Buelens, 2008)". The hypothesis testing supports the relationship between Program Effectiveness and Behavioral Intention. Program Effectiveness positively affects Behavioral Intention of User Acceptance of telecentre. The finding suggests that user that is satisfied with the effectiveness of service rendered, is more prone to accept telecentre due to uniqueness of services roll-out by the telecentre. Moreover, the significant influence of Program Effectiveness to the intention of users could be attributed to the perception that only motivated staff could translate organizational goals of program in to an important output. More so in non-profit organization like telecentres where researches have shown that it is facing sustainability challenges (Ibrahim et al., 2010; Pade et al., 2006; Pal, 2007). From the practical perspective, the findings suggested that positive perception towards users' intention to acceptance and use of telecentre could be sustained through efficiency of service rendered by telecentre from all ramifications.

5.3.7 Effect of Facilitating Condition on User Acceptance (H_{7A})

The hypothesis testing supports the relationship between Facilitating Conditions and User Acceptance. Facilitating Conditions (FC) is defined as "the degree in which a user

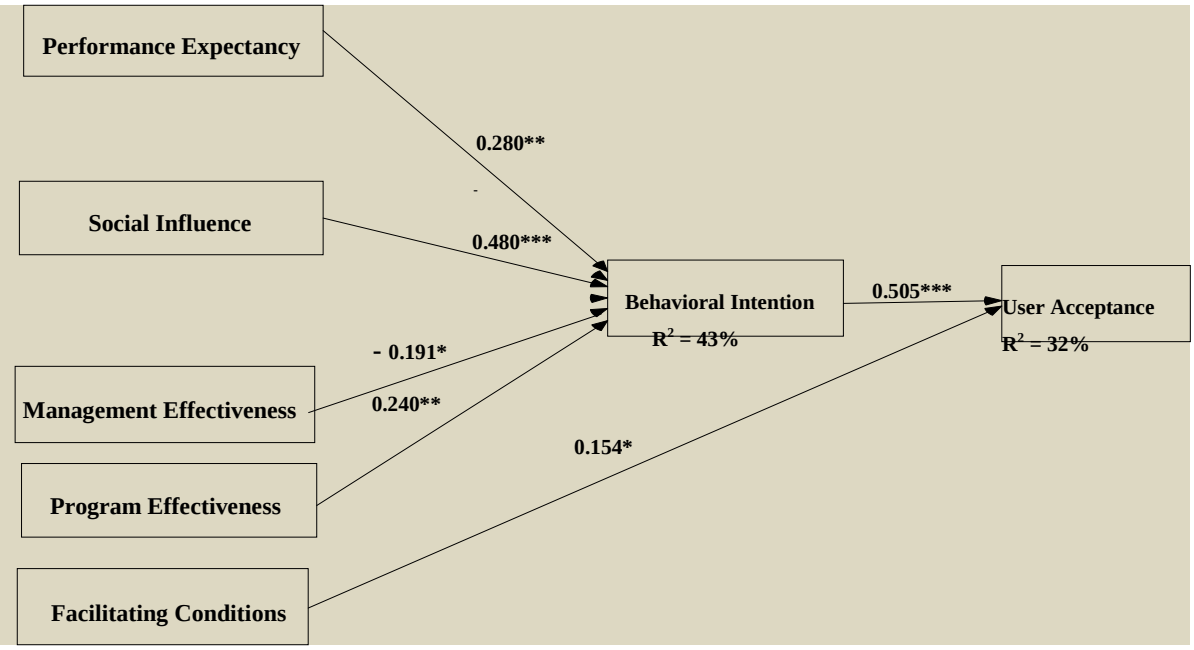
believes that an organizational and technical infrastructure exists to support the use of telecentre (Venkatesh et al., 2011)". Facilitating Conditions were observed to have a significant influence on User Acceptance of telecentre. The difficulty of the technology could be curtailed if the user perceived that sufficient arrangements in terms of technological and human resources necessary for the smooth running of the telecentre initiatives are in place for its successful implementation. This finding is consistent with most prior research in technology acceptance proposing a direct positive relationship between Facilitating Conditions and User Acceptance (Wang & Shih, 2008; Park et al., 2007; lm et al., 2011).

5.3.8 Effect of Behavioral Intention on User Acceptance (H_{8A})

The hypothesis testing supports the relationship between Behavioral Intention and User Acceptance. Behavioral Intention (BI) is defined as "a measure of the strength of one's intention to perform a specified behavior (Davis et al., 1989)". Previous research has shown that Behavioral Intention has a direct impact on the individuals' actual use of a given technology (Davis, 1989). In context of this study, Behavioral Intention positively affects User Acceptance of telecentre. Further, the finding shows that Behavioral Intention is the most important determinants of User Acceptance of telecentre (β = 0.505, t = 1.787), suggesting that the higher the intention of an individual to use the telecentre the more he/she will be inclined to accept telecentre. This finding is consistent with the results of previous studies proposing a direct positive relationship between Behavioral Intention and Usage (Al-Gahtani et al., 2007; Wang & Shih, 2008). Also the finding has empirically substantiated the arguments of Igbaria et al. (1997) and Jackson

et al. (1997), that Behavioral Intention is the major determinant of technology acceptance. Due to its importance, it is referred to "as a key criterion in user acceptance research' (Venkatesh et al., 2003, p 470).

In summary, the significant findings among the eight main research hypotheses showed that only six determinants supported the hypothesized structural relationships as enumerated: (BI ← PE, BI ← SI, BI ← MEF, BI ← PEF, UA ← FC and UA ← BI). Consequently, Performance Expectancy, Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and the Intentions were key determinants of User Acceptance of telecentre. Figure 5.1 shows the revised model of telecentre acceptance.



P** < 0.10; ****P** < 0.05; ** **P** < 0.01,

Figure 5.1 Revised Model of User Acceptance of Telecentre

The next section discuss on the significance of moderating effects of gender, age, ethnicity and location on the determinant of Behavioral Intention and User Acceptance.

5.4 Significance of the Moderating Effects

The study examines the moderating effects of demographic variables of gender, age, ethnicity and location on the determinants of Behavioral Intention and User Acceptance. The results obtained from the multi group analysis suggested only significant moderating effects of gender, age, and ethnicity but the moderating effect of location could not be supported. Fourteen hypotheses were proposed across different groupings (that is, male and female, younger and older etcetera) but only seven was significant in this study.

The finding has shown that effect Performance Expectancy on Behavioral Intention to telecentre acceptance is more strongly for female than for male. The result obtained is inconsistent with prior studies by Venkatesh et al. (2003) and Wang & Shih (2008) that found Performance Expectancy as a strong determinant on Behavioral Intention for male than for female. Showing that gender role in IT acceptance is dynamic and could be change overtime. The gender difference obtained from this finding could be attributed to female having higher motivation in their quest with interacting with Information Technology initiative in context of the study. Thus, their perceptions of usefulness of telecentre strongly influence their intention of using telecentre. Another interesting finding from this study was that the effect of Social influence on Behavioral Intention, found to be stronger for female than male. This finding is consistent to prior research

which has found Social Influence as stronger determinant of IT Usage intention for female than male (Venkatesh et al., 2003; Park et al., 2007; Wang & Shish, 2008). The effect of Management Effectiveness on Behavioral Intention was stronger for female than male. This may be due to the fact that, female are more inclined to managers' decision to provide the best possible services within available resources than male. The unexpected finding from this study was effect of Effort Expectancy on Behavioral Intention which is inconsequential for both gender groups. Even though moderating variable do change relationship between two variables in either ways. The moderating effect of gender on the relationship between Effort Expectancy and Behavioral Intention could not be substantiated. This is not surprising as the effect of Effort Expectancy was not significant in main the hypothesis reported earlier.

Age groups have demonstrated significant moderating effects on the relationships between the main determinants of Behavioral Intention towards User Acceptance of telecentre. For both age groups (that is, the younger group with ages $\leq$ 30 years and older group with age > 30), all the determinants of Behavioral Intention other than Effort Expectancy, Anxiety and Program Effectiveness was significant for younger group. Specifically, Performance Expectancy and Social Influence was stronger for younger than older people. These findings are consistent with prior research (Wang & Shih, 2008; Wang et al., 2009; Venkatesh et al., 2011), which have found that Performance Expectancy and Social Influence as stronger determinant on Behavioral Intention for younger people. Another interesting finding from this study was that the effect of Facilitating Conditions on User Acceptance of telecentre which was found to

be stronger for older than younger group. This finding also agrees with the studies by Czaja and Sharit (1988) that found older group perceived more comfort and efficacy over computer than younger groups. Finally, Social Influence effect on Behavioral Intention is stronger on major ethnic group than minority group. The implication of which is that the minority group use telecentre less than the majority group the proposition that minority groups would be least integrated in telecentre was confirmed.

5.5 Summary

The preceding chapter presents detail discussion on the findings from the hypothesized relationships between exogenous and endogenous variables. A total of 22 hypotheses have been tested in achieving the objectives of the research (Figure 3.2). From the eight main hypotheses tested, six were found to be statistically significant to users' intention in telecentre acceptance. There was no evidence to support relationships between EE and ANX with BI, thereby empirically confirming the claims by Venkatesh et al. (2003). Fourteen hypotheses were proposed across different groupings (that is, male and female, younger and older etcetera) but only seven were found significant in the current study. The findings from the multi-group analysis suggested the moderating effects of gender, age and ethnicity but the moderating effect of location could not be substantiated. The next chapter presents the final chapter in context of this research; the chapter highlights the accomplishment of the research objectives.

CHAPTER SIX

CONCLUSION

6.1 Introduction

The last chapter presents summary of the findings that led to the accomplishment of the research questions and the objectives of this study. The contribution of the research as well as the research limitations and suggestions for future research were highlighted.

6.2 Research Questions

Based on the problem statement, the study adopted five research questions in addressing the problem statement highlighted in chapter one. The first question is concerning the factors that determine the User Acceptance of telecentre:

1. **What are the factors that determine the user acceptance of telecentre?**

To answer this question, entails the assessment of the alternate model which comprises eight constructs mainly Performance Expectancy, Effort Expectancy, Social Influence, Anxiety, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention. The findings from the eight main research hypotheses indicated that only six determinants supported the hypothesized structural relationships as enumerated (BI ← PE, BI ← SI, BI ← MEF, BI ← PEF, UA ← FC and UA ← BI). Consequently, Performance Expectancy, Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention are suggested

as significant factors that determines user acceptance of telecentre. Thus, the significant factors are represented in Table 6.1 based on the accepted hypotheses.

Table 6.1: Factors Influencing User Acceptance of Telecentre

Factors	Measure
Performance Expectancy	1. Using telecentre enhances job performance 2. Using telecentre help in the accomplishment of the job more quickly 5. Frequent use of telecentre can contribute to increase in user's value in terms of competency
Social Influence	1. Important people in my community think I should use the telecentre 2. People who are important to me will want me to use the telecentre 3. People in my community that use the telecentre have more prestige 4. Using telecentre has enhanced my knowledge about the environment
Management Effectiveness	1. I have confidence that this telecentre will be durable 2. The manager receives assistance to render efficient service 4. I observed team spirit and motivated staff within the telecentre staff 5. Capable hands are available to impart knowledge in the telecentre
Program Effectiveness	1. Using telecentre help in socioeconomic development 3. Telecentre staffs are competent enough in discharging their work 4. There is cooperation between telecentre staff and the users
Facilitating Conditions	1. A specified person (or group) is available in case of difficulty 2. I have the resources and knowledge to use *ICT facilities in* telecentre 4. Sufficient Electricity and Internet service are available to use *ICT*
Behavioural Intention	1. I intend to use the ICT facilities in Telecentre in the future. 2. I predict I would use the ICT facilities in Telecentre in the future

The second research question seeks to address the significant relationship among the factors:

2. Are these factors sufficiently related to form a basis for the basic model of user acceptance of telecentre?

In the context of this study, it was hypothesized that six factors; Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Anxiety (ANX), Management Effectiveness (MEF) and Program Effectiveness (PEF) collectively determine Behavioral Intention (BI). While the Behavioral Intention and Facilitating Conditions are the determinants of User Acceptance of telecentre (UA). The relationships among the factors were initially represented by eight hypotheses. The result obtained from the path analysis has shown that out of the eight proposed relationships, two were rejected (H_{A2} and H_{A4}), six proposed relationships were accepted. Table 6.2 shows the summary of the accepted hypotheses among the factors in the research model with corresponding Beta values.

Table 6.2: Summary of Significant Factors with Corresponding Beta Values

Hypotheses	β
Behavioural Intention has a significant influence on User Acceptance	0.505
Facilitating Condition has a significant influence on User Acceptance	0.154
Performance Expectancy has a significant influence on Behavioural Intention	0.280
Social Influence has a significant influence on Behavioural Intention	0.480
Management Effectiveness has a significant influence on Behavioural Intention	0.191
Program Effectiveness has a significant influence on Behavioural Intention	0.240

The relationships among the factors can be expressed in the equations with the corresponding results.

$$B = \beta_1 BI + \beta_2 FC \quad (5.1)$$

$$B = \mathbf{0.505}BI + \mathbf{0.15}4FC$$

$$BI = \beta_3 PE + \beta_4 SI + \beta_5 MEF + \beta_6 PEF \quad (5.2)$$

$$BI = \mathbf{0.280}PE + \mathbf{0.480}SI + \mathbf{(-0.191)}\ MEF + \mathbf{0.240}PEF$$

$$UA = \beta_1 BI + \beta_2 FC + \beta_3 PE + \beta_4 SI + \beta_5 MEF + \beta_6 PEF \quad (5.3)$$

$$UA = \mathbf{0.505}BI + \mathbf{0.154}FC + \mathbf{0.280}PE + \mathbf{0.480}SI + \mathbf{(-0.191)}\ MEF + \mathbf{0.240}PEF$$

The highest value among the four significant determinants of Behavioral Intention was Social Influence with beta value 0.480 as in equation 5.2. Over all, Behavioral Intention recorded the highest beta value of 0.505 as the determinants of user acceptance as in equation 5.3. However, the results obtained from the relationships showed that the factors are sufficiently related justifying a basis for the basic model of user acceptance of telecentre. Concerning the third research question:

3. Do gender, age, ethnicity and location moderates' relationship between the determinants of intention and user acceptance of telecentre?

The multiple group modeling suggested the moderating effect of gender (male against female) on the structural model. Further analysis indicated that the moderating effect of gender on the relationship between Social Influence (SI) and Behavioral Intention (BI) is stronger for female than male (0.637** > 0.454**). The relationship between Management Effectiveness (MEF) and Behavioral Intention (BI) is stronger for female than male (-0.297* > -0.009). Also the multiple group modeling suggested the moderating effect of age (younger against older) on the structural model. Further analysis indicated that the moderating effect of the relationship between Performance Expectancy (PE) and Behavioral Intention (BI) is stronger for younger than older people (0.377** > 0.036). The relationship between Social Influence (SI) and Behavioral Intention (BI) is stronger for younger than older people (0.538*** > 0.503**). Also the relationship between Management Effectiveness (MEF) and Behavioral Intention (BI) is stronger for older than younger people (-0.441*** > 0.034). The relationship between

Facilitating Condition (FC) and User Acceptance (UA) is stronger for older than younger people (0.254**>0.103).

The multiple group modeling suggested the moderating effect of ethnicity. Further analysis suggested that the moderating effect of the relationship between Social Influence (SI) and Behavioral Intention (BI) is stronger for major ethnic than minor ethnic groups (0.475*** > -0.377). Finally, the multiple group modeling suggested the non-moderating effect of location. Thus gender, age and ethnicity were the only moderators of the determinants of user acceptance. The fourth research question which stated as follow:

4. Of what significance are perceived Anxiety, Management Effectiveness and Program Effectiveness in measuring User's Behavioral Intention to Acceptance of telecentre?

The fourth research question is addressed by comparing the results of squared multiple correlations when all constructs are incorporated. Against when only the four constructs of original UTAUT are used without including the Anxiety, Management Effectiveness and Program Effectiveness. Comparing both results from Table 4.16, the variances of Behavioral Intention and User Acceptance of telecentre explained without including the three additional constructs: were found to be 37% and 30% respectively. While 43% and 32% variance were explained with the inclusion of Anxiety, Management Effectiveness and Program Effectiveness constructs. Thus, the modified model is more appropriate in predicting the User Acceptance of telecentre in Nigeria. The last research question is concerning the applicability of UTAUT model in different context.

5. Can the underpinning theory of UTAUT be used to explain telecentre acceptance in Nigeria?

Most theories related to behavior have been developed and tested in advanced countries. The dearth of previous studies articulated the need to test the applicability of the model in Sub-Saharan Africa, specifically in Nigeria. A valid research model that demonstrated acceptance of telecentre among users using UTAUT was proposed and validated in context of Nigeria and this is achieved through the results obtained. The question is answered based on the GOF index of the alternate model.

According to Table 4.15 (see chapter four), the results of the alternate model of UTAUT achieved an adequate model fit (CMIN/DF = 1.078; p-value = 0.142; AGFI= 0.850; CFI= 0.985; TLI = 0.983; RMSEA = 0.020). Table 4.17 shows that there are eight direct effects (H_{A1}: Performance Expectancy to Behavioral Intention; H_{A2}: Effort Expectancy to Behavioral Intention; H_{A3}: Social Influence to Behavioral Intention; H_{A4}: Anxiety to Behavioral Intention; H_{A5}: Management Effectiveness to Behavioral Intention; H_{A6}: Program Effectiveness to Behavioral Intention; H_{A7}: Facilitating Conditions to User Acceptance; H_{A8}: Behavioral Intention to User Acceptance). The results obtain from Table 4.17 indicated that H_{A1}, H_{A3}, H_{A5}, H_{A6} H_{A7} and H_{A8} are significant, while, H_{A2} and H_{A4} are insignificant. Hence, the results affirmed that UTAUT can be used to explain the determinants of telecentre acceptance in Nigeria. The results obtained have demonstrated a good fit and robustness of the model. Consequently, by modifying and validating a research model akin to UTAUT, it is possible to demonstrate user acceptance of telecentre in Nigeria.

The next section highlights the accomplishment of the research objectives.

6.3 Research Objectives

The following objectives stated answer the research questions:

First Objective: To determine the factors that lead to the user acceptance of telecentre. The revised model of UTAUT suggested the determinants of user acceptance of telecentre include: Performance Expectancy, Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention. There was no evidence to support relationship between Effort Expectancy and Anxiety with Behavioral Intentions. Investigating what motivates users to accept telecentre became essential considering the huge investment in terms of human and financial implications geared towards the deployments of telecentre. Understanding the key factors influencing telecentre implementation in Nigeria will enhance the acceptance and usage. Thus, the factors obtained could be suggested as the success factors of user acceptance of telecentre.

Second Objective: To examine the relationships between the identified factors. The objective is achieved by depicting the relationships between the six hypotheses base on significant beta values. Social Influence was found to be the most significant determinants of Behavioral Intention in the context of Nigeria because the users want to be identified by the peer groups (that is, social status) with the use of telecentre. The overall determinant of user acceptance was Behavioral Intention as indicated in equation 5.3. Consequently, the results obtained from the relationships showed that the factors are

sufficiently related, justifying a basis for the basic model of User Acceptance of telecentre in Nigeria.

Third Objective: To examine the moderating effects of gender, age, ethnicity and location on the relationship between the determinants of Intention and User Acceptance of telecentre. This objective is achieved through conducting multi group modeling. The moderating effect of gender, age and ethnicity were established on the relationships between exogenous and endogenous variables. But the moderating effect of location could not be substantiated. The fact that gender, age and ethnicity were key moderating variables, attention should be accorded to the male, older people and the minority ethnic group since findings suggested disparity in those groups.

Fourth Objective: To determine the significance of perceived Anxiety, Management Effectiveness and Program Effectiveness in measuring User's Behavioral Intention to Acceptance of telecentre. This objective is achieved by comparing the two models result in terms of squared multiple correlations. It was revealed that the modified model is able to explain more variances in Behavioral Intention and User acceptance with inclusion of additional constructs. The additional constructs of Anxiety, Management Effectiveness and Program Effectiveness increase the explanatory power of the new model compared to the original UTAUT model. Thus, the revised model is suggested more appropriate in measuring the acceptability of telecentre in Nigeria

Fifth Objective: To evaluate the applicability of UTAUT (underpinning theory) in explaining the determinants of User Acceptance of telecentre in Nigeria. The last objective is realized base on the results obtained from the alternate model fits with the data. It is affirmed that UTAUT explained the telecentre acceptance in Nigeria. These

results have demonstrated a good fit and robustness of the model. Consequently, by modifying and validating a research model akin to UTAUT, it is possible to demonstrate the generalization of the model in different context. The next section presents research contribution from two main perspectives: theoretical and practical contributions.

6.4 Research Contribution

Base on the results obtained from the hypothesized relationships between exogenous and endogenous variables, including the effects of moderating relationships between those variables. The study has advanced some theoretical and practical contributions in the following angles:

6.4.1 Theoretical Contribution

Theoretically, this study has contributed to the technology acceptance and community informatics research. Firstly, the study has successfully developed the modified unified theory of acceptance and use of technology (UTAUT). It shows that UTAUT model is strongly supported in context of telecentre. Being context driven it became appropriate to suggest that the modified UTAUT model contribute to the body of knowledge. In particular, the research has modified and validated UTAUT model structure by incorporating new determinants of Behavioral Intention linkages with Management Effectiveness and Program Effectiveness. The findings from this research revealed an empirical support for the link between Management Effectiveness and Behavioral Intention, also Program Effectiveness with Behavioral Intention.

In contrast to the influence of Management Effectiveness and Program Effectiveness on Behavioral Intention, Anxiety justifies the position of prior studies (Venkatesh & Davis, 2000; Davis et al., 1989; Venkatesh & Brown, 2001). That Anxiety has an insignificant relationship in IT acceptance. This is in conformity with Venkatesh et al. (2003); the findings of this study further validate the original UTAUT model. In addition, the

research re-tested the relationships that have been established in previous studies such as: Performance Expectancy —> Behavioral Intention (β = 0.280, t= 2.981), Effort Expectancy —> Behavioral Intention (β = -0.073, t= -0.608), Social Influence —> Behavioral Intention (β = 0.480, t= 4.184), Anxiety —> Behavioral Intention (β = -0.085, t= -1.07), Facilitating Conditions —> User Acceptance (β = 0.154, t= 1.987) and Behavioral Intention —> User Acceptance (β = 0.505, t= 5.705). These results provide new empirical support for the established determinants of User Acceptance and theoretical linkages. The new theoretical linkages between Management Effectiveness —> Behavioral Intention (β = - 0.191, t= -1.935) and Program Effectiveness —> Behavioral Intention (β = 0.240, t= 2.192), specifically the unique relationship obtained Management Effectiveness —> Behavioral Intention was found to be negative, implying user would be encouraged to use technology platform only under less control and stringent regulation from Management staff in non-profit settings.

The empirical validation of the modified UTAUT is in line with the suggestion by Venkatesh et al. (2011) of the need of empirical research on UTAUT. As been noted recently, despite being widely cited empirical test of UTAUT are fairly limited (Venkatesh et al., 2011). The empirical evidences of moderating effects of ethnicity (majority versus minority) in explaining the linkage between Social Influence and Behavioral Intention was achieved. The inclusion of moderating effects of ethnicity supported the suggestion of Sun and Zhang (2006) and Srite and Karahanna (2006) with regards to understanding the effects of ethnic identity intensity as a moderator in the

technology acceptance model. Empirically, the variable was established to moderate Social Influence – Behavioral Intention relationship.

A substantial contribution in this research involved the design of survey instruments for assessing user acceptance of telecentre based on reviewing previous studies. The instruments used could be of immense benefits to future researchers in community informatics. The application of structural equation modeling using AMOS could be considered as a contribution. Using SEM permit the researcher ease of analysis more so with a complex model employed in this research especially in modeling multivariate relationships. The research adopting SEM technique help in simultaneous assessment of adequacy of measurement model and hypothesized model used to assess the targeted behavior. The research adopted two types of group analysis using SEM technique: measurement and structural model through covariance structure analysis to examine the impact of research model. As argued by Sowa et al. (2004) that a more comprehensive and methodological tools is required in capturing entities to fully capture their reality. SEM allows for more in-depth assessment of phenomenon perceived effectiveness as it provides researchers to measure latent variables, related to management and program using multiple items.

6.4.2 Research Practical Contribution

The first important set of contribution is to the community informatics. It has been suggested that user acceptance represents a biggest challenge when it comes to success of telecentre implementation (Pal, 2007; Wang & Shih, 2008). Therefore, understanding

what inspire user intention to accept and use telecentre is a significant contribution. The major contribution of this research can be viewed from the angle of being a pioneering work that investigates the determinants of telecentre acceptance. The study enables the understanding of telecentre implementation based on user perspective in Nigeria by revealing the key success factors.

The findings from this research could equip the management with crucial information about the most important factors that influence user behavior on telecentre acceptance in Nigeria. Base on this factors the telecentre management could work on developing and improving the acceptance of telecentre in subsequent telecentres implementations

The findings have reinforced the role of Behavioral Intention as the fundamental driver in technology acceptance research. In context of this study, Social Influence is the most important determinant of intention to telecentre acceptance. Therefore, Social Influence is a criterion for successful implementation of telecentre since users learn from their peer group about the benefits of telecentre. More innovative initiative is needed by having promotional programs, membership and involving various community associations in the affairs of telecentre.

Among the most important contribution of the current research is the role of Program Effectiveness in Intention of users on telecentre acceptance. The finding suggested that user that is satisfied with the effectiveness of service rendered is more prone to accept telecentre due to uniqueness of services roll-out by the telecentre. Only motivated staff in non-profit setting could translate organizational goals of program in to a meaningful

output. Among the most important contribution of this study is the introduction of two new moderating variables of ethnicity and location. The strength of moderation between Social Influence and Behavioral Intention is stronger for major ethnic groups. The implication of this suggests that there is disparity in terms of IT knowledge and skills between major and minor ethnics groups. Hence the needs to engage more minority population to the telecentre usage by building telecentres close to their places and persuading their community leaders in the affairs of running the telecentres.

In general, the current research has shown that the proposed modification to the UTAUT model is valid for non-western culture. These demonstrated that the aggregate model of (UTAUT) is dynamic and can be used to examine user acceptance in different culture context. Few prior studies have been conducted in developing countries (Wang & Shih, 2008; Bankole et al., 2011).

The modification of UTAUT in this study could be considered as a contribution and suggested that introduction of additional variables improved supremacy of UTAUT model. It is expected that this finding would be of interest to community informatics scholars because there have been some questions about the sustainability of non-profits initiatives (Mayanja, 2001; Ibrahim et al., 2010).

The empirically validated model provides a framework for stakeholders to develop, implement and promote user acceptance of telecentre. The model could offer constructive support for government and other stakeholders to plan, implement and promote better user accepted telecentre in the context of the current research. The

empirical evidence presented in the findings will no doubt assist in maintaining the existing projects and as well as serving as a guiding principle for further implementation of telecentre, throughout the un-served and underserved areas in Nigeria. The model could also be applied to other developing countries having similarities with Nigeria.

6.5 Limitations of the Study

This research is a pioneering work that attempts to assess the determinants of telecentre acceptance. Therefore, it became necessary to highlight several limitations related to the study these notably include:

a) Firstly, being a pioneering work on telecentre acceptance additional research is needed to confirm the results obtained from of the current research;

b) The dearth of empirical studies relating to telecentre acceptance was the major limitation of this research;

c) The results obtained were mixed and full support was not obtained for all the hypotheses and the gender, age and location invariance's. Additional research is required to resolve Effort Expectancy hypothesis;

d) Also, the study has primarily focused on cross-sectional research design that was conducted within the shortest timeframe. With the aim of testing the hypothesized model that can explains the success factors of telecentre acceptance. The main advantage of adopting this technique in the current study is related to

cost effectiveness and time. Due to time constraints and the limited funds, it was not possible for the researcher to collect data at multiple times;

e) The key factors identified as the determinant of user acceptance of telecentre (Performance Expectancy, Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention) could change overtime and varies across different culture. Thus, longitudinal or an in-depth research is required to ascertain fully the dynamic nature of these factors;

f) The study used self-administered questionnaire as a primary source of data collection from the respondents. The tendency could be a resultant single source bias the fact that data collected only from one source;

g) The study focused only from the perspective of user in acceptance of telecentre. Thus, understanding the complete acceptability of telecentre could also be assessed from the perspective of organization (such as, the telecentre stakeholders including telecentre management staff); and

h) The proposed model is limited to the context of telecentre and other non-profit initiative; caution should be made in generalization of the model to other context.

6.6 Future Research

Some suggestions for future research arise from the limitations observed from the current work. Several limitations could be overcome in future research by adhering to the following:

a) Firstly, additional research is needed to test the model of user acceptance of telecentre in different cultural context to see if comparable result can be obtained;

b) The fact that the scope of this study is limited to community telecentre other non-profit initiatives such as school-based telecentre should be studied to ascertain the interplay among the factors;

c) Future research could also extend the model of user acceptance of telecentre to include other theoretical constructs relevant to non-profit initiatives. It would be interesting for instance to explore the constructs of Perceived Trust and User Satisfaction;

d) The users' perception on Performance Expectancy, Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention towards acceptance of telecentre could change overtime. Therefore, the findings of the current study should be regarded as preliminary evidence on the determinants of telecentre acceptance. Longitudinal study on these factors might provide a more in-depth understanding of how those factors affect Behavioral Intention and User Acceptance overtime;

e) An additional area for future investigation is the impact of moderating effect of location. The current result obtained shows the non-moderating effect of location, future investigation is suggested; and

f) The fact that this study used individual as unit of analysis, this type of analysis is susceptible to a common methods variance problem. Future research could use multiple types of respondents (such as, dyad or even triad) to curtail the effect of single source bias. The study could also be conducted in organizational settings (comprising the telecentre stakeholders and telecentre management staff).

6.7 Conclusion

An empirical study was conducted based on prior research to test a modified UTAUT model, with the purpose of exploring the determinants of telecentre acceptance from users' perspective. The findings of the research suggested that the user acceptance of telecentre can be demonstrated by Performance Expectancy; Social Influence, Management Effectiveness, Program Effectiveness, Facilitating Conditions and Behavioral Intention. The results obtained from the relationships among the key factors indicated those factors are sufficiently related, justifying a basis for the basic model of User Acceptance of telecentre. Moreover, the findings from the multi group analysis suggested significant moderating effects of gender, age, and ethnicity on the relationships between the latent variables (factors). While the moderating effect of location could not be established. Consequently, based on these findings, the final research model known as modified UTAUT based telecentre model is proposed to

explain and predict end-user intention in accepting telecentre. A comprehensive understanding of this model will assist government to identify the reason for the acceptance or rejection of telecentre among the users in the future and support them to enhance the telecentre acceptance and usage. The fact that gender, age and ethnicity are key moderating variables, attention should be accorded to the male, older people and the minority ethnic group since the empirical results highlighted disparity in those groups. This study has demonstrated that the modified UTAUT model could be successfully used in assessing user acceptance of telecentre in Nigeria and the model could be applied to other developing countries with situation similar to Nigeria.

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Appendix A

Research Instruments

QUESTIONNAIRE ON USER ACCEPTANCE OF COMMUNITY COMMUNICATION CENTRE (CCC-TELECENTRE) IN NIGERIA

Dear Sir/Madam,

I am a postgraduate student of Universiti Utara Malaysia, currently conducting a research on user acceptance of community communication centre (Telecentre) in Nigeria. This research served as a major requirement for the award of PhD (Information Technology). Kindly assists in completing this questionnaire as accurate as you can. We assure you that your responses will be accorded the extreme confidentiality as the purpose of this research is purely based on academic. It is expected that the questionnaire, will be filled in within 15 minutes (approximately). Your cooperation is highly appreciated.

Thanks for dedicating your valuable time

Yours Sincerely

Abdulwahab, L.,

Guides for completion of the survey questionnaire

1. You are required to either **circle** the option that best suit your choice by just **tick [√]** or write your answer in the space provided.

2. There is no right or wrong answers. Your honest and complete response to help us understand your views is appreciated.

3. We re-assure you that, your response will be treated in confidentially.

4. Please you are kindly expected to response to all ***questions***.

5. All the questions are based on 7-point Likert type rating scales as follows:

1 – Strongly disagree

2 – Disagree

3 – Slightly disagree

4 – Neutral

5 – Slightly agree

6 – Agree

7 – Strongly agree

Abbreviation: ICTs Means Information and Communication Technology Section A: Describe your expectations and facilitating conditions towards users' behavioral intention		
Please indicate the degree to which you agree or disagree with statement base on 7-point Likert scale e.g. 1=Strongly disagree (SD) 4 = Neutral (N) 7 = Strongly agree (SA)		
PE1	Using telecentre enhances job performance	1 2 3 4 5 6 7
PE2	Using telecentre help in accomplishment of job more quickly	1 2 3 4 5 6 7
PE3	Using telecentre can increase productivity	1 2 3 4 5 6 7
PE4	Using telecentre enhances job efficiency	1 2 3 4 5 6 7
PE5	Frequent use of telecentre can contribute to increase in user's value in terms of competency	1 2 3 4 5 6 7
EE1	My interaction with telecentre will be clear and understandable	1 2 3 4 5 6 7
EE2	I find using facilities in telecentre easy	1 2 3 4 5 6 7
EE3	I find using facilities in telecentre to be flexible	1 2 3 4 5 6 7
EE4	Using telecentre frequently makes one easy to be skilful	1 2 3 4 5 6 7
EE5	Over all, I find facilities in telecentre easy to use	1 2 3 4 5 6 7
SI1	Important people in my community think I should use telecentre	1 2 3 4 5 6 7
SI2	People who are important to me would want me to use telecentre	1 2 3 4 5 6 7
SI3	People in my community that use telecentre have more prestige	1 2 3 4 5 6 7
SI4	Using telecentre has enhances my knowledge about environment	1 2 3 4 5 6 7
SI5	In general, my community has supported the use of telecentre	1 2 3 4 5 6 7
ANX1	I fell nervous in using facilities in telecentre	1 2 3 4 5 6 7
ANX2	It scares me to think I could make mistakes using facilities in telecentre	1 2 3 4 5 6 7
ANX3	The facilities in telecentre are somehow intimidating to me	1 2 3 4 5 6 7
ANX4	It scares me to use facilities in telecentre because I lack adequate skills	1 2 3 4 5 6 7
MEF1	I have confidence that this telecentre will be durable	1 2 3 4 5 6 7
MEF2	The management receives assistance to render efficient service	1 2 3 4 5 6 7
MEF3	The management & staff of this telecentre are accommodative	1 2 3 4 5 6 7
MEF4	I observed team spirit and motivated staff within the telecentre staff	1 2 3 4 5 6 7
MEF5	Capable hands are available to impart knowledge in the telecentre	1 2 3 4 5 6 7
PEF1	Using telecentre help in socio economic development	1 2 3 4 5 6 7
PEF2	*ICT* Facilities in telecentre are always accessible within the operating hours	1 2 3 4 5 6 7
PEF3	Telecentre staffs are competent enough in discharging their work	1 2 3 4 5 6 7
PEF4	There is cooperation between telecentre staff and the users	1 2 3 4 5 6 7
PEF5	Over all, the likelihood of replicating this program in neighborhood is clear	1 2 3 4 5 6 7
FC1	I have the resources and knowledge to use *ICT facilities in* telecentre	1 2 3 4 5 6 7
FC2	Detail instruction about telecentre use is available to me	1 2 3 4 5 6 7
FC3	Sufficient Electricity and Internet service are available to use *ICT* in telecentre.	1 2 3 4 5 6 7
FC4	Adequate *ICT* facilities in telecentre are available for access	1 2 3 4 5 6 7
FC5	A central support is available to help with technical problems	1 2 3 4 5 6 7
FC6	A specified person (or group) is available in case of difficulty	1 2 3 4 5 6 7
Section B : Describe behavioral intention towards user Acceptance		
BI1	I intend to use *ICT facilities of the* telecentre in the future.	1 2 3 4 5 6 7
BI2	I predict I would use *ICT facilities of the telecentre* in the future.	1 2 3 4 5 6 7
BI3	I plan to use ICTs facilities of the telecentre in the future.	1 2 3 4 5 6 7
B14	I do not plan to use the ICT facilities in the near future.	1 2 3 4 5 6 7

Section C: Describe User Acceptance (Choose your choice the list below)

(a) Please indicate how many times you use Telecentre in a Month

☐ Not at all ☐ about once ☐ 2 or 3 times ☐ 4 or 5 times ☐ 6 or 7 times ☐

☐ 8 or 9 times ☐ More than 9 times

(b) Please indicate how many hours you use Telecentre in a Month

☐ Not at all ☐ Less than or equal to1 hour ☐ More than 1 and Less than or equal to 3 hours ☐ More than 3 and Less than or equal to 6 hours ☐ More than 6 and Less than or equal to 9 hours ☐ More than 9 and less than or equal to 12 hours ☐ More than 12 hours

(c) Please indicate how many day(s) you visit Telecentre in a Month

☐ Not at all ☐ Less than 1 day ☐ 1–2 days ☐ 3–4 days ☐ 5–6 days

☐ 7- 8 days ☐ More than 8 days

(d) Please indicate how frequent you use Telecentre

☐ Very irregular ☐ Fairly irregular ☐ Slightly irregular ☐ Neither

☐ Slightly regular ☐ Fairly regular ☐ Very regular

This section intends to get information about the respondents' demographic background.

1. Please Indicate Your **Gender**

☐ Male ☐ Female

2. Please Indicate Your **Age** _____

3. Which of the following represents your **Ethnicity** / or T**ribe**

☐ Yoruba ☐ Hausa/Fulani ☐ Igbo ☐ Others

4. Please indicate your Highest **Qualification**:

☐ Primary ☐ SSCE /TCII ☐ OND ☐ HND/B.Sc ☐ M.Sc/PhD ☐ Others

5. Which of the following describe Y**our Occupation/ Job?**

☐ Student ☐ Civil Servant ☐ Unemployed ☐ Others

6. Your **Monthly Income (US$)**

☐ Less than $66

☐ $ 67 - $433

☐ More than $434

7. Do you have Personal **Computer at Home?**

☐ Yes

☐ No

8. Do you **have access to Internet at Home?**

☐ Yes

☐ No

9. Did the **Location of Telecentre affect** your accessibility?

☐ Yes

☐ No

Profile of the Experts Involved in Content Validity

Expert ID	Status	Area of Specializations	Age
Expert 1	Senior Lecturer	Information Management	42 years
Expert 2	Assoc. Professor	Management Information System	44 years
Expert 3	Chief Lecturer	Entrepreneurship	52 years
Expert 4	Assoc. Professor	Technology Adoption	50 years
Expert 5	Senior Lecturer	Technology Management	39 years

Appendix B

Sample Size Tables and Others

The mission, vision and objectives of Nigeria Communication Commissions (NCC)

" To establish a regulatory framework for the Nigerian communications industry and for this purpose to create an effective, impartial and independent regulatory authority

To promote the provision of modern, universal, efficient, reliable, affordable and easily accessible communications services and the widest range thereof throughout Nigeria

To encourage local and foreign investments in the Nigerian communications industry and the introduction of innovative services and practices in the industry in accordance with international best practices and trends

To ensure fair competition in all sectors of the Nigerian communications industry and also encourage participation of Nigerians in the ownership, control and management of communications companies and organizations

To encourage the development of a communications manufacturing and supply sector within the Nigerian economy and also encourage effective research and development efforts by all communications industry practitioners

To protect the rights and interest of service providers and consumers within Nigeria

To ensure that the needs of the disabled and elderly persons are taken into consideration in the provision of communications services and

The facilitation of investments in and entry into the Nigerian market for provision and supply of communications services, equipment and facilities

The protection and promotion of the interests of consumers against unfair practices including but not limited to matters relating to tariffs and charges for and the availability and quality of communications services, equipment and facilities

Ensuring that licensees implement and operate at all times the most efficient and accurate billing system;

The promotion of fair competition in the communications industry and protection of communications services and facilities providers from misuse of market power or anti-competitive and unfair practices by other service or facilities providers or equipment suppliers

Granting and renewing communications licenses whether or not the licenses themselves provide for renewal in accordance with the provisions of this Act and monitoring and enforcing compliance with license terms and conditions by licensees

Proposing and effecting amendments to license conditions in accordance with the objectives and provisions of this Act

Fixing and collecting fees for grant of communications licenses and other regulatory services provided by the Commission

The development and monitoring of performance standards and indices relating to the quality of telephone and other communications services and facilities supplied to consumers in Nigeria having regard to the best international performance indicators

Making and enforcement of such regulations as may be necessary under this Act to give full force and effect to the provisions of this Act

Proposing, adopting, publishing and enforcing technical specifications and standards for the importation and use of communications equipment in Nigeria and for connecting or interconnecting communications equipment and systems

The formulation and management of Nigeria's inputs into the setting of international technical standards for communications services and equipment

Carrying out type approval tests on communications equipment and issuing certificates on the basis of technical specifications and standards prescribed from time to time by the Commission

Encouraging and promoting infrastructure sharing amongst licensees and providing regulatory guidelines thereon

Examining and resolving complaints and objections filed by and disputes between licensed operators, subscribers or any other person involved in the communications industry, using such dispute-resolution methods as the Commission may determine from time to time including mediation and arbitration

Designing, managing and implementing Universal Access strategy and programmed in accordance with Federal Government's general policy and objectives thereon"

Sources: http//www.ncc.org.ng

The Objectives of Nigeria IT policies are stated as follows:

"To ensure that IT resources are readily available to promote efficient national development;

To guarantee that the country benefit maximally and to contribute meaningfully by providing the global solutions to the challenges of the information age;

To empower Nigerians to participate in software and IT development;

To encourage local production and manufacture of IT components in a competitive manner;

To establish and develop ICT infrastructure and maximize its use nationwide;

To empower the youth with ICT skills and prepare them for global competitiveness;

To establish and develop ICT infrastructure and maximize its use nationwide;

To create ICT awareness and ensure universal access in promoting ICT diffusion in all sectors of national life;

To create an enabling environment and facilitate private sector (national and multinational) investment in the ICT sector;

To encourage government and private sector joint venture collaboration;

To develop human capital with emphasis on creating and supporting a knowledge-based society; and

To build a mass pool of ICT literate manpower using the NYSC, NDE, and other platforms as a train-the-trainer scheme for capacity-building".

The National Information Technology Agency operates and implements the National IT policy and ensures that the entire citizenry is empowered with information technology through the development of a critical mass of IT capable and globally competitive manpower

IT policy on education as stipulated in the documents

"Making the use of IT mandatory at all levels of educational institutions through adequate financial provision for tools and resources;

Developing relevant IT curricula for the primary, secondary and tertiary institutions. Such curricula will be based on the appropriate national syllabus at the selected level and other

global certification syllabi, to tie into key elements of Government's Universal Basic Education (UBE), the proposed digital virtual library scheme, and related educational initiatives;
Establishing facilities for electronic distance learning networks and ensuring effective internet connectivity, which would provide opportunities for educationally disadvantage areas to educationally leapfrog into the modern era;

Empowering IT institutions and development centre's to develop IT capacities initially at zonal, state and local levels;

Facilitating the growth of private and public sector dedicated primary, secondary and tertiary IT educational institutions"

Digital Bridge Institute

***Mission**: To contribute to the creation of knowledge-based information society in Africa, through human resource capacity building in the information and communication technology (ICT) sector. The following mandate is envisage:*

The DB Institute shall serve as a most important centre for human resource development and workforce capacity building, as well as, research thrust on issue relating to telecommunications in Nigeria, and Africa in general.

The DB Institute shall offer a Broad range of practical engineering and technical training programmes for professionals and practitioners in the telecommunications and IT industry. The program shall cover every theme that involves proper implementation and management of telecommunication, data communication, and internet infrastructures.

The DB Institute shall concentrate on educating and training manpower in all aspect of telecommunications and information technology at post graduate and diploma levels.

The DB Institute shall educate and train policy makers, regulators, legislators, judges, lawyers, bankers, economists, accountants, and other distinguished professionals in the development of national policies concerning telecommunication regulation, legislation, license management, interconnectivity, costing, tariff charges, billing, spectrum venture financing, management, business opportunities, multilateral trade agreements, global information society initiatives, future trends and analysis.

The DB Institute shall have modern multimedia training facility that can support video-conferencing, E-learning and in-class training options.

USPF

Vision: *The USPF vision is tailored to demonstrate the broader Government policy objective of ICTs access to all.*

Mission*: To achieve universal access, universal coverage and universal services through a public-private partnership framework that stimulates economic and social development private sector investment and provision of basic affordable and quality information and communication technology (ICTs), infrastructure. Services to un-served and underserved areas, communities and populations (www.uspf.gov.ng)*

Source: USPF Annual report (2009)

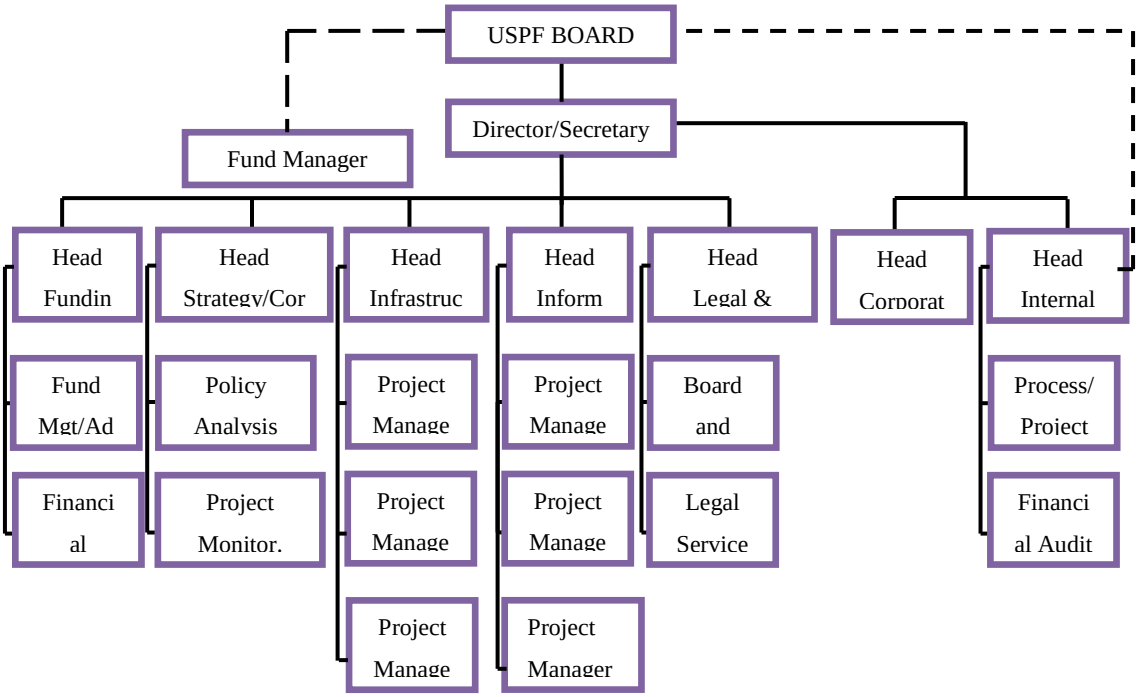


Table 1: Table for Determining Minimum Returned Sample Size for a Given Population Size for Continuous and Categorical Data

Population size	Sample size					
	Continuous data (margin of error = .03)			Categorical data (margin of error = .05)		
	alpha = .10 t = 1.65	alpha = .05 t = 1.96	alpha = .01 t = 2.58	p = .50 t = 1.65	p = .50 t = 1.96	p = .50 t = 2.58
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	323	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623

NOTE: The margins of error used in the table were .03 for continuous data and .05 for categorical data. Researchers may use this table if the margin of error shown is appropriate for their study; however, the appropriate sample size must be calculated if these error rates are not appropriate. Table developed by Bartlett, Kotrlik, & Higgins.

Source: Bartlett et. al., (2001)

TABLE FOR DETERMINING SAMPLE FROM A GIVEN 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	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Source: Krecjcie & Morgan (1970)

Table 2A: *Theories and Models Used in Developing UTAUT Model Constructs*

Theories/Models	**Constructs**	**Definition**
1. Theory of Reasoned Action (TRA)	Attitude toward Behavior	The positive or negative feeling that an individual has towards certain behavior
	Subjective Norm	An individual experiences others thinking that he should not have that kind of behavior
2.Technology Acceptance Model (TAM)	Perceived Usefulness	The degree that the user believes that using the information system can improve work performance
	Perceived Ease of Use	The degree that an individual believes it is easy to use system
	Subjective Norm	An individual experiences others thinking that he should not have that kind of behavior
3. Motivational Model (MM)	Extrinsic Motivation	User has the feeling to perform some actions because of some activities, improvement of work, Salary and advertisement
	Intrinsic Motivation	User has the feeling to perform certain behaviors because he want to, not because of any external stimulus
4. Theory of Planned Behavior	Attitude toward behavior	The positive or negative feeling that an individual has towards certain behavior
	Subjective Norm	An individual experiences others thinking that he should not have that kind of behavior
	Perceived Behavioral Control	The restriction that an individual has experienced from inside and outside towards his behavior
5. Combined TAM and TPB (C-TAM-TPB)	Attitude toward Behavior	The positive or negative feeling that an individual has towards certain behavior
	Subjective Norm	An individual experiences others thinking that he should not have that kind of behavior
	Perceived Behavioral Control	The restriction that an individual has experienced from inside and outside towards his behavior
	Perceived Usefulness	The degree that the user believes that using the information system can improve work performance
6.Model of PC Utilization (MPCU)	Job-fit	The degree that the system can strengthen an individual work performance
	Complexity	The degree that the system is difficult to understand and use
	Long term consequence	The result will be somewhat benefitted in the future
	Affect Toward Use	An individual feels joyful, happy, depressed and detesting towards certain behavior
	Social factors	The internalization of individual towards team culture and agreement with the group
	Facilitating Conditions	The subjective factors that makes people feel it is easy to take action under a certain environment

Continuation…		
7. Diffusion of Innovation Theory (DOI)	Relative Advantage	The degree of using new method and can do better
	Complexity	The degree of using new system and make people feel difficult to use
	Image	The degree that using new system can strengthen others impression
	Visibility	The degree that one can observe different users to use the new system in the organization
	Compatibility	The degree that user feels the new system is in the line with the value of existing demand and experience
	Results Demonstrability	The substantial result of using new system include the things that are visible and can be expressed by languages
	Voluntariness of use	The user experiences the innovations of the new system and begins to have voluntariness and freedom
8.Social Cognitive Theory (SCT)	Outcome Expectations Performance	The performance expectancy is related to the result of behavior, especially the performance expectancy that is related to work
	Outcome Expectations Personal	The individual expectancy is related to the result of behavior, especially personal respect and achievement feeling
	Self-efficacy	The judgment ability that an individual has when using a kind of technique to complete a specific work or assignment
	Affect	Personal interest towards a special behavior
	Anxiety	The anxiety or emotional response that an individual has when performance behavior is involved

Source: Venkatesh et al. (2003).

Table 2B: *Summary of Past Research that Adapted UTAUT Model on various Technologies*

Source	Sample/Context	Constructs	Moderators	Comments and results
Al-Gahtani et al. (2007)	722 knowledge workers in Saudi Arabia	Performance expectancy, effort expectancy, subjective norm and facilitating conditions	Gender, age, and experience	Performance expectancy and subjective norm positively influence intention & effort expectance and facilitating conditions did not have a significant effect in presence of moderating variables, using Hofstede dimension between USA and Saudi Arabia, finding established culture is a significant moderator of technology acceptance in Saudi Arabia
Park et al. (2007)	221 Chinese nationals, Mobile technology	Performance expectancy, effort expectancy, attitude, subjective norm and facilitating conditions	Gender, age, and experience	Performance expectancy, effort expectancy, social influence and facilitating conditions influence attitude using mobile and gender and education are significant moderating factors while usage experience does not.
Wang and Shih (2008)	244 Taiwanese citizens, Information Kiosk	Performance expectancy, effort expectancy, social influence and facilitating conditions	Gender and Age	Performance expectancy, effort expectancy, social influence and facilitating conditions influence intention using information kiosks and gender and age are significant moderating factors.
Wang et al. (2009)	330 Taiwanese citizens, mobile-learning	Performance expectancy, effort expectancy, social influence , perceived playfulness and self-management of learning	Gender and Age	Performance expectancy, effort expectancy, social influence perceived playfulness and self-management of learning are all significant determinants of behavioral intention to use m-learning and gender moderates effects of SI and self-management of learning on BI while age moderates the effects of EE and SI on behavioral

				intention.
Continuation Loo et al. (2009)	200 Respondents in the Multimedia Super Corridor, multipurpose smartcard applications, Malaysia	Performance Expectancy, social influence, facilitating conditions, perceived credibility, anxiety	Nil	Users do not have high intention to use multipurpose applications even though; the users accept e.g. My-kad due to its cultural characteristics. Lack of high intention may be attributed to lack of understanding or benefits PE of the application Further, these limitation cause lack of social support and credibility, however, the limitation does not help to ease anxieties of using applications
Wang and Wang (2010)	343 Individual Mobile internet users Taiwan	Performance expectancy, effort expectancy, social influence, perceived playfulness, perceive value and self-efficacy	Gender	Performance expectancy, effort expectancy, social influence, perceived values and self-efficacy had a significant influence on adoption intention of mobile internet, Perceived playfulness, however did not have strong influence attributed to service or network communication issue.
Curtis et al. (2010)	409 Employee of Non-profit organizations, Social media for public relations	Performance expectancy, effort expectancy, social influence, facilitating conditions, voluntariness of use, self-efficacy , anxiety and credibility	Nationality	The study use data from Korea and USA to examine two technologies internet banking and MP3. The findings indicate the UTAUT factors are significant determinant of intention and use. Furthermore, the comparison of the results between Korea and U.S revealed that the effects of effort expectancy on BI and the effects of BI on Use behavior were greater in the U.S sample.
Venkatesh et al. (2011)	141 respondent using Longitudinal studies on hospital adopting EMR in USA.	Performance Expectancy, effort expectancy, social influence and facilitating conditions	Age	The finding has established that the modified UTAUT that included only age as a moderator perform better in explaining the intention and use of an EMR system

Appendix C

Statistical Analysis

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav

Descriptive Statistics for Demographic Variables

(GENDER)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	122	63.9	63.9	63.9
	Female	69	36.1	36.1	100.0
	Total	191	100.0	100.0	

(AGE)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	≤ 20	39	20.4	20.4	20.4
	21-25	73	38.2	38.2	58.6
	26-30	7	3.7	3.7	62.3
	31-35	13	6.8	6.8	69.1
	36-40	45	23.6	23.6	92.7
	41-45	9	4.7	4.7	97.4
	≥ 46	5	2.6	2.6	100.0
			100.0	100.0	

(ETHN)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Major	126	66.0	66.0	66.0
	Minor	65	34.0	34.0	100.0
	Total	191	100.0	100.0	

(QUAL)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary	6	3.1	3.1	3.1
	Secondary	83	43.5	43.5	46.6
	Diploma	38	19.9	19.9	66.5
	Bachelor	49	25.7	25.7	92.1
	M.Sc / Doctorate	3	1.6	1.6	93.7
	Others	12	6.3	6.3	100.0
	Total	191	100.0	100.0	

(INCOME)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	127	66.5	66.5	66.5
	Medium	59	30.9	30.9	97.4
	High	5	2.6	2.6	100.0
	Total	191	100.0	100.0	

(COM. ACC)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Home access	72	37.7	37.7	37.7
	Lack Home access	119	62.3	62.3	100.0
	Total	191	100.0	100.0	

(LOC)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Convenient	85	44.5	44.5	44.5
	Not. Conv.	106	55.5	55.5	100.0
		191	100.0	100.0	

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
MTPE	191	100.0%	0	.0%	191	100.0%
MTEE	191	100.0%	0	.0%	191	100.0%
MTSI	191	100.0%	0	.0%	191	100.0%
MTANX	191	100.0%	0	.0%	191	100.0%
MTMEF	191	100.0%	0	.0%	191	100.0%
MTPEF	191	100.0%	0	.0%	191	100.0%
MTFC	191	100.0%	0	.0%	191	100.0%
MTBI	191	100.0%	0	.0%	191	100.0%
MTUA	191	100.0%	0	.0%	191	100.0%

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEFALFA2011.sav

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(PE1.1)	191	1.0	7.0	5.843	.1009	1.3941
SMEAN(PE1.2)	191	1.0	7.0	5.665	.1144	1.5804
SMEAN(PE1.3)	191	1.0	7.0	5.342	.1218	1.6839
SMEAN(PE1.4)	191	1.0	7.0	5.085	.1218	1.6837
SMEAN(PE1.5)	191	1.0	7.0	5.144	.1214	1.6782
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(EE2.1)	191	1.0	7.0	5.342	.1053	1.4560
SMEAN(EE2.2)	191	1.0	7.0	4.873	.1182	1.6335
SMEAN(EE2.3)	191	1.0	7.0	4.805	.1220	1.6855
SMEAN(EE2.4)	191	1.0	7.0	5.291	.1239	1.7122
SMEAN(EE2.5)	191	1.0	7.0	5.100	.1239	1.7123
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(SI3.1)	191	1.0	7.0	5.142	.1115	1.5410
SMEAN(SI3.2)	191	1.0	7.0	5.136	.1195	1.6519
SMEAN(SI3.3)	191	1.0	7.0	5.149	.1224	1.6918
SMEAN(SI3.4)	191	1.0	7.0	5.148	.1148	1.5859
SMEAN(SI3.5)	191	1.0	7.0	5.308	.1114	1.5392
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(ANX4.1)	191	1.0	7.0	3.872	.1406	1.9425
SMEAN(ANX4.2)	191	1.0	7.0	3.654	.1378	1.9046
SMEAN(ANX4.3)	191	1.0	7.0	3.630	.1355	1.8723
SMEAN(ANX4.4)	191	1.0	7.0	4.000	.1393	1.9249
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(PEF6.1)	191	1.0	7.0	5.626	.1032	1.4262
SMEAN(PEF6.2)	191	1.0	7.0	5.090	.1073	1.4823
SMEAN(PEF6.3)	191	1.0	7.0	4.942	.1121	1.5498
SMEAN(PEF6.4)	191	1.0	7.0	5.100	.1184	1.6369
SMEAN(PEF6.5)	191	1.0	7.0	4.906	.1126	1.5565
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(MEF5.1)	191	1.0	7.0	5.602	.0973	1.3451
SMEAN(MEF5.2)	191	1.0	7.0	5.377	.1014	1.4009
SMEAN(MEF5.3)	191	1.0	7.0	5.471	.0970	1.3408
SMEAN(MEF5.4)	191	1.0	7.0	5.351	.0962	1.3288
SMEAN(MEF5.5)	191	1.0	7.0	5.526	.0992	1.3715
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(FC7.1)	191	1.0	7.0	4.916	.1144	1.5806
SMEAN(FC7.2)	191	1.0	7.0	5.090	.1103	1.5243
SMEAN(FC7.3)	191	1.0	7.0	4.995	.1151	1.5911
SMEAN(FC7.4)	191	1.0	7.0	4.649	.1248	1.7252
SMEAN(FC7.5)	191	1.0	7.0	4.770	.1178	1.6285
SMEAN(FC7.6)	191	1.0	7.0	4.927	.1246	1.7213
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(BI1.1)	191	1.0	7.0	5.717	.0989	1.3664
SMEAN(BI1.2)	191	1.0	7.0	5.555	.1059	1.4639
SMEAN(BI1.3)	191	1.0	7.0	5.696	.0985	1.3619
SMEAN(BI1.4)	191	1.0	7.0	5.553	.1049	1.4491
Valid N (listwise)	191					

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
SMEAN(UA1.1)	191	1.0	7.0	4.984	.1198	1.6559
SMEAN(UA1.2)	191	1.0	7.0	4.707	.1356	1.8745
SMEAN(UA1.3)	191	1.0	7.0	5.178	.1162	1.6058
SMEAN(UA1.4)	191	1.0	7.0	5.010	.1058	1.4618
Valid N (listwise)	191					

Univariate Statistics of Missing Value

	N	Mean	Std. Deviation	Missing		No. of Extremes	
				Count	Percent	Low	High
PE1.1	191	5.84	1.394	0	.0	34	0
PE1.2	191	5.66	1.580	0	.0	17	0
PE1.3	190	5.34	1.688	1	.5	0	0
PE1.4	189	5.08	1.693	2	1.0	6	0
PE1.5	187	5.14	1.696	4	2.1	9	0
EE2.1	190	5.34	1.460	1	.5	4	0
EE2.2	189	4.87	1.642	2	1.0	5	0
EE2.3	190	4.81	1.690	1	.5	10	0
EE2.4	189	5.29	1.721	2	1.0	0	0
EE2.5	190	5.10	1.717	1	.5	8	0
SI3.1	190	5.14	1.545	1	.5	6	0
SI3.2	191	5.14	1.652	0	.0	5	0
SI3.3	188	5.15	1.705	3	1.6	6	0
SI3.4	189	5.15	1.594	2	1.0	4	0
SI3.5	188	5.31	1.551	3	1.6	4	0
ANX4.1	188	3.87	1.958	3	1.6	0	0
ANX4.2	191	3.65	1.905	0	.0	0	0
ANX4.3	189	3.63	1.882	2	1.0	0	0
ANX4.4	189	4.00	1.935	2	1.0	0	0
MEF5.1	191	5.63	1.303	0	.0	5	0
MEF5.2	191	5.40	1.373	0	.0	0	0
MEF5.3	191	5.47	1.341	0	.0	19	0
MEF5.4	191	5.38	1.291	0	.0	18	0
MEF5.5	190	5.53	1.375	1	.5	18	0
PEF6.1	190	5.63	1.430	1	.5	8	0
PEF6.2	188	5.09	1.494	3	1.6	1	0
PEF6.3	190	4.94	1.554	1	.5	7	0
PEF6.4	189	5.10	1.646	2	1.0	9	0
PEF6.5	191	4.91	1.556	0	.0	5	0
FC7.1	190	4.92	1.585	1	.5	4	0
FC7.2	189	5.09	1.532	2	1.0	2	0
FC7.3	190	4.99	1.595	1	.5	5	0
FC7.4	191	4.65	1.725	0	.0	0	0
FC7.5	191	4.77	1.628	0	.0	8	0
FC7.6	191	4.93	1.721	0	.0	6	0
BI1.1	191	5.72	1.366	0	.0	9	0
BI1.2	191	5.55	1.464	0	.0	12	0
BI1.3	191	5.70	1.362	0	.0	8	0
BI1.4	190	5.55	1.453	1	.5	8	0
UA1.1	191	4.98	1.656	0	.0	2	0
UA1.2	191	4.71	1.874	0	.0	0	0
UA1.3	191	5.18	1.606	0	.0	0	0
UA1.4	191	5.01	1.462	0	.0	3	0

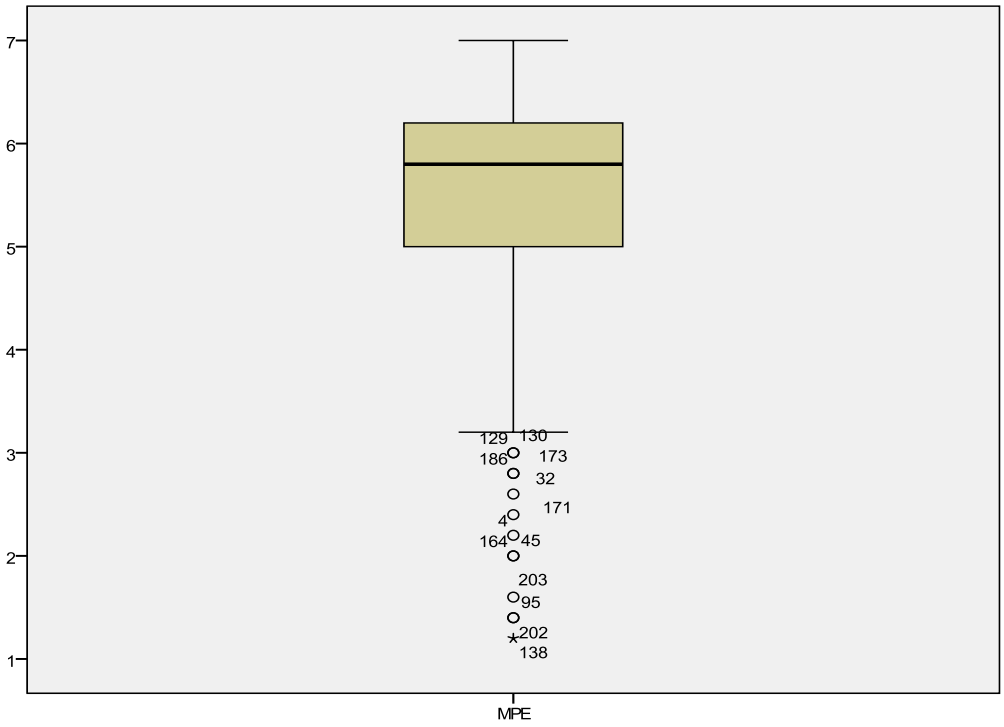
Observation number	Mahalanobis d-squared	p1	p2
185	50.809	.010	.859
142	49.638	.014	.731
103	48.107	.019	.716
102	48.056	.020	.515
106	47.204	.024	.477
16	46.889	.026	.361
73	46.583	.027	.269
50	46.447	.028	.173
111	45.839	.032	.165
86	45.308	.036	.156
127	45.123	.038	.108
164	44.464	.043	.127
27	44.094	.047	.114
43	43.616	.052	.120
156	43.461	.053	.088
84	43.137	.057	.080
74	43.112	.057	.048
49	43.092	.058	.028
182	43.025	.058	.017
120	42.348	.067	.031
150	41.987	.072	.034
75	41.961	.072	.020
176	41.899	.073	.013
89	41.011	.087	.043
179	40.930	.088	.030
116	40.463	.096	.045
77	40.026	.104	.065
109	39.557	.114	.097
83	39.311	.119	.101
181	39.234	.121	.079
70	39.230	.121	.053
28	38.694	.133	.098
119	38.503	.137	.096
56	38.407	.140	.080
39	38.399	.140	.056
147	38.372	.140	.039
163	37.752	.156	.095
53	37.621	.160	.086
97	37.590	.161	.065
180	37.221	.171	.095
187	37.112	.174	.085
68	36.775	.184	.117
5	36.721	.185	.096
22	36.566	.190	.095
98	36.309	.198	.115
26	36.308	.198	.085
165	36.096	.205	.096
63	36.064	.206	.075
44	36.023	.207	.059
62	35.852	.213	.062
78	35.752	.216	.056
174	35.719	.217	.043
57	35.707	.218	.031
161	35.495	.225	.037
87	35.457	.226	.028

7	35.393	.229	.023
48	35.243	.234	.024
24	35.193	.236	.019
118	34.922	.245	.028
137	34.917	.246	.019
153	34.779	.251	.020
69	34.695	.254	.017
4	34.657	.255	.013
88	34.170	.274	.037
18	34.122	.276	.030
158	34.047	.279	.026
113	33.597	.297	.063
1	33.441	.304	.069
14	33.347	.308	.065
67	33.311	.309	.053
64	33.268	.311	.043
126	33.252	.312	.032
21	33.211	.313	.026
65	33.109	.318	.025
60	33.085	.319	.019
40	33.037	.321	.015
76	32.709	.335	.029
145	32.308	.353	.066
42	32.263	.355	.055
46	31.786	.378	.135
175	31.749	.379	.115
171	31.570	.388	.135
82	31.373	.397	.164
71	31.348	.398	.137
112	31.324	.400	.114
128	31.274	.402	.100
152	31.231	.404	.085
177	31.076	.412	.097
94	30.971	.417	.096
146	30.954	.418	.077
9	30.847	.423	.078
80	30.793	.426	.068
41	30.732	.429	.061
92	30.728	.429	.046
104	30.677	.431	.039
108	30.515	.440	.047
33	30.395	.446	.049
30	30.178	.457	.068
54	30.140	.459	.057
141	29.712	.480	.132

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	*Lower*	*Upper*
Gender	Equal variances assumed	2.837	.094	.840	189	.402	.059	.070	*-.079*	*.197*
	Equal variances not assumed			.843	186.181	.400	.059	.070	*-.079*	*.196*
Grouping	Equal variances assumed	5.712	.018	-1.303	189	.194	-.092	.071	*-.231*	*.047*
	Equal variances not assumed			-1.299	181.472	.196	-.092	.071	*-.232*	*.048*
Ethnicity	Equal variances assumed	.001	.975	-.016	189	.987	-.001	.069	*-.137*	*.135*
	Equal variances not assumed			-.016	184.282	.987	-.001	.069	*-.138*	*.135*
Qualification	Equal variances assumed	.017	.895	-.342	189	.733	-.060	.175	*-.406*	*.286*
	Equal variances not assumed			-.344	187.638	.732	-.060	.174	-.404	.284
Income	Equal variances assumed	.481	.489	-.600	189	.549	-.047	.078	-.200	.106
	Equal variances not assumed			-.600	184.331	.549	-.047	.078	-.200	.106
Computer Access at Home	Equal variances assumed	20.373	.000	2.997	189	.003	.207	.069	.071	.343
	Equal variances not assumed			2.972	176.748	.003	.207	.070	.070	.345

Outliers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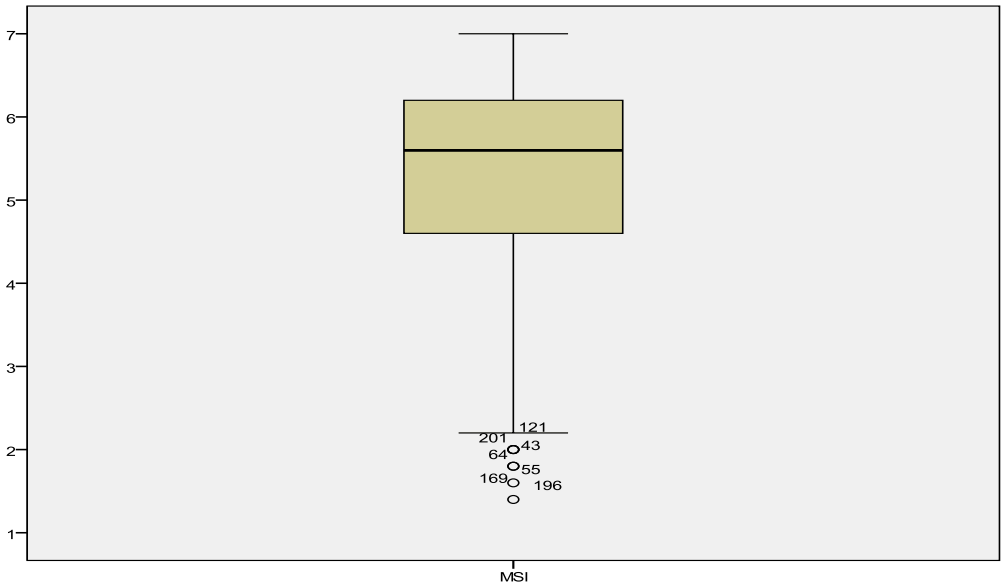
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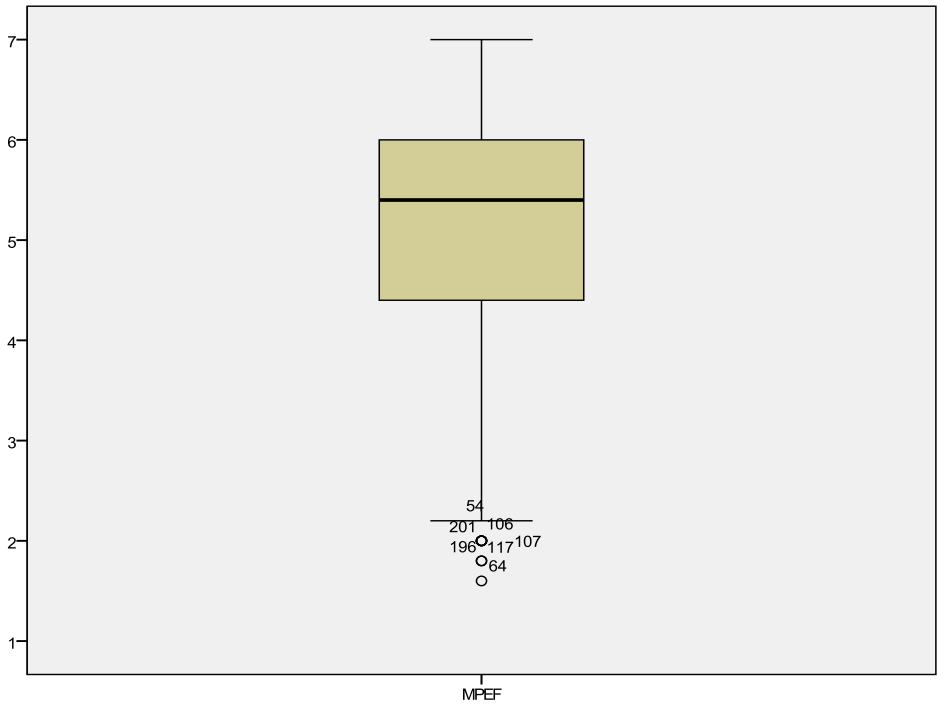
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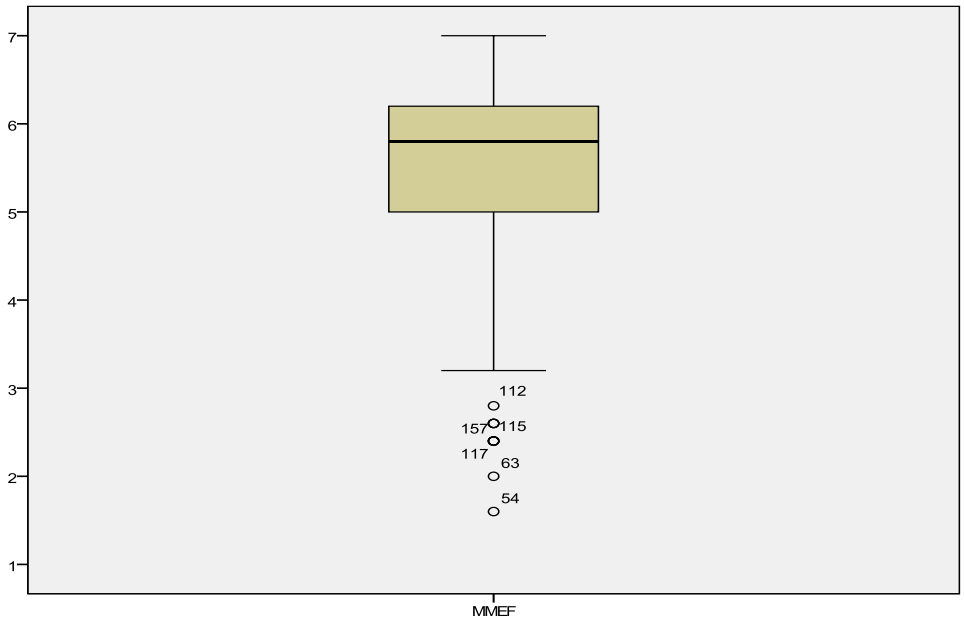
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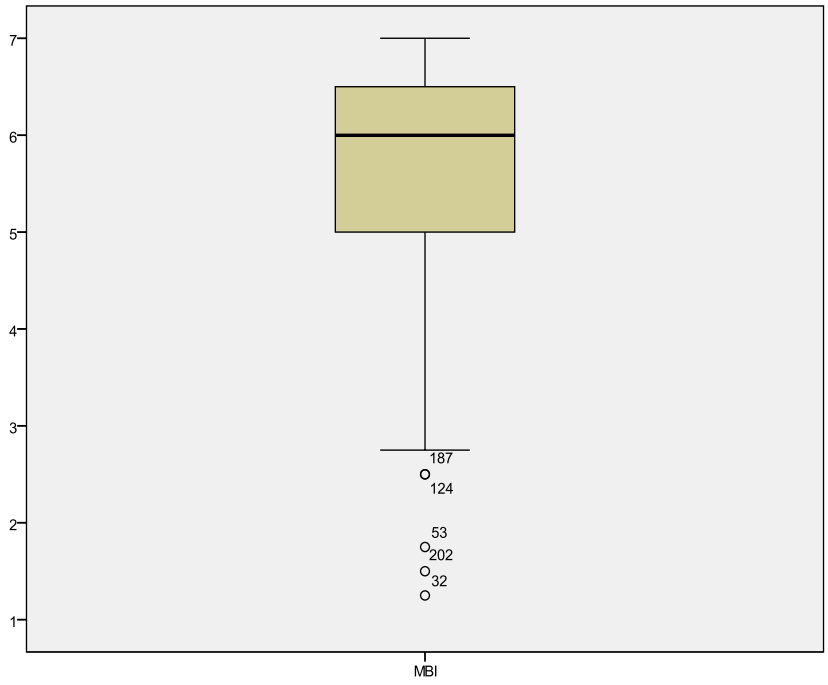
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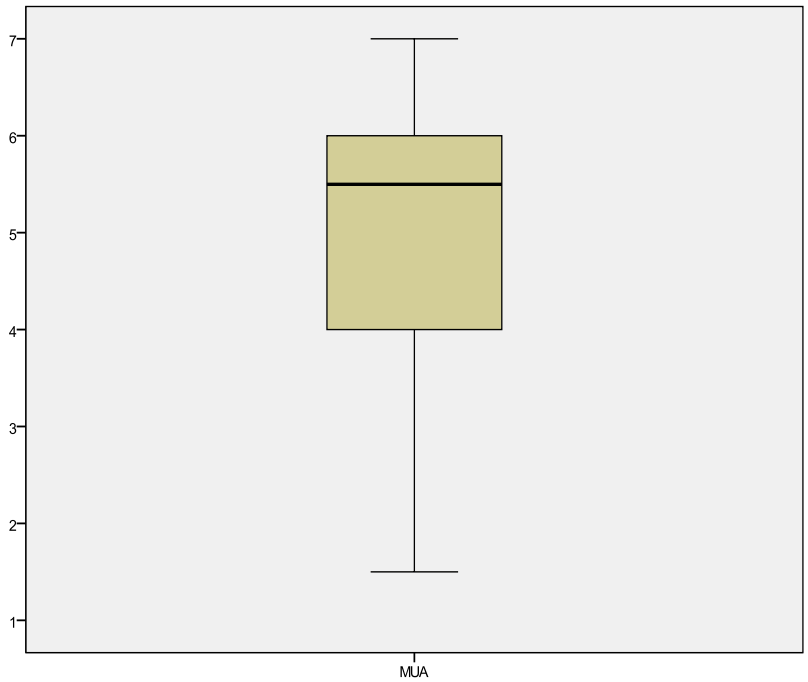
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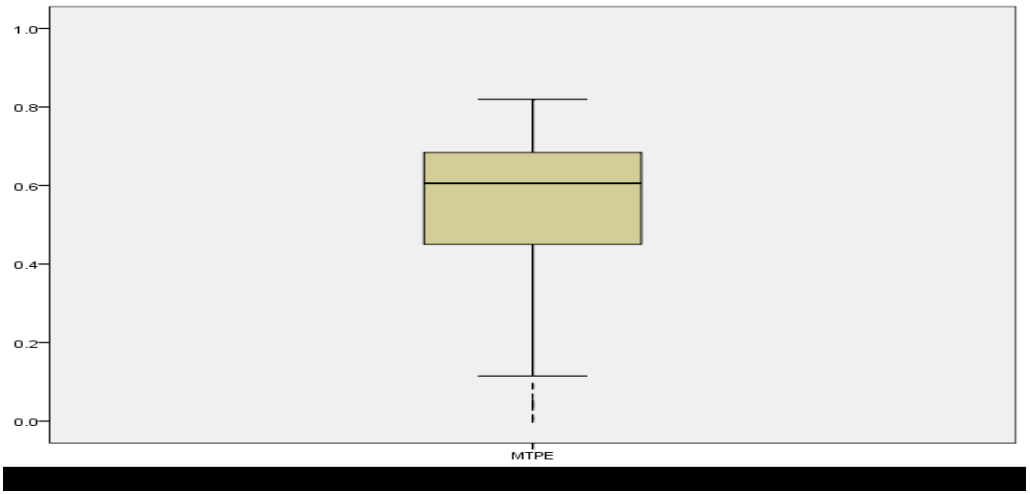
Variable	min	Max	skew	c.r.	kurtosis	c.r.
TMEF5	.001	.859	-.599	-3.377	-.718	-2.025
TEE5	.008	.865	-.413	-2.328	-1.248	-3.521
TPE5	.006	.867	-.553	-3.118	-1.029	-2.902
TFC4	.018	.914	-.320	-1.808	-1.336	-3.769
TFC2	.004	.895	-.445	-2.509	-1.138	-3.210
TFC1	.007	.910	-.393	-2.218	-1.281	-3.614
TPEF4	.007	.880	-.530	-2.992	-1.034	-2.916
TPEF3	.007	.909	-.430	-2.428	-1.094	-3.087
TPEF1	.001	.831	-.666	-3.759	-.866	-2.443
TMEF4	.004	.897	-.328	-1.852	-1.103	-3.112
TMEF2	.006	.971	-.376	-2.121	-1.212	-3.420
TMEF1	.002	.853	-.495	-2.794	-1.036	-2.924
TANX4	.063	.943	.042	.236	-1.540	-4.344
TANX3	.082	.965	.199	1.123	-1.402	-3.956
TANX2	.081	.963	.051	.290	-1.512	-4.266
TANX1	.073	.950	.009	.048	-1.534	-4.328
TSI4	.005	.875	-.413	-2.332	-1.210	-3.412
TSI3	.007	.861	-.466	-2.628	-1.170	-3.300
TSI2	.006	.871	-.443	-2.497	-1.222	-3.448
TSI1	.003	.882	-.406	-2.289	-1.258	-3.550
TEE3	.012	.901	-.394	-2.223	-1.194	-3.368
TEE2	.009	.899	-.335	-1.893	-1.347	-3.800
TPE2	.002	.799	-.915	-5.162	-.303	-.856
TPE1	.000	.793	-.799	-4.511	-.568	-1.603
TBI2	.001	.838	-.525	-2.961	-1.051	-2.965
TBI1	.000	.827	-.721	-4.067	-.573	-1.617
TUA4	.003	.913	-.379	-2.140	-1.240	-3.497
TUA3	.005	.870	-.380	-2.143	-1.233	-3.478
TUA2	.025	.888	-.185	-1.041	-1.470	-4.146
TUA1	.009	.888	-.270	-1.524	-1.297	-3.659
Multivariate					29.372	4.632

Assessment of normality (Group number 1)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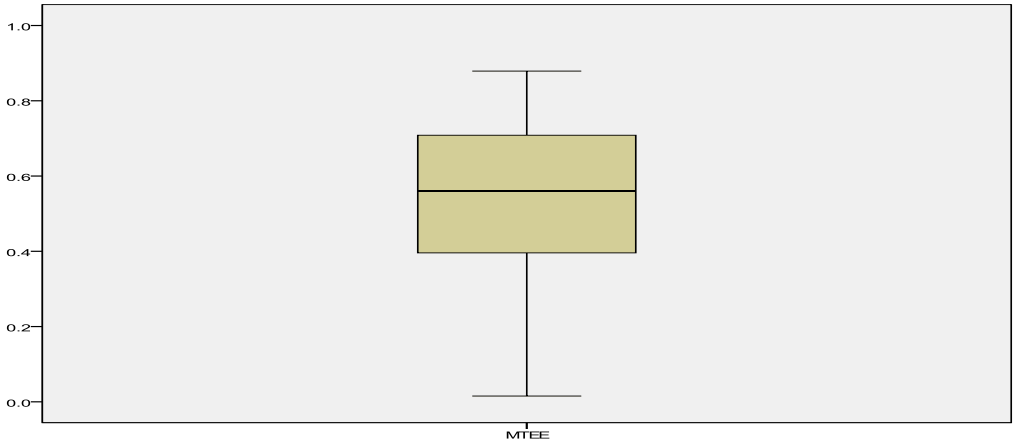
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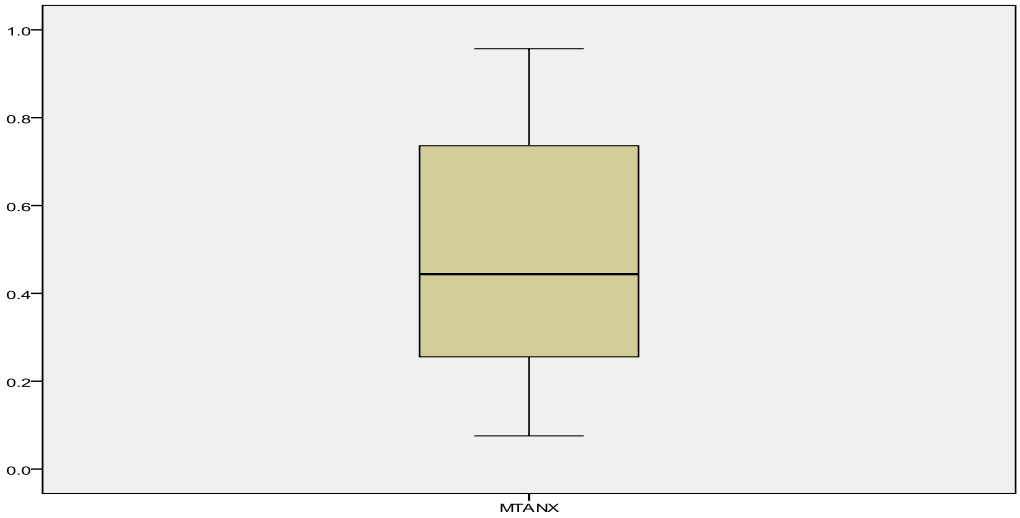
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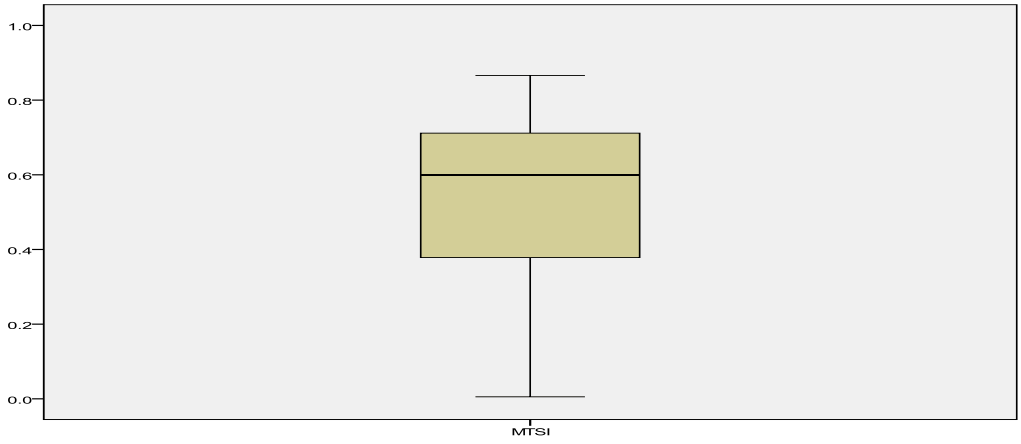
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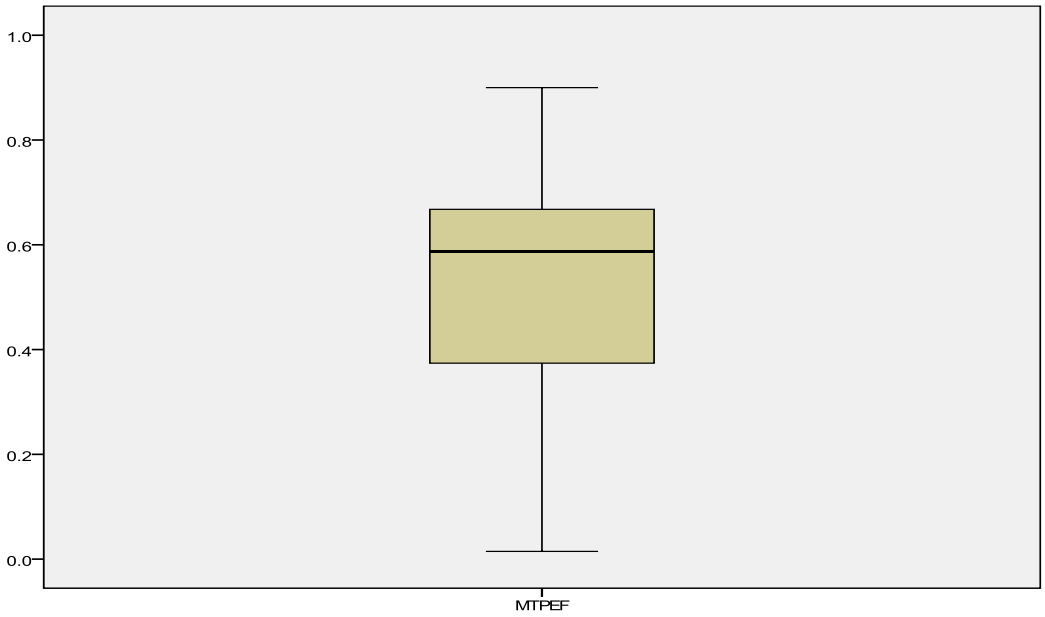
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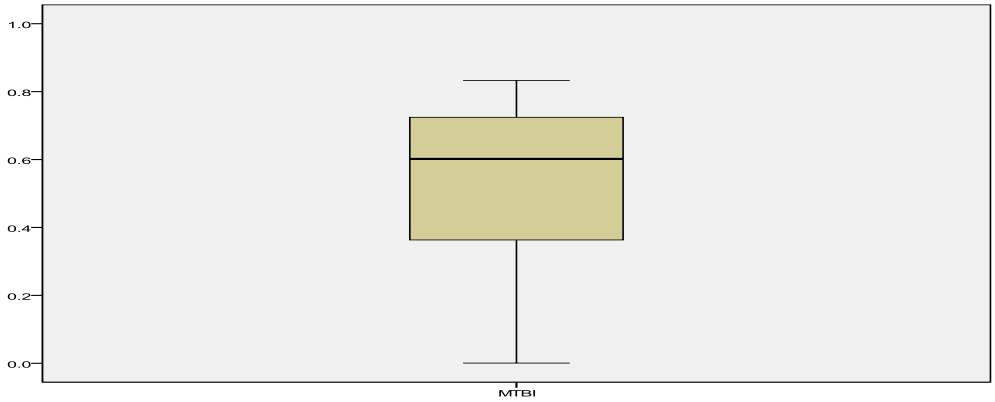
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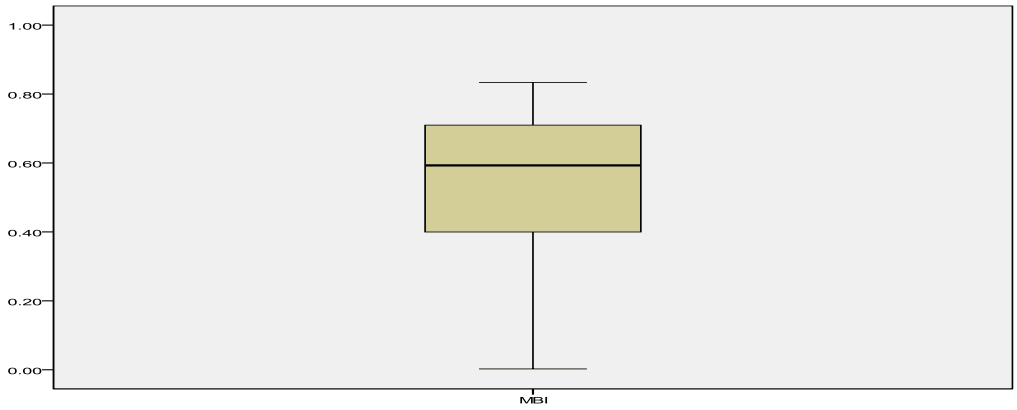
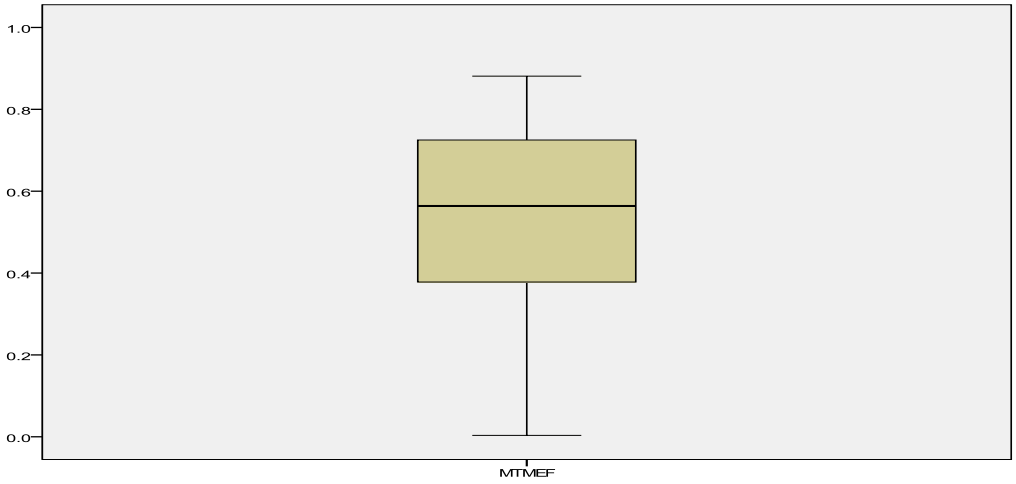
0.0
MTBI


1.00
0.80
0.60
0.40
0.20
0.00
MBI


1.0
0.8
0.6
0.4
0.2
0.0
MTMEF

Multicollinearity detection through Correlation

	MPE	MEE	MSI	MANX	MMEF	MPEF	MFC	MBI	MUA
Pearson Correlation	1								
Sig. (2-tailed)									
N	191								
Pearson Correlation	.347**	1							
Sig. (2-tailed)	.000								
N	191	191							
Pearson Correlation	.342**	.435**	1						
Sig. (2-tailed)	.000	.000							
N	191	191	191						
Pearson Correlation	-.122	-.108	.030	1					
Sig. (2-tailed)	.092	.135	.678						
N	191	191	191	191					
Pearson Correlation	.201**	.345**	.335**	.031	1				
Sig. (2-tailed)	.005	.000	.000	.667					
N	191	191	191	191	191				
Pearson Correlation	.206**	.424**	.269**	-.105	.436**	1			
Sig. (2-tailed)	.004	.000	.000	.147	.000				
N	191	191	191	191	191	191			
Pearson Correlation	.168*	.464**	.372**	-.094	.313**	.359**	1		
Sig. (2-tailed)	.020	.000	.000	.194	.000	.000			
N	191	191	191	191	191	191	191		
Pearson Correlation	.567**	.371**	.448**	-.140	.138	.271**	.292**	1	
Sig. (2-tailed)	.000	.000	.000	.053	.056	.000	.000		
N	191	191	191	191	191	191	191	191	
Pearson Correlation	.364**	.231**	.272**	-.024	.127	.302**	.187**	.513**	1
Sig. (2-tailed)	.000	.001	.000	.745	.080	.000	.010	.000	
N	191	191	191	191	191	191	191	191	191

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX D

Reliability of Constructs

RELIABILITY OF THE CONSTRUCTS FROM MAIN STUDY

PERFORMANCE EXPECTANCY

```
RELIABILITY
  /VARIABLES=TPE1 TPE2 TPE3 TPE4 TPE5
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.790	5

PEFFORMANCE EXPECTANCY

```
RELIABILITY
  /VARIABLES=TEE1 TEE2 TEE3 TEE4 TEE5
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.802	5

EFFORT EXPECTANCY

```
RELIABILITY
  /VARIABLES=TSI1 TSI2 TSI3 TSI4 TSI5
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

Reliability Statistics

Cronbach's Alpha	N of Items
.824	5

SOCIAL INFLUENCE

```
RELIABILITY
  /VARIABLES=TANX1 TANX2 TANX3
TANX4
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.

[DataSet1] C:\Documents and
Settings\ABDULWAHAB\My
Documents\tRIALWITHLATEEF.sav
```

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.874	4

ANXIETY

```
[DataSet1] C:\Documents and Settings\ABDULWAHAB\My Documents\tRIALWITHLATEEF.sav


RELIABILITY
  /VARIABLES=TMEF1 TMEF2 TMEF3 TMEF4 TMEF5
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.797	5

MANAGEMENT EFFECTIVENESS

```
RELIABILITY
  /VARIABLES=TPEF1 TPEF2 TPEF3 TPEF4 TPEF5
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability Statistics

Cronbach's Alpha	N of Items
.773	5

PROGRAM EFFECTIVENESS

```
RELIABILITY
  /VARIABLES=TFC1 TFC2 TFC3 TFC4 TFC5 TFC6
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.725	6

FACILITATING CONDITIONS

```
RELIABILITY
  /VARIABLES=TBI1 TBI2 TBI3 TBI4
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.795	4

BEHAVIORAL INTENTION

```
RELIABILITY
  /VARIABLES=TUA1 TUA2 TUA3 TUA4
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	191	100.0
	Excluded[a]	0	.0
	Total	191	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.853	4

USER ACCEPTANCE

APPENDIX E

Factor Analysis

Communalities for independents Variables

	Initial	Extraction
TPE1	.514	.515
TPE2	.646	.816
TPE3	.451	.525
TPE4	.477	.475
TPE5	.342	.288
TEE1	.547	.562
TEE2	.544	.571
TEE3	.491	.459
TEE4	.471	.399
TEE5	.454	.454
TSI1	.575	.601
TSI2	.583	.651
TSI3	.440	.474
TSI4	.508	.519
TSI5	.460	.431
TANX1	.612	.649
TANX2	.675	.749
TANX3	.683	.756
TANX4	.540	.527
TMEF1	.422	.494
TMEF2	.449	.410
TMEF3	.558	.600
TMEF4	.462	.451
TMEF5	.395	.484
TPEF1	.545	.672
TPEF2	.469	.434
TPEF3	.446	.560
TPEF4	.495	.488
TPEF5	.369	.376
TFC1	.408	.463
TFC2	.420	.476
TFC3	.390	.394
TFC4	.404	.530
TFC5	.396	.427
TFC6	.321	.293

Extraction Method: Principal Axis Factoring.

KMO and Bartlett's Test for Independents Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.821
Bartlett's Test of Sphericity	Approx. Chi-Square	2614.394
	Df	595
	Sig.	.000

Total Variance Explained for Independents Variables

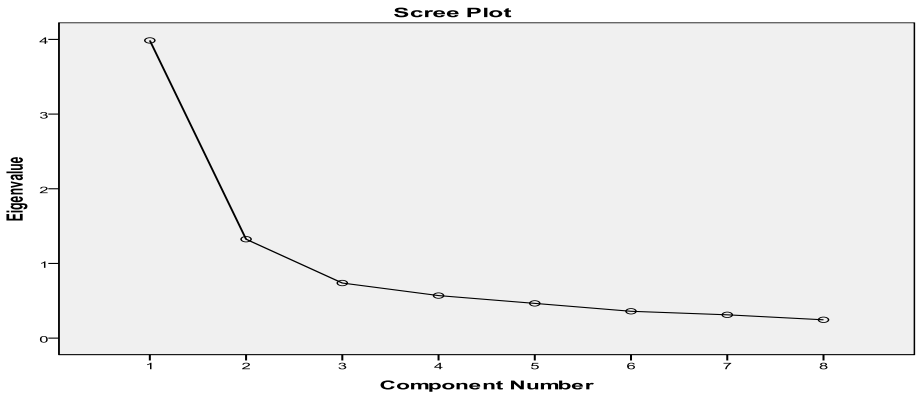
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.469	21.340	21.340	6.976	19.930	19.930	2.674	7.639	7.639
2	3.142	8.978	30.318	2.793	7.980	27.911	2.605	7.442	15.081
3	2.574	7.355	37.673	2.120	6.057	33.968	2.519	7.198	22.278
4	2.101	6.004	43.677	1.620	4.630	38.597	2.422	6.920	29.198
5	1.762	5.034	48.711	1.279	3.653	42.251	2.410	6.886	36.084
6	1.546	4.418	53.130	1.068	3.051	45.301	2.205	6.300	42.384
7	1.403	4.008	57.137	.901	2.573	47.874	1.286	3.673	46.057
8	1.155	3.301	60.439	.648	1.851	49.725	1.242	3.548	49.606
9	1.070	3.056	63.495	.569	1.627	51.352	.611	1.746	51.352
10	.941	2.690	66.185						
11	.907	2.591	68.776						
12	.847	2.421	71.197						
13	.821	2.345	73.542						
14	.696	1.988	75.530						
15	.648	1.852	77.382						
16	.634	1.811	79.193						
17	.620	1.770	80.963						
18	.592	1.692	82.655						
19	.533	1.523	84.178						
20	.521	1.489	85.668						
21	.502	1.434	87.101						
22	.470	1.343	88.444						
23	.436	1.246	89.690						
24	.424	1.210	90.900						
25	.401	1.145	92.045						
26	.355	1.015	93.059						
27	.340	.970	94.030						
28	.332	.950	94.979						
29	.314	.897	95.877						
30	.302	.863	96.740						
31	.285	.815	97.554						
32	.241	.688	98.242						
33	.230	.657	98.899						
34	.208	.594	99.492						
35	.178	.508	100.000						

Extraction Method: Principal Axis Factoring.

Rotated Factor Matrix[a]

	Factor								
	1	2	3	4	5	6	7	8	9
TANX3	.860								
TANX2	.858								
TANX1	.773								
TANX4	.695								
TSI2		.723							
TSI1		.697							
TSI3		.655							
TSI4		.610							
TSI5		.562							
TMEF3			.667						
TMEF5			.640						
TMEF1			.625						
TMEF4			.617						
TMEF2			.580						
TEE1				.674					
TEE2				.637					
TEE3				.611					
TEE5				.569					
TEE4				.504					
TPE2					.832				
TPE1					.663				
TPE3					.645				
TPE4					.591				
TPE5					.482				
TPEF1						.655		.348	
TPEF3						.628			
TPEF4						.618			
TPEF2						.580			
TPEF5						.478			
TFC2							.619		
TFC1							.617		
TFC4								.637	
TFC3							.337	.379	
TFC6								.376	
TFC5								.337	.416

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.



KMO and Bartlett's Test for Dependents Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.837
Bartlett's Test of Sphericity	Approx. Chi-Square	664.139
	Df	28
	Sig.	.000

Communalities Dependents Variables

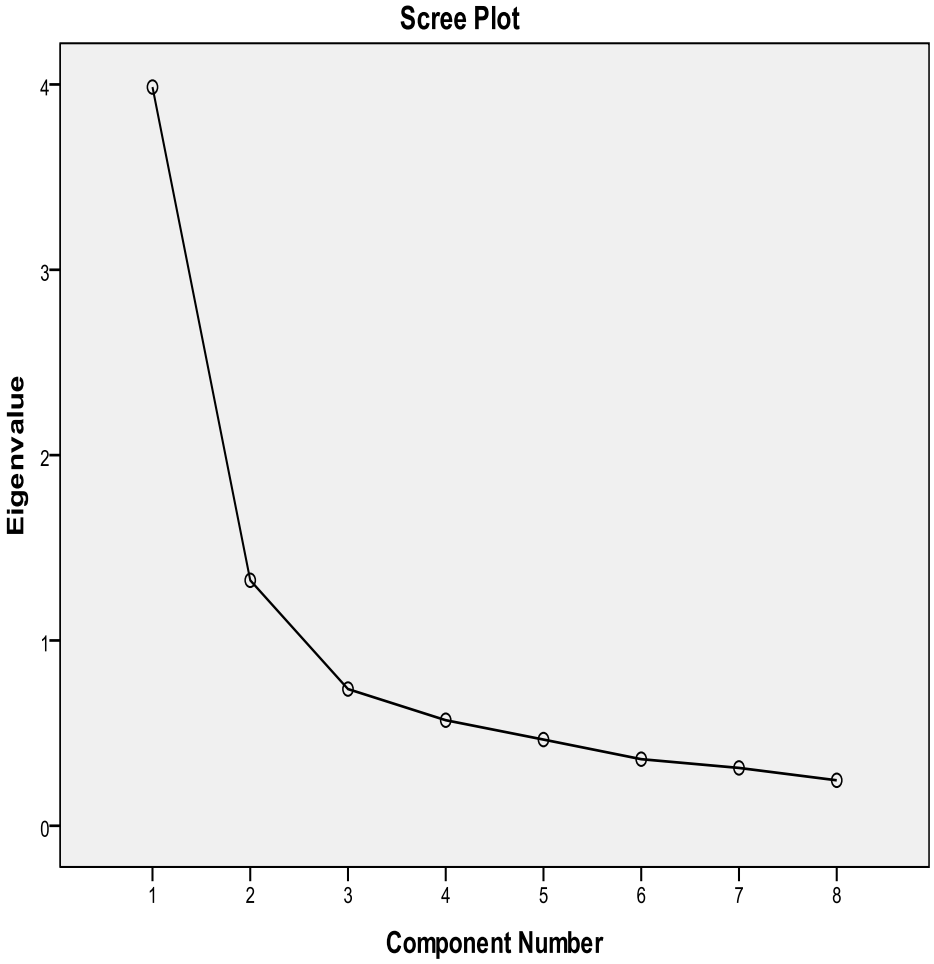
	Initial	Extraction
TBI1	.529	.635
TBI2	.520	.663
TBI3	.360	.420
TBI4	.371	.361
TUA1	.577	.614
TUA2	.635	.778
TUA3	.557	.637
TUA4	.378	.400

Extraction Method: Principal Axis Factoring.

Total Variance Explained Dependents Variables

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.986	49.826	49.826	3.572	44.652	44.652	2.445	30.565	30.565
2	1.325	16.557	66.382	.936	11.702	56.354	2.063	25.789	56.354
3	.738	9.221	75.603						
4	.570	7.120	82.724						
5	.465	5.815	88.539						
6	.359	4.492	93.031						
7	.312	3.902	96.933						
8	.245	3.067	100.000						

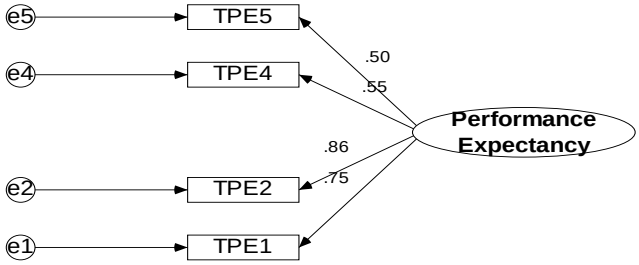
Extraction Method: Principal Axis Factoring.



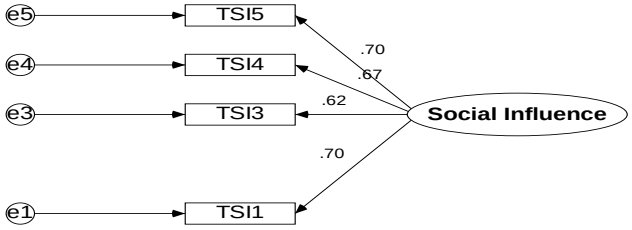
Appendix F

Confirmatory Factor Analysis (CFA) on Individual Constructs

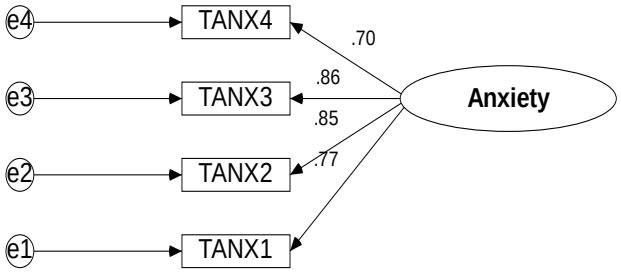
Standardized estimates
Chisquare: 3.015
Df: 2
Ratio 1.508
P Value: .221
GFI: .992
CFI: .995
TLI: .985
RMSEA: .052



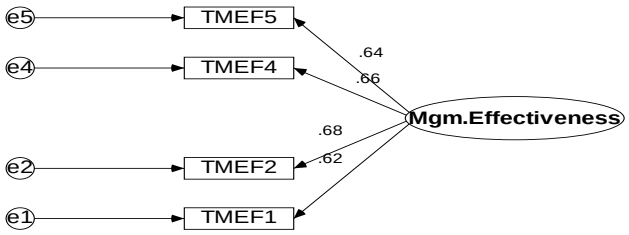
Standardized estimates
Chisquare: 2.835
Df: 2
Ratio 1.418
P Value: .242
GFI: .992
CFI: .996
TLI: .987
RMSEA: .047



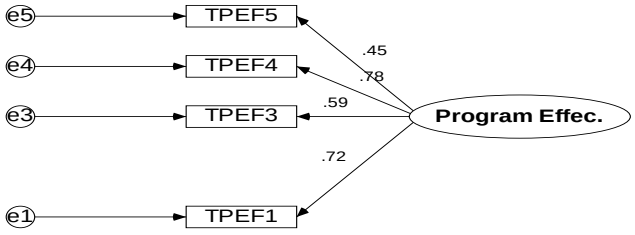
Standardized estimates
Chisquare: 1.183
Df: 2
Ratio .592
P Value: .553
GFI: .997
CFI: 1.000
TLI: 1.014
RMSEA: .000



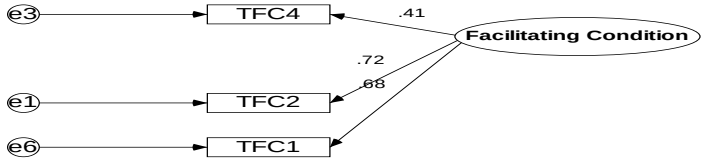
Standardized estimates
Chisquare: 3.139
Df: 2
Ratio 1.569
P Value: .208
GFI: .992
CFI: .997
TLI: .991
RMSEA: .055



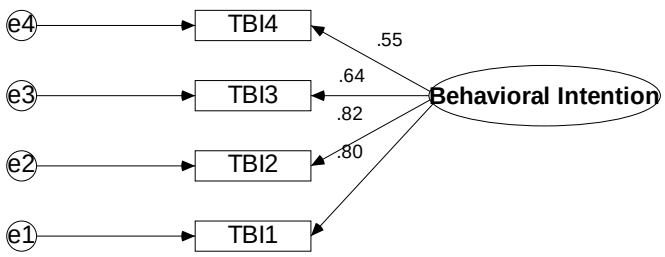
Standardized estimates
Chisquare: .080
Df: 2
Ratio .040
P Value: .961
GFI: 1.000
CFI: 1.000
TLI: 1.038
RMSEA: .000



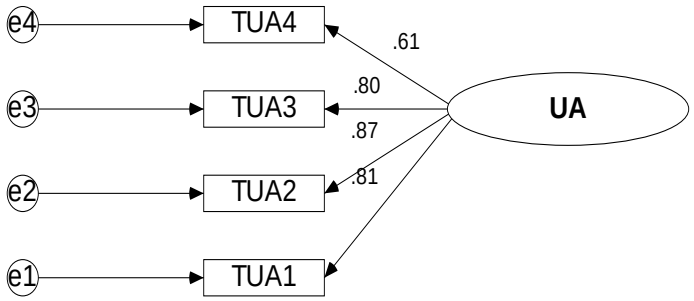
Standardized estimates
Chisquare: 4.329
Df: 2
Ratio 2.164
P Value: .115
GFI: .989
CFI: .985
TLI: .956
RMSEA: .078



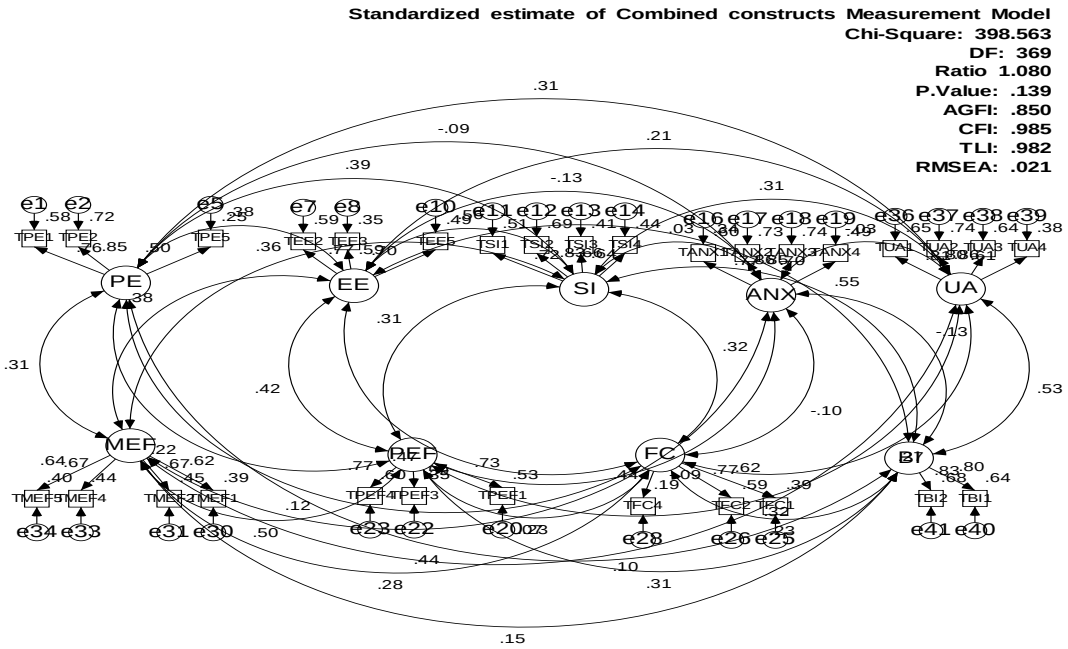
Standardized estimates
Chisquare: 1.767
Df: 1
Ratio 1.767
P Value: .184
GFI: .994
CFI: .990
TLI: .969
RMSEA: .064



Standardized estimates
Chisquare: 4.583
Df: 2
Ratio 2.291
P Value: .101
GFI: .989
CFI: .989
TLI: .967
RMSEA: .082



Standardized estimates
Chisquare: 1.796
Df: 2
Ratio .898
P Value: .407
GFI: .995
CFI: 1.000
TLI: 1.002
RMSEA: .000



Amos Output

Date and Time

Date: Saturday, August 27, 2011

Time: 11:51:52 AM

Title

Final hypo 2012.amp: Saturday, August 27, 2011 11:51 AM

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
BI	<---	PEF	.256	.117	2.192	.028	par_45
BI	<---	MEF	-.225	.130	-1.935	.043	par_46
BI	<---	PE	.299	.100	2.981	.003	par_47
BI	<---	EE	-.088	.146	-.606	.544	par_48
BI	<---	SI	.488	.117	4.184	***	par_49
BI	<---	ANX	-.074	.070	-1.070	.285	par_50
UA	<---	BI	.581	.111	5.704	***	par_43
UA	<---	FC	.198	.102	1.987	.044	par_44

Standardized Regression Weights: Modified UTAUT (Group 1 - Default model)

			Estimate
BI	<---	PEF	.240
BI	<---	MEF	-.191
BI	<---	PE	.280
BI	<---	EE	-.073
BI	<---	SI	.480
BI	<---	ANX	-.085
UA	<---	BI	.505
UA	<---	FC	.154
TUA1	<---	UA	.805
TUA2	<---	UA	.862
TUA3	<---	UA	.801
TUA4	<---	UA	.614
TBI1	<---	BI	.796
TBI2	<---	BI	.827
TPE1	<---	PE	.753
TPE2	<---	PE	.852

			Estimate
TEE2	<---	EE	.770
TEE3	<---	EE	.593
TSI1	<---	SI	.718
TSI2	<---	SI	.831
TSI3	<---	SI	.640
TSI4	<---	SI	.662
TANX1	<---	ANX	.771
TANX2	<---	ANX	.854
TANX3	<---	ANX	.860
TANX4	<---	ANX	.702
TMEF1	<---	MEF	.625
TMEF2	<---	MEF	.671
TMEF4	<---	MEF	.669
TPEF1	<---	PEF	.715
TPEF3	<---	PEF	.592
TPEF4	<---	PEF	.783
TFC1	<---	FC	.632
TFC2	<---	FC	.760
TFC4	<---	FC	.438
TPE5	<---	PE	.500
TEE5	<---	EE	.697
TMEF5	<---	MEF	.638

Squared Multiple Correlations: UTAUT (Group number 1 - Default model)

	Estimate
BI	.427
UA	.306
TMEF5	.407
TEE5	.486
TPE5	.250
TFC4	.192
TFC2	.577
TFC1	.400
TPEF4	.613

	Estimate
TPEF3	.351
TPEF1	.511
TMEF4	.448
TMEF2	.450
TMEF1	.390
TANX4	.493
TANX3	.740
TANX2	.729
TANX1	.594
TSI4	.439
TSI3	.410
TSI2	.691
TSI1	.515
TEE3	.352
TEE2	.592
TPE2	.725
TPE1	.567
TBI2	.684
TBI1	.634
TUA4	.378
TUA3	.641
TUA2	.743
TUA1	.648

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	89	405.497	376	.142	1.078
Saturated model	465	.000	0		
Independence model	30	2387.530	435	.000	5.489

Model Fit Summary

CMIN

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.004	.879	.850	.711
Saturated model	.000	1.000		
Independence model	.018	.413	.372	.386

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.830	.804	.985	.983	.985
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.020	.000	.034	1.000
Independence model	.154	.148	.160	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	583.497	618.202	872.950	961.950
Saturated model	930.000	1111.321	2442.307	2907.307
Independence model	2447.530	2459.228	2545.098	2575.098

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.071	2.916	3.349	3.254
Saturated model	4.895	4.895	4.895	5.849
Independence model	12.882	12.095	13.708	12.943

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	198	208
Independence model	39	41

Execution time summary

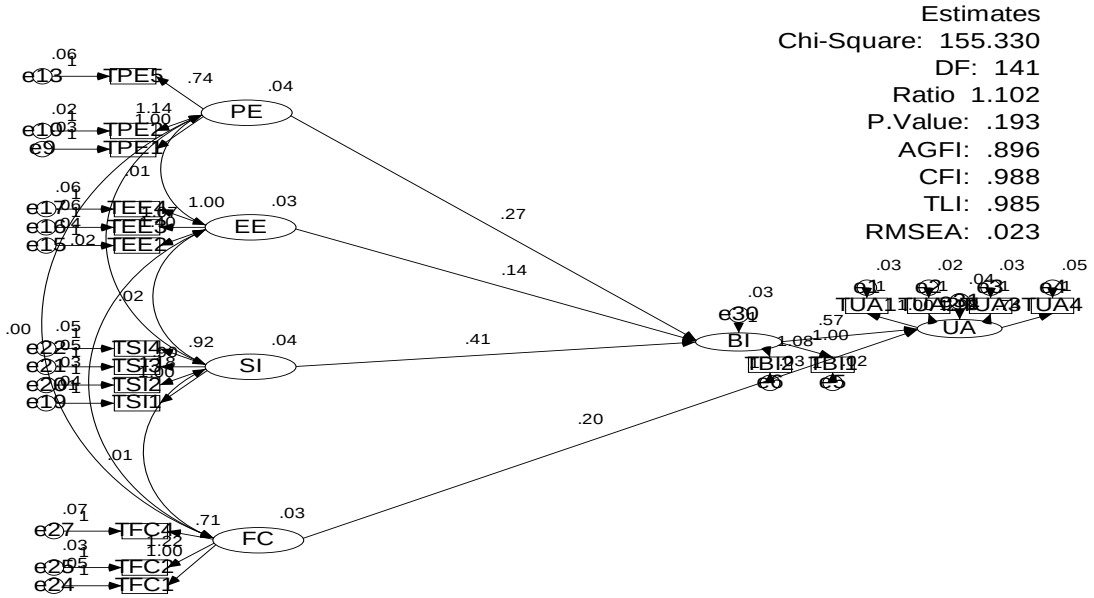
Minimization: .063
Miscellaneous: .500
Bootstrap: .000
Total: .563

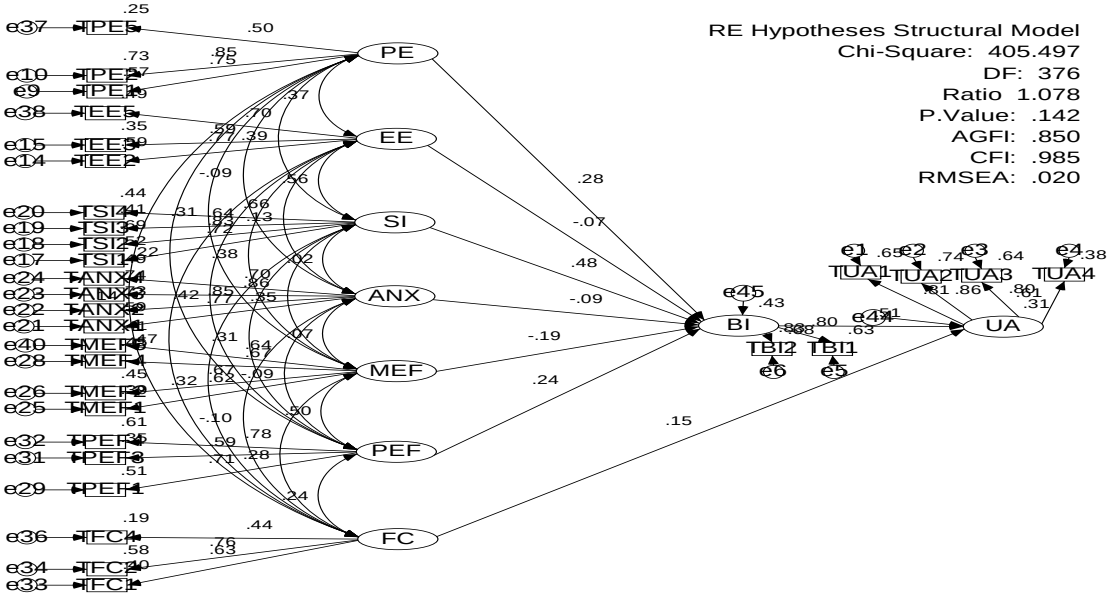
APPENDIX G

(SEM Output)

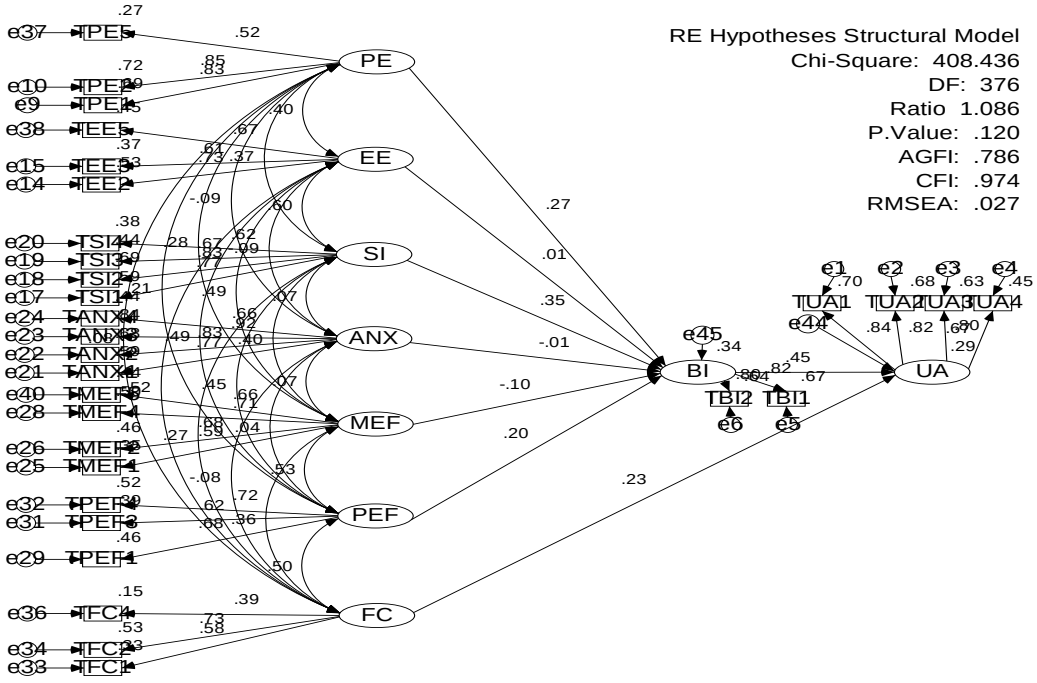
Revised Models

Original UTAUT Model

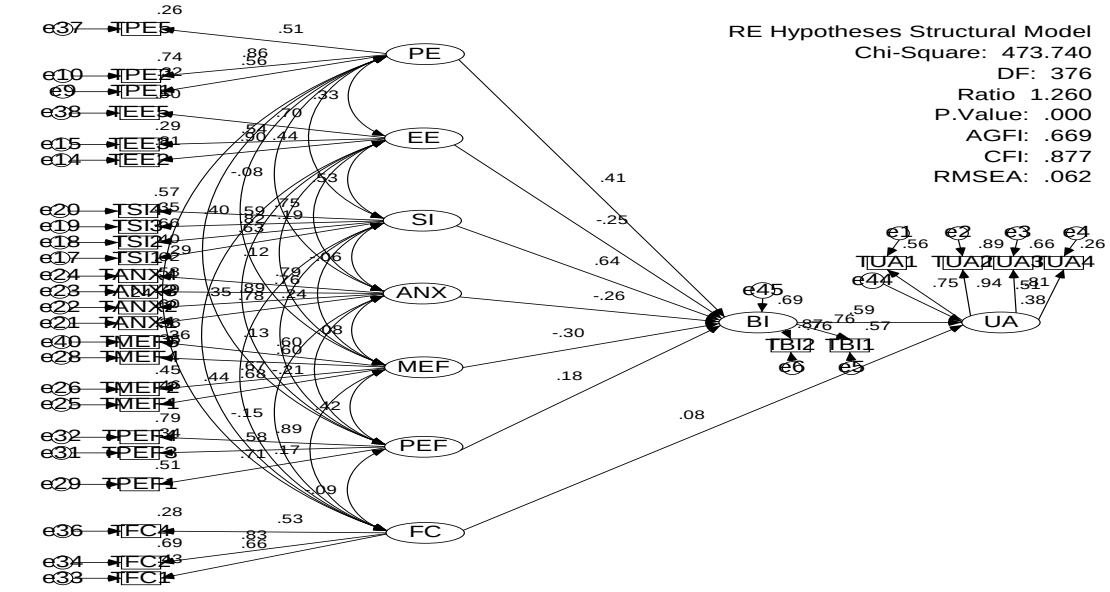




Gender model

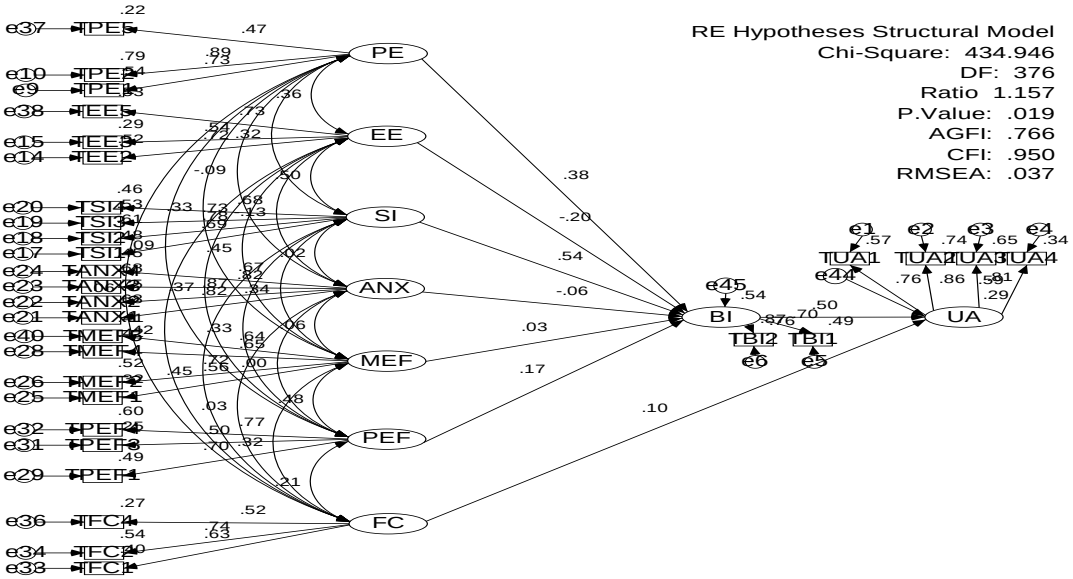


Male model

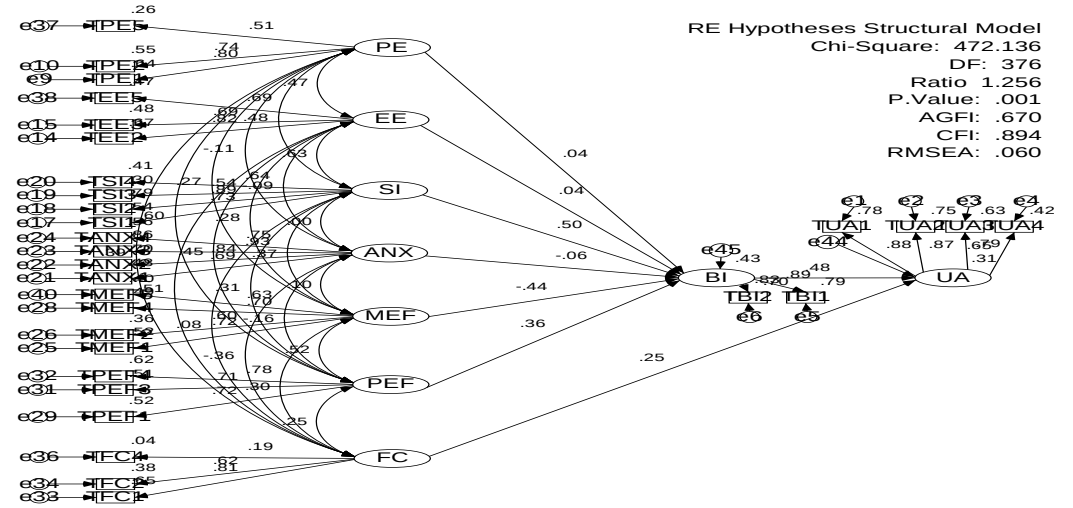


Female model

Age group model

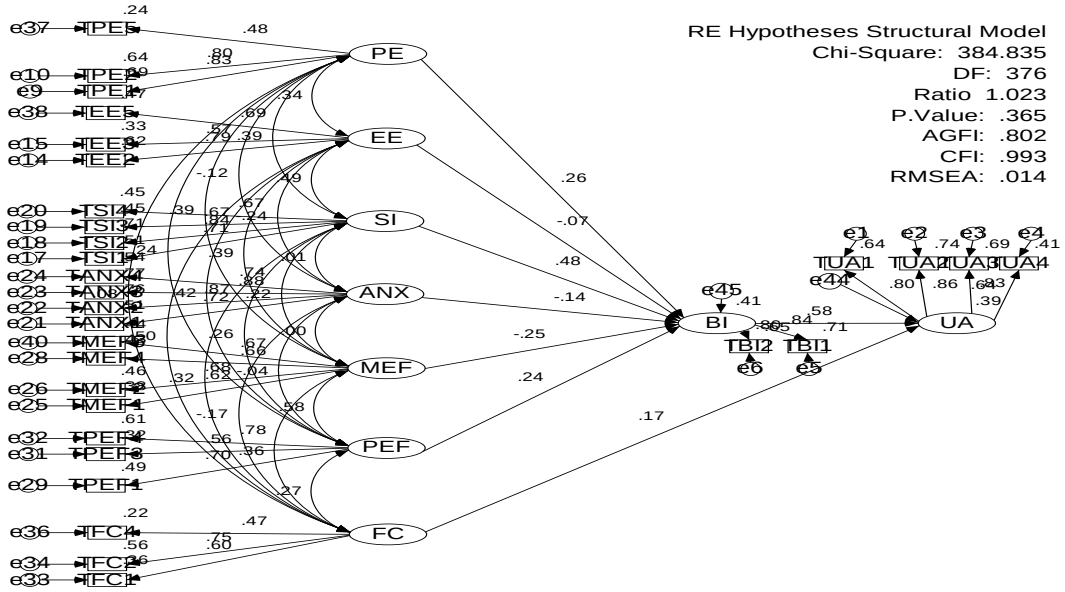


Younger model

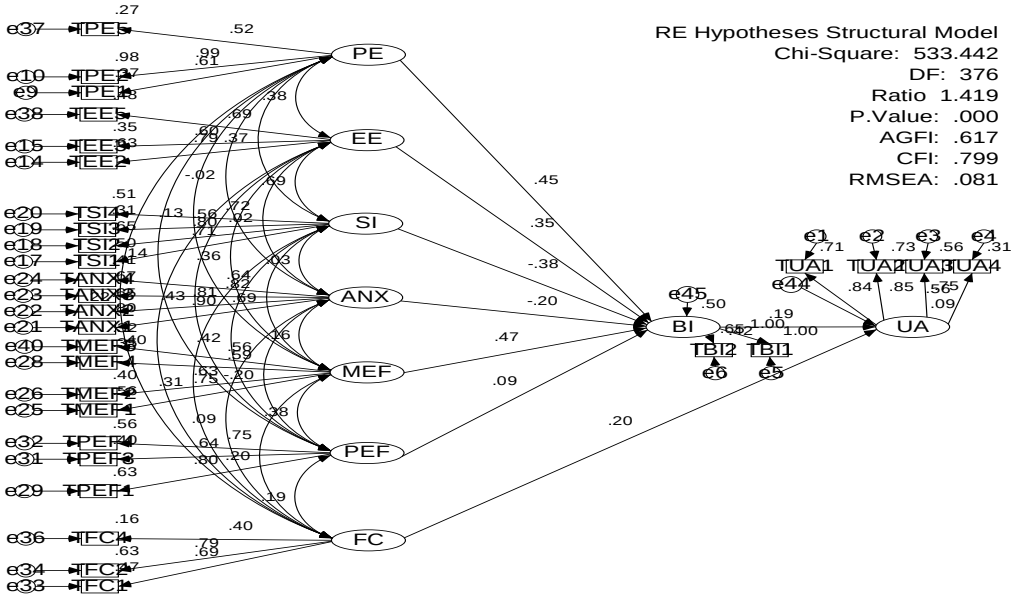


Older model

Ethnicity model

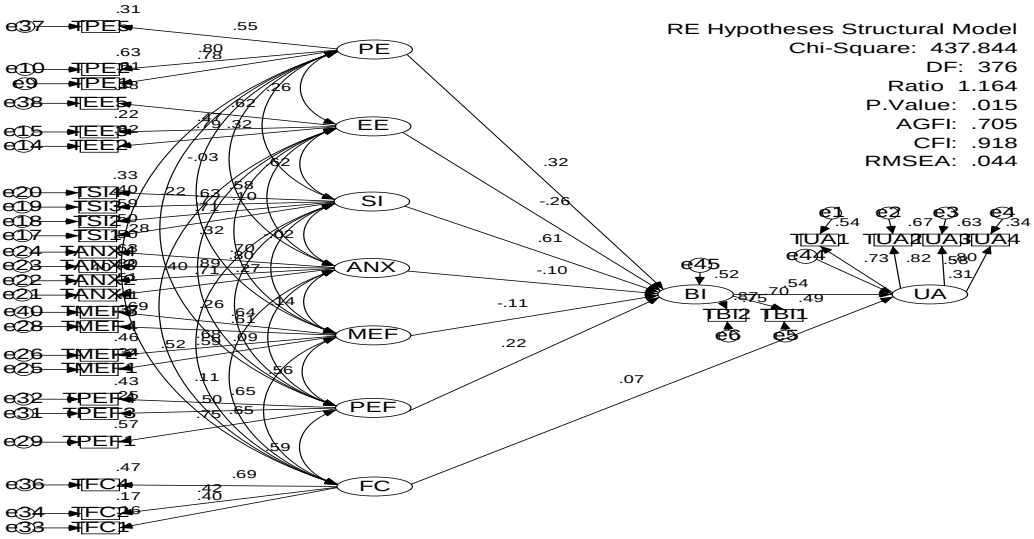


Majority model

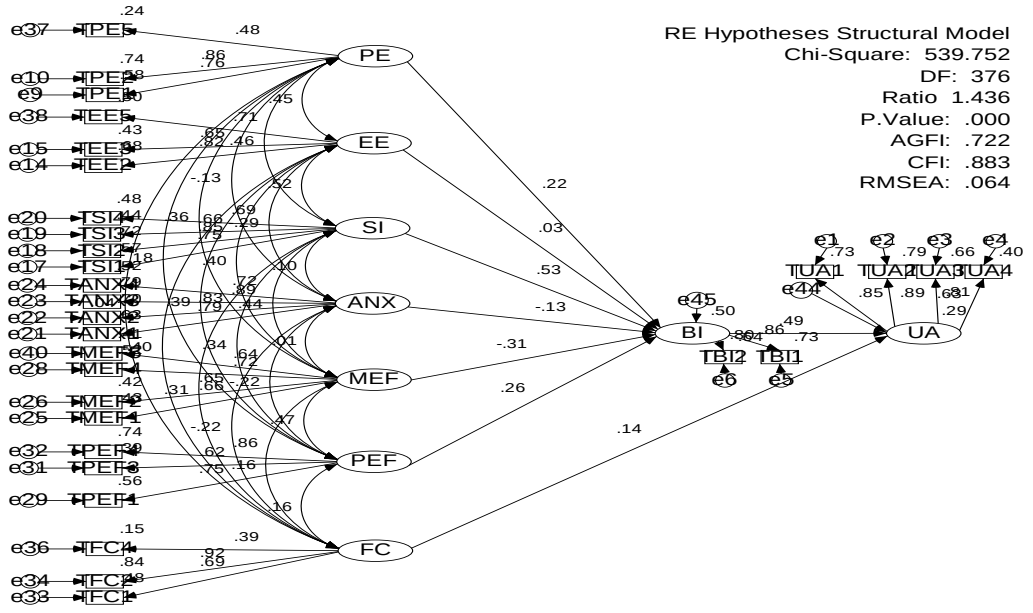


Minority model

Location grouping



Convenient model



Not convenient model

CMIN (Multi Group modeling Gender)

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	178	883.173	752	.001	1.174
Model 1	157	898.488	758	.001	1.162
Model 2	149	908.074	781	.001	1.163
Model 3	178	883.173	752	.001	1.174
Model 4	178	883.173	752	.001	1.174
Model 5	178	883.173	752	.001	1.174
Saturated model	930	.000	0		
Independence model	60	2930.063	870	.000	3.368

CMIN (Multi Group modeling Age group)

Model	NPAR	CMIN	DF	P	CMIN/ DF
Unconstrained	178	907.752	752	.000	1.207
Model 1	157	929.424	763	.000	1.202
Model 2	149	937.616	781	.000	1.201
Model 3	178	907.752	752	.000	1.207
Model 4	178	907.752	752	.000	1.207
Model 5	178	907.752	752	.000	1.207
Saturated model	930	.000	0		
Independence model	60	2954.821	870	.000	3.396

CMIN (Multi Group modeling Ethnicity group)

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	178	919.956	752	.000	1.223
Model 1	157	933.507	758	.000	1.208
Model 2	149	940.242	781	.000	1.204
Model 3	178	919.956	752	.000	1.223
Model 4	178	919.956	752	.000	1.223
Model 5	178	919.956	752	.000	1.223
Saturated model	930	.000	0		
Independence model	60	2965.734	870	.000	3.409

CMIN (Multi Group modeling Ethnicity Location)

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	178	977.604	752	.000	1.300
Model 1	157	1000.727	773	.000	1.295
Model 2	149	1003.846	781	.000	1.285
Model 3	178	977.604	752	.000	1.300
Model 4	178	977.604	752	.000	1.300
Model 5	178	977.604	752	.000	1.300
Saturated model	930	.000	0		
Independence model	60	3027.122	870	.000	3.479