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***CONSUMER ACCEPTANCE OF MOBILE PAYMENT
SERVICES IN NIGERIA: A CUSTOMIZED UNIFIED THEORY
OF ACCEPTANCE AND USE TECHNOLOGY (UTAUT) MODEL***

By

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DEDICATION

Carrying out this research has been a joy and has given me a sense of deep satisfaction. It would not have been possible to devote such time and energy without the patience, understanding and dedicated love of all members of my family. I dedicate this work to my late parents (Mr. Braimoh Elegbede Ogundega and Mrs. Grace Ajoke Ogundega), wife (Wuraola Janet Ogundega), children (Emmanuel Abiola Ogundega; Victor Ajibola Ogundega; and Elizabeth Adunola Ogundega) and my sisters (Mojisola, Jemila, Biodun, and Oyinda).

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LIST OF ABBREVIATIONS

Abbreviations

ATB	Attitude Toward Behaviour
AVE	Average Shared Variance
Aw	Awareness
BI	Behaviour Intention
CBN	Central Bank of Nigeria
C-TAM-TPB	Combined TAM and TPB
DCs	Developing Countries
EB	Expected Benefits
EE	Effort Expectancy
FC	Facilitating Conditions
GLM	Generalised Linear Model
Ha	Alternative Hypothesis
IC	Internal Consistency
ICT	Information Communication Technology
ICFA	Internal Consistency Factor Analysis
ICFL	Internal Consistency Factor Loading
IDT	Innovation Diffusion Theory
IMF	International Monetary Fund
IT	Information Technology
ITU	International Telecommunications Union
LUT	Lazy User Theory
MANOVA	Multivariate Analysis of Variance
MM	Motivational Model

MP	Mobile Payment
MPCU	Model of PC Utilisation
N	Population
n	Sample Size
NFC	Near Field Communication
PBC	Perceived Behavioural Control
PCA	Principal Component Analysis
PE	Performance Expectancy
PEOU	Perceived Ease of Use
PLS	Partial Least Square
PU	Perceived Usefulness
RFID	Radio Frequency Identification
Re	Relevance
SCT	Social Cognitive Theory
SE	Self Efficacy
SEM	Structural Equation Modelling
SI	Social Influence
Stata	Data Analysis and Statistical Software (STAT ANALYSIS)
TAM	Technology Acceptance Model
TTF	Technology Task Fit
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UB	Usage Behaviour
UTAUT	Unified Theory of Acceptance and Use Technology
www	World Wide Web

ABSTRACT

Innovations in technology continue to influence the daily routines of consumers. In the case of mobile devices, their multifunctionality transforms opportunities for consumers, for instance by conducting mobile payments. In spite of the merits of mobile payment services, the number of users of these services is very low among Nigerian consumers. Hence, the aim of this research is to design a conceptual model for measuring the acceptability rate of consumer acceptance of mobile payment in Nigeria. More specifically, this research analyzes the factors influencing consumer acceptance of mobile payment services in Nigeria and also measures the acceptability rate of consumer acceptance.

By using a quantitative research approach with structured self-completion questionnaires, 500 questionnaires from Nigerian consumers were gathered and statistically analyzed so as to empirically test the model of mobile payment acceptance. The researcher employed a cross-sectional survey across three different universities in Lagos Nigeria for collecting data to design a customised model. Analysis of the investigation data was performed with SPSS, PLS, PCA, Chi-Square and Regression Analysis. The model was validated with the aid of data extracted from the original investigation of the respondents.

The results show that out of the examined seven factors, performance expectancy, relevance, culture, technical support, trust, security and awareness have proven to be significant as they influence the behavioural intention of the Nigerian consumers surveyed towards mobile payment services. In addition, an association between the characteristics age and mobile phone usage behaviour and the behaviour intention could be detected.

A key finding is that a behavioural intention among Nigerian consumers toward mobile payment occurs according to this research. This study presents recommendations for service users to improve on the identified influential factors for successful innovation of mobile payment.

This research contributes to theory by using the less-researched perspective of innovation resistance to the research field of mobile payment. Also, insights into Nigerian consumers were provided to help service providers to design effective marketing strategies that will satisfy the needs of the consumers.

CHAPTER ONE

INTRODUCTION

1.1. Introduction

This section introduces a review of mobile payment and an introduction to mobile payment industrial background. This chapter describes the context and presents general reviews of end-user acceptance of mobile payment services to highlight the need for the study. The researcher discusses the objectives and research questions.

Mobile business has been growing speedily globally (Poushter, 2016), presenting ever-widening content and services (Baptista & Oliveira, 2016a) and promoting stiffer associations than the previously existing ones between financial institutions and clients (Riquelme & Rios, 2010).

Moving clients to electronic channels is an essential issue for banks and service providers as it permits them to decrease operational costs (Riquelme & Rios, 2010), giving consumers, at the same time, a more convenient way to satisfy their payment needs, completely and with more timely information (Lin, 2011). As a result of this, it is very important to know the most vital mobile payment drivers of acceptance and use.

Advancement is on-going in financial services in developing countries. Most people in metropolitan areas of the developing nations have an easy avenue to opening bank accounts. It is usual for banks to make available various bank operations channels outside the banking hall like ATM, online and mobile banking operations. This medium allows customers who have a route to these channels to make use of services like bills payment. Regardless of this

advancement, there is a vast populace in developing nations that are unbanked (Ericsson Report 2016).

Nonetheless, the broader penetration of mobile phones in developing countries had presented an avenue of reaching out to the populace without a bank account. For example, 89 per cent of individuals sampled in Nigeria by the Pew research centre possess either a smartphone or a mobile phone (Pew Research Center 2015).

In some cases, it is necessary to link a mobile payment device to a financial source such as a card or account. However, in some cases, it is not compulsory (Wang, Hahn, Sutrave, 2016). According to the report (Square, n.d.) volume of mobile payments are expected to increase enormously by 2020. Therefore, the importance of mobile payments is expected to increase as well. In addition, mobile broadband subscriptions are also increasing in all around the world.

The speedy acceptance of mobile phones and their role in the growth of personal and professional activities has been one of the most essential technological events in recent decades (Liébana-Cabanillas et al. 2015). Statistics show that mobile subscriptions globally have passed the seven billion mark, of which about 770 million are estimated to be in Africa alone (ITU, 2016). This figure shows the number of SIM cards in a nation in terms of a percentage of the nation's populace.

In light of this growth, merchants, financial institutions and telecom operators are concentrating their efforts to increase the number of mobile-enabled services available to mobile phone users. These developments in mobile technology have an influence on people's daily lives; and they are starting to provide exciting advantageous new services (Kim, Mirusmonov, & Lee, 2010). An area that is undergoing exponential development is the

mobile payment (Liébana-Cabanillas et al., 2015), which enhances consumers to pay for goods and services by using their mobile phones anywhere they go (Kim et al., 2010).

Mobile payment services are available in 61% of the world's developing nations and about 53% of active worldwide mobile payment services are in Sub-Saharan Africa (GSMA, 2014). Forecasts recommend that worldwide mobile payment services will have 450 million end users and \$721 billion in transaction value by 2017 (Statistica Corporation, 2015; Slade, Williams, & Dwivedi, 2014).

South Africa has the highest rate of smartphone and mobile penetration in Africa, constituting 51% of smartphones and 133% mobile penetration, followed by Kenya with 31% of smartphones and 70% mobile penetration, and then, Nigeria with 29% and 72%, respectively (Fripp, 2014).

Advances in technology in the global mobile devices market have resulted in an entirely new mobile application fields in the past decade. Hence, these devices are indispensable for a modern digital community, as established by the fact that 85 per cent of Nigerians owns mobile phones (Statista, 2016). The mobile phone has advanced from a communication tool to a multifunctional information system. There had been some efforts to enable mobile phones to pay directly at the POS terminal in the 1990s to enhance the payment process to meet the growing need for mobility (Lerner, 2013).

Some five years ago, the numbers of financial institutions that are in Nigeria were less to permit any inquiry as to who were under-served. But now, both state and private sector participants are making commendable moves in promoting financial inclusion (Techpoint Africa, 2017).

The benefit of financial inclusion is not only critical for people but economies too, as it connects to a nation's social and economic development (Techpoint Africa, 2017).

A 2016 report by Ericsson showed that 53 per cent of Nigeria's populace is in the banking system. This report indicates, 4 out of every 10 Nigerians are unbanked and hence lack avenue to financial services that they need to better their lives (Ericsson Report 2016).

Nigeria is still not in seclusion as a predicted 2 billion adults universally are unbanked, following World Bank (2017). That implies financial exclusion is affecting 70% of the world's population.

1.1.1. Overview

Mobile telephony and the Internet are good examples of mobile technology transformations whose usefulness to the community is the target of a number of studies. Mobile devices are portable technologies found everywhere, and users possess a personal association with the devices concerned.

These mobile operations are related to other technology systems which range from infrastructural networks to telecom facilities and features that solve daily issues or satisfy users' wishes require a technology to be flexible, mobile and efficient (Rao & Troshani, 2007).

Organisations associated with telecom and payments functions concentrate on better business opportunities which results from the satisfaction of these issues and necessities (Overbr, 2014). Mobile payment is defined as a combination of payment system with mobile devices and services to provide users with the ability to initiate, authorize and complete a financial transaction over the mobile network or wireless communication technology (Mohan, S. 2014).

IT development in the world has been an essential aspect of future business and industrial growth globally. The cash, cheque or card payment method is slowly giving way to 21st-century contemporary payment method.

A company should know the needs of her end-users and should possess the ability to satisfy their demands. Mobile Payment (MP) usage in Nigeria is not well popular like in advanced nations; hence the financial and mobile industries have a prominent role to play in making MP well-known. Nigeria, today, remains one of the African countries with the fastest developmental growth in telecoms. The rapid mobile phones development in a developing nation like Nigeria resulted in a high amount of cell phone users exceeding the number of bank customers (Porteous, 2006).

The M-commerce consists of applications such as MP, mobile banking, and mobile marketing (Ngai & Gunasekaran, 2007).

Mobile Payment (MP) is payment services operated under financial regulation operations and done via a mobile device. In this case, consumers can make payment for goods and services using a portable device as against cash, cheque or card payments. MP is now widespread globally leading to a positive change from end-users' perception. In Nigeria, MP has gained limited awareness in the literature (CBN, 2012); hence, this study bridges that gap. This study contributes to MP acceptance literature concerning a developing country's context.

1.1.2. Industry Background

In Nigeria, according to the National Bureau of Statistics (NBS, 2018), mobile payments record 4.5% growth in three months from October 2018 to December 2018 with a total of 26.2 million transactions carried out through the mobile payment platforms. Data from the National Bureau of Statistics put the value of these transactions at N592.9 billion.

An increase in account ownership in developing nations and technology role like MP accounts in Sub-Saharan Africa propelled this trend. Notwithstanding the dwindling direction of unbanked individuals globally, there still exist close to 2 billion unbanked adults globally. Of the many purposes, there are still a lot of unbanked individuals, poverty, illiteracy and lack of infrastructural facilities in developing nations (Techpoint Africa, 2017).

More extensive mobile phones penetration in developing nations had presented an avenue for banks reaching out to the unbanked. For example, according to a Pew Research Center study, 89 per cent of those sampled in Nigeria possess mobile phones (Pew Research Center 2015) with 27 per cent having smartphones and 62 per cent having cell phones. The mobile phone is rapidly changing to being part of an individual's daily life in Nigeria. Establishments like telecommunications firms have expanded several services that target individuals with mobile phones who are unbanked. Mobile payment is "payment using mobile devices like cell phones, PDAs (Personal Digital Assistants) and smartphones" (Lee & Chung 2009). The banking service provision is via conventional bank or MP operator. MP operators in developing countries deliver two types of banking services. One makes use of a mobile phone and another offered by a mobile payment operator does not make use of a mobile phone; instead, agents provide mobile payment services.

Tobbin (2012) described two models in which MP can perform. As a transformational model, MP was employed to reach the unbanked that are prevalent in disadvantaged areas. The influence of this transformation exists in nations such as Kenya and Zimbabwe (EFInA 2016) and this model can assist Nigeria to attain her vision of minimising cash flow and digital financial exclusion of individuals from the cash economy. As an additive model, MP supplements other banking functions. MP is rampant in advanced nations and cities of the developing nations. Embracing a transformational model could assist in changing the

lifestyles of the unbanked via the economic and marketing opportunities obtained by accessing financial services (Mohan & Potnis 2015). As a platform, MP utilised mobile phones in developing nations thus enabling good and affordable access to banking service (Donner & Tellez 2008). MP is an effective means to save and have secure means to finance in case of emergency periods like payment for hospital bills in life-threatening situations.

This study investigated the factors which influence MP with the aim of assisting banks, mobile network operators and mobile developers as well as consumers. Following CBN (2011), the payment structure is a critical part of an economy because it is through that the monetary resources circulate among the different sections of the economy. As such, it formed the basis of the current marketplace.

The Central Bank of Nigeria (CBN) introduced mobile payment as a service to achieve its cashless policy aimed at encouraging the ‘financial inclusion’ of many Nigerians and provides affordable commercial facilities around the country. A pilot scheme of the cashless system started in Lagos on 1st of January, 2012. The pilot scheme was extended to five additional states in July 2013, instead of a nationwide implementation as planned by the CBN to allow time for more enlightenment campaign that will facilitate the acceptance of the new programme in the whole nation.

Central Bank of Nigeria is optimistic that the cashless policy is capable of encouraging those who are unbanked to open bank accounts and carry out transactions electronically throughout the country without bothering to go to the location of their banks. However, there are a lot of controversies over the possibility of its successful implementation, and the willingness of Nigerians to accept and use it (CBN, 2012). Therefore, this study explored the influential factors of mobile payment system acceptance among Nigerians to help the Federal

Government of Nigeria and the Central Bank of Nigeria in ensuring a fruitful execution of the cashless project in the nation.

1.2. Acceptance of Information Technologies as a medium of branchless banking

Acceptance of new information technologies in various sectors of an economy creates development and innovation such as blockchain technology in different areas like banking, commerce and government. New technologies assist in improving people's lives and society. The degree to which they transform the community is dependent on the magnitude to which the city welcomes the technologies (Tarhini et al. 2015). Following (Ibid), internet technology has transformed how banks perform and how they attend to customers. This Internet provides online banking choice to customers to facilitate bills payment and fund transfer. Banks and their customers gain from the acceptance of online banking which can assist banks towards saving cost, service improvement and increase revenue. Speedy progress and development in IT resulted in the evolution of alternative routes of payment services like payment service. The importance of this evolvement saw how banks persist to improve service to customers as they offer branchless operations which deliver "financial services outside standard bank branches, making use of agents and depending on ICT like card-reading, or POS, to carry out transactions" (Lee & Jaramillo 2013). This branchless banking allows access to financial services any time of the day and remotely without the need to visit a branch. The ATM pioneered delivery of banking service to customers outside the bank branches. At a stage, telephone banking emanated such that banks provided customers with the opportunity to conduct financial transactions via phone calls. Internet exploration in the mid-1990s and mobile telecoms resulted in the times of online banking as a medium to perform business operations across the World Wide Web (Callaway & Jagani 2015). Broader mobile phones penetration and large telecoms firms' presence enables mobile phone-based

banking to be a possible and definite form of branchless banking. The next section presents a context on mobile telecoms in Nigeria having considered the mobile telecoms as a critical aspect of mobile payment.

1.3 Mobile telecommunications in Nigeria

The GSM communication was launched in Nigeria in 2001 at a time when Nigerians needed it most, and the then President Obasanjo enabled private firms' entrance into the telecoms space. Four mobile telecoms firms (MTN, Airtel, Globacom and Etisalat) got licenses between the year 2001 and 2002, and they are still in existence till date. Based on this, the population of mobile phone users continue to rise (Ubabudu, 2013).

Nigeria has a teledensity of 109.96% as of November 2016 even as active lines rose to 153.9 million (NCC, 2016). Previous statistics revealed that the emergent of mobile telecom resulted in a fast development in the country's telecom firm and, Nigeria presents one of the rapidly spreading telecom markets, realising over 129 million subscribers in 2014 and a telecom density of 92.14 per cent (NCC, 2014). Facilitated by a strengthened telecom industry, it is plausible that effecting mobile banking would be a possible and valuable enterprise as advantages like enhanced service delivery and the improved end-user base would be vital to providing banks with the competitive advantage that is crucial for accomplishment in the sector. Furthermore, regardless of the existence of possible rationale to perform mobile banking and the purportedly conducive Nigerian banking setting, past studies have revealed that the acceptance of mobile banking by consumers has faced obstacles (Agwu & Carter, 2014).

The telecommunication industry has improved to become an essential aspect of Nigeria's economy representing 8.83% of the country's Gross Domestic Product (NBS 2016). The

population of GSM subscribers rose rapidly from 2.27 million (NBS (2015) to 147 million lines in March 2016 in a population of 180 million representing 81.7% mobile phone users in Nigeria (NBS 2016). It is common for a person to subscribe to 2 or more cell phone providers. One of the purposes of having 2 or more cell phones is because of the changes in network coverage quality. Another objective is that individuals endeavour to benefit from many offers by various mobile phone providers. The population of GSM internet subscribers is almost 92 million (NBS 2016). Furthermore, internet entrance in rural communities is weak (Okeke et al. 2015).

1.4 Mobile Payment offered by banks

MP in Nigeria is a new experience in comparison with developed nations. Banking reforms and the need for Nigerian banks to compete locally and globally has resulted in the utilisation of technologies as a different medium for serving customers outside banking halls (CBN 2014). The growth and implementation of these cellular technologies by banks present a different medium for banks to better their service quality, lower operation cost and increase bank penetration. These mobile technologies are in connection with CBN's cashless policy.

The CBN's cashless policy drive issues like lowering the large cost of cash management by supporting electronic-based transactions and cut down the cost of safety and security risks connected with carrying cash. (CBN 2014). To facilitate easy account-opening, the CBN initiated a three-tier KYC criterion for banks (CBN 2013). The first tier allows banks to register customers with only passport photographs. Furthermore, there is a limitation on the volume of cash and transactions performed by the account holder. Banks have commenced the implementation of these criteria.

Online banking presents Mobile payment service as a part of its extended services. Banks also provide SMS banking. For instance, an account holder could send a particular form of an

SMS to send cash to a beneficiary in a similar or separate bank as the sender. Notwithstanding the merits that cellular technologies offer to customers, banks and Nigeria economy, the acceptance of these technologies is low in comparison with several developing nations. Almost two-thirds of the Nigerian populace with banks accounts have not used mobile payment platform (KPMG 2016). Some of the problems that hinder the acceptance of MP recognised in investigations are security, trust, usage difficulty or cultural beliefs (Tarhini et al. 2015).

1.5 Mobile payment offered by Mobile Payment Providers

MP is a type of limited mobile banking service that commenced with facilitating unbanked end users to transfer cash via cell phones. It has recently developed into a platform that provides extra financial services. Some MP Providers that render these services include Firstmonie in Nigeria and M-Pesa in Kenya (David-West, 2015). These types of services are irrelevant in developed nations because of too many banked individuals and easy accessibility of the internet which is essential for online banking. It is commonplace for telecoms firms to lead or partner with banks to provide MP services to consumers.

In Nigeria, the CBN licensed and regulated MP. The service implementation is in two models (Bank-led and Non-bank led) (CBN 2015). In the former, either a bank or in conjunction with other banks/approved organisation render MP. In the latter, a licensed organisation by the CBN presents MP to its customers. Nigeria has achieved less success as compared to a nation like Kenya.

A telecommunications-led sector with a chief competent telecoms operator, a low-regulation setting, more extensive telecommunications penetration, the large unbanked populace, and cultural appreciation of an innovative market facilitated MP success in Kenya. Nigeria has a

similar background as Kenya like broader telecom penetration and sizeable unbanked populace; furthermore, it has attained little progress as compared to Kenya (Llewellyn-Jones 2016). Internal and industry issues within Mobile Payment Operators and the regulatory framework governing their operations arose from some of the limitations to digital MP progress in Nigeria as described by David-West (2015).

Mobile payment schemes render services like person to person (P2P) payment, mobile airtime top-up and utility payments. Some Mobile Payment Operators provide cash-out services via ATM rather than through agents (Robertson, 2010).

1.6. MOBILE PAYMENT CHALLENGES IN NIGERIA

Considering these acceptance trends and consumer behaviour towards MP, together with its low acceptance rate in Nigeria, MP is faced with penetration threats among Nigerians. Investigators like Agwu & Carter (2013) have emphasised the obstacles MP faces in Nigeria and the reasons why MP is facing such a low acceptance rate in the country. Particularly, exploring these threats will encourage the investigator to provide useful and relevant recommendations strategies which can assist in improving the acceptance rate of MP in Nigeria. Some of the critical obstacles acknowledged as the main challenges faced by the cashless system and MP are:

Education and literacy level: The low level of literacy and education is a crucial obstacle to access and accept cashless payment systems, like MP, and also to uneducated demographics (Agwu and Carter, 2014). There is a perception that if the cashless programme consistently gains ground in Nigeria without suitable initiatives put in place to deal with the low literacy level, the illiterate population will be compelled to accept MP and become unsafe to the literate population who may take advantage of them (Okoye & Ezejiofor, 2013). This panic

of susceptibility and fear of being exploited results in the illiterate population to be unyielding towards accepting and not trusting the cashless policy.

Lack of required skills: Studies have presented facts, which reveal that over sixty per cent of Nigerians doesn't have the skills necessary to operate IT infrastructures like MP (Adesina and Ayo 2010). Non-availability of needed skills to use MP results in people possessing either a pessimistic view of their capability to using MP facilities or unfavourable opinion of the complication encountered to perform the service and in both situations, the person is unlikely to accept MP (Agwu and Carter, 2014).

Occupation and unbanked Nigerians: An objective of the cashless programme is to boost financial inclusion in Nigeria, introducing monetary services to places without an avenue to the services due to limitations like geographical area (CBN, 2013). This objective is because the cash-based economy has resulted in 66 per cent of the nation's money being lodged outside the fiscal system, leading to a more significant per cent of the nation's populace unbanked. With such a large rate of monies outside the country's formal banking system, it is hard for CBN to coordinate the fiscal system, control inflation and establish economic development (Princewill and Anuforo, 2013). With a populace of more than 165 million, over 30 per cent of Nigerians (an approximation of 57 million) are unbanked (Odunmeru, 2013). Agwu and Carter (2013) presented further awareness into the nature of these unbanked Nigerians with their investigation showing that many are low-income earners. These unbanked Nigerians have cell phones but are unaware of the MP functions presented by banks and mobile operators (ibid).

Adogamhe (2010) highlights this obstacle by indicating that low-income earners do not see a bank account as necessary since they don't earn sufficient wages, therefore resulting in an

insight amongst the unbanked population that banking services including MP are not vital to them and do not match their desires. Based on the threat this factor presents to CBN's cashless programme, it is regrettable to observe that suitable steps have not been taken to deal with the absence of awareness, which is prevailing between the unbanked in Nigeria (Agwu & Carter, 2013).

Online crimes and security: A widespread of electronic fraud, identity theft and unauthorised account access is a central issue for the cashless programme and MP, as these security issues have an impact on core areas of cashless payment which are confidentiality, access control and data integrity. Ineffective security controls will continuously result in an absence of confidence in MP and low acceptance rates (CBN, 2013).

Frequent power interruption: Nigeria has witnessed the persistent issue of an unstable power supply and the shortage of this necessary facility is critical for IT infrastructure to operate and result in availability issues for cashless payments, which continuously hamper the acceptance and practical use of MP in Nigeria (CBN, 2013).

Lack of confidence and trust: The prevailing absence of trust and confidence in MP is as a result of the climax of the influence all the threats stated above have on the Nigerian consumer (Odunmeru, 2013). Payment system faces constant problems like unacceptable issues of security, integrity and availability. There is a level of mistrust in MP systems among Nigerians which prevents the people from accepting MP (ibid). Nigerians were asked why they had not accepted MP in a survey carried out by EFINA in 2013.

Some problems were recognised from the sample group according to issues discussed by investigators like Agwu and Carter (2013) which include the absence of trust resulting as the

element with the topmost effect on consumer's defiance to MP acceptance. This factor is fundamental to this research as the thesis aim to use suitable theories and frameworks to recognise the elements which contribute to consumer acceptance of MP as well as the level of influence these factors have on MP acceptance in Nigeria.

1.7. SIGNIFICANCE OF THE STUDY AND CONTRIBUTIONS

This investigation provided measures of behaviour intentions and use of MP applying UTAUT model as its conceptual base. The research designs a customised framework of end-user acceptance and usage of MP services introducing unique constructs applicable to Nigeria. Each constructs' validity in the new framework was tested utilising regression analysis, and the outcomes of this investigation enhanced our knowledge of levels of consumer acceptance and MP usage and contributed to discussions on acceptance of the new technology in less-developed countries.

Findings from this analysis contributed to the acceptance literature in the scope of MP and developing nations. Furthermore, it also bridged the gap in acceptance of MP in Nigeria as it serves as a start point for additional investigation. The outcomes of this study are useful for banks and mobile operators towards the improvement of MP facilities and for the identification of features that contributes to the failure or success of the MP sector which might be useful to make decisions.

The research contributes to technology adoption knowledge through developing a research model in a Nigerian cultural perspective. This investigation shows the customised "Mobile Payment Acceptance Model", towards an intention to use MP by examining and confirming the research model alongside practical applications in Nigerian universities setting. This result is meant to be significant from an academic perspective and will enhance other investigations in Nigeria and different cultural backgrounds.

1.8. RESEARCH GAP

Despite the great prospects for the success of mobile payment in Nigeria, the rate of usage is still low in comparison to what is available in similar developing nations in Africa and Asia (Llewellyn-Jones 2016). Investigations indicate that Kenya, South Africa, India and Botswana have a higher rate of usage of mobile payment systems than Nigeria (UNCTAD, 2011). The study of factors impacting the use of mobile payment in Nigeria is also scarce in the literature. With the high volume of active mobile phones in Nigeria, mobile payment has the prospect of contributing greatly to the success of the cashless policy. It is hence crucial to determine those factors that impact the rate of acceptance of mobile payment in Nigeria so as to guide the implementation aimed at encouraging its usage. This thesis will also fill the existing knowledge gap on factors impacting the use of mobile payment.

Most of the Technology Acceptance Models have been widely tested in developed nations. The literature lacks technology models that describe technology acceptance in developing nations. In particular, the literature lacks technology models that describe factors of technology acceptance in the Africa business context (Anandarajan et al. 2002).

Few types of research are available in the literature on mobile payment in Nigeria taking into consideration the diversity in Nigeria including socio-cultural differences in regions. Social and cultural factors have been discovered to play an important function in the acceptance of mobile payment among consumers in developing nations (Crabbe et al. 2009; Tarhini et al. 2015).

Therefore, a study on the acceptance of mobile payment is required in Nigeria to present evidence and help guide relevant stakeholders to channel in the right path. There has been

very limited success in mobile payment in Nigeria (Llewellyn-Jones 2016; David-West 2015).

The sampled population of the studies that have investigated mobile payment acceptance present a limitation. Previous investigations in Nigerian context have not considered a significant section of persons without bank accounts to know what would impact their intentions to accept mobile payment service. For instance, an investigation suggested a future study that considered non-academics and a data-analysis that utilises Structural Equation Model (SEM) (Olasina 2015).

Even though mobile payments are expected to gain popularity and increase the number of users in the next years, there are hurdles to overcome.

First, it is essential to mention the position of Nigeria when comparing the number of users to other nations. The acceptance of MP has witnessed success in Kenya but with little success in Nigeria, though both nations share similarities in a developing nation's setting, more extensive mobile telecom penetration and large populace (Llewellyn-Jones 2016). The reasons behind the low usage of Nigerian consumers for mobile payment services remain rather unexplored. Therefore, this study aims to bridge this research gap by investigating the factors that will influence Nigerian consumers from using this mobile payment method, because so far mainly research about the acceptance of mobile payment exists with a focus on other markets (Dahlberg et al. 2015).

This study focuses on the barriers which hinder Nigerian consumers from accepting mobile payments. Consequently, the contribution of this research will be to apply the customized UTAUT model to mobile payment, which is a new technology. This way, this study will

contribute to knowledge by providing strategy and marketing recommendations for service providers to overcome obstacles consumers face with mobile payments.

1.9. RESEARCH AIM

The aim of this research is to design a conceptual model for measuring the acceptability rate of consumer acceptance of mobile payment in Nigeria. According to Davis (1989), evaluations are mainly carried out for two purposes: to predict the acceptability rates and to find out barriers to the acceptance so that necessary measures can be taken for improvement. This rationale led to the following objectives:

1.10. RESEARCH OBJECTIVES

Four (4) objectives were developed in line with the aim, and these are:

1. To critically review the literature related to MP acceptance in Nigeria.
2. To recognise the elements impacting consumers' acceptance of MP in Nigeria by identifying the important elements which affect consumers' behaviour intention.
3. To empirically authenticate the study framework against the acceptance and MP usage in Nigeria.
4. To develop recommendations on how stakeholders can encourage MP acceptance in consumers.

1.11. RESEARCH QUESTIONS

1. What are the determinants affecting mobile payment acceptance by consumers?
2. How can MP acceptability rates be predicted?
3. What can be recommended for an improved and enhanced mobile payment acceptance by consumers to move them from traditional payment to mobile payment?

1.12. RESEARCH PROCESS

1.12.1. Data Collection

The researcher sampled 500 students, academic and non-academic staff in universities/colleges who use mobile phones in Lagos (Commercial capital city of Nigeria). In selecting the target group, purposive sampling, based on the researcher's judgement was employed as they represent individuals who use mobile devices and are likely to use mobile payment services (Patton, 2002) as described in chapter five of this study. The investigator chose participants who are regular users of mobile phones.

1.12.2. Data Analysis

To analyse the effect of the independent constructs (PE, relevance, culture, technical support, trust, security risks, awareness and demography) on the dependent variable 'Behavioural Intentions', regression analysis was employed.

A path analysis focused on sequences of regression analysis using SPSS software was carried out for the hypotheses testing as explained in chapter five.

1.13. DEFINITION OF TERMS AND CONCEPTS

The investigation context showed how some terms and concepts were applied in this section. The subsequent text defined terms and concepts not set in this section the first time they are mentioned.

Academic staff means a member of an instructional team of a university. Academic faculties in any university are employed to teach and conduct research.

Davis (1989) defines **acceptance** as the decision made by someone when to use technology. Nevertheless, Martinez-Torres et al. (2008) suggest the concept of the first time one makes that decision to use and continues using it.

Adapt is a verb used to mean being able to adjust to new conditions or make the conditions suitable for another purpose.

ATB is a previous attitude of an individual toward carrying out that behaviour. Association with a particular behaviour requires individuals to envisage about their choices and the likely results of their behaviours.

Behavioural Belief is the possible results of the behaviour and the investigation of these findings. This belief yield suitable or unsuitable ATB.

Bootstrapping Procedure is used in AMOS as an all-purpose procedure to estimate how the sampled parameter estimates are distributed.

Compatibility is the degree whereby novelty is recognised to be homogeneous with the prevailing principles, previous experience, and receivers' needs.

Complexity is the extent whereby novelty is recognised as hard to comprehend and utilise. Acceptance rate associates negatively with the complexity of innovation.

Cross-Sectional Study is an investigation whereby data are gathered once (sometimes extended for certain periods) to report the study questions.

Culture is a combined organisation of the mind that separates representatives of a class of individuals from the other. It is an individual's total way of life.

Culture Context is the macro setting whereby the investigation of user adoption behaviour may happen, and the particular institution is situated.

Dependent Variable is a construct of principal concern to the investigation.

Discriminant Validity is a separate means to evaluate Construct validity. It shows the degree whereby the model variables are dissimilar.

Ethics is a presumed behavioural guide during an investigation.

Generalisability is the chance that the outcomes of the study findings relate to other groups/contexts and different situations.

Information Communication Technology (ICT) is a phrase characterized as computing and telecoms technologies that give automatic ways of administering and delivering data (Heeks, 1998). A list of examples of ICTs is PCs, mobile phones, the internet and e-payment systems. The definition and the samples provided a highlight with the concepts of the meaning of ICTs without explicitly defining the boundaries of the meaning, as this may be an indication of the developments of technologies and the services they offer. Furthermore, Omwenga (2006) defines Information Communication Technologies (ICTs) as computing and communications facilities and characteristics for supporting teaching, learning and varieties of educational activities. This investigation rests strongly on the concept of automatic means as provided by Heeks, the concept given in Omwenga's definition and Dutton's entire view of ICTs.

Longitudinal Study: An investigation whereby data are collected at different times to answer research questions.

Methods: The many procedures employed to collect and explore data associated.

Methodology: The strategy associated with and connecting the preference and use of specific techniques to the required results.

Moderating Variable: This is a construct with a substantial contingent impact on the independent and dependent construct association

Multicollinearity: This occurs when the dependent constructs are highly associated.

Non-Academic Staff means a non-teaching member of a university or college.

Observability: The extent whereby others see innovation results.

Perceived Behavioural Control (PBC): It implies an individual's perceptions of being able to carry out a particular behaviour and its impacts on intentions.

Perceived Ease Of Use (PEOU): The extent whereby an individual thinks that utilising a specific technology would be effortless.

Perceived Usefulness (PU): The extent whereby an individual thinks that utilising a specific technology would encourage their job performance.

Population: The whole class of individual that the investigator intends to study. In this study, it is academic and non-academic staff and student of universities in Lagos, Nigeria who use mobile phones.

Reliability: The degree whereby research results would be very much alike if the investigation was to be done again later, or with a separate subject.

Sample: A population subset which comprises of certain members chosen from the populace.

Social Influence (SI): The degree whereby a person thinks that other significant individuals anticipate they should use the system.

Structural Equation Modelling (SEM): A multivariate method which combines some area of multiple regressions (analysing dependence associations) and factor analysis (which represents unevaluated concepts-factors with various constructs) to evaluate a range of complementary dependence associations at the same time.

Students are learners studying at a university or college.

Subjective Norm: The social pressure applied to a person to carry out the behaviour. It represents an individual's impression of what other individuals anticipate their behaviour.

Theoretical/Conceptual Framework or Research Model: A group of theories and models underpinning a positivistic investigation. It is a conceptual model of how the investigator postulates the associations amongst many determinants recognised as significant to the problem. These terms are made use of mutually in this study.

The Internet: A computer network available to the public and comprising a worldwide network of computers utilising the TCP/IP protocols for facilitating data transmission and exchange

Use in this context refers to the cause to act or serve a purpose or to exploit for one's ends.

Validity: The degree whereby the data gathered shows a reflection of the researched phenomenon.

1.14. RESEARCH SCOPE

1.14.1. Geographical Scope – Research was limited to colleges/universities academic staff, non-academic staff and students in Lagos Nigeria, a representation of the populace of interest in a developing nation setting.

1.14.2. Theoretical Scope – The theory that underpins the whole research was culled from UTAUT's model and was limited to identify factors affecting MP acceptance. It will further be limited to including the identified factors/constructs in modifying UTAUT to design, apply, analyse and validate a new model that could evaluate adoption and use of MP.

As explained in later chapters, the research was majorly limited to the variables in an existing UTAUT model which consist of Performance Expectancy (PE), relevance (modified from Effort Expectancy EE), culture (changed from Social Influence SI) and technical support (adjusted from Facilitated Conditions FC) as independent constructs; Behavioural Intention

(BI) and use behaviour as dependent variables; and gender, age and education level (changed from experience) as moderator variables. Also studied were factors identified by the researcher: three independent constructs (trust, security risks and awareness) and one dependent variable (expected benefits)

1.15. Structure of the Study:

Seven chapter divisions make up this research, each comprising of multiple sections. The following themes: Introduction, Literature Review, Conceptual Framework, Research Methodology, Data Analysis, Findings and Analysis and lastly Conclusions, Contributions and Recommendations form the structured branches of this research.

Chapter one consist of an introduction, industry background, research questions, aim and objectives. It presents an introduction to the setting of the thesis topic and recognises the gap in the investigation. It gives an essential extensive history of the investigation and describes the context of important themes that are linked to the research. Presentation of term definitions, historical importance and a recent assessment of the situational setting concerning the area of investigation expressed the critical items. It continues by stating the research questions underpinning the investigation and describes the scope of the research. It then ends with a short explanation of the chapters that form the investigation.

Chapter two consist of a literature review on technology adoption models and Mobile Payment which establish the basis of the investigation model. It gives a synopsis of the major theories and empirical findings from previous works of literature. It commenced with an overview of the technique adopted to conduct the literature review. The section then progressed on with a description of essential theories and practical outcomes related to the questions that underpin the investigation.

Chapter three examines the conceptual framework developed from the UTAUT model. It commenced by describing the foundations and conceptual framework that guides the study. As a guide for explaining the assumed philosophies and selected research approach to the investigation, the conceptual framework elements are then adopted. It is based on this that the stages from collecting the data to presenting the results are elaborated.

Chapter four discusses the study methodology, the method employed and the reason why such a method was used considering its strengths and weaknesses. It examined the study model by investigating the UTAUT model as the theory adopted in the empirical analysis and describing the basis of the theory and justification for its use in the investigation.

Chapter five contains data analysis. It explains the procedure guiding the conduct of the exploratory and confirmatory studies carried out.

Chapter six tests the study hypotheses against the newly designed model and discusses the empirical findings regarding this direction with an interpretation of the findings in the background of related literature.

Chapter seven presents the conclusion and original contributions. It offers a complete review of the study results and brings the research to an end by restating the answer to the research questions. In conclusion, it describes a summary of the implications that can be culled from the research, and the limitations of the investigation are recognised.

1.16. Conclusion

This chapter displayed the analysis background, aim, objectives, questions and possible advantages from the investigation outcomes and information linked with the recognised study gap which supports both the research originality and its new addition to the body of knowledge.

The next section, Chapter two, reviews vital works of literature relating to technology acceptance and mobile payment, and also provided the basis for the research.

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

This section evaluated a critical review of relevant literature on user acceptance of new technologies with a specific focus on the essential determinants affecting consumers' behavioural intention towards m-payment acceptance.

Mobile Payment is an emerging payment system (Khan et al., 2015). As end users got fully engaged with these mobile devices, their features became well refined from the remote and initial function of a phone to an advanced phone with a computer. The tablet and smartphone boom have changed the mobile device to an avenue that the end users utilise in engaging service providers with an array of choices (Verma, 2013).

In the last two decades, some financial institutions in Nigeria have gradually welcomed this paradigm with several views of internal customers; not giving sufficient importance to the external customer base. As a result of this, only a few firms could make a profit and develop quickly, conveniently and be able to adapt to the financial sector reform in Nigeria (Soludo, 2006). However, implementing the recommendation of Honohan (2012) to prevent the turbulence in the banking sector can also protect the interest of the banking technology players and can inspire them towards industry expansion.

The Global System for Mobile Communication (GSM) technology entry in the Nigeria market paved the way for the availability of internet services to the masses. But, the give-and-take between the quality of service and the slashing prices has always been a big challenge for the service providers (Hassan et al., 2016). Padoa-Schoppa (2004) stated in the survey of improvements on the internet and MP revealing the banking strategies of the internet and mobile banking globally. Based on discussions on MP in Nigeria, a report has it that security issues, law enforcement, legal issues and many more are subjects of the cellular

payment process. Retaining equilibrium between these MP issues and the citizen profile could be one crucial hurdle (Musa et al., 2015). Following Wray (2008), there is an increase of 60 million GSM mobile connections yearly, and in the African region, the annual growth is rising rapidly to be 27%. Furthermore, the West African nations such as Nigeria, Ghana are still lagging behind in MP coverage (Etim, 2014).

Additionally, there are many hitches about the customer group in Nigeria.

Several investigators emphasise the importance of demographic variables to understand the customers. Fox (2013) concluded from the work that demographic variables do play an important part to decide MP usage. Notably, the age is discovered to be inversely proportional to MP usage. The higher the age of people, the lower will be the usage of MP (Duggan, 2013). Boateng et al., (2014) is of the opinion that ‘mobiles for development’ operations seize the opportunity of the mobile phones across all demographic partitions, which play an essential function (Heang & Khan, 2015) in decision-making on MP.

2.1.1. Introduction to M-Commerce

M-Commerce allows end-users interaction with one another, anytime and anywhere. It employs mobile devices during products/services transactions. M-commerce has its disadvantage, though it’s gradually, showing indications of robust recovery (Tiwari & Buse, 2007).

The mobile facility allows operations to be non-dependent of consumer geographical location, unlike electronic commerce which is location dependent (Stanoveska-Slabeva, 2003). M-commerce consists of MP, m-entertainment and m-banking (Tiwari & Buse, 2007). M-commerce has its distinctive characteristics giving it dominance over other means of financial transactions. These characteristics include fast connectivity, immediacy, localisation, ubiquity and authentication (Tsalgatidou & Pitoura, 2001).

2.1.2. Acceptance and Use of a New Technology

Information Science (IS)/Information Technology (IT) can be a value-addition to a nation, firm or persons if and only if there is acceptance. For acceptance and technology usage to be predicted and explained, there should be an understanding of why individual use or don't use the technology. Acceptance and utilisation of new technology have drawn a substantial number of studies (Hu et al. 1999), especially in advanced nations. A considerable amount of technology acceptance theories which include TRA, TAM, and TPB have been designed. UTAUT was established by Venkatesh et al. (2003) through capitalising on the similarities of the prevailing theories.

Mobile Payment is a system which uses mobile devices to carry out transactional payment such as bills payment and doing financial businesses (Gerpott & Kornmeier, 2009). The significant part of MP is that mobile operators can deliver payment which implies that MP gives the mobile operators a chance of extending their business to banking (Viehland & Leong, 2007).

End-user lack of MP interest in Nigeria is the biggest obstacle, and end-user acceptance is a decisive factor (Dahlberg et al. 2008). End-users are afraid of the unknown with MP idea and are unwilling to make payment with phones. The panic of breach of security and identity theft also exist despite the prevalence of hope and enthusiasm about MP.

As a substitute for cash, cheque, or card payment, end-users may pay for a variety of services with their mobile devices. Gartner Research Firm (2009) made a forecast that there will be a meaningful advancement of MP globally between 2010 and 2012, and over 3% forecasted a significant number of all mobile device users would make MP such that the trend will have approached mainstream in 2013.

Since M-commerce and its unique business strategy were introduced, Mobile Payment from the start had faced exponential business advancement, together with success in the employment of a vibrant and dedicated marketing group (Chen, 2008). As mobile technology evolves speedily, with an increase in mobile phone users, MP has gained recognition for development prospect in the mobile commerce space (Au & Kauffman, 2007).

Previous works in Mobile Payment setting globally reveals that end-user acceptance has focused on security as a challenge (Viehland & Leong, 2007), convenience (Dewan & Chen, 2005), cost, PEOU and usefulness (Zmijewska, 2005).

As a summary of the investigations of MP works, there must be security, convenience, and ease of use to the end-user, to be successful.

2.1.3. Mobile Payment

With the mobile phone transforming into an essential tool for users, banks became more persuaded to benefit from the cellular phone's high penetration rate across the present and probable consumer base which resulted in introducing proximity and non-proximity payment (Infosys, 2009).

With non-proximity payment, MP consumers could finish transactions through mobile phone communication links like SMS, 3G and 4G (ibid). Banks were able to design detailed websites; presented consumers with real-time account access and also developed usability. These facilities were as a result of developments in cellular phone technology which leads to smartphones with screens of easy to use navigation and more adequate to show web pages without visual discomfort to consumers (Infosys, 2009).

For proximity payments, a payment device employing a new technology into the cashless payment known as Near Field Communication (NFC) was a transformation of the mobile phone. NFC is an introductory infrastructure in MP setup in Nigeria.

Mobile technology is now an essential aspect of life (Schierz et al., 2010). MP system opens and extends chances for end-users; it integrates common payment methods with mobile technology and boosts payment efficiency by reducing transaction costs as compared to long-established means of payment. For MP, end-users require an internet-connected mobile device. What differentiates MP from other payment method is that MP utilises mobile devices as an essential aspect of the process (Henkel, 2002).

MP is a different means of electronic payment process (Schierz et al., 2010). MP is the next stage in e-payment business growth (Mallat, 2007) and might be used for different payment means (Kim et al., 2010).

This research investigates MP acceptance from the end user's perspective. The first form of MP (remote MP) occurs when one transfers money to a different individual through a mobile device. The second form of MP (proximity MP) happens when one pays for goods/services bought online through a cellular device. The last type of MP exists when one remits for an item through a cell phone at the POS.

Two types of MP exist (Becker, 2007): remote MP and proximity MP. The two forms of MP stated above are samples of remote MP; the last type is a sample of proximity MP.

Remote MP is very suitable for individual-to-individual payment and payment to merchants without a traditional POS system. Remote MPs also comprise of payment for items bought from an online merchant through a mobile phone and executed with the use of prevailing payment facilities (Smart Card Alliance, 2008).

Proximity MP is viable for POS; they utilise RFID (Radio Frequency Identification (RFID) or NFC systems. In this case, rather than employing a long-standing payment means, such as cash or credit/debit card, an end-user makes an MP which depends on a platform requiring NFC. From the end user's part, the transaction seems to be a contactless credit/debit card one, without releasing cards to the merchant. The total MP activity occurs in the presence of the end-user (Card Technology Today, 2009). The contactless payment device always remains with the end-user (Kasavana, 2006). This kind of payment is highly suitable, as transactions are done in short time eliminating the inconvenience of utilising physical card (Ding & Unnithan, 2005).

A proximity payment process comprises different elements which include Contactless Reader, Payment Gateway, Portable Device, Wireless Network, and E-Wallet App.

The primary gain of NFC is that it is consistent with prevailing contactless payment specifications. Proximity payments rely on EMV (Europay, MasterCard and Visa) standards, ensuring greater security level.

2.1.4. Mobile Subscription and Cashless System in Nigeria:

This part gives a brief on the level of mobile subscription in Nigeria and also explains what a cashless economy is all about, as well as the justification for the introduction of the policy in the country. Also discussed are the benefits derivable from the cashless system.

2.1.4.1. Mobile Subscription Base in Nigeria

The CBN disclosed that as of December 2012, operators of mobile money have carried out transactions with a total value of N17.3 billion (CBN, 2013). As publicised by a study which was conducted by Enhancing Financial Innovation and Access (EFINA), there are about

400,000 mobile money subscribers in Nigeria, out of a population of 167 million (EFInA, 2012).

2.1.4.2. Mobile Payment Services in Nigeria

Due to an increase in demand to conduct payment throughout and at any time in Nigeria, the CBN came up with the suggestion that MP is the facilitating solution for such micropayments in Nigeria. MP is the utilisation of a cellular device for conducting payment transactions such that monies are conveyed from the owner to the beneficiary through a link person, or direct with no link person (Mallat, 2007). As this entails transaction done through an m-banking system, consideration should be taken on the difference between MP and M-banking system. M-banking operations depend on banks' legacy systems with offerings to their customers.

M-banking denotes banking operations and facilities provided by financial institutions using an e-Mobile device. MP consists of many facilities essential in delivering MP services to the banked and unbanked people in the community (CBN, 2011). In Nigeria, MP will assist in solving the issue of long queues in banks. MP also increases job opportunities, thereby limiting unemployment rate in Nigeria.

UBA, a leading Nigerian bank is a licensed operator offering MP. It commenced first Nigeria's MP services (U-MO) in November 2011, allowing phone users to buy airtime, pay utility bills, and pay for products/services offline and online. It is on offer to prevailing customers and non-customers of UBA.

"PocketMoni" is an MP conceived by Etranzact International Plc (an MP provider). It allows users to pay TV and electricity bills, and hotel bookings. The service comes with security, cost-effectiveness, convenience and availability for all.

2.1.4.3. Mobile Banking in Nigeria

Following Ajayi and Ojo (2006), a country's fiscal progress is connected to its investment and enhancement in IT infrastructure, towards establishing a secure, convenient and reliable payment system. Nations like the USA, Japan and Germany have already witnessed expanded economic development as a result of continuous investment in IT infrastructures (Jorgenson, 2001). Furthermore, IT investment do not consequently lead to fiscal progress without actual implementation (ibid), a verifiable truth Anie (2011) agrees with by stating that it can lead to fiscal growth if the country's IT objectives and programmes are well executed and used. With the development in IT existing as an element in economic advancement, advanced nations are facing trends where traditional systems, in different aspects like education and health, are being enhanced or substituted with more secured IT structures (Humphrey, 2004). The financial sector is also facing this transformation as online and cashless schemes are executed as options to the cash payment (Tunji, 2013). These transformations have benefitted nations such as the USA and the UK where financial institutions reported cashless options which led to advantages like quick transactions and limited queues at PoS (Akhalumeh & Ohiokha, 2012). They have also resulted in high clarity in consumer activities and even limited operational costs and high consumer satisfaction (ibid). Based on these advantages, the CBN (2013) has hinted that it is vital for Nigeria to transit from a cash to a cashless economy as a result of these established advantages and also many demerits of the country's cash-heavy economic paradigm (Yaqub et al. 2013).

2.1.4.4. THE CASHLESS ECONOMY

As part of the CBN's commitment to deliver a balanced framework to develop the economy of Nigeria, the Central Bank of Nigeria introduced many policies capable of strengthening the country's financial system. In the cashless policy, the mobile payment system is one of the

means tailored to realising the goal of Nigeria as a top 20 economy by the year 2020 which represents the primary objective of the policy (Nigeria Vision 2020, 2009).

A cashless society is an economy characterised by a very little quantity of money in circulation supplied by a Central Bank (CBN, n. d.). Under the platform of a cashless economy, the amount of money you have in your wallet is virtually immaterial. Any of a ‘plethora’ of credit cards or bank transfer can be used to make payment for your purchases (Roth, 2010).

Olusola et al. (2013) listed the reasons behind the introduction of the cashless policy as given by CBN.

1. To develop and modernise the payment scheme in connection with Nigeria’s vision 2020 goal towards aiming for a place in the top 20 economies by the year 2020. Vision 2020 is a programme initiated by the government and aided by CBN, to boost fiscal advancement via an IT-enhanced cashless community. The plan hopes to put Nigeria at equality with world associates amongst the leading economies globally by the year 2020.
2. To steer the improvement of effective monetary policy to manage inflation and drive economic growth.
3. To reduce banking services cost (including credit cost) and drive financial inclusion through the provision of more efficient transaction regardless of limitations like geographical location.
4. The high cost of cash: The handling cost for a cash transaction in the country continues to have a rising depleting impact on its financial system. CBN estimated the cost to reach 192 billion naira in 2012 (CBN, 2011).

5. High subsidy: CBN investigation displayed that only 10 per cent of daily banking transactions are more than 150,000 naira, but the 10 per cent account for most of the high-value transactions which conclude that the whole banking populace subsidises the costs that the little community of 10 per cent bring upon themselves regarding high cash usage (Olusola et al. 2013).
6. The high risk of using cash: Cash encourages robberies (Olusola et al. 2013).
7. Informal Economy: Huge cash use leads to a lot of money outside the formal economy, thereby making monetary policy less-effective in curbing inflation and facilitating economic development (Olusola et al. 2013).
8. Fostering transparency and curbing corruption: This is because transactions carried out through cashless methods can be traced and audited unlike cash-heavy systems, which enhance bribery and corruption. Colossal cash use leads to corrupt practices (Olusola et al. 2013).

In furtherance to the potential advantages of a cashless economy, initiatives to change from the traditional systems also arise from the recent detriment Nigeria's prevailing cash-heavy economy is bringing on the country. These drawbacks have continuously put a monetary struggle on the economy and also on the daily life of the people.

2.2. Global Mobile Phone & Mobile Payment Forecast

According to Gartner's predictions, 448 million people will use m-payment services in 2016 in a market worth \$617 billion, but Africa will account for the highest revenues. Portio Research (March 2010) stated that 81.3 million people globally used their cellular device for payments in 2009. By the close of 2014, there is a likely forecast of it rising to about 490 million. According to Juniper Research (July 2011), the whole monetary worth of m-payment for digital & physical goods, money transfers and NFC business deals are to reach \$670

billion in 2015, up from \$240bn. About 200 million users might choose MP facility by 2013, a figure that currently stands at 100 million (Juniper Research, 2011).

Around 40 per cent of the effective mobile payment users will perhaps be from Africa and the Middle East regions by 2015 (Juniper Research, 2011). A total of 40 million mobile payment users exist in Africa (UNCTAD, Nov 2011). This figure will rise to 1.2 billion by 2015 (Ovum Research, Nov 2011)

2.2.1. Mobile Payment Forecast in Nigeria

In Africa, mobile phones are the vastly employed means to communicate (ITU, 2007), making Africa's mobile market the fastest growing globally as compared to other continents (ITU, 2007). Following an investigation, Nigeria is among leaders for m-commerce utilisations in Africa (UNCTAD, 2007) and the fast-moving telecoms nation in Africa.

This investigation is credited to these reasons:

Nigeria is presently the fastest progressing telecoms backbone country in Africa and studies show that it is ranked third globally (Ayo et al., 2007).

As Nigeria's population size kept increasing, and with about 150 million people by 2009 with an expectation of 155 million by July 2011 (CIA, 2011), Nigeria is adjudged as the country with the largest population in Africa (Muganda et al., 2008).

At present, Nigeria leads the m-commerce utilisation in Africa (Ibid), and the country with the leading subscriber base of about seventy million (ITU, 2009).

Mobile telecoms device is a convenient means of providing mass market compared to branch banking in Nigeria. According to ITU, up until December 2009, Nigeria has 24 million Internet users in a population of 150 million representing 16.2% while mobile technology has penetrated about 51% of the people with development potentials. Studies show that Nigeria is

the fastest growing telecoms country with 150 million subscriber base up until September 2015 and a penetration rate of 107% from a populace of 182.2 million (ITU, 2016).

2.2.2. Prediction of High-Technology Consumer Behaviours

Throughout the years, marketers and investigators have steadily researched the many motivating impacts on purchase behaviour (Mansur and Kuncoro, 2012). Booth and Shepherd (1988) argued that the factors of culture, economy, emotions, value, and attitudes will impact the decision process of end-user purchase behaviour. Loudon and Della Bitta (1993) also indicated that the end-user purchase behaviour is a decision process in which customers can select and use the products and services. Specifically, through the decision-making process, end-user can check their actions and the purpose for why they would intend to buy this product. Consequently, Kotler (1997) further recognised that end-user purchase behaviour is impacted by cultural, social, personal, and psychological factors. Otherwise, end-user behaviour is usually goal-oriented, not haphazard or accidental. For example, end-users have a goal or a set of goals aiming to satisfy presently unfulfilled needs. From the above, apparently, end-user behaviour is the model of behaviour that individuals follow in searching for, buying, using, or evaluating goods, services, and ideas that they hope to fulfil their needs and wants (de Mooij, 2010).

Prediction of end-user behaviour is usually a necessary task for marketing managers. They have to know the possible buying behaviour of end-user and the factors impacting end-user acceptance of products so that they can suggest ideas for Research & Development staffs to enhance and improve the products. In high-technology end-user behaviour, the concept of purchase behaviour is essential for its implication that end-users are different; therefore, the marketing managers should design differentiation marketing strategies to contend with an array of situations. de Bellis et al. (2008) argued that the relevant marketing strategies will

promote rich interactions with their customers and improve marketing efficiency and effectiveness. Therefore, knowing the end-user behaviour of high technology and defining the relevant policy are a demanding task for the banks and mobile payment service providers. For technology usage of end-user behaviour, Rogers (2010) proposed that there are differences in end-users' disposition toward using technology. He further defined end-user into five groups clarifying their character, ranging from innovators to laggards (ibid). As a result of the differences in end-users' traits, technology readiness index being suggested to describe end-users' beliefs concerning several dimensions of technology differs. The definition of technology readiness is divided into four dimensions of end-users (Elliot et al. 2011). Optimism: optimism is a positive view of technology and belief, giving end-users increased control, flexibility, and efficiency in life due to technology. Innovativeness: innovativeness is the propensity to be a technology pioneer and thought leader. Discomfort: discomfort means having a need for the control and sense of being overwhelmed. Insecurity: insecurity means disturbing technology for security and privacy purposes.

Through the investigations of marketing and end-user buying behaviour, marketers and investigators would aggressively like to design relevant marketing strategies to assist electronic companies. Above all, these companies should know those issues as follows before they define marketing strategies (Kamins et al. 2007): how end-users think, feel, select from various products, and make decisions; how the end-users are impacted by the environment and their background (i.e., media and family); the behaviour of end-users while making purchasing decisions; the decisions impacted by the limitation of end-user information abilities; how end-users' decision strategies and motivation vary between products that are different in level of interest or significance; how firms can modify and enhance their marketing strategies to more efficiently accomplish the end-users' needs.

Compared to the traditional market, Moriarty and Kosnik (1989) recapped the features of a high-technology market from three dimensions: the market uncertainty, technological uncertainty, and the competitive volatility. Market uncertainty is the ambiguity about the type and degree of end-user needs that can be fulfilled by a specific technology (Lee et al. 2012). There are five sources which can lead to the high-technology market certainty. The sources include the needs which might be met by the new technology, the possible changes of the needs in the future, the adoption of industry standards or not, the diffusion rate of innovations, and the possible size of the high-technology market. Technological uncertainty means that whether the technology can meet specific needs is unclear. Five factors give rise to technological uncertainty. The factors include the new product function, the delivery timetable, the service quality, and the sustainability issue being raised by the new technology. Competitive volatility refers to both the intensity in the extent of change in the competitive landscape and the uncertainty about competitors and their strategies (Mohr et al. 2009). Competitive volatility is made up of three sources: the new competitors in the future, new competitive tactics, and new products to compete with.

2.3. End-user behaviour towards Mobile Payment

According to Lamb, et al. (2000, p.142), an end-user behaviour is a decision-making process which has to do with how need-satisfying products and services are obtained and used, entailing a decision-making process preceding and determining these actions. Following Rice (1997, p.78), end users are individuals who use and pay for products and services. Two types of end users exist following Schiffman & Kanuk (2000, p.8) which are individual and business end users. Business end-users are those individuals who purchase equipment, products, services, etc. to advance a business while personal consumers buy goods and services for self-use. Following Block & Roering (1979 p.132), the process to obtain and use

commercial products is known as end-user behaviour. End users partake in the decision-making procedure when shopping over the internet or in-store and financial institutions can explore these end users' profile to understand their end users, hence facilitating the elements that impact their purchasing behaviour and the issues faced when transacting over the internet.

Various pre-decided elements influences end-user attitude towards MP and investigators have discovered that motivation, demography and private acceptance of new technologies are part of the main influences. In advanced nations, end user's attitude might be impacted by experience in similar technology, and it has assisted to improve the acceptance rate as a result of prior experience but, this might be a little dissimilar in less-developed nations where technology is still growing.

2.3.1. End-user Acceptance of New Technology

A vital part of this thesis is end-users' acceptance of MP. It is the crucial determinant since end-users make a decision of using or not using new technology. That is why elements affecting end-user acceptance behaviour should be cautiously noted and investigated (Amberg et al., 2003).

It is necessary to know the elements that affect the end user's perception of MP and acceptance.

Past investigations in the terrain of end-user acceptance of MP concentrated on compatibility (Lu et al., 2011); individual mobility (Schierz et al., 2010); subjective/social norms (Shin, 2010); convenience (Hayashi, 2012); perceived benefits/relative advantage and perceived risk (Lu et al., 2011); security and cost (Hayashi, 2012); trust (Shin, 2010); and PEOU and usefulness (Kim et al., 2010).

The investigations of several research workers are summarised accordingly:

MPs could possess a comparatively high end-user acceptance rate if the system on offer possesses security, convenience, ease of use, and is cost-effective to the consumer (Shin, 2010). Despite industry forecasts on the vast opportunities of MPs, it is essential to know what encourages end-users to adopt MP for daily use. As a result of refinement and MP expansion dynamics, its analysis should be done from multiple aspects, to examine system features, individual differences, and behaviour intentions of end-users.

Consumer satisfaction is an essential booster of continued use, but trust is the most critical element to determine the intention of continued consumer use. For comparatively new services, end-users desire security and privacy. The result of the perceived influence of ease of use signifies an application of constant learning by consumers.

Oye et al. (2014) displayed UTAUT's importance towards an anticipated acceptance of ICT by staff in a Nigerian university. The investigation analysed unveiled the need for employing systems that are simple to utilise and facilitate more desirable achievement. The results indicated effort expectancy and SI as the critical predictors and time and technical support as the crucial hindrance towards acceptance and technology use.

In a similar investigation, Martins et al., (2014) designed a research model combining the UTAUT with the perceived risk in explaining BI and Internet Banking Use Behaviour. The cross-examination was carried out with present and past university students in Portugal and deduced on the significance of PE, EE SI and risk factors in predicting Intention.

Similarly, Shafinah et al., (2013) chose investigations and models (TAM, TAM2, UTAUT and C-TAM-TPB) in determining BI with the desire of identifying the important constructs of intention to use mobile technologies. They established that the constructs 'perceived usability' and 'PEOU' were frequently employed in discovering behavioural intentions of

consumers of cellular systems. These variables are also found in the model suggested by Venkatesh et al., (2003).

The conceptual frameworks which attempt in explaining consumer behaviour concerning innovation in technology were employed in new settings and various phases of end-user decision activity.

2.3.2. Mobile Payment Acceptance Literature:

The first example of mobile payments came in 1997 when Coca Cola introduced a reduced number of vending machines, from which the consumer could make a mobile purchase. The consumer would send a text message to the vending machine to set up payment and the machine would then release the item (Dahlberg, Guo, & Ondrus, 2015). Mobile payment studies commenced immediately after the first mobile payment transaction in 1997 (Dahlberg et al., 2015).

The mobile payment definitions refer to some kind of monetary value transfer with three main entities: the mobile service provider, the mobile payment vendor and the mobile technology in use (e.g., 3G network) (Qasim & Abu-Shanab, 2015). For the reason of this study, mobile payment is defined as the ability of a mobile phone user to initiate, authorize, and complete a financial transaction, in which money or funds are transferred over the mobile network, or via the wireless communication technologies to the receiver through the use of a mobile device (Slade et al., 2014).

This definition is relevant for this research as it makes reference to the completion of payments and transactions between three major parties (banks, mobile network service providers and retailers) in a speedy, convenient, safe, and easy way, at any time and anywhere, with the use of a mobile device.

Proximity payments are mobile point-of-sale (mPOS) payments to constitute payments that occur when the consumer is in close proximity to the merchant (GSMA, 2016). In this type of payment, the transaction credentials are saved on the mobile phone and interchanged within a small distance by the use of a barcode scanner or radio frequency identification (RFID) technology (Qasim & Abu-Shanab, 2015).

2.3.3. Prior research mobile payment (MP):

The research area of MP is still in its commencements compared to related areas like mobile commerce, internet banking or mobile banking (Oliveira et al. 2016). Furthermore, the number of researches rose during the last years as between 2007 and 2014, 188 new articles were published (Dahlberg et al. 2015). This indicates to the increasing significance and relevance of MP which corresponding investigators attribute to its potential to change the payment market (Hedman & Henningsson 2015), its success in Asian countries (Miao & Jayakar 2016) and its promising future as a technological novelty (Oliveira et al. 2016).

The prevailing research titles in the area of MP up until today are technology and consumer adoption of MO (Dahlberg et al. 2015).

Several studies (Teo et al. 2005, Zmijewska et al. 2006) have focused on advanced nations and innovation has drawn attention in different works of literature, and this has created various models and theories meant to impact the acceptance of a novelty. These theories have been utilised in multiple studies and are employed in advanced nations. Some innovations researched include m-banking, e-banking, etc. (Gao & Owolabi, 2008). Such investigations are limited in less-developed countries like Nigeria (Adeshina et al., 2010).

Lu et al., (2011) designed an MP acceptance model to explore if Chinese end-users' confidence regarding Internet payment could have an impact on the original trust in

outsourced MP systems. The correlation of these beliefs with positive and negative elements which affect its acceptance forms the decision-making model in the innovation acceptance practice. The investigators established that early confidence influences end-users intention in MP usage. Besides, the research created notable dissimilarities in the size of these impacts between students and workers.

Furthermore, Yang et al., (2012) aimed at identifying the factors of MP and analysed the temporal development of these determinants before and after the acceptance of the service. Holistically, importance was stated on behavioural beliefs, SI and personal characteristics. The investigators surveyed 483 prospective and 156 present MP users in China. In the long run, for likely users, they established the critical impact of the elements investigated, with habit compatibility being the most useful of the behavioural beliefs. For present consumers, the anticipated cost was not crucial in determining behavioural intention, as against the knowledge of other investigators (Martins et al., 2014). Additionally, the 'relative advantage' was the most significant determinant, seconded by perceived risk and compatibility. In summary, the investigators discovered that there is a change in BI all through the phases, before and after acceptance.

Dalhatu et al. (2014) examined mobile payment acceptance by Nigerian retail bank customers by sampling Nigerian students and staff members at the Nigerian High Commission in Malaysia. They included external variables of trust, awareness and technology quality comprising of convenience and security and privacy. In agreement with the result of Tarhini et al. (2015), all the included elements add influence on the usefulness and ease of use of mobile payment. Other purposes emphasised that impacted the acceptance of mobile payment are culture, relative advantage, support knowledge and literacy level (Tarhini et al. 2015). Some of the people interviewed by Tarhini et al. (2015) showed their lack of trust in the bank

and banking staffs (Tarhini et al. 2015). It is common for people to suspect other people when it comes to sharing sensitive information and their money. Agwu indicated that some customers don't trust the bank to resolve their problems within a reasonable time when they face a problem using mobile payment (Agwu 2012). Okeke et al. employed risk as a variable but in the same meaning as trust in the sense that customers think what will happen if anything goes wrong when using mobile payment (Okeke et al. 2015).

2.3.4. An overview of Technology Acceptance Models:

The TAM, TRA, TAM2, TAM3 and UTAUT have been used over the years by several investigators to explain the acceptance technology systems. For this current thesis, these theories have been reviewed to ascertain the best that fits this research.

In a previous study, Sathye (1999) validated a model which may be employed to study Internet banking acceptance; and service awareness and benefit were anticipated as essential elements to determine acceptance. The real diffusion research was done in the early 1990s by Gabriel Tarde (French sociologist) who came up with the real S-shape diffusion curve (University of Twente).

2.3.4.1. Theoretical background:

Regarding IS/IT literature, several frameworks have been developed explaining innovation usage (Venkatesh et al., 2003). Of all these theories, the TAM, recommended by Davis (1989) looks like the most renowned (Chau & Hu, 2001). It can be compared with existing acceptance models to explain a considerable variance value in usage intentions (Venkatesh, 1999). To this end, TAM determinants can also be useful to predict end-user acceptance in different situations.

TAM's usefulness in analysing behavioural intention is appreciated, but the researcher postulates that specific extensions to the theory are vital in explaining behavioural intention to use MP. Suggestions have been raised that TAM is too economical to apply and should be extended by elements related to the particular technology user research (Venkatesh & Davis, 2000). A better understanding of consumer acceptance can be provided by the integration of variables from related theoretical perspectives (Nysveen et al., 2005). Because of this, the investigator considers TAM as the start point of this study, expanding it with additional determinants significant to mobile payment acceptance.

2.3.4.2. ACCEPTANCE AND USE OF TECHNOLOGY EVALUATION MODELS

Presented here is a brief review of theories and model developed and employed to forecast, describe and comprehend personal & organisational acceptance and use of new technology. These theories had progressed for many years and were due to endless attempts at validating and extending models which occurred when each model was introduced.

Information Systems literature is quite rich with a lot of research about individual and organisational acceptance of technology innovations. To be able to explain how end users choose to accept new technologies, there is a need for psychologically based theories. SCT created by Bandura in 1986 presents a psychometric research view that affects people's decision-making processes. The theory is essential in the study of technology acceptance area because it lays the foundation for understanding human behaviour. The theory postulates that human behaviour is established by three elements; personal, behaviour and environmental factors. While other sociologists suggest that behaviour is a result of consequences, SCT assumes that cognitive processes have a prominent role in how one reacts to different situations and circumstances. Recent studies use most of Bandura's principles to estimate the acceptance of new technologies. Such studies are referred to as technology acceptance

models most of whose constructs were integrated into the 32 condensed by Venkatesh et al. (2003).

The progress of technology acceptance is presented in depth with pertinent literature by Moran (2006), that the current study acknowledges their existence and usefulness.

In general, studies of technology acceptance theories and models either emphasise on user acceptance of a technology utilising intention or usage as the dependent construct or focus on project implementation success in organisations. One of the prominent models, UTAUT, was designed by Venkatesh et al. (2003) as a hybrid of 8 user adoption models. Integrated into UTAUT are the TAM, TRA, TPB, Motivational Model, C-TAM-TPB, IDT, MPCU, and SCT. Given the significance of UTAUT in Information systems research, a description of each theory contributing to it follows.

2.3.4.3. Theory of Reasoned Action: Invented in 1967, revised and extended in mid-1970 by Ajzen and Fishbein who suggested that an individual's actual behaviour can be resolved by observing his intention coupled with beliefs that the individual would have for the behaviour (Davis, 1985). The intention that an individual has before the actual behaviour is known as BI of an individual and is an assessment of an individual's intention to execute the behaviour. Following Ajzen & Fishbein (1980), TRA recommends that an individual's BI might be resolved by their attitude towards actual BI coupled with the subjective norm that is linked to the behaviour. The models have been implemented in studying human behaviour and developing suitable interventions in the 1980s. This model is essential as it is useful in explaining and predicting the behaviour and attitude of a person, yet intention elements are not always restricted to the proposal factor (Werner, 2004).

In this model, consumer behaviour is described by three elements which include BI, individual attitude about the behaviour, and a subjective norm. Employing the TRA, Ajzen &

Fishbein (1980) propose that a person's real behaviour is because of their intention to display that behaviour and this intention is a product of the individual's attitude and subjective norms. They described BI as a person's willingness level to display behaviour. Attitude acknowledges the person's perception of the results of showing this behaviour multiplied by the person's evaluation of the results. Subjective Norm is a person's evaluation of what other individuals of importance anticipate and also the person's eagerness in meeting these expectations (Ajzen & Fishbein, 1980).

The TRA framework presumes that the behaviour relies on the person's intention to either carry out or not carry out that behaviour (ibid). The TRA framework has been employed by investigators to conveniently analyse UB by presuming that person's real behaviour is presided over by their investigation of individual's notions, behaviour results and their attitude (Yousafzai et al. 2010). Furthermore, judgements of this model came up as a result of indistinguishable associations between subjective norm and attitude and also the model's presumption that BI led to real behaviour without restrictions (Truong, 2009). These opinions revealed the constraints of this model and analysing these advantages and limits is necessary towards advancing this thesis framework to analyse the function of technology on MP acceptance in Nigeria.

The TRA being a framework has identified several casual factors which proved to impact an individual's intention to execute a behaviour (Venkatesh & Davis 2003). These causal factors represent an asset of this framework since identifying BI and the factors which affect it enables investigators to employ this model to understand the cognitive areas of human behaviour and recognise the aspects which can be focused to affect willing conduct resulting in investigators like Sheppard et al. (1998) showered praises on the model's prediction capabilities and concluded that it could be used in research outside its intended sociological area. Past research has made success by using this framework to understand and predict

behaviour with Olsen et al. (1993) having employed the model to investigate buyer purchasing behaviour and stated that the model's investigation of BI is a near exact determinant of real behaviour. Furthermore, various weaknesses have resulted in this model being revised and changed to consider restrictions recognised from investigation judgement.

With MP acceptance being the required behaviour, this framework proposes that the intention to accept MP result in the acceptance of the technology. Furthermore, literature has shown that MP use is not entirely under the control of the user's intentions; and demographic factors participate in the intention to accept the technology. These elements must be inclusive in the study framework, which intends to explore their impact among MP consumers in Nigeria. The TRA theory is believed to be important when anticipating behaviour (Abbas & Nik, 2010) and its separation of BI and actual behaviour into a series of ideas can be embraced into the model.

2.3.4.4. Technology Acceptance Model: Invented by Davis in 1985. He proposed that users' motivation could be on three elements: Perceived ease of use, perceived usefulness, and attitude towards system usage. Davis suggested that the preparedness of a consumer in using or not using a new system depends on the user's attitude which is impacted on by two beliefs (PU and PEOU). TAM is the most extensively employed and adopted model amongst research workers as a result of its usefulness (Agarwal & Prasad, 1999) and use (Mathieson et al., 2001). TAM has its weaknesses and can't be completely useful in understanding elements affecting user's acceptance (Moon & Kim, 2001). For this reason, suggestions were made of several other extension models. The perceived credibility, financial cost and SE have been embraced relying on literature, as an extended TAM towards investigating and understanding user BI of MP (Luarn and Lin, 2005). Venkatesh et al. made a publication on how acceptance prediction had improved from 17% to 42% (Venkatesh et al., 2003).

TAM's flexibility has led to it being adjudged a significant and extensive tool by various investigators to understand user acceptance of IT (Mathieson et al., 2001). Investigators have put forward external constructs into the model (Venkatesh, 2000) and successfully analyse the impact of these variables on consumer acceptance directions.

Notwithstanding its widespread acceptance and use in technology acceptance research, the TAM model has passed through careful examination by investigators to make its strengths valid and evaluating any restrictions of the model. Lee et al., (2003) is of the argument that even though many research had confirmed TAM's prediction validity, a wide array of research was carried out in controlled settings with sampling groups that may not have presented precise data for analysis and generalisation. Legris et al., (2003) also agree with this assertion by stating that depending on a broad meta-analysis of TAM-linked investigations, most of these investigations have employed controlled sampling groups, who may have subjective motives in presenting data for analysis. This result in a restriction of the TAM model, as such researchers cannot generalise effects to the real world.

Yousafzai et al., (2007) establish additional restriction of TAM, disclosing that its utilisation has been widely focused on investigations of voluntary system use, leading to the non-existence of literature on its operation in settings where system use is semi-compulsory or compulsory. This restriction also affects TAM's true utilisation since firms often need people under their control to utilise the new technology (Lee et al., 2003).

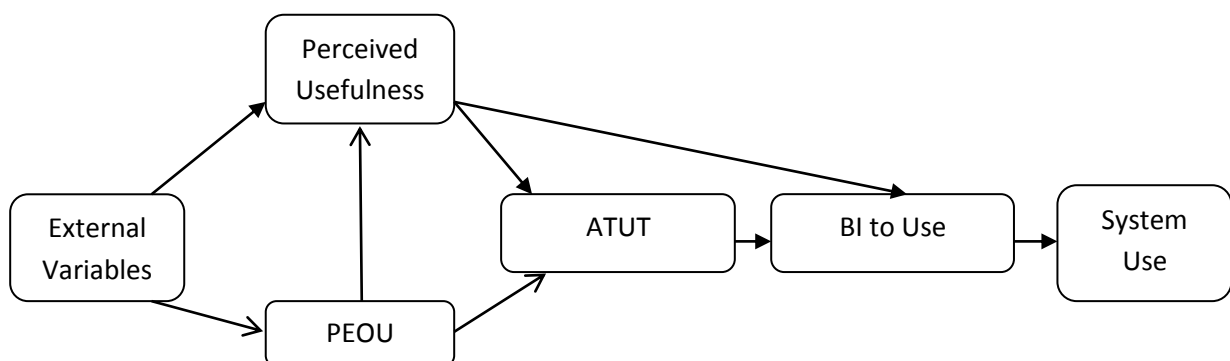


Figure 2.0: TAM model. Source: Davis et al. (1989)

2.4. Motivational Model (MM): Formed and advanced from research on psychology (Davis, et al., 1992). In the MM model, important psychology studies are supporting how motivational model relates to behaviour. Motivation illustrates users' attitude and intention toward accepting an advanced system and Davis et al. (1992) showed that their theory on motivation comprises intrinsic and extrinsic motivational variables to understand the method of selecting, implementing, accepting and using new technology in the area of the information system.

2.4.1. Theory of Planned Behaviour: Due to the constraints found in TRA, Ajzen & Fishbein (1985) proposed and designed TPB by including perceived behavioural control variable to TRA. TPB was employed and validated by many types of research in the prediction of individual intentions and behaviour of technology acceptance. Taylor and Todd (1995b) criticise TPB and TRA that the theories needed the motivation of users to carry out certain behaviour and they stated that this presumption could have issues when examining consumer adoption behaviour. The results indicate that this theory demonstrates between 21% and 37% of the variance in technology adoption and user behaviour. Eagle & Chairken (1993) proposed that other constructs which could forecast behaviour intention from the perspective of TRA theory were not looked into when TPB was introduced. The authors argue that TPB didn't show how individuals should strategise and how strategising relates to TPB.

2.4.2. Decomposed Theory of Planned Behaviour (DTPB): Two separate efforts examine this theory. By including constructs from the IDT perspective (Taylor & Todd, 1995a), DTPB is an improvement of TRA. Variables of DTPB are PU, complexity, compatibility, subjective norm, SE and FC. In their investigation, Taylor & Todd (1995a) intended to analyse how appropriate TRA, TPB, and DTPB are as theories for predicting behavioural intention of consumers.

Using SEM, findings from the exploration indicated that TRA and TPB were able to predict behaviour, but the DTPB was ideal to explain the behaviour. This theory describes between 21% and 25% of the variance in technology acceptance and user behaviour.

The theory underpinning this model was that a person's real behaviour is a product of the four variables (subjective norm, attitude, BI and PBC).

The TPB's basic aim is to forecast and comprehend human behaviour relying on an assessment of the impacts of the four variables (Armitage & Christian, 2003). Furthermore, contrary to the TRA, TPB is an extension of the predictability of its framework past the complete knowledge of BI to also think of behaviour not under the total willing control of the person, by establishing a fourth variable, PBC (Bilic, 2005). The conception of this fourth variable is established on the basis that people will display a particular behaviour depending on the simplicity or toughness of implementation related to the behaviour and presence of enhancing external variables (Ajzen, 1991). The TPB also postulates that if the intention is constant, the implementation of specific behaviour becomes unavoidable (ibid). This presumption hence makes TPB experience some accomplishment in analysis application but also face the same restrictions with TRA.

TPB's implementation has been a success in an investigation in the area of health, technology and social behaviour (Brown and Venkatesh, 2005). Investigators like Armitage and Conner (2001) and Godin and Kok (1996) have established that all three variables can explain 39-42 per cent of the variance in intention to display behaviour. PBC together with BI can explain 24-39 per cent of the variance in actual behaviour. These outcomes have resulted in these investigators, which include, Elliot et al., (2003) and Sheeran et al., (2001) to adjudge this framework as a full model employed in the investigation and understanding of individual behaviour. Furthermore, TPB still maintains the presumption that intention to display a

behaviour will lead to the actual implementation of that behaviour. This presumption has resulted in the evaluation of the model originating from investigation findings where real behaviour failed to be a direct outcome of BI (Taylor & Todd, 2001). Notwithstanding investigators disclosing that the variables of TPB explained significant variance in BI and actual behaviour, there exists a significant part of variance, which the variables of TPB did not explain. Following Sharma et al. (2007), discrepancies still prevail concerning the association between subjective norm and attitude, and TPB does not take into consideration the impact of external variables to determine an individual's behaviour. Not considering external variables restricts TPB's predictability to four variables, which is inadequate in exploration settings, and need an individual's behaviour to be forecasted with a more grounded set of variables (ibid). Taking these restrictions into consideration, TPB could not be employed to investigate consumer acceptance of MP in Nigeria since it does not take into account the impact of other external constructs, such as demographic constructs (Knabe, 2012). A revised investigation has presented the effect of these constructs on technology acceptance and this model's failure to think these constructs makes it inappropriate for this research. Taylor and Todd (2001) emphasise another characteristic of this model, making it inadequate for utilisation in this research into customer acceptance of MP in Nigeria. The distinctive nature of variables like Attitude Towards Behaviour (ATB) makes it hard to analyse the variable practically as it is a variable which is well-examined qualitatively. Taking into consideration that this research is a factual analysis aimed at describing consumer acceptance of MP in Nigeria, TPB is therefore seen as a less than suitable model for execution. Hence, this research developed a model, which considered the impact of these constructs and also adopts some of the advantages of prevailing models, like TRA and TPB's separation of BI and actual behaviour into different variables. Primarily, this led to the advancement of a holistic model, which empirically investigated this research.

2.4.3. Combined Technology Acceptance Model & Theory of Planned Behaviour (C-TAM-TPB): is an integrated theory combining the variables of TPB with PU from the technology acceptance model. Taylor & Todd (1995a) included two elements to TAM: subjective norms and PBC to develop more comprehensive and vital determinants use of information technology. The authors suggest that their model provides enough usage for experienced and non-experienced accounting for some measure of the variance in intentions and user behaviour. In that case, C-TAM may be useful in predicting future usage behaviour even when the person has had no experience, and this implies that the model can be used for the prediction of future usage behaviour for those with or without experience with the technology being studied.

2.4.4. Model of PC Utilisation (MPCU): In 1991, Thompson and others designed the MPCU to predict personal computers (PC) usage. The main variables in MPCU theory are: “affect towards use, complexity, FC, job fit, long-term consequences and social factors”.

2.4.4.1. Innovation Diffusion Theory (IDT): Rogers (2003, p.5), define diffusion as a means to communicate a novelty via definite routes within a definite timeframe between the group of a social system”. Furthermore, Rogers (1995) defined communication as a means of designing and distributing information amongst individuals to achieve a shared understanding. The simplicity of use and newness of innovation can ascertain the method of response to innovation by a person. Certain elements have been noted as an element of a novelty adoption and they include complexity, relative advantage and compatibility. This implies that there will be easy and faster acceptance of novelty with relative advantage, with less complexity and compatibility, by a person. Rogers (1993) considers that relative advantage and compatibility are essential elements when innovation acceptance pattern issues

are discussed and these believe lacked concern for social economic consequences (Zhao, 2008).

2.4.4.2. Social Cognitive Theory (SCT): Invented by Bandura (1986) to analyse human behaviour as highlighted in the introduction part of this chapter. Compeau and Higgins (1999) used it to study computer usage. It entails variables of affect, anxiety, outcome expectancies (performance, and personal) and SE. SCT invented by Bandura in 1986 presents a psychometric research view that affects people's decision-making processes. The theory is crucial in the analysis of technology acceptance area since it lays the foundation for understanding human behaviour. The theory postulates that human behaviour is decided by three elements; personal, behaviour and environmental factors. While other sociologists suggest that behaviour is a result of consequences, SCT assumes that cognitive processes have a big role in how one reacts to different situations and circumstances. Recent studies use most of Bandura's principles in evaluating the acceptance of new technology.

2.4.4.3. Unified Theory of Acceptance and Use of Technology (UTAUT) Model: Ventakesh, et al. (2003) established this theory through the combination of eight (8) distinct models (TAM, TRA, LUT, IDT, TTF, TPB, SCT, MPCU) to give a UTAUT model which focuses on intention and user behaviour. The theory comprised of 4 constructs (PE, EE, SI and FC) influencing users' behavioural intention towards accepting and using new technology, and 4 moderators (gender, age, experience and voluntariness of use).

2.4.4.4. Technology Task Fit: Goodhue and Thompson (1995) established TTF model, that IT has a favourable effect on the performances of a person so long as the new system avails individuals with the essential necessities and the model is useful in measuring user

acceptance of new technology so as to boost their job performance and comprises of three determinants; individual ability utilisation, technology characteristic, and task requirements.

2.5. Lazy User Theory (LUT): established by Tetard & Collan (2009) for the understanding of a user's choice of available services/products. The model focuses on two determinants, first, users make a technology choice which relies on their own needs, and also, they adopt a user-friendly technology.

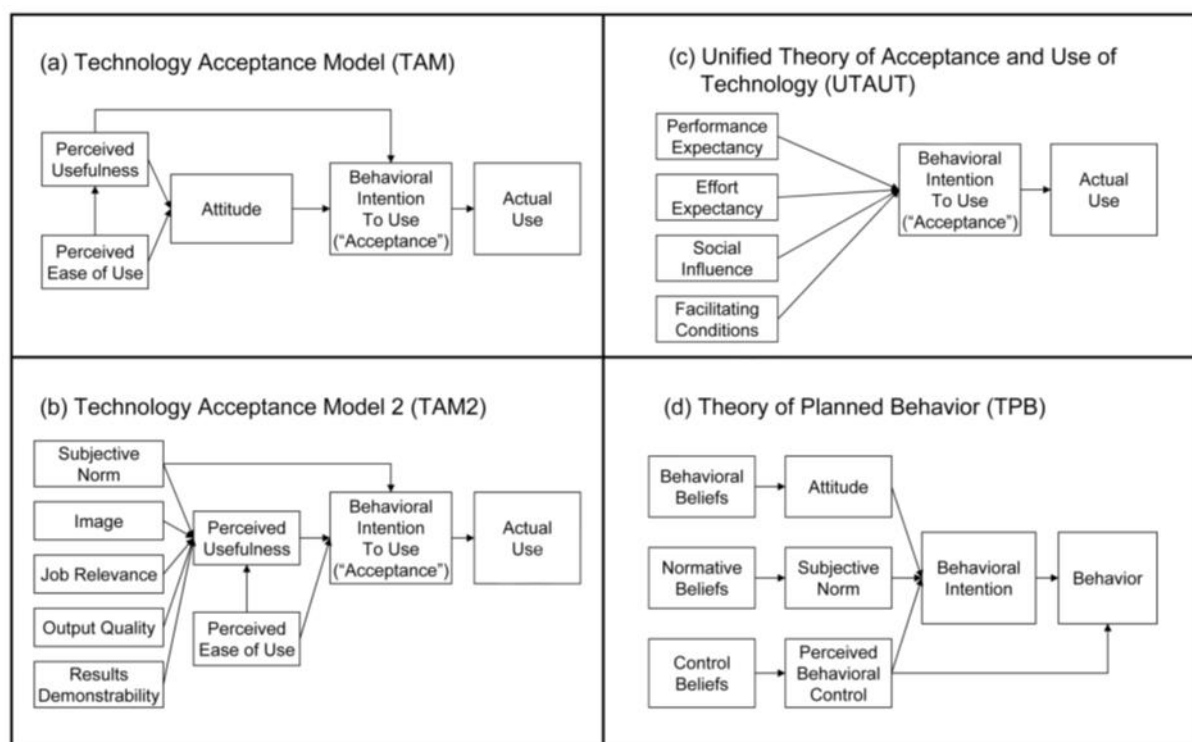


Figure 2.1: Illustrations of (a) TAM, and other models, which includes (b) TAM2, (c) UTAUT), and (d) (TPB). Source: Holden, R and Karsh, B (2010)

2.5.1. COMPARISON OF MAJOR TECHNOLOGY ACCEPTANCE MODELS

Analysis of significant adoption and use models shows some similarities especially in TRA, TAM, TPR, DTPB, C-TAM-TPB and UTAUT in the concept of one's perceptions in determining IT/IS acceptance and use. TAM is simple (Figure 2.1) and convenient in different investigation settings (Davis et al., 1989). TAM compares well with TRA and TPD

in comprehensiveness (Han, 2003). Mathieson et al. (2001) compared TAM with TPD and conclude that TAM appropriately explains the construct of intention. Whereas TPB provides details and shows why technology may not be adopted, TAM offers secure means of generating information about someone's perception of technology. When applying theories, DTPB has more advantages than TAM because not only does DTPB identify certain decisions which can affect the use of IT like TAM, it also provides more elements of subjective norms & PBC which are not in TAM (Ajzen & Brown, 1991). By adding seven more constructs to TAM, DTPB improved the prediction powers of behavioural intent by two per cent (Taylor & Todd, 1995b).

However, when it comes to the prediction of IT/IS usage, TAM is still better than DTPB. TAM is helpful for system design efforts. DTPB theory comprises of design efforts and recognises control and standard efforts. Chau & Hu (2001) compare TAM, TPD and DTPB to understand personal clinicians' telemedicine technology use". Their findings show that TAM justified 40 per cent variance, TPB interpreted 32 per cent, and DTPB interpreted 42 per cent in the doctors' adoption of the technology. PU was notable with attitude and BI in TAM and DTPB theories, PEOU didn't have an effect on PU or attitude in all three models. This finding suggests that tools developed for longitudinal studies with users and managers in business contexts as subjects might be unable to be used when studying people in a professional setting - the case of doctors.

According to Bagozzi (1992), if all statistical analysis and interpretation means are the same, the best acceptance and use model is the one that is simple to use. Some authors argue that compactness is not required but is only desirable to the scope of enabling the mastery of a phenomenon (Venkatesh et al., 2003). The 8 sample models studied by (Ibid), justified a range of 17% to 37% variance in user intention to use a system. The variance interpreted in TAM2 and the original TAM theories rose from 35% to 53% and 52% respectively when

gender was included. For studies in the developed world, Venkatesh et al. (2003) UTAUT theory is comprehensive enough, and above all, they provide an instrument for predicting prospects of either success or failure of an introduced technology.

2.5.2. Research Employing the UTAUT Model

With the vast number of references in research activities right from the design of UTAUT model, an examination of these was carried out by Williams et al., (2011) attempting to know its motives, use, and modifications of the theory. Additionally, he analysed different use and theoretical developments. 870 cited articles were recognised in academic journals, where 450 of them were obtained.

The investigation by (Ibid) shows the use of several independent constraints in line with UTAUT variables in various chosen types of research. With regards to UTAUT use, the investigators established that:

- Most publications that mentioned the model did so to enhance an altercation and not to use it productively;
- Many types of research employed it partly, at times using only some of the variables;
- A limited number of articles used all variables, but without the need to consider the moderating factors;
- There is a pattern of a growing use of constructs and external theories in line with UTAUT to describe acceptance and use of technologies.

These findings enhance UTAUT's model adaptation to show the association between relevant elements preceding the intention to accept and use MP for a group of Nigerian consumers of mobile payment.

Li & Kishore (2006) performed an invariance test of UTAUT instrument of the new measurement scale with a quest of testing whether the main UTAUT model variables were non-variant across various population subgroups. The focus of their investigation was Weblog users. Therefore, the dissimilarity in subcategories is reliant on demographic features such as user's gender, computer knowledge, particular Weblog-related knowledge, Weblogs experience, and Weblogs usage frequency. Relying on past literature, they hypothesised that UTAUT's four main variables would remain non-variant across the gender categories, low/high computer experience users, users who have/who don't have specific Weblog experience, and those who have low/high-frequency Weblogs use.

Data analysis comprises of 3 phases. The first was to divide the data depending on the five demographic patterns into two reasonably equal categories for each pattern. With goodness to fit test index (0.09), the next phase comprised of equivalent-item-factor loadings measurement over two categories under each pattern. The third phase consists of full-equivalence test for each measure.

The investigations showed that those having varied knowledge in computer and Weblog use possess similar interpretations of PE and EE instruments. Furthermore, SI is not explained in the same manner amongst those having a high/low frequency of Weblog use; nor is the scores of FC instrument compared to users with various stages of weblog experience and frequency use from a statistical importance context, but they can be compared with computing and Weblog knowledge. Furthermore, the investigators asserted that this statistical importance is not an indication that the difference in exact score between these subcategories is high in size. Gender analytical outcomes indicated that EE and FC instruments could be compared, but not the same for PE and SI instruments.

The authors suggested carefulness during the interpretation of the findings because the instrument relating to the UTAUT variable possesses non-variant exact scores across most subcategories in the acceptance of Weblog services. They also showed the need for more non-variant investigation about UTAUT variables that weren't found to be invariant in their research (Ibid).

Wang & Yang (2005) expanded UTAUT to align with their investigation of online stocking, by including personal trait variable. They addressed this expansion in 2 styles by investigating the part of personal traits as indirect or intermediary. In their study layout, the personality traits were hypothesised to influence intention to accept online stocking indirectly through UTAUT variables in the first model and the second model to moderate the influence of UTAUT variables on intention to accept. The other moderating factors were eliminated for simplicity reason, except Internet experience.

The result indicated that the variance justified in the investigation was very low in comparison with the moderating effect which was 60% and this suggests that personality traits perform more significant functions as moderating factors than external constructs. The authors suggested that future study may reconsider original UTAUT moderating effects to boost the model (Ibid).

UTAUT was in explaining advanced mobile services on a personal level and mass use perspective. The Carlsson, et al. (2006) aim was in examining the elements which affect the intention to use mobile devices/services. The influence of attitude toward using mobile device and anxiety on the BI of mobile services was investigated together with the original paths in the model.

The findings indicated that PE and EE positively influence intention to use mobile services and such an influence was depleted when 'attitude' variable was included in the model,

suggesting that attitude justifies part of the intention to use a mobile service. SI also had a crucial favourable influence on intention; moreover, the impact was unsustainable in all models studied.

Anxiety did not possess direct influence on intention, but instead, other constructs like PE and SI mediated the impact. Attitude didn't maintain direct influence on intention which verifies the model presumption that with EE and PE, the 'attitude variable' wouldn't support a direct impact on intention.

Furthermore, in the analysis of the actual use of 3 separate cellular services, intention to use possessed a critical favourable effect on the use of the investigated services but on adjusting the model for other constructs (EE, PE, FC, anxiety, and attitude), the influence of intention ceased to exist. The investigators asserted that these findings indicated the role performed by these constructs towards affecting behaviour intention to use mobile services. With regression analysis applied, the results showed, for all events investigated, that introducing BI in the model would reduce the influence of independent constructs on mobile services usage.

The investigators recognise that the findings obtained didn't agree in all instances with the original UTAUT assumptions. Hence, their first preserve on the use of UTAUT to analyse both behaviour intention of mobile service use in a non-synchronous way was established. The investigators asserted the purpose of modifying or extending the model employed in accounting for the dissimilarities in the acceptance behaviour of mobile services (Carlsson et al., 2006).

Knutsen (2005) applied UTAUT's subset to find out the association amongst expectations linked with the performance, efforts required and how these variables influence attitudes toward new mobile service.

The study layout comprises PE and EE, age as a precursor to UTAUT variables, and attitude succeeding the two variables. Furthermore, EE was hypothesised to affect PE.

Data collection was done, and the empirical result justified the association between PE-EE and attitude and also between EE-PE. Findings also demonstrated that PE and EE are active elements of attitude toward new mobile service. Increased age was discovered to be in connection with reduced levels of expected ease with new mobile service.

Also, age happened to influence PE positively which indicates that older people have more anticipations towards new mobile service (Ibid).

Research leaders (Venkatesh et al. 2003, Dahlberg et al., 2015) obtained UTAUT in the technology acceptance field. The theory was derived depending on the sameness of ideas amongst eight ruling theories in the domain. Following its writers, UTAUT is a defined theory synthesising what is known and develops progressive theory while maintaining a simple and economical design. Though established investigations that adopted this theory are rare, it doesn't reduce the strength of this theory in comparison to other models.

2.5.3. Technology Acceptance Models

Past explanations of each theory indicated its evolution with documentation of how the first three theories were expanded when investigations recognised restrictions. TRA was broadened into TPB and then broadened into DTPB, playing an intermediary function in the expansion setting because it groups TPB and another expansion to TRA: TAM and IDT. The other theories can be linked to the Psychology field, which describes the display of constructs like 'social pressure', 'SE', and 'affect' in other theories employed in explaining technology acceptance field.

The familiar elements amongst the technology models are shown in Table 2.0

Model	Determinants of Behaviour
TRA	individuals' ideas, ATB and SI
TPB	ATB, subjective norms and PBC
DTPB	attitude decomposed to relative advantage (PU), complexity (ease of use) and compatibility, subjective norms and PBC decomposed to SE and FC (Taylor and Todd, 1995a and 1995 b)
TAM	PU + PEOU
IDT	innovation attributes and innovators' characteristics
SCT	SE, Outcome expectations and Affect (Venkatesh, 1999)
MM	intrinsic motivation (enjoyment and fun), perceived benefits (PU) and external pressure, i.e., social pressure (Igbarial, 1996)
MPCU	Peoples' beliefs, affect, social norms, perceived consequences, habit and FC.
UTAUT	EE, PE, SI, and FC

Table 2.0: Behaviour elements in technology acceptance models. Source: Holden, R and Karsh, B (2010)

In summary, the list below simplifies the comparisons/contrasts and strengths/restrictions of each of the formerly explained models

1. TAM and IDT are different from SCT; TAM proposed that positive result projections would support the use of computer system (yet TAM did not indicate how such projections would affect behaviour). TAM and IDT approach relies on beliefs about the results of system usage. SCT acknowledges that beliefs about findings may be insufficient to encourage behaviour. In this case, SCT and TPB have some things in common.

2. SCT and TPB included beliefs which could affect behaviour. SCT contributed to the SE concept while TPB included perceived behavioural control as an independent construct affecting behaviour. The construct was broken down to SE and FC by Taylor & Todd (1995a & 1995 b). The SE was from Banduras' SCT model, and FC was obtained from Triandis' model.

3. TAM, IDT and TPB have some things in common; they share a one-dimensional perspective of the original causal relationship between the variables and the belief that the setting affects cognitive beliefs, which at the same time affect attitude and behaviour. SCT also recognises the mutual interactions amongst setting, personal factors (cognitive perceptions) and behaviour.

Hence, an individual's understanding of his self-efficacy can be seen as a cause and effect.

4. MPCU shares the same feature with TAM and TRA, the willing control to explain and predict behaviour, even though Triandis' model suggested that the willingness level happens to fall as the level of habit (in carrying out the behaviour) rises.

5. Triandis (1980) and Bandura (1986) both argue to separate cognitive and affective elements of attitudinal beliefs.

6. Intrinsic motivation in the MM model is the same as variables of enjoyment and anxiety.

2.5.4. Definitions of Some Constructs in this research context:

Attitude: Personal thoughts (positively or negatively) about carrying out the target behaviour.

Behaviour Intention (BI): The extent whereby an individual possesses prepared conscious ideas to execute or not to implement specific particular future behaviour.

Culture: Culture has an essential influence on the acceptance of advanced technology (Levy, 2007). Straub et al. (2002) understood culture as values transferable and shared between inhabitants in a particular human society which affects human attitude and behaviour.

Effort expectancy (EE): is the extent of convenience linked to customers' technology use

Facilitating condition (FC): means customer understanding of the resources and support accessible to execute a behaviour (Venkatesh et al., 2012).

Performance expectancy (PE): is the extent whereby technology usage will be beneficial to consumers in carrying out specific activities

Perceived Ease of Use (PEOU): As defined in EE.

Perceived Usefulness (PU): As defined in PE.

Perception of external control: As defined in facilitating conditions.

Social influence (SI): Is the extent to which customers understand that friends, parents, and relatives admit they should accept and use mobile service (Venkatesh et al. 2003 cited in Lwoga and Lwoga 2017, p.4).

Voluntariness: The extent whereby potential end-users perceive the decision to accept technology is optional.

2.5.4.1. Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT model has drawn investigators' attention having been employed to study user acceptance of mobile technologies (Yu, 2012), having been experimented and employed in various technologies, from both individual and organizational use, within single or multiple nations. Apart from presenting a very good and accurate model for acceptance and use of technology, UTAUT has some limitations (Negahban & Chung, 2014). Attempting to ameliorate these issues, Venkatesh et al. (2012) extended and adapted the UTAUT2 model to the individual perspective. Compared to its predecessor, UTAUT2 yields substantial improvement in the variance explained in behavioural intention and technology use (Venkatesh et al., 2012). UTAUT2 combined with other known theories like DOI (Rogers, 2003), trust and risk (Bélanger & Carter, 2008), and culture (Hofstede, 1980), are employed in this research.

UTAUT framework integrates eight separate models (TRA, TAM, MM, TPB, C – TAM – TPB, MPCU, IDT and SCT) to establish an integrated framework emphasising on consumers' behavioural intention towards accepting new technology (Venkatesh et al. 2003), as stated before. Venkatesh et al. (2003) illustrated that having evaluated and consolidated the eight separate frameworks, they discovered seven factors impacting behavioural intentions, and these are PE, EE, SI, FC, ATUT (Attitude Towards the Use of Technology), Anxiety and SE (Self Efficacy).

Further, four moderators (age, gender, experience and voluntariness of use) were recognised for impacting significant effects. Ventakesh, et al. (2003) studied the framework and found out that there were variables (PE, EE, and SI) that had a crucial influence on user behaviour through behaviour intentions. FC positively affected 'use behaviour'. Nonetheless, the other three variables had no significant impact on behaviour intentions or use behaviour (Ibid). Ventakesh, et al. (2003) established their results that ATUT was relevant only in respect of certain reasoning which relates to PE and EE. Therefore, ATUT affects intentions and user behaviour through PE and EE. Otherwise, SE and anxiety have no direct variables since they are theoretical from EE as PEOU. Therefore, Venkatesh et al. (2003) developed UTAUT.

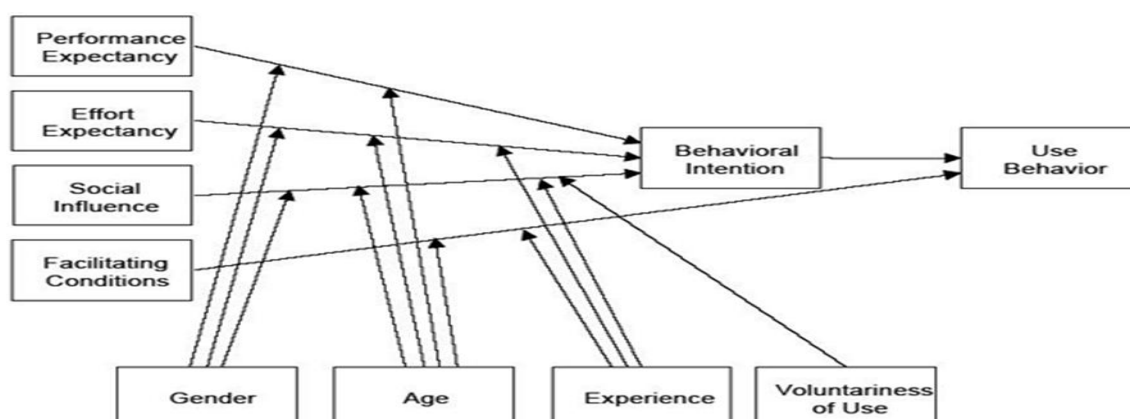


Figure 2.2: Original UTAUT Model (Venkatesh et al. 2003)

To comprehend the UTAUT framework's contents and features, Venkatesh et al. (2003) defined the framework's variables and moderating factors below:

Performance Expectancy is the degree to which technology usage will be beneficial to customers in carrying out specific actions (Venkatesh et al 2003 cited Khalilzadeh, Ozturk and Bilgihan 2017, p.462). The consumer's perception that using mobile payment will assist to attain gains in performing payment activities may, therefore, impact the behavioural intention to accept mobile payment. Moreover, Yeow et al. (2008) resolved that people accept technology (m-payments) when they are aware of its importance & relative advantage. Hennington & Janz (2007) asserted that PE comprised of five (5) related variables as depicted below.

Table 2.1: Root constructs of Performance Expectancy		
Performance Expectancy	Root Variables	Models
	PU	TAM
	Extrinsic Motivation	MM
	Job-fit	MPCU
	Relative Advantage	IDT
	Outcome Expectations	SCT

Lastly, Yousafzai & Yani-de-Soriano (2012) researched the association between PE and BI moderated by age and gender; and discovered that younger persons were usually more cognisance of the importance of new technology.

Effort Expectancy is the extent of ease related to consumers' technology use (Venkatesh et al., 2012). Following Miltgen et al. (2013), it gives rise to an accurate prediction of intention to accept new technology. When consumers feel that mobile payment is simple to use and doesn't need much effort, they have greater expectations toward achieving the required performance (Venkatesh et al., 2003). Hennington & Janz (2007) described that EE is

represented by three associated variables: PEOU (TAM), complexity (MPCU), and ease of use (IDT). Furthermore, each of these variables has an impact on technology acceptance, mostly at initial stages of acceptance. Also, gender, age and experience moderated the association between EE and BI (Venkatesh et al., 2003). EE was more crucial for older females and users with little experience (Yousafzai & Yani-de-Soriano, 2012).

Social Influence is the degree to which consumers recognise that friends, parents, and relatives believe in the acceptance of cellular service (Venkatesh et al. 2003 cited in Lwoga and Lwoga 2017, p.4). Hennington & Janz (2007) described that SI is represented by three associated variables: subjective norms (TAM2, TPB, DTPB and C-TAM-TPB), social factors (MPCU) and image (IDT). Also, four main moderating factors modified the relation between SI and behaviour intentions as older females and less-experienced people knew more of other people's judgements, and SI variables appear unimportant in optional perspectives (Venkatesh et al., 2003).

Facilitating Conditions (FC): describes customers' recognition of the resource and support accessible in performing a behaviour (Venkatesh et al. 2012). If an operational infrastructure occurs and supports the use of mobile payment, the behavioural intention to accept mobile payment will grow. Hennington & Janz (2007) stressed that FC was obtained from 3 associated variables: PBC (TRA, TPB, and C-TAM-TP), FC (MPCU), and compatibility (IDT). Likewise, two moderating factors (age and experience) modified the relation between FC and user behaviour, since the need of FC were found to be very significant for older and less-experienced persons in the initial phases of accepting a technology (Venkatesh et al., 2003).

Behaviour Intentions: before the choice of using and accepting a technology, people should have a definite intention for new technology (Venkatesh et al., 2003). As an illustration,

customers should be conversant with the new system: how it operates; what advantages users will achieve the new technology qualities; what other individuals feel about this new technology. Currently, measures should be embarked upon by customers whether to welcome or refuse the new technology, which decides future usage (Wang et al., 2006).

Framework Moderating Factors: Venkatesh et al. (2003) recognised four moderating factors affecting the interrelationship between the framework variables and end user's BI.

Modifying UTAUT's framework

UTAUT framework development stemmed from the USA, an advanced nation, as one of the most extensive, in-depth and vital technology acceptance framework which has an implementation in a variety of science areas (Hennington & Janz, 2007). It is probably to modify this framework if it is to be implemented in a developing nation like Nigeria. This chapter reviews UTAUT variables and takes into consideration the likelihood of including or removing variables to create a coherent conceptual framework identifying the main determinants affecting m-payment acceptance in Nigeria.

Reviews of UTAUT Variables:

From past statements, UTAUT framework comprises four variables and moderating elements. The constructs and moderating elements were analysed below.

UTAUT Moderating Factors:

The original TAM didn't contain any moderators, and several investigations proposed integrating these moderating effects to comprise of experience, voluntariness, gender and age into it, to better predict and explain user behaviour for a specific system.

Based on the study of the four moderating factors, 'experience' moderating factor was eliminated because it was employed in other settings as a substitute for a user's experience of

technology. Nevertheless, this isn't suitable in the Nigeria setting. Development of computing skills and internet application now exist with enhanced information technology infrastructure together with accessible computing facilities in Nigeria. If the 'experience' moderating factor were employed, it wouldn't be regarded as a real indication of the user's experience as their experience is determined by the nation's standard of education and information technology infrastructure. Furthermore, if the 'experience' moderating factor were employed, there would be two defined categories which would be those before the changing of the education system and the improvement of information technology infrastructure, and those after the implementation of those changes. Consequently, if 'educational level' were employed as a moderating factor, the current reform in education and information technology infrastructure would reflect well in the final framework.

However, Nafziger (2006) described the educational level as having a significant effect on technology acceptance, since persons with high education are more foreseeable in accepting and using new technology compared to persons with low education. Moreover, it appears that 'gender', 'age' and 'education level' moderating factors are linked to the individual user. Therefore, these three moderating factors are grouped as a common moderating factor termed 'individual moderator'.

Experience and Voluntariness

Use of a specific technology being optional is an assumption of TAM (Davis 1989). An investigation by Agarwal and Prasad (1997) indicated that perceived voluntariness was essential to explain present use, but didn't affect intention to continue use. In TAM2 (Venkatesh & Davis 2000), voluntariness was proposed as a significant moderating factor, a control construct which influences a customer's internal beliefs, attitude and intentions concerning technology. The results indicated that both experience and voluntariness moderated impacts of social norms on BI.

Experienced and Inexperienced Users

Previous experience was discovered to be a significant factor in behaviour (Ajzen & Fishbein 1980). However, the past experience might make small probability events more critical, confirming their consideration when intentions are formed (Ibid) which means that IT use may be more functionally designed for experienced customers. It becomes necessary for assessing the use of models like C-TAM-TPB to understand the behaviour of inexperienced customers. More fundamentally, there may be dissimilarities between experienced and inexperienced users in the relative impact of the several constructs of IT use. Such contrasts may propose different means to control the growth and execution of new technologies functionally. Direct experience will lead to a powerful, more balanced BI association (Ibid). For experienced customers, BI is meant to resolve the association between PBC and behaviour completely, and PU and attitude has a substantial impact on BI and consequent behaviour for experienced customers. By comparison, for inexperienced users without previous knowledge of assessing control determinants, PBC may have a direct impact on behaviour because it is this experience that makes the impact of control determinants recognisable (Taylor & Todd 1995a). The effect of subjective norm on intention is meant to be powerful for promising customers without previous experience as they are more possibly to depend on the responses of others to form their intention (Hartwick & Barki 1994).

These determinants might have separate impacts based on experience. There existed a powerful interrelationship between BI and behaviour for the experienced customers which might be because experienced consumers use the insight derived from their previous experiences to form their intention (Ajzen & Fishbein 1975). PU was the more robust predicting construct of intention for the new category. By comparison, experienced users put little effort on PU but stressed that PBC and BI completely resolved the association between PBC and behaviour. Furthermore, for inexperienced customers, the intention was better

forecasted by the other constructs that were the intentions of experienced consumers which may be because to communicate information to inexperienced customers can have a substantial impact on intention but that this intention won't change entirely to behaviour. The reason may be because of their need to access the various antecedents of intention. Additionally, PBC had little influence on intention but had a meaningful impact on behaviour. This PBC proposed that inexperienced consumers are disposed of giving little deliberation to control information in the creation of intention, but depending on their accounts mainly on PU (Taylor & Todd 1995a)

Expectation Gap

Following Taylor and Todd (1995a), an expectation gap is distinct between BI and behaviour. For experienced customers, the route from intention to behaviour was powerful than the inexperienced customers' route. It may be proposed that experience could close the expectation gap. It is significant to discover how we could deduce a means of closing the gap. This gap occurs due to non-realistic user expectations and has been proposed as a vital determinant of systems execution failure (Szajna & Scamell 1993). Expectations are created when the costs and advantages of employing a technology are evaluated. The creation of realistic expectation requires the control factors to be considered (Sheppard et al., 1988). Inexperienced users might not sufficiently think about specific control data in creating their expectations. Since they undervalue costs, they rather concentrated majorly on the PU or promising advantages of system use. A means of closing the expectation gap for inexperienced users requires the need to communicate to users the factors that encourage or discourage "system use" together with the benefits of the system and to ensure that both are sufficiently considered.

Age and Gender

Gender influences attitude, subjective norm, and PBC. It's been discovered that attitude was crucial for men, but both subjective norm and PBC were essential for women in initial phases of experience (Venkatesh et al., 2000). However, age was discovered to have an impact on attitude, subjective norm, and PBC. "Attitude" was important for younger workers while PBC was crucial for older workers. Subjective norm was essential to older women (Venkatesh & Morris 2000).

Both gender and age were discovered to have an impact on the determinants toward behaviour. For example, the impacts of PE, EE, and SI were moderated by gender and age following the results of Venketesh et al. (2003).

Culture

Culture could influence a person's decision to accept specific technology (Myers & Tan 2002). Gender, which is a basic part of a culture, was discovered to impact on IT acceptance (Gefen & Straub 1997). Moreover, TAM was found to exist in the US and Switzerland alone which signifies that TAM might not forecast system use over all cultures globally (Ibid). That is to say; this finding is a sample of culture that influences IT acceptance.

Gender, age, experience, voluntariness, and culture were moderating factors as established in prior studies and were discovered to influence the impact of core variables toward behaviour. Depending on this rigid prove, it is essential for this study to explore the influence of these moderating factors on the effect of the factors toward behaviour, to create a model that better explains BI.

Performance Expectancy:

Investigating PE's root variables as indicated in Figure 2.3, it might be asserted that they comprise variables associated with industry staff and end-user performance. Therefore, since this research focuses on end-users' acceptance of MP, the job-fit root variable dealing with staff performance was eliminated.

Further to what was stated by Venkatesh et al. (2003) as regards gender and age moderating factors, Robinson (2006) asserted that gender doesn't moderate the association between PE and user's intention since no proof exists of any critical impact. Subsequently, Abu-Shanab and Pearson (2007) established the results of Venkatesh et al. (2003) and revealed that gender impacts the association between PE and user's BI of using a new system. Also, Compton et al. (2002) described that 'education level' moderated the association between PE and behaviour intention, since people with high education were more conscious of the value of technology. Therefore, 'education level' took the place of experience as a moderating factor as well as age and gender in this analysis. Figure 2.3 indicates *PE* root variables.

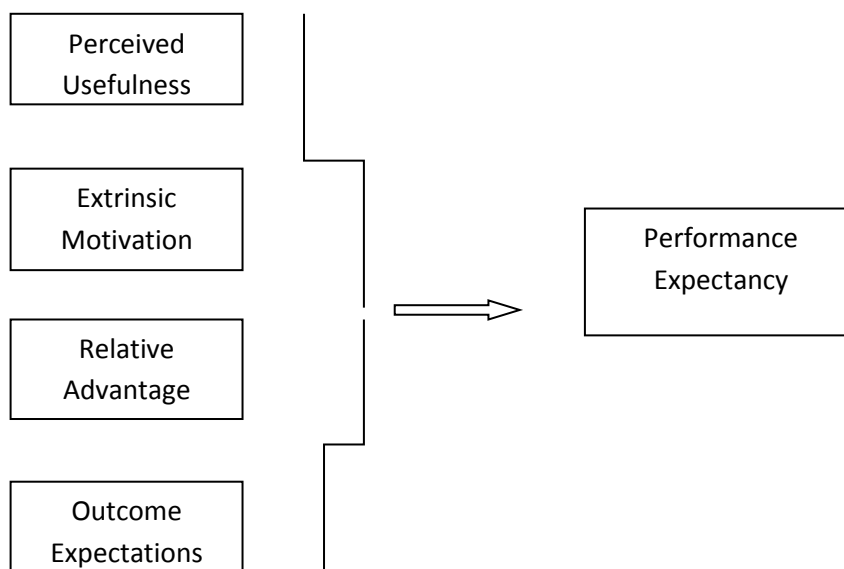


Figure 2.3: Performance Expectancy root variables

Effort Expectancy (EE):

Investigating the three root variables (PEOU, complexity and ease of use) of EE as indicated in Figure 2.4, Venkatesh et al. (2003) explained that EE variable is vital in optional and compulsory use settings, mostly in the initial stages of technology acceptance. Further to (Ibid) ‘gender’ and ‘age’ moderating factors, ‘education level’ impacts the association between EE and behaviour intention, as people with high education are more ready in accepting and using new technology in comparison to users with little education (Al-Gahtani et al., 2007).

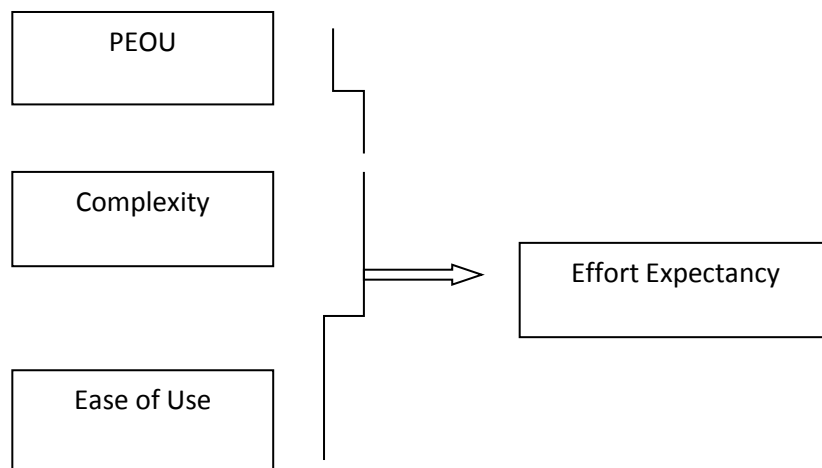


Figure 2.4: Effort Expectancy root variables.

The researcher redesigned the original UTAUT framework and replaced the independent construct “EE” with “**Relevance**”. Following Thong et al. (2004), Relevance in this context means ‘the extent whereby one feels that the initiated technology is essential in MP performance’. Researchers supporting this variable’s significance in other settings comprise Saracevic (2004).

Social Influence (SI):

An evaluation of SI variable appears that social influence is a subset of cultural impact. Therefore, to research this variable in-depth, SI variable was substituted with the “**culture**”

variable so as arrive at a detailed conceptual model of MP acceptance in Nigeria. To this end, various investigators evidenced that ‘culture’ possess an important effect on acceptance and usage of developed technology (Levy, 2007).

Culture appears to be an abstract bond which influences and control individuals that are living together. Moreover, it describes the way people associate with every religion, persuasions, principle, arts, belief and literature (Lee et al., 2007). Furthermore, it is significant because the unique identity of a person is accorded (Leung et al., 2005).

Therefore, it is a vital element for technology acceptance to succeed or fail. Tan et al. (1998) recognised that a few investigators had analysed the effect of culture on accepting IS. Twati & Gammack (2006) identified that several investigators explained that the primary cause of failure to accept a new system was because of a non-consideration of cultural influences. Furthermore, Levy (2007) explained that the successful acceptance of new technology in a specific culture might not indeed succeed in another. In respect of the culture effect in financial analyses, Megicks et al. (2005) also recognised that it was a vital construct in association with accepting innovative commercial products. Al-Sajjan & Dennis (2010) described that culture impacted MP acceptance.

Investigating the influence of culture on MP acceptance, Nelson & Quick (2003) restated Hofstede’s (1980) dimensions of culture:

Power Distance

Individualism

Uncertainty Avoidance

Masculinity

This section studied these dimensions of culture in detail since it appears that culture is a primary element impacting on MP acceptance, mainly in developing nations’ societies.

Power Distance is the extent whereby a specific culture welcomes ranking and uneven power distribution (Khatri, 2009). Groups, like nations, presume and admit that power is unevenly assigned to members of society, for instance, power distance in a family shift from parents to children. Furthermore, Chan and Cheung (2008) illustrated that in power distance communities, typical individuals are afraid of disagreeing with those that make decisions, while, in less powerful nations, they feel free not to agree. In less power distance communities, the leaders are usually ready to hear from the public before they make a judgement.

Individualism: In individualist cultures, individuals are part of a loose social model, while focusing on their rights and needs; their primary objective is for self and family (Avery et al., 2008). Muk (2007) consented to this and described that in this culture, individuals are very anxious with one another and the relations between individuals are not healthy, as people are inspired by assurance and accomplishment of their own goals. Ren & Gray (2009) described that individual cultures might be grouped based on attitudes as people decide alone, whereas collectivist cultures can be grouped based on norms, on the premise that society representatives determine individual's decisions.

Collectivist community representatives are unconcerned entirely with themselves. Inhabitants in this community, share, co-operate and trust in group agreement. Furthermore, the relations between individuals in these cultures are dominant. The broad society accepts all their resolutions, and thus, any decision manifests on the general society in the locality (Martinsons et al., 2009). Communities are grouped based on the relations level between representatives as 'tightness' or 'looseness'. Thus, it could be observed that advanced nations can be arranged as individualist cultures since individuals usually dwell as part of a small family and decide on their own, while under-developed nations are arranged as a collectivist

culture because individuals reside in prominent societies, and they choose in groups reflecting it on all society members.

Uncertainty Avoidance evaluates communities where ambiguity and unknown issues are tolerated (Martinsons et al., 2009). Hofstede & Hofstede (2005) observed that uncertainty avoidance relies on community representatives appearing appropriate or inappropriate. On the contrary, Chan & Cheung (2008) highlighted that people in low uncertainty avoidance communities are more open-minded of fresh and separate ideas, like new technology, and they show less worry with uncertainty. In low uncertainty avoidance nations, individuals are fairly relaxed and not reluctant to taking risks (Hofstede, 2014), and are thus more likely to try something new or accept an IT technology (Png & Tan, 2001). Thus, inhabitants of low uncertainty avoidance communities are more ready for the acceptance and usage of new technology, because they are ready to take more significant risks. At the same time, inhabitants in high uncertainty avoidance societies see the usage of new technology irritating (Downey et al., 2005). Hofstede & Hofstede (2005) differentiated between uncertainty avoidance and risk avoidance stressing that risk avoidance is the chance that an unusual episode may take place at any period.

Masculinity is the extent of displaying an assertive and materialistic behaviour in a specific society (Martinsons et al., 2009). Avery et al. (2008) stressed that Hofstede noticed that people in separate nations and cultures have varying self-confidence level. Thus, cultures with high masculinity are full of self-pride, because of the different consideration of principles and treatments between males and females (Hofstede, 2001). Moreover, Chan & Cheung (2008) proposed that in high masculinity nations, men don't show care and they have to show assertiveness and ambition, whereas women are expected to care tenderly. Conversely, in feminine cultures, gender positions overlap where there is equality in status between males and females. Therefore, in these nations, there is no difference between men

and women, since both have similar roles (Nelson & Quick, 2003). Thus, Hofstede (2009) investigated the strength of cultural dimensions in Asia continent as shown in Figure 2.5. He discovered that Asia nations possess:

Large Power Distance

Collectivist Culture

High Uncertainty Avoidance

Masculinity Culture

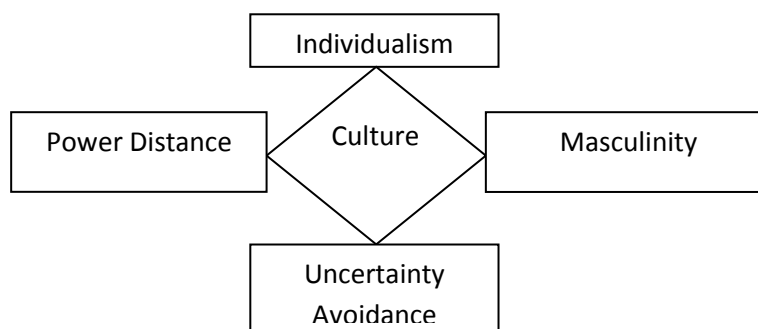


Figure 2.5: Root variables of Culture

Venkatesh et al. (2003) discovered that there are four significant moderating factors moderating the relation between SI (now substituted with culture) and BI. It was discovered that older people and females have more awareness of the thinking of others. Together with the gender and age moderating factors, Chanasuc & Praneetopolgrang (2008) explained that ‘education level’ moderated the relation between ‘culture’ and ‘BI’, on the reason that culture influence precisely on those who are deemed as individuals with low education. Lastly, culture variables happen to be unimportant in optional settings (Venkatesh et al., 2003).

Facilitating Condition (FC):

FC in UTAUT framework can be thought of as the only variable, in theory, making a direct contribution to “user behaviour” rather than “BI”. Venkatesh et al., (2003) explained that no exact impact between FC and behaviour intention exist. Furthermore, FC becomes unimportant in predicting behaviour intention when both PE and EE variables exist. Friertag

& Berg (2008) asserted that FC influences behavioural intention towards accepting and using new technology, despite the existence of PE and EE.

Ventakesh (1999) discovered that FC and external control assisted as foundations that users apply to investigate PEOU about IT. Support such as ‘FC’ and ‘external control’ were robust variables of PEOU. Of recent, Ngai, et al. (2007) expanded TAM by including ‘technical support’ as an independent construct in studying Web Course Tool. Thus, the investigator amends FC and substitutes it with ‘**technical support**’.

Also, the specific moderating factor influences the relation between FC and behaviour intention. Friertag and Berg (2008) clarified that younger people are more ready in accepting and using new system than older people with no help. Dundell & Haag (2002) highlighted that females were usually seen asking for help when using a new system. Additionally, Pare & Elam (1995) explained that ‘education’ influences the relation between ‘FC’ and ‘behaviour intention’, as less well-educated people were keen in accepting and using developed technology with no help. Thus, this research evaluated the impact of age, gender and **education level** moderating factors on the relation between FC and behaviour intention.

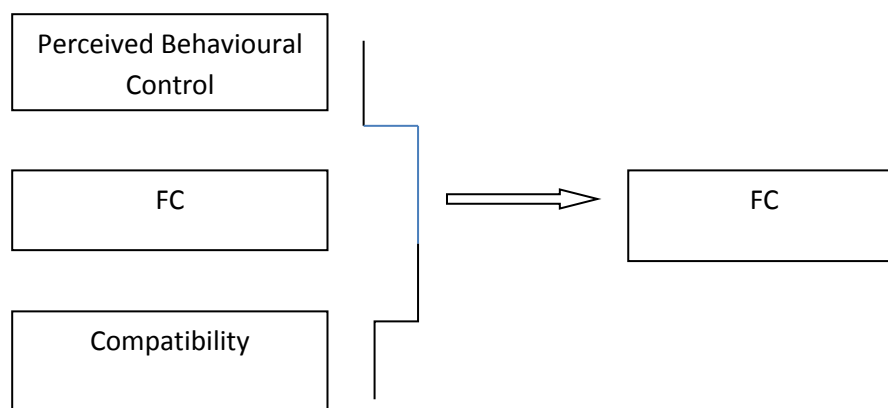


Figure 2.6: Root variables of Facilitating Conditions

Trust and Security:

Trust and security, no doubt are vital elements influencing end-users acceptance of an innovation involving electronic transactions. The ability to convince Nigerian end-users that MP will be fraud-free, and also protection of their privacy, might be a reason for accomplishment. Perceived security and trust are essential factors of m-commerce being successful (Mallat, 2007). Shneiderman (2000) argues that the improvement of security and privacy opinions are crucial for uninterrupted activity in MP. Dahlberg et al. (2008) suggested the Trust-enhanced TAM. The theoretical foundation of their research relies on the TAM model to evaluate if it gives brief clarification for end-user choices associated with MP acceptance. The need for trustworthiness isn't restricted to MP operator but comprises vendors also. End-users would only wish to carry out transactions with established and trustworthy vendors.

Trust:

Trust is the individual's beliefs about the organisation's reliability, ability, truth and strength of a person (Castelfranchi & Falcone, 2000). Humphries & Wilding (2004) illustrated that trust is the necessary element maintaining longstanding relations between people and business. Furthermore, Al-Sajjan & Dennis (2010) made it clear that the absence of trust is a vital hindrance for consumers to accept m-payment systems since consumers intend ensuring the use of a secure system. Moreover, end-user trust is an important variable that influences end-user attitudes and BI to use e-service (Cai et al., 2008).

Trust is believed to be a big issue in MP as it has a substantial and vital influence on end-user behaviour intention toward accepting and using MP (Nor & Pearson, 2007). Lee et al. (2007) proposed that it is an essential challenge for MP activities. End-users recognised internet **privacy** and **security** as two variables associated with trust (Kim & Prabhakar, 2004).

Nevertheless, privacy and security are necessary variables affecting trust in the internet. However, implementing privacy and security in m-payment requires the effort of banking institutions and mobile operators in providing their end-users with guarantees that no mediator can gain entry into their account details without consent (Sohail & Shanmugham, 2003).

Reliable internet security is essential for the MP system to be trusted by consumers because this will encourage them to conclude their transactions through secured mediums giving them the necessary measure of privacy and confidentiality.

Yousafzai et al. (2009) recognised that trust is a basic variable that influences m-payment to be accepted and used. It may be perceived that the principal rationale for failure to identify a new technology arises from the negligence of trust. In this research, MP is a technology which consumers have to consider, and also a new marketing medium proffered to customers by financial institutions and telecoms industries. Thus, '*trust*' which must be allowed by consumers cut across the new technology (m-payment) and the new marketing channel. Nevertheless, '*trust*' has been broadly investigated in several studies and it's a significant element that a variety of transactions required for business success (Dimitriadis et al., 2011).

Corritore, et al. (2003) observed that when users handle online solutions, their education level moderates the relation between trust and behaviour intentions. Additionally, Siegrist et al. (2005) illustrated that gender and age take part in technology trust and acceptance. Thus, the investigator studied the impact of the three moderating factors (gender, age and education level) on the interaction between trust and BI toward accepting and using MP. The variable '*Trust*' has undergone a test and shown for enhancing the prediction of behavioural intention to use MP, thus, its incorporation towards the enhancement of this research.

For any type of payment to become acceptable, individuals need to trust that the conventional currency money is acknowledged by all parts involved. As ‘money is a conception built on trust’ (Chakravorti and Mazzotta 2013, p.3), individuals need to feel confident that the currency possessed by them is acknowledged by others and it holds the same value (Vigna and Casey 2015, p.15).

Trust has been the centre of attention of many investigations over the past decades. Several academics have been researching the impacts of trust on mobile payment acceptance. A research performed by Duane et al. (2014, p.318), stressed that ‘trust is the most substantial factor affecting end users’ readiness to use Smart Phones to make mobile payment’. This is in agreement with past studies carried out by Xin et al. (2013, p.1), which indicated that ‘trust is an important factor of end user’s intention to accept mobile payment’. Dastan (2016) stressed that perceived trust has a positive effect on the acceptance of a mobile payment which was also endorsed by Mahad et al. (2015, p.6) who indicated that ‘perceived trust have a significant positive effect on the intention to use mobile banking’. Lastly, Gong et al. (2016, p.1) proposed that ‘emotional trust in mobile payment has a much powerful influence on end users’ intention to use, while cognitive trust in mobile payment has both direct and indirect impacts on intention to use’. Therefore, trust is an important factor on mobile payment acceptance and building trust has become a critical factor that has an impact on mobile payment in so far as ‘keeping a relationship with end users is hard, especially when there are less face-to-face contacts’ (Bourreau and Valetti 2015, p.31). In this perspective, it is important for service providers to build consumers’ initial trust so as to ease their usage of mobile payment’ (Zhou 2014b, p.1519). Furthermore, several authors have proposed that trust has an impact on other factors such as perceived usefulness, ease of use, perceived risk and so forth, and this, as a result, affects the acceptance of mobile payment. Chen and Li (2016, p.1), for instance, pointed out that while post-acceptance perceived risk’ was

negatively impacted by institutional-based trust, post-acceptance perceived usefulness was positively impacted by it. Gao and Waechter (2015, p.1) stressed the positive influence that trust has on perceived convenience and perceived benefit, and how the intention of use of mobile payment can be speculated by these three impacting factors. Zhou (2015, p.56) has indicated that 'switch intention may be influenced by the enablers, which comprise of trust, satisfaction and flow'. Killian and Kabanda (2017, p.1), disclosed that 'trust, risk and habitual use were factors that significantly impacted intention to accept mobile payment by South African middle-class citizens'. Lastly, Lwoga and Lwoga (2017, p.1) proposed that 'mobile payment knowledge, trust and compatibility speculated perceived ease of use of mobile payment. In contrast, various academics stressed that trust is impacted by a multiple of factors. Yan and Yang (2015, p.117) established in their research that consumer's trust is significantly impacted by perceived ease of use, ubiquity, structure assurance and perceived usefulness and this, therefore, has a suitable impact on user's readiness to use mobile payment. Shuhaiber (2016, p.11) proposed that trust is strongly impacted by end users' uncertainty avoidance, which is regarded as the most negative factor that has an impact on mobile payment acceptance, followed by perceived privacy risks. Wu and Zhang (2017, p. 363) indicated that trust is impacted by reference groups and reputation. Lastly, Abidin et.al (2017, p.5) asserted that 'perceived risk has a negative direct impact on behavioural intention and a negative indirect impact through trust'. Thus, trust itself impacts and it is impacted by various different factors and this may have an effect on mobile payment acceptance.

Trust and risk are interconnected concepts (Hanafizadeh et al., 2014). When a new disruptive service is launched, consumers may feel fearful about using it (Luarn & Lin, 2005).

Literature proposes that trust will contribute to shaping consumer acceptance (Oliveira et al., 2014), assisting to reduce fears, potential risks and enabling business transactions (Corritore et al., 2003). Conversely, perceived risk sentiments towards mobile banking services are

influenced by perceptions of risk and uncertainties concerning security, transactions, and data transfers (Duane et al., 2011). Consumers find it more difficult to conclude about the trustworthiness of an institution in a mobile electronic context than in the conventional business face-to-face context (Mohammadi, 2015).

Trust is included in the UTAUT model in which is at what consumers perceived on the level of security. In the research carried out by Yan, H. and Yang, Z. (2015) it is established that Trust is the key construct in transactional services incorporating private and sensitive information transmission. Privacy influences trust and that will influence behavioural intention to make a financial transaction.

Trust also has a positive and significant influence on user behaviour, which supports Yan, H. and Yang, Z. (2015). End-users believe that an entrusted firm behind the infrastructure of the product and security for private information is a necessary factor.

Previous investigations on online acceptance of mobile payment have added trust and trust-based variables like risk and credibility into acceptance models (Faniran & Odumeru 2015). Although trust, risk and credibility are said to be conceptually distinguishable (Luarn & Lin 2005), trust is defined as a psychological expectation that a trusted party will not behave opportunistically. In the mobile payment service setting, trust signifies the belief that several parties engaged in providing the service are inclined to behave based on a user's expectation and will not behave opportunistically (Kim et al. 2009).

Bankole et al. (2015) studied the impact of Trust and privacy among other factors. They expressed in their investigation that it was surprising their study results did not find a significant impact of trust and privacy on behavioural intention. Faniran and Odumeru (2015)

included risk to their research model. “Risk” was seen to have a significantly low negative impact on the acceptance of mobile payment.

Privacy: Consumers and non-consumers did not see the use of their details by authorized or non-authorized parties as a necessary factor to take into consideration when accepting mobile payment (Tarhini et al. 2015).

Security Risks

In line with PEOU and PU, new technologies always present some risks (Schierz et al., 2010). From a mobile services perspective, the most significant issue for end-users rests on the chance of their privacy being invaded. Security risks matters are central issues for some industries, but banks and big telecoms operators have sufficient trust from end-users, and therefore end-users give their personal information to these organisations easily (Mallat & Tuunainen, 2008). Security risks is the main issue facing Mobile Payment market breakthrough (Kim et al., 2010) and identity theft, portable nature and the likelihood of phones being lost are primary issues of phone users in MP.

End-users perceive safety and security risks of MP as the central issue and obstacle to success in MP usage.

The other drawbacks for MP acceptance in the United States are issues relating to hacking on end-users’ mobile accounts. It is discovered to be the major drawback of end-user acceptance of the new MP system (Tavilla, 2012). Kreyer et al. (2002) claim that security idea can be split into objective security (a regular technical feature, which might acknowledge all of 5 security objectives: confidentiality, integrity, authentication, authorisation and non-repudiation) and subjective security (a necessary precedent for MP acceptance). Subjective security is known as the extent where an “individual is of the belief that making use of a

particular MP process would be secure” (Pousttchi & Wiedemann, 2007). It is essential to recognise that both security dimensions are not incoherent and are not separate.

A subsequent investigation showed that the genuine purpose for security issues from end-users’ perspective is when subjective security is neglected (Linck et al., 2006). Thus, it was hypothesised that the perceived security of use of proximity MP should give favourable impact on the intention to use MP. The researcher considered security risks in his model, as a result of its extensive importance in payment transaction processes (Levente and Sandor, 2016).

Since mobile payment includes financial information that is personal and sensitive, security risks can be a hindrance to technology acceptance (Duane et al., 2014), therefore security risk was also added in the research model, presenting a better understanding of one of the most essential resistance elements that could describe actual mobile payments low usage, representing in the same work positive and negative factors towards acceptance.

One of the major hindrances to the use of mobile payments is the feeling of insecurity. It is essential to initiate new security systems for mobile payment techniques to ensure the security of consumer transactions and to create confidence hence thereby enhancing attitudes toward them (Ramos-de-Luna et al., 2015). This is so because security threats in mobile devices are more challenging than those in personal computers as mobile devices are easily lost or stolen (Liu, 2015). Insecurity, according to Parasuraman and Colby (2014) is the distrust of technology emanating from scepticism about its ability to work properly and relates to its potentially harmful consequences. End users are afraid that hackers may obtain data through Bluetooth or radio frequency identification (RFID) or as an alternative, the mobile device may have malware infection through the downloading and scanning of QR-

codes (Liu, 2015). Hence, there is a negative likelihood for insecurity to negatively affect the acceptance of mobile-payment services.

As virtually all innovations comprise risks, Antioco and Kleijnen (2010) found functional and performance risk to be negatively associated with acceptance intention of technological innovations. Risk and security play a vital role in the area payment process (Henkel, 2001). The fear of fraud in electronic payment transactions is also an important issue (Levente and Sandor, 2016). Therefore, the researcher added the “security risks” of the mobile payment services regarding fraud and information risks.

End-users also see an operational risk in the technical systems of the payment process, as they could fail during the transaction process and, therefore, hinder data exchange (Bernet, 2014). Experts agree that security risks are the major purpose for the low level of usability (PwC, 2016). Thus, Bernet (2014) recognised risk as the most essential acceptance hindrance for mobile payment services.

Security was seen to be a highly significant purpose why non-consumers of mobile payment chose not to use the technology. Many people have been affected by online fraud, credit card scam and feel insecure about using online banking technologies. Many of these non-users use ATM and are very comfortable with the convenience it affords them. Nonetheless, they are aware of the security risks in using ATM cards such as stolen ATM cards and technical issues leading to a payment being made twice. Hence, they are cautious of using another technology which means to them another security risk. (Tarhini et al. 2015; Okeke et al. 2015)

Security issues can be a hindrance to technology acceptance (Duane et al., 2014), and therefore “security risks” was also added to the research model, presenting a good knowledge

of one of the most essential resistance elements that could explain mobile payments low usage.

Expected Benefits (Consumer Acceptance):

The researcher presented another variable (a dependent construct) named “**Expected Benefit**” to the framework which is the **consumer acceptance** variable.

Expected Benefit is equivalent to perceived usefulness established in Davis et al. (1989, p.985), and it is “the level that people feel utilising a specific system would improve their job performance”. This construct is an extra predicting factor of future MP use. The reason being that in theory by Davis et al. (1989), the expected benefit variable was a main recognised determinant. This variable was established in the study theory as a dependent construct employing similar words like those in TAM for ‘perceived usefulness’.

2.5.4.2. UTAUT Model’s Justification:

It can be asserted that the given theories are largely employed in technology acceptance. Even so, it is evident that virtually all theories depend on TRA framework. For instance, TAM was built on TRA, together with TPB and C-TAM-TPB, as well as IDT. Otherwise, Venkatesh et al. (2003) combined the different technology acceptance frameworks with their expansions into an extensive framework termed UTAUT, which is dependent on eight (8) several models already established. UTAUT condensed thirty-two determinants of the existing eight (8) frameworks into four main variables and four moderators. With these improvements by Venkatesh, et al. (2012), the predictive power of the hybrid model has risen to 70 per cent which is above the value for each model separately, and this is the more reason while the researcher considers the UTAUT framework as the conceptual model for this investigation. Unifying from the eight predominant IS acceptance model, the investigators

postulate the four main variables which consist of EE, PE, FC and SI. As the unified model explains 70 per cent variance in BI, recent investigations have embraced the model in m-banking (Zhou et al., 2010).

UTAUT framework considers the variables affecting the acceptance of new technology with a specific attribute to whether this acceptance is optional or compulsory (Yeow et al., 2008). For users to be encouraged in accepting and using new technology, several techniques may be employed. These techniques may be classed into voluntary and mandatory. UTAUT allow the measurement of whether the users' acceptance and use of MP are optional or compulsory.

UTAUT identifies variables that are different between under-developed and advanced nations. The acceptance of new technology influences a series of elements which may change from one community to another. In this study, the variables affecting m-payment acceptance in developed nations are not necessarily the same variables influencing m-payment use in developing countries. In comparison with other acceptance theories, UTAUT represents 70% of the variance influencing acceptance of new technology in several communities (Bandyopadhyay & Francastoro, 2007).

UTAUT is used in a variety of science areas (Hennington & Janz, 2007). Consequently, UTAUT framework is not sector-specific; hence it is useful in telecommunications and banking industries to recognise the real variables affecting consumers' behavioural intention toward m-payment acceptance.

This framework has been known as an essential framework used in evaluating technology adoption. Hennington & Janz (2007) stressed that the UTAUT framework is currently a detailed, all-embracing and vital technology adoption frameworks. Bandyopadhyay & Francastoro (2007) asserted that UTAUT framework has application in societies where individuals can decide by themselves with regards to technology acceptance, as the creation

of this specific model stems from an advanced nation perspective (USA). Besides, Yeow, et al. (2008) stressed that UTAUT is a comprehensive framework utilised to investigate the acceptance of new technology in a range of disciplines.

UTAUT framework was applied in different investigations for the exploration of technology acceptance decisions in developing nations. In particular, Bandyopadhyay & Francastoro (2007) analysed 'culture' on customer acceptance of IT in India employing UTAUT framework. The findings determined that PE, EE and SI were essential variables which positively affected a pre-payment metering system. Lin & Anol (2008) employed the UTAUT framework in studying online social support in Taiwan. The results indicated that all framework variables are crucial other than for FC variable which was unimportant.

Abdul-Rahman et al. (2011) evidenced the impacting determinants for general IS employing tablet PC and cellular telecommunication in Malaysia relying on a modified UTAUT framework. The results showed that PE, EE and information quality were critical, while service quality was unimportant to user's behaviour intention toward technology acceptance and usage.

Conclusively, UTAUT framework is a *usefulness* acceptance framework which can employ technology acceptance and use, in several developing nations context.

Certain modifications of the UTAUT model were made to match the needs of this investigation and the character of the sampled population. These modifications required the addition or removal of some constructs for it to be employed in a developing nation's context such as Nigeria.

2.6. Conclusion

This chapter evaluated the literature on technology adoption and the relevance of the independent variables in MP and also recognise the several theoretical assumptions about consumer demography and their appropriate acceptance behaviour. Additionally, the literature review presented an academic argument in designing a conceptual model necessary to evaluate the function of the factors affecting MP acceptance in Nigeria.

Taking into consideration this research's basis on IS management, this chapter also described the models of behaviour theory focusing on consumer behaviour and highlighting different models of consumer behaviour.

The researcher also examined technology acceptance theoretical foundations in applied psychology, its course and brief existence were discussed in the IS field and lastly drawing up on this knowledge, the researcher expatiated on technology adoption literature to establish a theoretical basis for the study aim.

The chapter analysed trust, as a vital factor in technology adoption summarising the presence of trust in technology to determine whether consumers accept or reject that technology. EFINA (2013) reports from Nigeria indicated that the most common obstacle to MP acceptance in Nigeria was the absence of trust, and this research investigated the role trust, and other factors played employing a detailed research model and presenting significant results.

Various academics have recognised demographic factors as constructs, which indicate consumer acceptance of MP. In this chapter, MP acceptance likelihood of consumers depending on gender, age and education level were described with literature demonstrating that variations occurred between the male and female demographic, older and younger age groups and the more educated and least educated demographics. This research included these

constructs as elements in the theoretical model that are examined to show any critical impact on the independent variables and its association with the demographic variables.

This section also presented the UTAUT framework which was modelled based on contributions from useful theoretical propositions and also prevailing technology adoption frameworks. The TRA and TPB were examined together with TAM and the DOI theory.

The layout of this research model resulted in a set of hypotheses, which were proven employing data derived from the sampling category in Nigeria, investigated utilising statistical approaches and justified depending on the findings of the data. These assumptions highlighted the function of trust, PE, culture, technical support, relevance, awareness, demography and BI in association with actual acceptance of MP in Nigeria.

The next chapter, Chapter 3, presents the conceptual framework for this thesis having reviewed the UTAUT framework.

CHAPTER THREE: CONCEPTUAL FRAMEWORK

3.1. INTRODUCTION

A conceptual framework, by definition, is a group of theories and models from literature underpinning a positivist investigation (Mugenda, 2008). It is a concept of how the investigator makes logical sense of associations between elements which are recognised as a problem to be studied. It helps the researcher to hypothesise testable relationships which can enhance the knowledge of the determinants of the problem being studied (Sekaran, 2003).

A review of the literature of prominent models and recent evaluation studies in the field of M-commerce significantly support the designing of an MP services model. It was noted that technology acceptance models have already been employed in predicting future use of technology especially in the field of IS. Additionally, according to Taylor & Todd (1995a), evaluation of a framework should be regarding its parsimony and how it contributes to knowledge of the phenomenon. The current research is aimed at establishing a conceptual framework of the crucial elements that affect consumer acceptance of MP in Nigeria. The choice of the research model relied on the most predictive of behaviour intentions and usage behaviour. UTAUT was identified as more comprehensive and the most predictive of all other models.

3.2. Basic concepts in Technology Acceptance Models Methodologies

The researcher recognised that the emphasis of investigation on acceptance of technology affects the type of study to be carried out. The study can either use longitudinal survey method or cross-sectional survey method, depending on the situation being studied. In a longitudinal analysis, data are gathered more than once, say twice, three times or more, over

an extended period (Sekaran, 2003). In cross-sectional research, data are collected once, days, weeks or months.

The initial models of acceptance of technology focused on BI or UB or both depending on the research period (cross-sectional research or longitudinal research). Furthermore, the literature reviewed showed that some IS studies focus on one's acceptance of technology by using behaviour intentions to use as the key dependent construct or user behaviour.

In the next paragraph are descriptions of some differences in the two and an indication of the type of study selected for the current inquiry.

In previous technology acceptance studies, the tendency was to use cross-sectional surveys to measure only behaviour intentions as the significant dependent construct (Gefen et al., 2003) and many others. On the other hand, some studies used cross-sectional surveys to measure only usage behaviour as the dependent variable. These studies include among others, those by Lederer et al., (2000) and Heijden, (2003).

Studies which have evaluated behaviour intention and usage behaviour as the dependent constructs have used longitudinal research methods, for example, studies by Venkatesh et al. (2003).

Another issue observed from the literature is that studies which used cross-sectional methods did so if the technology being studied had either not been introduced or had just been introduced, and this implies that the users had no prior experience or were in the early stages of the experience. Such studies only measured behaviour intentions. An example of such studies is Chau & Hu (2002) who studied behaviour intentions to use telemedicine technology when it had just been introduced in Hong Kong utilising a cross-sectional method.

Therefore behaviour intentions to use were measured before the actual user behaviour in longitudinal studies concerned with the acceptance of new technology. At a later stage, a similar study would regulate user behaviour. Venkatesh et al. (2003), for example, evaluated behaviour intentions and some months/years later evaluated usage behaviour.

If technology has been in use for a period, actual usage was analysed using cross-sectional survey method. In other words, studies using cross-sectional surveys are mainly to evaluate current usage or prediction of future usage. The current research aimed at assessing the present usage behaviour to predict the future realisation of MP. Unlike previous studies, the researcher studied usage behaviour together with behaviour intentions.

3.3. RESEARCH HYPOTHESES

The researcher highlighted many elements which influence mobile payment usages such as performance expectancy, relevance (modified from effort expectancy), culture (changed from social influence), trust, security risks, technical support (modified from facilitating conditions) and demography variable. Therefore, the researcher postulates these hypotheses:

H₁. Behaviour Intention and Use behaviour will possess a significant impact on Consumer acceptance of MP.

H₂. PE will demonstrate a crucial impact on Bi.

H₃. Culture will positively influence Bi

H₄. Relevance will positively affect Bi.

H₅. Trust will positively influence Bi.

H₆. Technical Support will demonstrate a significant influence on Bi.

H₇. Awareness will positively influence Bi.

H₈. Demography (gender, age, education) will moderate PE, Culture, Relevance, Technical Support, Trust and Security which will have a positive impact on Bi.

H₉. Security Risks will negatively influence B_i.

3.3.1. Working Hypothesis Development:

The hypothesis is a statement of the predicted association between two or more constructs. As an investigator, you do not know about a phenomenon, but you do have a theory to form the basis of specific assumption. You test these by gathering information to help in concluding if your argument was right. The verification process has one of the three outcomes, right, partially right and wrong. Without this verification process, your assumptions validity cannot be concluded. Therefore hypothesis is a theory or assumption about an association, the reality or truth of which one does not know. Hypotheses, generally, form the basis for enquiry (Slideshare, 2013)

3.3.2. Research Hypotheses linked to the Framework

The hypotheses guiding the study are developed in this chapter and tested in the Hypotheses testing chapter six.

From earlier analyses and theoretical models, hypotheses were formulated with a focus to measure the acceptability rate of consumer acceptance of MP.

The researcher aims to evaluate the behavioural intention of using MP instead of actual use. Findings have shown that there is a high correlation between actual behaviour and intention (Davis, 1985).

Some research hypotheses were proposed to investigate the underlying problems, guided by the objectives of this study and relying on Venkatesh et al. (2003) as described below:

To estimate the predictive levels of the entire model, testing its goodness of fit and also to verify the associations between constructs.

a) The impact of the model on mobile payment consumers:

The hypotheses were to estimate the predictive levels of the entire model, that is, the levels of influence end-users' expected benefits of mobile payment services impacted on their intention and use of the services.

BI, UB and EB were the outcomes of the independent constructs of PE, Relevance (modification of EE), Culture (amendment of SI), Awareness, Trust and Security risks (three new independent variables) and Technical Support (modification of Facilitating Conditions). Behaviour intention leads to usage behaviour, in that with exposure to new mobile payment services upon accepting the innovation gains, end-users intend (or plan) to use them and subsequently use them.

Behaviour Intentions in this study was interpreted to mean:

“When one finds out the usefulness of services offered through technologies in mobile payment, one plan (intends) to use the services.”

Behaviour intentions of end-users from the sampled universities were assumed to influence actual usage of MP services. In this study, the dependent variable of Bi was investigated and measured such that BI will affect Ub. Information Systems and IT studies have discovered that BI and Ub have a significant association (Chin et al., 2003). The path coefficients from behaviour intentions to usage behaviour are substantial in TAM, TPB and DTPB models (Moran, 2004). According to the research model, usage behaviour was largely influenced by behaviour intentions. In other words, behaviour intentions play a prominent role in the prediction of Ub when one had previous knowledge of the technology being studied (Taylor & Todd, 1995b).

Usage behaviour is

“The extent to use mobile payment services after finding out their relevance and usefulness.”

The researcher noted that BI significantly influenced usage behaviour, so BI played an essential role in changing Ub (Venkatesh et al., 2003). According to Taylor and Todd (1995b), BI is more predictive of Ub with users’ previous knowledge of using technology. Ub was a dependent variable in Venkatesh, et al. (2003), and was retained in the current investigation.

Expected Benefit, similar to PU in Davis et al. (1989, p.985), is:

“The extent an individual believes that making use of a specific system would boost their job performance”.

In addition to the two dependent variables of BI and Ub, the researcher found it necessary to introduce another variable (Expected Benefits) as an additional predictor of future MP usage. The reason is that in the model by (Ibid) the Eb variable was an essential element. The expected benefits were assumed to influence end-users to use mobile payment services (Theng et al., 2007). This construct was integrated into the study framework as a dependent construct using similar words as in TAM for ‘perceived usefulness’. It was assumed that usage behaviour would significantly influence consumers in DCs who expected some benefits of using mobile payment services.

Advancing from the previous discussions the researcher assumed that:

- The three dependent constructs would have a critical effect on customers’ acceptance and mobile payment use, i.e. H₁.
- The model would measure and predict end-users’ levels of acceptance and MP usage in a DC setting, i.e. H₁.

H₁. Behaviour Intention and Use behaviour will have a crucial effect on Expected Benefit (Customer acceptance) of MP.

b) The Direct Path hypotheses

The second category of hypotheses had a direct path between independent constructs and dependent constructs. They were expected to measure the level of influence independent constructs have on dependent constructs. Independent constructs in this analysis are PE, relevance, culture, awareness, trust, security risks and technical support.

The assumption that **performance expectancy** was a determinant of acceptance of technology is supported by various acceptance and use of ICT/IT study models (Taylor & Todd, 2001). Venkatesh et al. (2003) postulated that PE was the strongest of the four variables. UTAUT developers suggested that PE construct was moderated by gender and age such that it was more significant for younger male workers. Earlier, Lynott & McCandless (2000) had suggested that this construct had a gender bias.

In the current study, the variable measured:

“the extent a person thought that utilising MP services would assist them to achieve benefits when undertaking his/her mobile payment tasks”.

The independent construct was expected to have some direct influence on end-users' perceptions of BI or Ub. This study assumed that:

- PE would demonstrate a critical impact on BI to use MP.
- PE would have a positive effect on moderation from the moderators (gender, age, education and awareness) in the new model such that the impact would be stronger for older male.

H₂. Performance Expectancy will demonstrate a crucial effect on behaviour intentions.

Relevance is defined by Thong *et al.* (2004) as:

“The magnitude whereby something is linked with the subject matter.”

It means ‘the extent whereby one accepts that technology is essential in MP operation’. Investigations which facilitate the significance of this variable in different settings comprise Saracevic, (2004) and Nicholson, (2004).

This study hypothesised that:

- Relevance (Re) was anticipated to have some direct effect on BI to use MP.
- Relevance influenced by the new model’s moderators would in turn positively affects behaviour intentions whereby the impact would be powerful for older users with long time experience.

H4. Relevance will demonstrate a significant effect on Bi.

Moran (2006) reports SI as a subjective norm. Venkatesh et al. (2003) identified some elements of social influence in various theories. The theories suggested significant and non-significant effects from this construct towards intention (Ibid). Igbaria et al. (1996) for instance, pointed out that social influence had a critical impact on usage. Preceding analysis (Kaba et al., 2007) whose investigations were done in DCs also suggest that the construct has vital impacts on usage.

However, (Venkatesh et al., 2003) discovered that the variable had no critical effect on BI. Hartwich & Barki (1994) observed that the construct has some impact on usage only when studied in a non-voluntary setting. These differences in findings may be due to variations in the environments in which such studies were carried out.

Following ibid (p.451), **SI** is:

“The extent whereby a person notices that other significant persons anticipate they should use the system.”

The current researcher used Venkatesh et al., 2003's meaning to study SI (modified as the culture) construct and evaluated it as a direct determinant of Bi, and made the following assumptions:

- Within the context of mobile payment services, would Culture affect behaviour intentions or usage behaviour?
- What would be the impact of Culture in the new model as far as mediator variables were concerned?

H₃. Culture will demonstrate an essential influence on Bi.

The construct of **facilitating condition** is:

“The extent whereby a person thinks an organisational and technical infrastructure is available to support system use” (Venkatesh et al. (2003, p. 453).

Venkatesh et al. (2003) proposed that FC construct was not a significant element of behaviour intentions, but retained it in their model because of its importance. Following Taylor & Todd (1995b), the availability of facilitating condition may not promote usage. However, Kunateb & Hurt (2000) found some associations between FC and actual usage of Internet-based teaching.

Despite the above findings, it was necessary to study the variable as a direct determinant of Ub in Developing Country (DC) context. The variable was assumed to be a crucial determinant of acceptance of technology as far as organisational and technical infrastructures in DCs are concerned (Rosenburg, 2005). The current study assumed that, in the MP scenario, the variable (modified as Technical Support) would be critical because if there were no technical support, neither BI nor Ub would be possible. The study theorised that technical support would directly determine Ub. The construct was hypothesised as follows:

- Technical Support was believed to have a direct effect on customers' perceptions of BI.
- Technical Support would have a crucial direct effect on BI.

H₆. Technical Support will demonstrate an essential influence on Bi.

H₅: Trust will positively affect BI.

H₉. Security Risks will negatively influence Bi.

c) The Moderation Impact Hypotheses

Besides, the next category of hypotheses included testing the impact of moderators' effect on independent constructs on the dependent ones. The moderator constructs studied are gender, age, educational level (modified from experience) and awareness.

Concerning definitions, a moderator construct has some strong influence upon an independent and dependent construct association. That is to say that the presence of the moderator construct affects some changes in the first connection between the independent and dependent constructs (Sakaran, 2003).

Following Venkatesh et al. (2003), UTAUT framework has four moderator constructs. In the present research, four moderators were proposed to see whether they would have some influence on the association between independent and the dependent constructs. The three moderator variables in this study [gender, age and experience (modified to educational level)] were culled from *ibid*. The fourth moderator (awareness) was a replacement of voluntariness of use which the researcher considered inappropriate in this context of mobile payment services. Voluntariness does not predict future acceptance.

Earlier studies showed that **gender** moderated the associations between social norm, beliefs, and PBC. Most of these relationships were important for female, and only "beliefs" were

important for males (Venkatesh et al., 2000, 2005). Venkatesh et al. (2003) reported that gender's moderation in the associations between PE and BI was powerful for men, and EE and BI were powerful for women. Based on these results and those of Morris et al. (2005) which shows that gender difference tends to drop with continuous use and higher educational level, gender was assumed to moderate the association amongst the framework's independent variables.

It has been argued that young people to look for more information about what to buy, does and so forth, more frequently than the older ones (Dennis et al. 2009). However, older people, in Dennis' view were more satisfied and loyal to particular products or brands. Venkatesh et al. (2003) made a report that **age** moderated the relationships in their model. The path for Performance Expectancy and Behaviour Intentions was stronger for younger workers. The path for Social Influence and Behaviour Intentions had an impact only on older workers under necessary conditions. The impact of facilitating condition towards usage behaviour was stronger for older workers who had more experience. Based on the conceptual model, age was assumed to moderate the association amongst the framework's independent variables.

Experience (modified to educational level) refers to:

“Individuals' level of knowledge or skill acquired through participation in that task.”

A person with considerable experience, i.e. “empirical knowledge”, in a particular field can be called an expert. Individual's level of education in this context was measured through self-assessment of necessary mobile devices usage skills and capability to carry out transactions using mobile payment services.

Novak et al. (2000) showed that expertise and proficiency among participants influenced technology usage. The variable influences PU (Johnson & Marakas, 2000). Based on these

findings, educational level was assumed to moderate the associations amongst the study framework's variables.

Awareness is:

“The magnitude whereby a person knows about the existence of a new service offered.”

Some individual may not be mindful of the presence of such a service, for if they knew they would decide whether or not to use it. Heinrichs et al. (2007) showed that awareness is an essential element of acceptance; hence, this construct was included in the framework. Based on information from the literature, awareness was hypothesised to moderate the connections between the study model's variables.

H₇. Awareness will positively influence Behaviour Intention.

The moderating effect of each of the demography moderator variables was hypothesised as follows:

- If the moderator variables of gender, age, and education would have a significant effect on the influence of the independent constructs (Performance expectancy, Relevance, Culture, Awareness, Trust, Security risks and Technical support) toward the dependent variables, i.e. hypothesis 8 as outlined below:

H₈. Demography (gender, age, education) will moderate PE, Culture, Relevance, Technical Support, Awareness, Trust and Security risks which will critically affect Bi.

- Performance Expectancy moderated by gender and age will positively influence Behaviour Intentions such that the impact is powerful for older males. (See also PE)
- Relevance moderated by gender, age and education will positively impact on BI to use mobile payment services such that the impact is stronger with higher educational level.

- Culture moderated by gender, age, and education will positively impact on BI to use MP whereby the impact is stronger for older females.
- Technical support moderated by age, gender and education will positively influence user behaviour such that the impact is powerful for users with higher educational level.

d) The study made further postulations to measure the predictive levels of each of the dependent construct

Three dependent variables, BI, Ub and Eb, were expected to be influenced by the independent variables in varying ways with influences by the moderator variables. The values of these variables would estimate the study population's levels of acceptance and MP usage in a relationship hypothesised as that:

- The dependent variable of BI would have a significant effect on Ub as postulated in hypothesis 1 below.

H₁: Behaviour Intentions to use mobile payment services demonstrate an influence on Usage Behaviour.

- The dependent variable of usage behaviour (Ub) would have a significant effect on expected benefits (consumer acceptance). i.e. hypothesis 1.

H₁: Usage Behaviour demonstrates a significant influence on the perceived benefits.

3.4. The Conceptual Framework

Technology acceptance models frequently used in explaining BI and use behaviour were discussed in chapter two. In the literature, it was observed that most of those models had been faulted for their low explanatory power based on behaviour intention that ranges between 20

and 40%. UTAUT model indicated an improvement in the capabilities to explain the variances up to 70%. While many investigations such as E-learning acceptance and Web TV acceptance utilised the model to examine the acceptance of diverse technologies in distinct situations, none have used the model to assess services, such as mobile payment services. The current study utilised the UTAUT model and proposed some modifications to its constructs to strengthen it and also to support studies on mobile payment services. The next section is a description of some of the basic concepts in the conceptual framework.

3.4.1. Mobile Payment Conceptual Framework: UTAUT model is very speculative compared to other stand-alone theories (Yeow et al., 2008). This rationale relies on the attribute that the theory is a combination of eight separate models and their expansions into a unified one. Moreover, UTAUT framework comprises most elements affecting IT intention and use behaviour (Hennington & Janz, 2007). The framework's development arose from the perspective of an advanced nation and didn't take into consideration developing nation's dynamics, like Africa. From past literature, it is evident that certain important aspects are not discussed in the original UTAUT framework (or other frameworks where it's foundation exist), which may impact accepting MP in developing nations like Nigeria. Thus, these factors (culture, trust, security risks, awareness, relevance, educational level and technical support) may have little effect in advanced nations, but a significant impact on underdeveloped countries, like Nigeria.

3.4.2. Basic Concepts in the Conceptual Framework

It is essential to define the important concepts underpinning the research to give a good knowledge of the rationale of this thesis.

The objectives of this investigation suggest a conceptual framework which is embedded in Technology Acceptance concepts by Hennington & Janz, (2007). The conceptual framework is composed of individual perceptions to use mobile payment services. One's perceptions to use the services could influence usage. Thus, the actual use of the services could affect the intentions of using MP. The study assumed that a research framework based on UTAUT concepts after some modifications and tests would have the power to explain behaviour intentions and usage behaviour and would predict future usage of mobile payment services.

The conceptual framework indicates the direction of the assumed association between the customized UTAUT. It illustrates how some perceived factors included in UTAUT and those not involved are transformed into end-users' benefits from mobile payment services.

The perceptions arising from intentions to use mobile payment services could be impacted upon by some socio-demographic attributes such as age, gender, and technical skills possessed by the users as proposed by (Ibid). In most investigations, age and experience of end-users were so pronounced (Hong et al., 2001).

Behaviour intentions and usage operate in specific favourable conditions that facilitate utilisation of service. The extent of mobile payment services usage could partly be explained by the degree of need regarding the expected benefits to be derived out of usage. The behaviours exhibited while using mobile payment services can partly explain levels of benefits and the user's experience. Whether the behaviours vary from one type of environment to another was a matter of debate and further research which this thesis assesses within the background of developing nations.

3.5. Defining the directions and variables

Some variables related to mobile services were identified. These are independent variables based on prominent theories/models identified in the literature. Based on this, the study customized the UTAUT model that integrates six variables (relevance, culture, technical support, trust, security risks and awareness) to support an inquiry into users' BI and use of MP with the aim of treating the variables and their dimensions as replacements to the dimension of 'effort expectancy', 'SI', 'FC', 'experience' and 'voluntariness' variables.

3.5.1. The justification for the variables

The researcher integrated the identified study variables into the existing UTAUT constructs. The investigation noted that UTAUT already had one of the defined variables, i.e. facilitating conditions. The study also pointed out that effort expectancy variable in UTAUT was associated with identified ease of use construct. The constructs of PE was assumed to be exclusively independent of the identified indicators and was retained in the study model. At this stage of the study, the findings showed that constructs such as performance expectancy, relevance, culture, technical support, gender, age, educational level, awareness, expected benefits and relevance would have some impact on mobile payment services.

All the study variables were categorised into independent variables, dependent variables and moderator variables depending on their mode of effect or association with each other. In both this study and the one carried out by Venkatesh et al. (2003), the aims were to find out which factors influence behavioural intentions or usage. These two constructs were categorised as dependent factors in other studies; and so did the current research.

The study assumed that expected benefits would be a result of usage and was accordingly classified as a dependent construct in this study. The study made another assumption that the identified factor of awareness was an independent variable. It was also noted that the

moderator variable of voluntariness in the UTAUT model would be redundant in the new model since it was assumed that the use of mobile payment services was neither mandatory nor voluntary. Based on this fact, the variable was eliminated. Factors which were identified to influence the dependent variables of BI to use MP services were categorised as independent variables, and they included: performance expectancy, trust, security risks, culture, technical support, awareness and relevance. The variables were logically organised in a conceptual framework according to their category.

Adopted UTAUT Framework

Figure 3.1 below shows the customization of the UTAUT framework.

In identifying the several variables affecting technology acceptance and in understanding what influences the acceptance and use of MP, certain minor adjustments on the framework is essential. Bandyopadhyay and Fraccastoro (2007) illustrated that social influence (SI) could be seen as a segment of culture. Thus, SI in initial UTAUT framework was substituted with ‘culture’ variable, by evaluating the impact of the framework moderating elements on the relation between culture and end-users’ BI.

Moreover, FC variable impacts on the behavioural intention in a direct manner. Lastly, a minor adjustment has been carried out with the framework moderating factors, such that the ‘experience’ moderating factor was substituted with ‘**educational level**’ moderating factor. Also, the first three moderating factors (gender, age and **education level**) were classified as a moderating factor called **individual moderating factor**. The fourth moderating factor construct (voluntariness of use) was substituted with ‘**awareness**’. Voluntariness has been investigated as a non-predicting factor of future acceptance.

By definition, **awareness** is “the extent of a person’s knowledge of something existing, in this scenario, a new service delivered with such technology.” Certain individuals are unaware

that such a technology is available, for if they knew, they would decide whether using it or not. Studies (Fortine, 2005; Heinrichs et al., 2007), have illustrated that ‘awareness’ is a significant variable in accepting and using new technology. The acceptance rate of innovation might be measured by awareness of end-users (Laforet & Li, 2005). Consequently, this variable was considered suitable to be contained in the framework.

A review of UTAUT indirect variables:

Following Venkatesh, et al. (2003), ATUT, SE and anxiety were detached from the UTAUT framework as they didn’t possess a significant impact on behavioural intention and use behaviour.

Additional Variable for the UTAUT framework:

A further significant variable (an external construct) in this research setting for inclusion to the initial UTAUT framework is ‘trust’.

The Customised Research Model

Figure 3.1 as shown below is the Customised framework representing the Research Model employed in the thesis.

Trust has a meaningful impact on BI toward UB as discussed in the above section. Thus, to obtain a justified and accurate study conceptual model, trust and security risks were included in the study framework, and the impact of trust and security risks toward behaviour intentions were evaluated by considering the effect of individual moderators (gender, age, and education level). Figure 3.1 shows the customised framework after including trust and security risks as new variables.

The independent variables are Performance Expectancy, Awareness, Relevance, Culture, Technical Support, Trust, Security Risks, and demography (gender, age, education level).

The dependent variables are Behaviour Intention, Use Behaviour, and Expected Benefits (Consumer Acceptance).

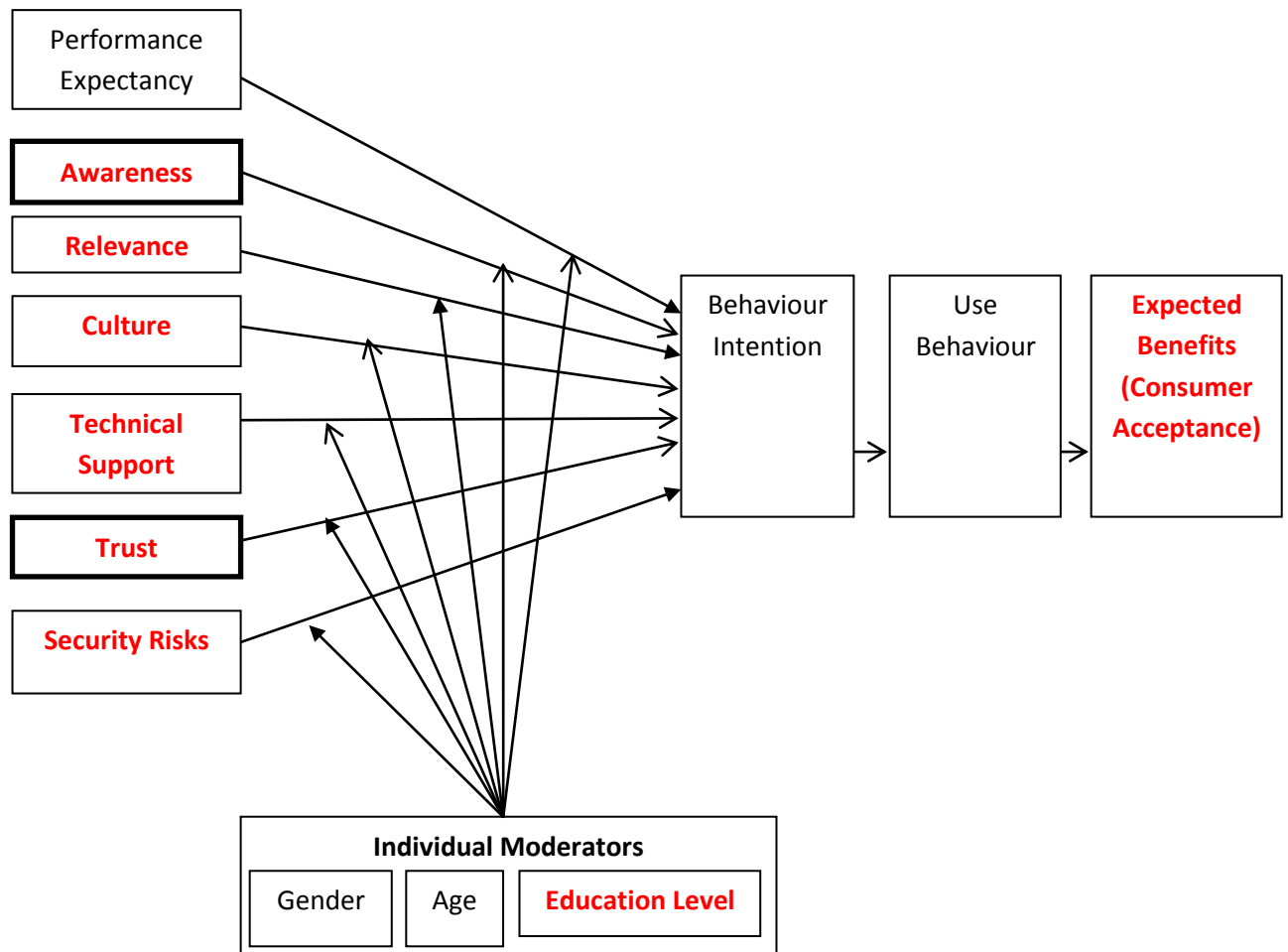


Figure 3.1: Customised UTAUT framework depicting the Research Model employed in the investigation.

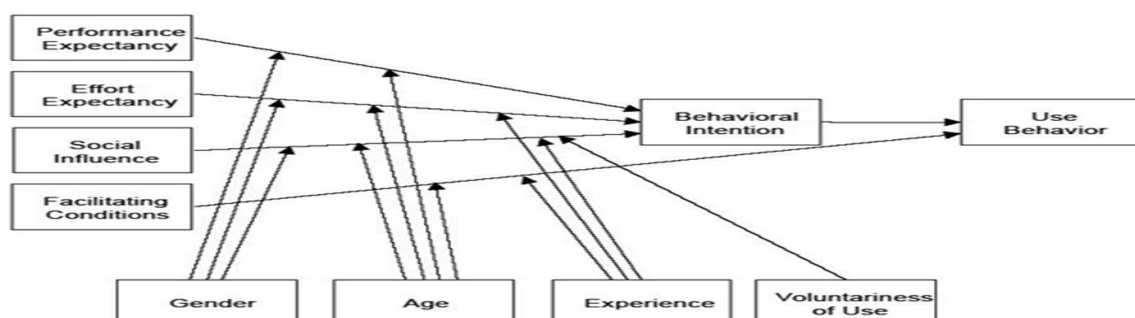


Figure 3.2: Original UTAUT Model (Source: Venkatesh et al. 2003)

Table 3.1 indicates the research model constructs and their root variables (Source: Venkatesh et al. 2003)

Constructs	Root variables	
Performance Expectancy	PU	
	Extrinsic Motivation	
	Relative Advantage	
	Outcome Expectations	
Effort Expectancy (Replaced with Relevance)	PEOU	
	Complexity	
	Ease of Use	
FC (Replaced with Technical Support)	Perceived Behavioural Control	
	<i>Facilitating Conditions</i>	
	Compatibility	
Culture	Power Distance	
	Individualism	
	Uncertainty Avoidance	
	Masculinity	
Trust	Trust in Bank / Mobile operators	
	Trust in the Internet	Privacy
		Security
	Trust in Bank / Mobile Operator Information	Information Accuracy
		Information Completeness and Relevance
Security Risks	Risk	
Awareness	Awareness	

3.6. Summary

The researcher designed a mobile payment conceptual framework from Venkatesh et al. (2003) original UTAUT model which was an integration of eight technology adoption frameworks. This approach presented the means of overcoming the limitations of adopting either the TAM or TRA model, and by combining the constructs, presents the broader scope of explaining a higher variance of intention to use MP. This conceptual framework, in

conformity with existing literature, introduced other factors (culture, technical support and trust) which affect behaviour intention.

3.6. Conclusion

This chapter presented the basic concepts in technology acceptance models methodologies, the conceptual framework and mobile payment conceptual framework, fundamental concepts in the conceptual framework, defining the directions and variables, and the justification for the variables.

The next chapter presents the methodology utilised in the thesis after reviewing several types of research methods.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1. INTRODUCTION

The section reviews the process employed to address the investigation questions. The research methods comprise methods used in obtaining and analysing appropriate data from Nigerian consumers (Saunders et al., 2009). The methodology is the comprehensive approach underpinning a study activity (Blaxter et al., 2006). Research methodology is a method of solving a research problem consistently (ibid). This chapter explains the methodology employed to justify the paradigm, questionnaire design, sample procedure and data gathering and administration. Furthermore, it also presents a preconceived analysis strategy to test the research hypothesis. Lastly, ethical considerations relating to collecting and applicable to this study are described.

A segment of this chapter justifies the paradigm and methodology utilised in answering the study questions and achieving the aim and objectives which starts with a review of social study design. The next part considers the chosen paradigm as the theoretical study procedure. Another part finds the method employed in this study for data collection. A further section lists the sample techniques and methods utilised in examining the collected data. The research methodology and study designs were selected for the achievement of the set objectives. The rationale for each choice is explained and discussed regarding research process, conceptual framework, study designs, instrument development, population, sampling, data gathering and analysis. Illustration of the research validity, reliability, ethical considerations, risk assessment and generalizability are also discussed in this chapter.

4.2. Justification of paradigm and methodology

A paradigm is a complete procedure fundamental to a research methodology (Kassim 2001). It is a reflection of the knowledge philosophy while methodology emphasises on the

practicalities of how we come to know (Trochim 1998). Primarily, the paradigm that is essential to this investigation can be classed as post-positivism (can be called realism) (Ibid). Realism concerns an external reality which cannot be known fully (no one knows what contributes to end-user behaviour intention) (Perry et al. 1998). The researcher collected and analysed data from several sources which include literature, exploratory research, and survey. Also, Structural Equation Modelling (SEM) of the examined data comprises complex dependencies employing multi-item scales to evaluate hidden, imperceptible constructs (Kassim 2001). Hypotheses were suggested and tested to ascertain the variables that enhance consumer acceptance of MP.

4.3. Research Design:

Following the establishment of a paradigm, the researcher developed a suitable research design.

By definition, research is a detailed study of an unusual event which the investigator evaluates in solving problems related to that event (Creswell 2007). In social sciences, several investigators put forward the research overview – the approaches (in theory and practice) in separate aspects. The distinction in a display can be noted between the frameworks of Crotty (2005) and Saunders et al. (2007). These researchers are of the agreement that social research can be considered concerning the approaches (in theory and practice). Moreover, the validated terms vary. For example, they use a variety of names which can be misleading for other researchers.

A research design is “a set of advanced choices that make up the blueprint identifying the techniques and processes for the collection and examination of the necessary data” (Burns & Bush 2002, p.120). A suitable exploration design is necessary as it decides the data type, data gathering procedure, the sampling method, agenda and budget (Hair et al. 2003).

Fundamentally, it assists in aligning the preparation method to the investigation problems (Churchill & Iacobucci 2004). There are a series of study design framework which is grouped into 3 established types: exploratory, descriptive and causal (ibid). Although not compulsory, it is normal that investigators use more than one research designs (Burns & Bush 2002). That is, an investigator might commence with an exploratory investigation which will present relevant practice data required following a descriptive analysis. Sequentially, data derived from a descriptive analysis might assist the investigator to develop innovative experimentation. This investigation purpose is to design a conceptual model of the critical elements that impact consumer acceptance of MP in Nigeria.

Various research workers explain the research outline – the theoretical and practical outlook in distinct methods. The different layout methods can be vividly recognized between the frameworks of Crotty (2005) and Saunders et al., (2007). These writers admit that investigation can be reasoned of concerning the outlook (both in theory and in practice). Nevertheless, the terminology embraced varies. For example, they employ languages which are not the same and which can lead to confusion for other researchers. This part describes three separate study designs to choose a suitable study design for the research.

Sarantakos (2005) recognised three phases of investigation (see Figure 4.0). The first phase comprises the research worker's theoretical method combining the epistemology and theoretical approach, noted by Sarantakos as the study paradigm. The second and third phases signify the practical outlook comprising of the study methodology and methods jointly.

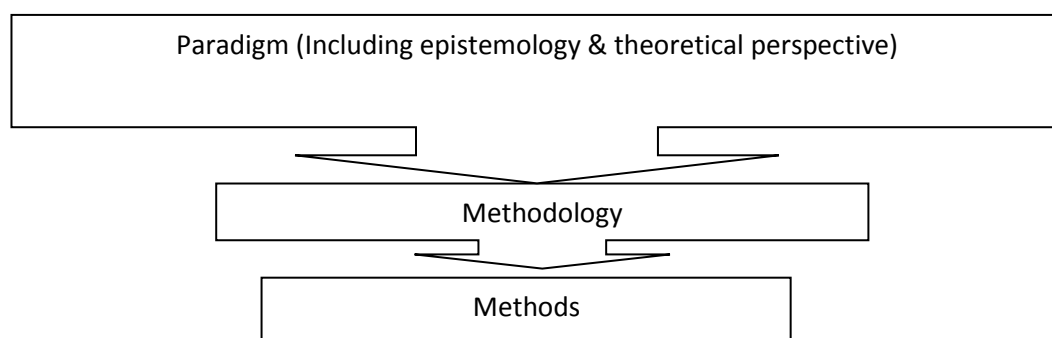


Figure 4.0: Sarantakos' social research design (Source: Sarantakos (2005))

Crotty (2005) recognised four distinct research steps for social research. The first two phases consist of the theoretical procedure which entails the study epistemology and theoretical standpoint. The subsequent two phases consist of the practical procedure – the study methodology and methods. Crotty (2005) established that the four phases are mutually dependent as the preference of the study epistemology is succeeded by a preference of theoretical approach, the preference of research methodology and the preference of particular method of collecting and analysing data. The last two phases, methodology and methods of Crotty and Sarantakos' frameworks are almost the same. Nevertheless, regarding theoretical perspectives, Crotty lists two phases – epistemology and theoretical approach are combined into a phase – the study paradigm in Sarantakos' framework. Figure 4.1 presents the Crotty study design.

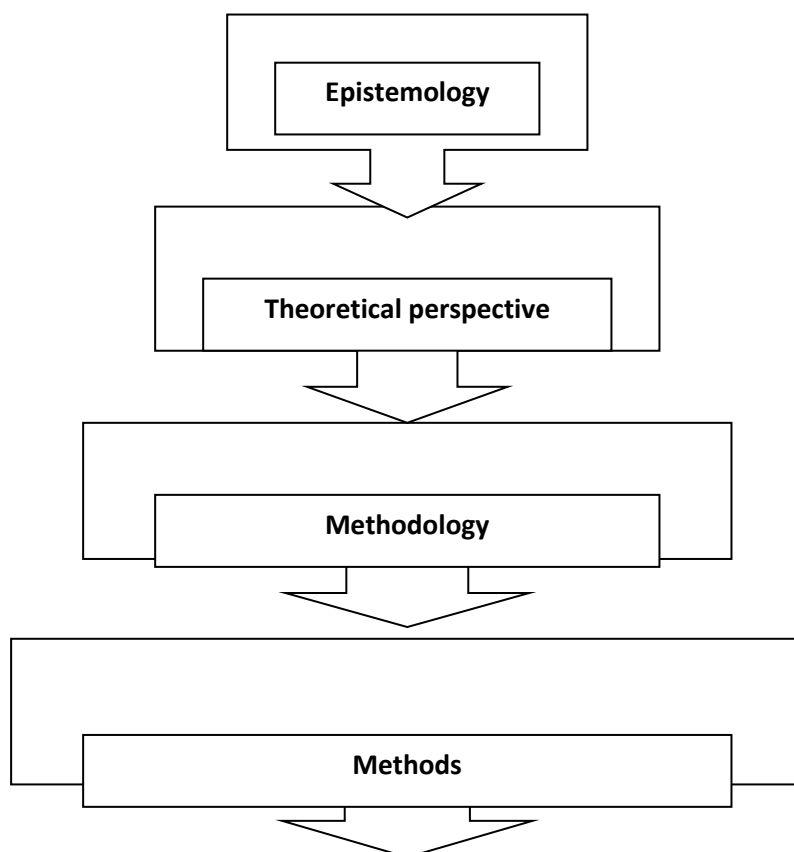


Figure4.1: Crotty social research design (Source: Crotty, M. 2005).

Saunders et al. (2007) present a separate framework for social study design known as “research onion” as shown in Figure 4.2. Following this framework, there are 6 phases in social science study. The study phases include philosophies (such as interpretivism); approaches (inductive or deductive); strategies (research methodology); choices (kinds of research methods); time horizon (cross-sectional or longitudinal) and methods and processes (which consist collecting and analysing of data).

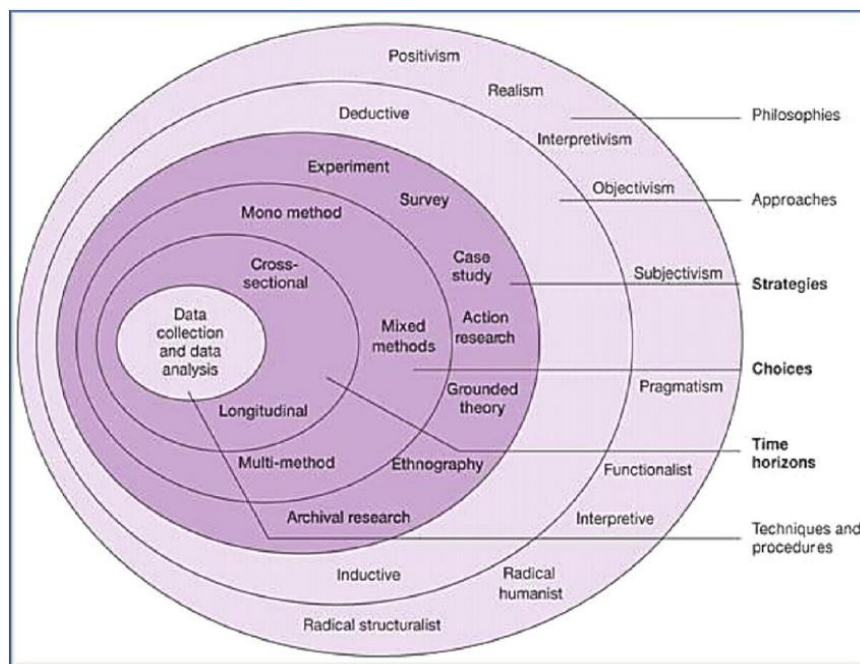


Figure 4.2 displays the research onion (Source: Sarantakos (2005))

The three study designs have reasonable overlaps when they are being considered into theoretical and practical approaches. This study emphasises on the Sarantakos (2005) framework because it displays an effective progression through which this research methodology is designed. The subsequent parts explain clearly the study design.

4.4. RESEARCH METHODOLOGY

Crotty (2005, p.3) established the methodology system as:

'the strategy lying behind choosing and using specific means and connecting the selection and utilisation of techniques to the appropriate results'.

Additionally, (Ibid) illustrated that there are various types of study methodology, and research workers should choose the best reliable for their study area.

A methodology is an approach underpinning a research process (Blaxter et al., 2006). This section shows a complete study approach rationale utilised in explaining the study questions and accomplishing the aim and objectives. This section is suggested to commence with a review of social research design which comprises deliberation of the paradigm as the theoretical study approach, discussion of the methodology and consideration of the procedures executed in this investigation for data gathering.

This part listed the sampling methods, analysis methods, and discussed the study validity, reliability, ethics considered and generalisation of the analysis.

The investigation was executed by the use of research methodology employing questionnaires for data collection because the survey concentrated on aspects and questions that could not be put across in verbal form via interviews. Questionnaires have the merit of privacy and secrecy and were chosen for the analysis depending on the disposition of the research topic (Furedi 2007). Mobile Payment is an event that requires privacy and secrecy of personal information.

The investigator is assured of honest and accurate answers using questionnaires, unlike other data collection techniques. Questionnaires were also employed since they are simple to be used by the participants and the language style used is more straightforward and more accessible to comprehend. Many participants tend to prefer the use of questionnaires due to the simplicity it gives in explaining the questions directed at them (Toolis 2005).

Questionnaires also give the participant time for reflecting on what they had forgotten and provide an answer that they consider is correct instead of being hurried into providing solutions that haven't been reflected upon. If a participant is afforded the time to reflect on what he had forgotten, the possibilities are that he is likely to give informed answers, opinions and views.

4.5. Research Paradigm

The term 'paradigm' is described as a necessary group of beliefs shared by scientists, a set of concurrences about how issues are to be known, how we see the world and so embark upon carrying out investigations (Creswell 2003). Therefore, these paradigms consist of a basic set of beliefs guiding our inquiries for a specific study (Guba & Lincoln 2005). Having considered this, Myers & Avison (2002) have declared that to define valid investigation, the best appropriate technique is to follow the study paradigm since by choosing a particular paradigm, the investigator does not abide in own philosophical know-how and get a better opinion accepted relative to other options. There are majorly four paradigms that have been extensively employed in IS studies which consist of Positivism, Interpretivism, Advocacy and Pragmatism (Willcocks & Mingers 2004). Pragmatism is a mix of Interpretive and Positivism.

In the initial review of Sarantakos study design, the first phase displays the theoretical approach which is known as the research paradigm (Sarantakos, 1998), and it is a specific concept to check and recognise social occurrence (Denzin & Lincoln, 2005). Guba & Lincoln (1994) grouped investigations into two paradigms, a subjectivist qualitative (constructivist) paradigm and an objectivist quantitative (positivist and post-positivist) paradigm. Guba (1990) also described the pragmatism (a relativist) paradigm which combines subjectivist

qualitative paradigm and objectivist quantitative paradigm. Subsequently, some researchers (Johnson & Onwuegbuzie 2004; and Creswell & Clark 2007) accepted pragmatism as integration of qualitative and quantitative approaches.

Bryman & Bell (2007) suggests that a research strategy (method) explains the assumptions model, ideas and approaches that distinguish quantitative and qualitative study. The two have some similarities, differences and areas where they are similar in approach. This research strategy mainly depends on the way a problem is defined, and the type of information being looked out for, as investigators decide on either to use one of the two or a combination of both.

In Information Science and social science research, several paradigms have been developed. Examples of these are positivist versus interpretive, quantitative against qualitative, inductive versus deductive and exploratory against confirmatory (Hussey & Hussey, 1997).

	Positivist	Interpretivist/ Constructivist	Pragmatic
Ontology <i>Nature of reality</i>	Single reality	No single reality	Social real life issues
Epistemology <i>Nature of knowledge</i>	Observer is independent of that being researched	Observer is dependent of that being researched	Combination of both
Axiology <i>Role of the researcher</i>	Unbiased	Biased	Goal- oriented
Methodology	Quantitative	Qualitative	Mixed Methods
Data Collection	<ul style="list-style-type: none"> • Experiments • Quasi-experiments • Tests • Scales 	<ul style="list-style-type: none"> • Interviews • Observations • Document reviews • Visual data analysis 	<ul style="list-style-type: none"> • May include tools from both positivist and interpretivist paradigms. Eg Interviews, observations and testing and experiments.

Table 4.0: Differentiates positivist, interpretivist/constructivist and pragmatic (Source: Hussey & Hussey 1997)

Positivism

The promoters of this paradigm think that real understanding can be derived from observation and experiment. So Positivists usually choose a scientific means to create understanding. Positivism is also known as Post Positivism and Quantitative Analysis. Levine et al. 1987, described that in positivism, the reality is stable and can be expressed via an objective.

Interpretivism

The promoters of interpretivism think on the in-depth knowledge of an idea and investigate the knowledge of the environment where they reside. They refine the personal meanings of their experiences. This paradigm is also known as Constructivism or Qualitative Analysis. Interpretivism believes that real understanding can be derived from a profound subject interpretation (Myers, 2009).

Advocacy

The promoters of advocacy paradigm assert knowledge through advocacy. Discussions commenced in the 1980s and 1990s from people who perceived that positivism does not entirely talk on social and political matters. Taking this into consideration, Fay (1987), and Kemmis & Wilkinson, 1998 have arisen the usefulness of advocacy in their investigations. These investigators think that investigation should be involved with political and social matters. In addition to this, an investigation should consist of the reform programme that eventually deals with empowerment, inequality, oppression, domination, suppression, and alienation matters.

Pragmatism:

This paradigm aims to discover weaknesses in research and strengthens it by using mix method approach (Johnson & Onwuegbuzie 2004). The promoters of this paradigm believe that mix method approach can achieve true knowledge. Rather than method being essential,

the problem is critical, and investigators should utilise all accesses to understanding the problem statement (Tashakkori & Teddlie 1998). Pragmatism is not linked to any philosophy. The important thing is to discover the leading process and method of analysis that resolve the problem statement.

Dewey (1920) stated that pragmatist philosophy found the definition of an idea which requires checking accordingly. Thus, when a research worker determines a situation, they must abide by its empirical and practical effects and observe its influence on the research populace (Tashakkori & Teddlie, 1998). Furthermore, Easterby et al., (2008) stated that, by employing pragmatism, research workers should investigate personal observations in-depth to understand a specific situation.

Furthermore, Krauss (2005) illustrated that the pragmatism relies on qualitative versus quantitative data and that, in answering the research question, research workers must combine objective and subjective approaches. Tashakkori & Teddlie (1998) explained that when pragmatism is used, the investigation logic comprises deductive and inductive approaches. Thus, pragmatism declines using specific study knowledge, such as positivist, post-positivist and constructivist. Consequently, when deciding ideas, pragmatists take into consideration their empirical and practical effects.

Pragmatism eliminates the demand to make a mandatory selection as regards the study epistemology between constructivism and positivism (and also post-positivism). It excludes traditional hypothesis regarding the nature of knowledge, truth and inquiry (Creswell, 2003).

Creswell (2003) illustrated that the option of pragmatism associated mostly with the justification and description of the investigation questions. It enabled the research workers to research several fields of interest by using a variety of suitable techniques and describe the research results positively. Thus, pragmatism is categorised as adequate research knowledge

that explores beliefs and attitudes employing a mixed methodology which involves the combined approaches of qualitative and quantitative techniques (Ibid).

Robson (2005) established that pragmatism is no more a philosophy to be debated on, but has gained extensive application in social research.

The following section explored the association between qualitative and quantitative study approaches.

4.5.1. Levels of Theory

A theory is a standardised postulate which explains the association between two or more ideas and constructs. Two levels of theory are recognised, an abstract level which act in accordance with the inductive theory path and an empirical level which act in accordance with deductive theory path.

Inductive level

Following Collis and Hussey (2013), an inductive theory is a means where theory is developed by observation, which an investigator has observed during his analysis. Moreover, it may be known as a procedure where you induce your thought about a particular construct. In addition to this, ibid have described the induction process as one in which an association between the meanings and actions of human subjects are to be recognised and explored.

Deductive level

Following Collis et al., a deductive approach is one in which theory is not obtained from perception. Theory already prevailed and verified by investigators, however, you can describe a study that is based on empirical perception and theory produced on a conceptual and theoretical structure. In general, investigators intend to test a theory relying on the gathering of the raw data from participants and examine the results by employing a series of statistical

tests. This technique is suggested for particular research whereby investigators work on a specific idea by generating presumptions and then verify those inferences.

4.6. Research Methods

In spite of the presence of many research method categorisation, quantitative and qualitative procedures are the most effective approaches. Extensive explanations of these approaches are discussed.

4.6.1. Qualitative method

A qualitative approach is employed for collecting in-depth details on a specific subject and assumes that an individual symbolises the group's feelings, and emotions of an individual are also essential to understand, which are disregarded by the quantitative approach. This method is frequently employed in interpretivism. According to Tashakkori and Creswell, (2008) this method is employed when investigators need to recognise or understand a setting with the aim of developing a theory.

4.6.2. Quantitative method

A quantitative approach is a scientific approach, and its basis can be recognised in positivism (Grinnell Jr & Unrau 2010). This approach emphasises on raw data gathering according to the issue from a large populace and data exploration but ignores a person's emotions and feelings or environmental setting. The quantitative strategy work on objective, and measures it through the conducts and viewpoints which assist researchers in describing the data instead of interpreting the data.

4.7. Comparison of Qualitative and Quantitative Study Approach:

As quantitative investigators emphasise on numerical data, following Gelo et al. (2008), qualitative investigators depend on non-numerical data, for example, words, narrative and

feelings. Maanen et al. (1982, p. 32) initiated a verbal picture for helping readers to know the dissimilarities between both study as follows:

‘Quality is the necessary attribute of a thing; quantity is the number or size. Qualitative characterises a thing, while quantitative presumes the meaning and makes reference to its measurement’.

Gray (2009) proposed that by the nature of the analysis, investigators can combine separate techniques, as it is difficult to decide the better one. Miller & Brewer (2003) established that utilising a mixed method reduces the research’s weakness and limitation.

Table 4.1: Differences between quantitative and qualitative study (Source: Crestwell, 2014)

Comparative View of Approaches

	Quantitative	Mixed methods	Qualitative
Nature of data	Variables	Mix of variables, words, images	Words, images, categories, patterns
Data analysis	Statistical relationships	Quantitative symptoms and qualitative support	Search for patterns, themes and holistic features
Results	Generalizing	Corroborated findings may generalize	Particularistic findings Representation of insider i.e. ‘emic’ view point
Final report form	Statistical report	Eclectic and pragmatic	Narrative even with direct quotations of research participants

Table 4.2: Summary of the main features of various research study designs as highlighted by Fitzgerald & Howcroft (1998)

1	Qualitative Determines what's in existence instead of the number of things. Less methodical and responds more to the needs and type of research situation.	Quantitative Use of statistical procedures in identifying certainty and causal associations. Samplings may be more significant and more representative. A generalisation of findings to larger populations within error.
2	Induction Starts with peculiar examples employed in arriving at total generalisation which can be anticipated on the balance of probability. New proof may allow reviewing of conclusion. Some science philosophers are critics of this, but it is significant regarding theoretical/hypothetical conception	Deduction Employs general findings to attribute properties to peculiar examples. Related to verifying/falsifying theory and hypothesis testing.
3	Exploratory Focused on how to discover patterns in research data and to describe/comprehend them. Put in place fundamental descriptive groundwork. May result in a generation of theory.	Confirmatory Focused on hypothesis testing and verifying of theory. Inclined towards positivism, quantitative methods of study

As observed in Table 4.1, while qualitative methods in research are based on interpretivism, quantitative methods rely heavily on positivism. The differences between the two go beyond the analytical and methodological issues. The purpose of a quantitative study is in developing and employing statistical frameworks, postulates or hypotheses related to the phenomena being studied. The measuring procedure is fundamental to quantitative research since it gives the critical link pertaining to factual statement and statistical statement of quantitative correlations.

The quantitative study is unlike qualitative research because qualitative work employs analyses and interpretations of assertions for the objective of finding fundamental meaning and patterns of relationships. In qualitative research, validity applies to a definition or description with which it is used. Kholoud (2009) argues that since the two types of methods don't study a similar situation, both techniques can't be grouped for cross-validation or

triangulation reasons. The author agrees that the two can only be combined for complementary purposes. According to Morgan (1998), the two methods have different strengths and combining them result in more productive results than would have been otherwise.

4.8. Research strategy

Research Strategy is a data collection and interpretation process with an understandable objective. Easterby-Smith et al. (2012) noted that strategy is an arrangement of how investigators' questions are answered. Yin (1994) reported that based on three situations - research question, control on behavioural events, and emphasis on modern events, there exist five basic research strategies which include:

Experiments: This concerns a variable testing procedure such that the effect of a construct can be seen with other constructs. Additionally, Malhotra et al. (1996) are of the opinion that this strategy is employed when investigators analyse cause and effect associations between constructs.

Survey: is common and related to deductive research technique (Mark et al. 2009), such that information is gathered by pre-designed questionnaire.

Archival analysis: accounts for the incidence and predominance related to a particular situation. Furthermore, it is hard to use this strategy in investigation areas.

History: is employed in exploring past events, and is selected when no suitable individual is alive to report about the specific event.

Case study: is a written explanation of an issue. It demonstrates small group issues or focuses on a specific topic. It is chosen when investigators have limited control over occurrences.

4.9. RESEARCH PHILOSOPHY

To select an appropriate philosophy guiding the investigator's approach towards understanding the influence of the factors affecting MP acceptance in Nigeria, the investigator embraced positivism as the chosen research philosophy. Taking into consideration the essence of the investigation aim and objectives, research question, design and analysis employed, it is appropriate to embrace positivism since particular characteristics of this research comply with criteria emphasised by Hussey & Hussey (1997) for positivism which include:

- **Generate quantitative data:** as observed in the data collection technique.
- **Utilises large samples:** The investigator collected data from a large sample size, and this agreed with positivism philosophy.
- **Involved with hypotheses testing:** this study intends to deal with the validity of assumptions which had been established from recognised elements and interacting constructs which were listed in conformity with the study's aim and objectives
- **Data is most definite and accurate:** The data collected was quantitative, and regression, correlation and principal component analysis provided exact and explicit results.
- **Generalising from sample to population:** the study theorised the results obtained as compared with data collected from the whole Nigeria populace. This factual proof resulted from a statistical analysis of quantitative data gathered in Nigeria. The results, having relied on the research findings, were generalised to the Nigeria populace. These processes conform with positivism and to a suitable philosophy embraced by this investigation.

4.10. The research methods for this investigation – A Quantitative Technique

The researcher's reasoning for selecting quantitative research approach is driven by the research questions. The research design adopted in this thesis draws from the design as recommended by Creswell (2003). According to Creswell, there are three key framework elements derived from three questions which form the research design of a research study:

- Philosophical assumptions: what knowledge claims are being made by the researcher?
- Research approach: What strategies of inquiry will inform the methods?
- Data collection and analysis: What data collection techniques and analysis will be utilised?

The adaptation of the recommended research design according to Creswell (2003) can be implemented to recognizing what research method approach to be employed for inquiry. Research method approach can be quantitative, qualitative or a mixed method. The three key research framework elements can be utilised as processes that comprise the outcome of the research design.

Given the philosophical positions adopted in different studies, the research philosophy of this study is in line with the postpositivism view which is also known as a positivist view. This view is widely implemented in information science investigations (Orlikowski & Baroudi 1991, 8). Positivism follows a deterministic philosophy that outcomes are probably impacted by causes. Referring back to the research question: ***What are the determinants affecting mobile payment acceptance by consumers?*** The research question presents a viewpoint that the consumer acceptance of mobile payment in Nigeria is objectively impacted by certain factors. Thus, the objective of this study is to seek to investigate such factors which can then be presented in the literature for other investigators who have an interest in the topic and also interested practitioners of mobile payment.

Epistemology is the association between the investigator and the reality (Carlson et al. 2001). There are two superior epistemological paradigms in information science studies; positivism and interpretivism (Smith, 2006). Supported is the fact that, in epistemological terms, the positivist study perspective is dominant in behavioural information science study (Orlikowski & Baroudi, 1990), the researcher adopted a posture feature of positivism in this thesis (Myers, 2009). The researcher took a controlled and structured approach in carrying out investigations, by recognizing a clear research title, designing suitable hypotheses and by adopting an appropriate research methodology (Carson et al. 2001). To study mobile payment acceptance, the researcher developed a particular design utilising cross-sectional survey methodology, enhanced with survey instruments. A deductive technique was employed to explain MP acceptance in Nigeria by testing the hypotheses. The purpose of this design was to correlate the score of all independent factors that impact mobile payment acceptance and behaviour intention to recommend. The quantitative approach adopted in this research is described as a good choice by the researcher.

Various investigations on MP have embraced positivism (Luarn and Lin, 2005). Furthermore, this research designed a measurement model incorporated from generally established investigations. These assumptions are supported as significant at $p < 0.05$ and highly significant at $p < 0.01$ if there is an impact of one variable on the other, hence, the H_0 is rejected.

The significance of the empirical approach and data collection is a shred of evidence from several existing literature reviewed and also emphasised by Hussey & Hussey (1997, p. 10) who stated that an empirical data evidence is needed for a purposeful study to be valid. Updated literature has now resulted in the selection of the quantitative technique as a suitable

research methodology. Making a choice to use quantitative techniques was a resolution based on current literature, study limitations and the data type needed.

In considering the reason for this investigation which is to design a conceptual model of the essential elements impacting consumer acceptance of MP in Nigeria, a quantitative approach was employed while considering the adopted research model. A quantitative technique was applied to get a more excellent and broader perspective of the situation quickly and economically (Easterby-Smith et al., 2002). After reviewing several works of literature, many factors brought about the selection of methods employed in this study.

Concerning technology acceptance research, technology acceptance seems to possess a superior conceptual positivism urge. The present study aim is in designing a viable speculative framework of behavioural intention of consumer acceptance of MP. This aim needs the procedure of an organised, explicit model, and accurate estimations that could ascertain relations between constructs, in a way that decisions can be obtained from the research survey to a more significant population. A lot of these characteristics can be tackled by quantitative study techniques (Johnson et al., 2007).

The inspiration for this investigation is in evaluating the assumptions linked to the recommended conceptual model together with several hypothesised relations initially accepted in the technology acceptance setting. The conceptual initiative of this study is deductive. The investigation suggests following an affirmative strategy of investigation empirically (a way to prove or disprove initially proposed hypotheses which relate to MP acceptance).

Figure 4.3 displays the eleven significant stages in a quantitative study process. In explaining the analysis questions, this investigation followed the route in the manner as shown below. Nevertheless, the phases sometimes might overlap as the study progresses.

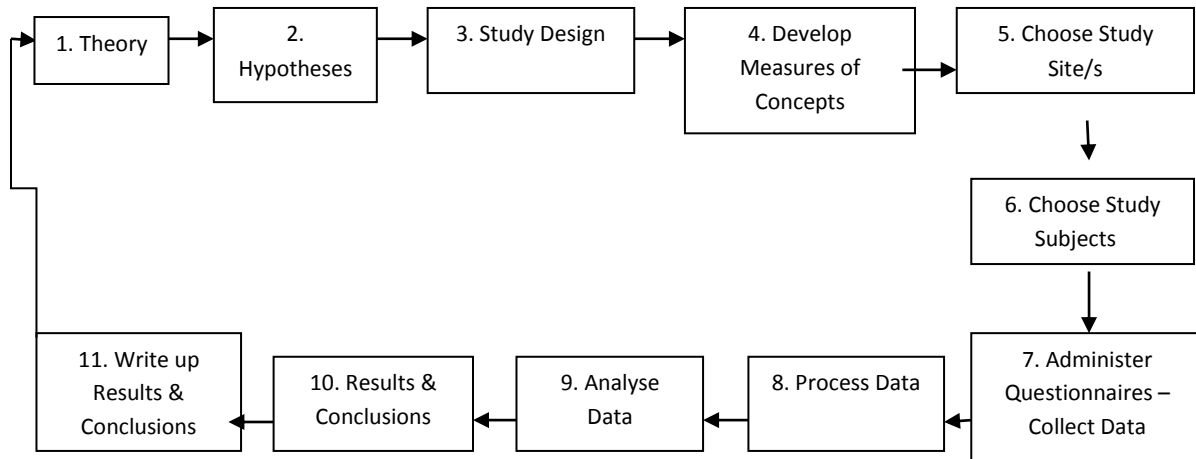


Fig 4.3: Quantitative Study Procedure as indicated by Bryman & Bell (2007).

In this research, theories and literature supporting this research were strengthened to guide the study deductively.

Below is an outline of the approach criteria presented by Anderson (2006) and their use in this research:

- **The investigator tested hypotheses and theory with data:** As described in chapter 3, a set of 8 hypotheses were produced based on theoretical propositions and these hypotheses were examined based on practical data.
- **Description of theoretical propositions by validation of hypotheses:** The theorised causal interactions between independent variables and dependent variable provided in the hypotheses and a conceptual model was described from the verified hypotheses.
- **Use of constructs:** As provided in chapter 2, this research had designated constructs to related variables in the model which were employed in data analysis.
- **Recognise analytical interactions amongst constructs:** The impact of factors of MP acceptance was evaluated and expressed with mathematical connections.
- **Gather quantitative data based on accurate measurement employing methodical and verified data-gathering tools:** Employing verified surveys to collect data and also statistical methods and software, ensured accurate and precise analysis of data.

- **Formal analytical report:** The final report contain correlations, regressions and with statistical proof to display the importance of results.
- **Generalizable results are presenting a description of the objective outsider perspective of the populace:** The research outcomes were generalised to give an accurate description of user behaviour towards MP acceptance in Nigeria.

Use of quantitative method is dependent on extant literature and also its usefulness to research aim and objectives. A sample instrument was designed to collect data from a sample group in Nigeria to achieve success in the implementation of this quantitative method.

4.11. My Study Designs:

In this study, surveys were employed as a data gathering instrument. The strategies employed to develop the survey and to attain validity and reliability of items in the investigation were stated henceforth.

The primary rationale of this investigation is to test the hypotheses of the dependent, independent and moderator constructs. Such studies are suitable for a correlational research design as explained below.

4.11.1. Correlational Designs:

Correlational design evaluates two or more constructs with a likelihood to measure the dependent constructs.

The central assumption of this study was that if a critical statistical relationship occurred between the independent and dependent constructs, there would be a chance of speculating the dependent construct using data accessible in the other construct. Within quantitative techniques, the research applied correlational study design (see Figure 4.4) in determining if a

specific association exist between independent constructs and dependent constructs of behavioural intentions in using MP.

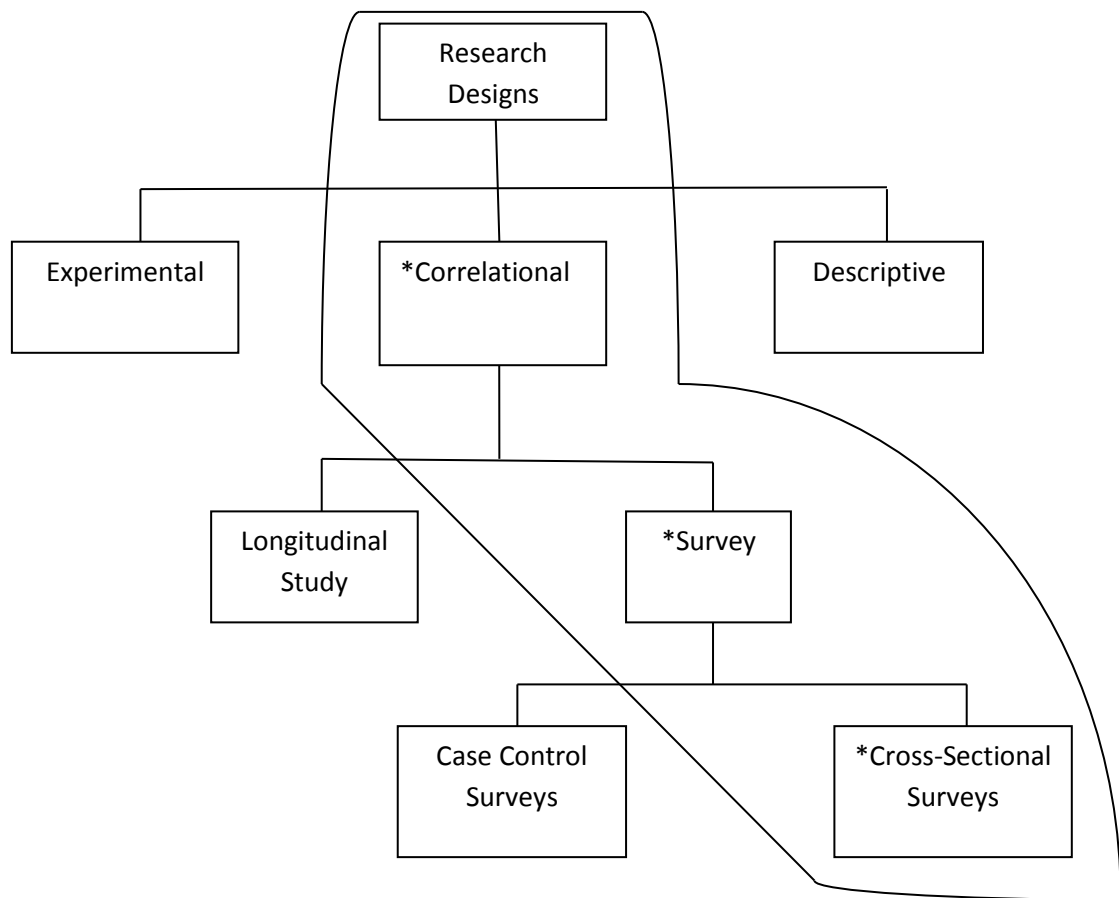


Figure 4.4: Description of the Study Design following Mugenda (2008, p.65)

4.11.2. Justification of Operationalizing a Correlational Design:

The researcher has adopted correlational design since m-payment is in its early years of introduction in Nigeria, and the researcher believes the best survey method is cross-sectional to predict future usage (Gefen et al. (2002). Having presented a theoretical/conceptual rationale for each variable under study, in chapters two and three, the researcher chose a correlational design for this study. Further confirmation for the application of correlational design includes the use of research questions; the fact that this analysis relates to needing the recognition of the direction and magnitude of the link between two sets of scores; the usefulness of recognising the types of the link; and the reason to describe in complex

associations of multiple elements. Some analysts who employed correlational designs in the past are Jackson (1988) whose study showed a relevant association between attitude and mathematical achievement; and also Arinola (1996) who evaluated the association between the achievement in MOCK and SSCE exams in maths between 1990 and 1994 at Ajibade Grammar School, Oyo State, Nigeria. Correlational analyses were used in determining the association existing between MOCK and SSCE examinations.

The principal advantage of correlational design over experimental designs is that they allow investigators to analyse the associations amongst a broad set of constructs in a single investigation. The second merit of correlational design is that they give information on the extent of association between the constructs being analysed. Correlational designs are employed for two critical reasons: (1) to examine the causal association between constructs and (2) to forecast scores on one construct from survey respondents' ratings on other constructs.

In this type of case, the study suggests utilising reliability coefficient, multiple correlation coefficients, generalised linear regression model coefficient; and path model coefficient for several research analyses of the gathered data as explained below:

a) **Reliability analysis** was done employing Cronbach's Alpha (α). Following De Vellis (1991), reliability is an evaluation of the extent to which a study instrument would give similar outcomes after iterated tests. Cronbach's Alpha demonstrates the magnitude to which each item in the variable is in correlation with a minimum of one other item of the variable. The evaluation can determine the amount of true score variance being represented by the indicators by differentiating the sum of indicator variances with the variance of the sum scale.

$$\alpha = (N/(N-1)) ((\text{Total Variance} - \text{sum of Individual Variance}) / \text{Total Variance}) \quad \text{Eq. 4.1}$$

If there is no true score but an error in the items (which is esoteric and unique, and, thus, not in correlation across participants), then the variance of the sum equals the sum of variances of the individual items. Thus, α will be 0. If all the questions are dependable and evaluate the same true score, then $\alpha=1$. In this analysis, the variable would establish a valid reliability level if Cronbach's alpha is at least 0.7.

b) **Multiple correlation coefficients (R^2):** was employed in describing the magnitude to which a set of independent constructs expresses a dependent variable. Statistics was applied to measuring the predictive power of the already evaluated framework. R^2 value span between zero and one, and in this research, neither threshold nor the least value is set, but rather, the statistic only expresses the percentage variation in 'dependent' constructs as described by independent constructs.

A total investigation analysis of the whole framework needs an evaluation of goodness of fit which assesses how well the framework parameter estimates will describe the variations in the dependent variable of the framework and duplicate the sample covariance matrix. The adjusted R^2 proportionately evaluates the goodness of fit just like R^2 , but rather, the previous statistic considers the degree of freedom. The explained variance, which is the variance justified by the regressed variables that are explained by the data. The adjusted R^2 values vary between 0 and 100%, with 75% or more as a very good value, 50% - 75% as good and 25% - 50% as fair. A value below 25% is considered poor, especially when using more than three independent variables (Neill, 2004).

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{[\sum (x - \bar{x})^2 (\sum (y - \bar{y})^2)]}}$$

c) **The Generalised Linear Regression Model (GLM) coefficients:** are weighed coefficients indicating the size, direction and importance of the linear connection between the independent and dependent constructs. The technique evaluates the direct and indirect influence of independent constructs on the dependent variable and also manages the moderating impacts in the investigation of linear frameworks. The GLM will be suitable as a result of its nature of managing fixed factors, covariates and interaction effects. The framework outcomes will enable a direct correlation of the variance described from both evaluation measures.

In this research background, the researcher postulates that five factors; PE, relevance, culture, technical support and trust determine behaviour intentions. The researcher also hypothesised that the independent variables in the framework would be moderated by gender, age, educational level and awareness, all requiring a suitable modelling technique. Therefore, GLM that will handle both direct and indirect influence was employed.

d) **The path model** uses path analysis statistics method to decompose correlation into separate parts to interpret effect. It permits the comparison of the direct impacts of constructs in an elaborate association system.

Path analysis: Padhazur (1982) discusses path analysis from the perspective of exploring a causal model versus finding the cause and effect between variables. A variable whose variability is assumed to be determined by causes outside the model is called an exogenous variable. On the other hand, constructs that are described by the variation of exogenous constructs in the model are called endogenous constructs.

Assumptions of path analysis are stated by the same author (Pedhazur, 1982) as first, relationships in the model must be linear. Second, residuals cannot be correlated with the variable(s) that precedes it in the model. Third, the model assumes a one-way causal

relationship. Fourth, variables are measured on an interval scale and without errors (refer to assumptions of multiple regressions and the testing of the model section for more details). All hypotheses are tested and explored to use multiple regressions in this study.

In estimating the path coefficients and the effects of variables on each other, Pedhazur (1982) use the correlation coefficients or the betas as surrogates for path coefficients. The detailed calculations of path coefficients are described in the model testing segment in this chapter.

The path model evaluates direct effects or the likely inclination of the independent constructs on the dependent construct. It validates the linear association between constructs and shows the predictive power of the analysed framework. Mathematically, the constructs are symbolised as a set of linear equations, named the path model. Following Keeves (1972), the basic concept of the path model for estimating the linear equations is:

$$r_{ij} = \sum p_{ik} * r_{jk} \quad \text{Eq. (i)}$$

Where i and j represent two constructs in the system, and the index k comprises of all constructs from which paths lead exactly to the dependent construct (j), r is the correlation coefficient, and p is the path coefficient. Equation (i) can be extended by sequential use of the formula itself to r_{jk} . Accordingly, the mistakes from behavioural intention all point at user behaviour. Where i is behavioural intention and j is user behaviour. Evaluated in extended form, this is read exactly from the path diagram by applying the direct relations as shown below in this research:

$$BI = \alpha_1 Pe + \alpha_2 Re + \alpha_3 C + \alpha_4 Ts + \alpha_5 T \quad \text{Eq. (ii)}$$

$$UB = \alpha_6 BI \quad \text{Eq. (iii)}$$

$$EB = \alpha_7 UB \quad \text{Eq. (iv)}$$

Where BI is Behaviour Intention, PE is performance expectancy, Re is Relevance, C is culture, Ts is Technical Support, T is trust, UB is user behaviour, and EB is expected benefit. In this research, a negative path coefficient indicates that there is a direct connection between the two constructs.

4.12. Testing for the effect of mediation

The indicators of significance used in path analysis are path coefficients and the correlations between variables (Baron & Kenny 1986). Any regression model will have univariate relationships between any two variables, and those correlations represent the associations between variables. Such correlations carry two meanings: first, the dependent and independent constructs are correlated. Second, the independent constructs are related (it indicates a multicollinearity issue). The second situation opens the door for a mediation situation.

4.13. Testing for the effect of moderation

The effect of moderation in the literature is explored through the test for the interaction between the independent construct and the moderator construct. If the communication is significant, the moderator construct is affecting the relationship between the endogenous and exogenous variables. The method of testing the moderation effect of each construct was conducted through the individual multiplication of the moderator construct by the independent construct and testing for the significance of this part of the equation.

4.14. Survey Designs

Two survey kinds (longitudinal and cross-sectional) exist which are useful in measuring the level of adoption of technology. Since m-payment under investigation is in its initial

introductory years, the best survey method is cross-sectional such that the research would have the capability of predicting future use.

i) Cross-sectional survey

The analysis used a survey procedure for collecting data which may represent a real situation in the population from which the research sample was extracted. The investigation focused on the consumer acceptance of m-payment. In evaluation studies on information system/information technology, cross-sectional survey techniques have been in use by different analysts (Venkatesh & Morris, 2000).

A cross-section survey design was used in gathering quantitative data for assessing the relations between the research constructs. Cross-sectional research consists of data collection covering a single time. Data collection of individual observations can take place at the moment or over a period. For this analysis, the data gathering period was for a three-month timescale. Following Mugenda (2008), this kind of sample assists in establishing if essential relationships exist amongst constructs. The extra advantage of this kind of survey is that one can initiate hypothesis which can be tested.

Cross-section designs possess three distinguishing qualities: no time dimension, only dissimilarities between groups are calculated in preference to changes over time; there is dependence on current dissimilarities in choice to change, following any intervention without allowing issues to arise over time; and classifying people in the survey depends on existing divergences to which they appeared to fit in, in preference to random allocation. The investigator knows the limits of this kind of investigation, but it will be beyond the study timescale to utilise longitudinal survey. When a collection of data occurs at two or more points in time, and after that, the investigation is termed longitudinal (Creswell, 2003) which

is practicable when there is a necessity in describing the model and course of change and stability (De Vaus, 2001).

The rationale of this research is in understanding user behaviour as a dependent construct for predicting actual use of m-payment in future. The present study involved a cross-sectional survey of academic, non-academic and college students from universities/colleges. Behaviour intention is linked to self-prediction of future use of new technology. Moreover, evaluating behavioural intention to predict future user behaviour is also significant. That too was investigated in this thesis.

The analyst thinks that the experience gained when m-payment is used would influence behavioural intentions of consumers if they intended to use MP in future.

4.15. THE STUDY POPULATION

4.16. Sampling:

Having established the study questions, aim and objectives in social research, the investigator decided on the study population. If the research population is complex and challenging to acquire, the investigator may utilise sample techniques (Bakeman, 1992). Fink (2003, p. 1) stated sampling as:

‘A sampling is a proportion of the populace....’

The researcher’s quantitative aim is in identifying the significant elements that impacted on end-users’ behaviour intention toward accepting and using m-payment. The need for a sampling technique was necessary since it was hard to cover the total population.

4.16.1. The Research Sample:

The size of the sampling was influenced by the central analytical technique utilised in the investigation. Other factors that affected the sample size decisions were related to the

complexity (for generalisation purposes) of the study, expected missing data rate, and the evaluation process employed (Hair et al., 2006). 500 responses were targeted, recognising the complicated disposition of designing the framework and instructions of investigators for using multiple group analyses, where the sample requirements were over ten times the number of variable in each of the study groups (Sekaran, 2003). The student and staff population in the three Nigerian universities during the 2016 academic year was recorded as thirty-five thousand (35,000) in number. For sample estimation, the researcher employed a convenient sampling frame that provided a sample that could be accessed at a reasonable cost, within the study period and which would yield reliable data. A forty-seven (47) item questionnaire was distributed to 500 students, academic staff and non-academic staff from three major institutions in Lagos, Nigeria. In addition to information regarding the research model constructs, demographic data were gathered from all participants. Data were collected for a three-month period with a response rate of 88%.

One important advantage of quantitative research methods is that valid inference can be made on the study population from the findings of the study sample, as far as the sample is selected conveniently enough to show the important features of the study population. So, estimating the sampling size and addressing non-response bias is crucial, as far as quantitative survey design (and this study) is concerned. The question now is on the size of the study sample. To estimate this and minimise the alpha error, Fisher, et al. (1983) formula was used (equation 4.5)

$$n = (Z^2pq) / d^2 \quad \text{Eq. 4.5}$$

Such that:

n is an estimate of sample size

Z is statistical certainty chosen or the standard z-statistic of the normal distribution (95%) corresponding to the chosen significance level (usually 4% - 5%).

p is the proportion of the character of interest or the estimated level/coverage to be estimated ($q=1 - p$)

d is the maximum probable error which the researcher is willing to tolerate or the tolerated maximum value of relative sampling error (this study proposes to consider an error of 4.35% deviation from the proposed results).

The student and faculty staff population in the colleges were recorded. The study estimated the sample from this large number of the population. The rationale behind this is to study samples with similar characteristics between colleges but with some defined differences within the study sites. Students display a critical function in an analysis: some analysts call them human ‘fruit flies’ (e.g. Rubenstein, 1982). They are ready for use in great amount and feasible. It is more comfortable than using populace outside the colleges. In spite of cautions about underpinning the scientific backgrounds of our subject of interest on the partial respondent populace, an analysis in psychology is susceptible to student involvement.

Following Kimmel (1996), almost 70% of investigations in personality and social psychology in current decades, and almost 90% of perception and cognition investigations utilise college students as respondents.

4.16.2. Sampling Frame:

This means nominating a subset of people from a populace to form the survey sample. There is a Probability Sampling method which depends on random selection in various ways from the population sample frame. They allow usage of higher-level statistical techniques for the calculation of the difference between your sample results and the equivalent population

values to infer that you know the population values; while Non-Probability Sampling doesn't have this allowance, are less complicated to implement, cheaper and employed when not sure of the population of interest.

The sampling frame used for this research was chosen from a population that own and use a cellular device (mobile phone or phablet) as a prerequisite to carry out mobile payment service. This is the more reason why the researcher chose institutions of learning since virtually all students, academic and non-academic staff (which includes bank workers and market traders inside the institutions) who own a mobile phone. The researcher pulled from a "larger population and then screened to remove non-members of the group (Cooper and Schindler, 2014).

Data were gathered at universities situated in Lagos (the commercial nerve centre of Nigeria). The researcher felt that choosing a university setting is suitable as students represent the largest category of mobile phone users. They are also potential mobile payment users, which matches the context of this research.

4.16.3. Sampling Design:

To come up with a manageable and a convenient number of selected participants from a fairly large population, and for generalisation purposes, convenient sampling method was chosen out of the under listed three sampling types: purposive, stratified and convenient random sampling. These are elaborated below:

a) Purposive Sampling:

Purposive sampling is a non-probability sample that is chosen based on the characteristics of a population and the objective of the study. This technique allows one to study cases that have the required information defined by a set of characteristics which ensures that participants with those important characteristics are included in the sample. This richness of

respondents improves the validity, usefulness and knowledge generated from investigations into the sample (Patton, 2002). Furthermore; this technique avoids extreme results by including it as part of multi-stage sampling to intensify the samples (Gall, et al., 2003) and other perimeters of purposively selected samples.

b) Stratified Sampling:

Stratified sampling is a technique which involves the division of a population into smaller groups known as strata. It boosts the representativeness of an investigation sample to various sub-groupings in the study population (Mugenda, 2008).

c) Convenient sampling:

Once the number of respondents from each college and sub-group were estimated, convenient sampling was chosen as the technique to identify respondents that were given questionnaires. Respondents were selected from each department and were requested to participate in the study. This study used a convenient sampling technique as a feasible and convenient way of selecting the survey respondents.

d) Sample size:

According to the generalizability of scientific results, guidelines for sample size estimation indicate that (Hair, et al., 2006):

- Sampling size over thirty and up to five hundred is acceptable for several studies.
- When samplings are to be split into sub-samplings, a sampling magnitude of at least thirty for each group is required.
- In multivariate studies, the sampling magnitude should be many times (ideally ten times or greater) as big as the number of research constructs.

Furthermore, a sample has been described as a population subset, which comprises of a few members chosen from the populace. In the current investigation, the researcher narrowed the population down by targeting three current faculties in each of the institutions.

For analysis method research, where structural equation modelling is used, these recommendations should be considered. Following Schikorski and Stevens (1997), 15 cases per variable are adequate when multiple regressions are needed, whereas Bollen (1989) asserted a portion of 5 samples per construct. A different investigation by Tabachnick and Fidell (2007) recommended that sampling magnitude should be 300 verified responses for factor analysis research. Following Hair (2003), studies that need factor analysis process to obtain the dimensionality for the utilised items should have a sampling size five times higher (lowest) or ten times higher (highest) than the items that need to be examined. Also, Hair (2003) asserted that a minimum sampling size of 200 is needed for SEM. Lastly, Comrey and Lee (1992) posited that sampling magnitude of 50 is inferior, while 100 is poor, 200 is acceptable, 300 is good, 500 is very good, and 1000 is excellent for SEM.

To achieve a representative sample, the researcher distributed the questionnaires among students (studying for bachelor degrees, and postgraduate degrees), academic staff and non-academic staff in the universities environment. The researcher first found out whether the participants had mobile phone usage experience.

Five hundred (500) academic & non-academic staff and students registered in a range of programmes from the three institutions were sent an e-mail invitation (e-mail addresses purchased from the institutions' registry offices) asking them to take part in the survey and all agreed to participate. Participants were told that involvement in the survey is entirely optional and they were offered extra credit for completing the questionnaire in the form of a gift voucher. The researcher got assistance in questionnaire distribution through some lecturers at these institutions (The University of Lagos, Yaba College of Technology, and Lagos State

University). After that, participants were asked to fill the questionnaire. The researcher collected the questionnaires by hand (200) and through emails (300), examined all responses and dropped those with too many missing values, which may affect estimation results in data analysis.

Young people aged 16-18 with adequate knowledge can provide their full approval to take part in the survey independently of their parents and guardian. Children under 16 can give their full permission in as much as they have been counselled and do not intend to involve their parents and they have the sufficient maturity to know the nature, reason and possible study outcome as was the case in this study. Those under 18 were college/university students who are matured enough to be involved in the survey.

4.16.4. Determination of sample size:

“How big a sampling should be is dependent on the changes in the populace criteria under investigation and the precise estimate required by the investigator” (Cooper & Schindler, 2014) and as a result of the variance that might come up within the population, the sample might require being more significant to account for the variance.

The researcher employed the sample size calculator tool from [surveymonkey.com](https://www.surveymonkey.com) website to obtain the sampling size.

Before using the sampling size calculator, two terms need to be known. These are the margin of error and confidence level.

The margin of error is the positive-or-negative value often announced in the newspaper. For instance, if you use a margin of error of 4, and 47 per cent of your sampling to choose an

answer, you can be “certain” that if you had asked the question of the whole suitable populace, between 43 per cent ($47-4$) and 51 per cent ($47+4$) would have chosen that result.

The confidence level is an indication of how certain one can be. It is a representation of how frequent the real population per cent that would choose a result lies within the margin of error. The 95% confidence level indicates one can be 95 per cent sure and this is the value several investigators employ.

When you put the confidence level and margin of error together, you can say that you are 95% certain that the actual population percentage is between 43% and 51%. The wider the margin of error one is willing to accept, the more certain one can be that the entire population answers would lie within that range.

The Margin of error used in this study is 4.35% which is an allowance for non-precision since a sample is used instead of a population.

The Confidence Level used in this study is 95% which is the percentage of all possible samples that can be anticipated to contain the true population parameter.

The Populace size of the three institutions surveyed in this research is 35,000.

Calculate Your Sample Size:

Population Size: 35000

Confidence Level (%): 95

Margin of Error (%): 4.35

Calculate

Sample Size

501

*This sample size calculator uses a normal distribution (50%) to calculate your optimum sample size.

Fig 4.5: Sample Size Calculator.

Source: www.surveymonkey.com

4.17. Data Collection Method:

According to Crotty (2005), the research method is a process employed by investigators for gathering and investigating data needed to fulfil the research questions. Furthermore, following Saunders et al. (2007), research method involves several procedures employed for collecting data, like questionnaires, observations/interviews, and analysing it using statistic and non-statistic methods, based on the disposition of the investigation.

According to Sekaran (2003), evaluation of acceptance and technology usage study utilises several techniques for data collection. Besides the structured interview, surveys are typical and widespread. With the introduction of new technologies, surveys span between using offline surveys and online surveys. The offline (non-internet) type of survey can be conducted in different ways: door-to-door surveys, ad-hoc mail survey and self-administered questionnaires and each of these ways have its merits and demerits. Table 4.2 outlines the advantages and disadvantages of each type as suggested by Sekaran (2003)

Since this research is quantitative, questionnaires were employed. Moreover, in determining the study reliability and validity, the investigator used several evidential sources.

The research method used was according to the research objective. For this research, the practical goal was in identifying the significant factors influencing end-user acceptance and use of MP. This objective was realised through the design of a brief questionnaire in identifying the major elements affecting end-users' behaviour intention toward accepting and using MP.

Table 4.3: Merits and demerits of questionnaires as a means of collecting data as outlined by Sekaran (2003)

Methods of collecting data	Merits	Demerits
A personal/self-administered questionnaire	Able to relate to and encourage participants. Uncertainties can be explained. Not costly when conducted to a category of participants. Tremendous response rate assured. Respondents' obscurity is large.	Firms may be unwilling in giving their time with staffs gathered for the motive.
Mail questionnaire	Obscurity is large. Extensive geographical coverage areas. Respondents may respond at ease. Can be conducted in an electronic form if necessary.	Low response rate. A 30 per cent rate is reasonable. Unable to explain questions. Follow-up methods for non-response are required.
Electronic questionnaire	Simple to administer; extends to all parts of the world; cost-effective; Delivered quickly; Ease of responding.	Computer knowledge is mandatory. The facility must be accessible to respondents. Respondents must be ready in completing the survey.

The present study used a personally/self-administered questionnaire because it might be able to motivate respondent and get a high response rate. The individually administered questionnaire is a better method of gathering data and is a feasible method because the survey will be confined to specific colleges in Lagos. The technique is recognised as a reliable forecaster of actual technology usage (Lederer et al. 2000).

4.17.1. Data Gathering Tools:

The data gathering instruments comprises a structured questionnaire which is described below:

4.18. Structured Questionnaire:

The principal data collection instrument was a structured questionnaire consisting of a composed written set of statements in ten sections. Section 1 was on Behavioural Intention, section 2 was on Performance Expectancy, section 3 was on Culture, section 4 was on Relevance, section 5 was on Trust, section 6 was on Security risks and obstacles of MP, section 7 was on Technical Support, section 8 was on Awareness, section 9 was on Security risks likelihood in MP and section 10 includes questions on gender, age, ethnic group, education level, occupation, income and marital status of participants. The reasons for using a structured and self-administered questionnaire as the primary data gathering instrument are the following:

- a) Quantifiable information will be required concerning the study population's behaviour intentions to use mobile payment services. The tool provides for this.
- b) A structured questionnaire will be the most useful and valid data collection tool especially when the study has defined variables to measure. Sekaran (2003) agrees that field studies often use questionnaires in measuring constructs of interest.
- c) A questionnaire can be shared to a large number of individual participants simultaneously; is less costly, less tedious and does not need a lot of expertise, compared to conducting interviews (Mugenda, 2008).

Besides the statements included in the customized framework to measure the variables, the study added some more comments to address the additional constructs introduced in the new

model by the researcher. The other/modified constructs are relevance, culture, and technical support, trust, security risks, education, awareness, and expected benefits.

4.18.1. Questionnaire Survey:

Depending on the study model, the questionnaire was formulated to determine the significant variables impacting end-user behaviour intention toward accepting and using MP. Therefore, a questionnaire survey technique was employed in this analysis.

Robson (2005) explained the complete merits of employing questionnaires in management analysis within a survey strategy. Fink (1995, p.1) recognised **survey as:**

A system to collect information for describing, comparing or explaining knowledge, attitudes, and behaviour. It entails setting objectives to gather data, design study, administer and score the instrument, analyse data, and report the results. Robson (2005) described a survey as a useful instrument for descriptive and exploratory reasons. Furthermore, a survey is useful when the study sampling is significant, and the investigator requires collecting a high size of standardised data (Schutt, 2006). If the investigator needs a considerable size of data within a limited timeframe, a survey might be the most excellent strategy (Alreck & Settle, 2004). Also, some procedures for collecting data may be employed in a survey study, like questionnaires, structured interview, structured observations and document (Moser & Kalton, 1981). Furthermore, Saunders et al. (2007) described that if investigators need to obtain a complete advantage of employing questionnaires, they should embrace the survey strategy.

Five hundred participants were incorporated into the research to find out how they perceive MP in Nigeria. The questionnaire is a conventional research method whose aim is to collect basic data from an extensive number of respondents (Burns, 2000). Oppenheim (2001, p.100) described the questionnaire as:

A set of questions from more solidly built scales or tests. It might comprise a checklist, attitude scale, projective technique, rating scale and different types of other study methods.

In general, a questionnaire may be classed into two principal kinds: self-administered and structured interview (Bryman, 2008). In the former, all participants answer the same questions in a specific sequential pattern (Oppenheim, 2001). Contrastingly, in a structured interview questionnaire, the respondents answer the same questions put to them by the inquirer (Bryman & Bell, 2007).

Bryman (2008) described that a questionnaire might be employed in various ways, like postal questionnaire where the investigator delivers the questionnaire via mail or other methods. Of recent, it may be delivered via the internet. Another way is via delivery and collection such that the investigator distributes it by hand to participants and receives the finished questionnaires at a later date.

Oppenheim (2001) described that the questionnaire technique has merits and demerits. Low cost, fast and secure means of gathering data from a vast size of participants in several areas are the chief merits. Furthermore, a low response rate is the major demerit of employing questionnaires.

Bryman & Bell (2007) signified that there is a contrast between kinds of questions that can be inquired and these can be classed into two main kinds:

- **Open questions:** Employed to explore investigation when the investigator needs to find out what is foremost in participants' minds or when the study requires a concise answer. The investigator does not give any options, and the participants need to note their responses completely. This kind of questions gets more comprehensive answers, but it is more complicated and time-consuming in analysing.

- **Closed questions:** The investigator gives participants some response options. Participants may be required in ticking a box which matches their chosen answer. Lists, categories, rankings and ratings are several types of closed questions. This kind of questions received more data answers, and the analysis is simple using statistical software.

For the response rate to be increased, a self-administered questionnaire was utilised in this research. From the analyst's viewpoint, a self-administered questionnaire is more suitable for this research and the questionnaires distributed and collected by the investigator increased the response rate because respondents are likely to be more encouraged to respond after relating with the investigator.

Moreover, for the response rate to be increased, the questionnaire design was meticulously evaluated (Hoddinott and Bass, 1986). Hereof, it was developed following Dillman's total design technique. (Hoddinott and Bass, 1986) described that using Dillman's method to design a questionnaire boosts response rate by about 80 per cent, and designing and printing of the questionnaire were in the form of a booklet with a cover sheet which explains the research aim.

Besides, the type and sequence of questions were taken into consideration in the questionnaire design (Black, 1999). Three major kinds of questions were used in this research, which includes:

Factual questions: This was in the form of reasonably straight-forward questions to gather personal data, gender, age, education, background, occupation and nationality.

Mobile Payment experience: here, participants were asked about their own mobile payment experience and their adoption of mobile payment.

Opinion and attitude questions: The questionnaire was dependent on the literature review outcomes, and questions were asked about participants' beliefs and attitudes towards mobile payment to recognise the important constructs that impacted on their behaviour intention towards accepting and using of m-payments.

Finally, the questions will be embraced from past studies with regards to technology and mobile payment adoption (Stone et al., 2006; Segelstrom, 2008).

4.18.2. Questionnaire Development:

Cognisant of the crucial function the questionnaire performs in any research, the study took considerable time to design it. The aim is to develop a good questionnaire that would meet the research objectives set by the study and be reliable. Guided by Information Systems (IS) technology acceptance theories, the conceptual framework and the postulated hypotheses, the researcher designed the questionnaire within a timescale of nine months.

The instrument was designed during the preliminary preparations for this study. Included in the study instrument were specific questions to assist us in establishing differences among consumers' acceptance and use of mobile payment taking into account that respondents were members of a community within a developing country context.

Measurement scale. Since this thesis aim is to design a model of the critical elements that impact customer acceptance of MP in Nigeria, multiple-item scales were adjudged suitable since it is usually employed in market surveys to evaluate attitudes (Parasuraman 1991) and the total score, which is a combination of various observed scores, reflects the exact underlying scores (Hayes 1998).

Three kinds of scales were employed in the study. **Nominal scales** were applied for recognition reasons (Kinnear et al. 1993). For instance, participants were inquired their ethnic

group. Also, **ordinal scales** were employed to rate participants' age and income. These scales were then presumed to be **interval scales**, as is usually observed in investigations (Perry 1998) and were employed to evaluate the individual features of participants. For instance, in this investigation, participants were inquired about their attitudes and behaviours concerning MP acceptance. This scale was employed as a result of its tenacity in organising the objects in a particular structure and also to evaluate the interval between the dissimilarity in response rankings (Churchill & Iacobucci 2004).

Question content and wording. The questions were formulated to be brief, detailed and averting ambiguity considering the relationship between question content and wording (Kassim 2001).

In this analysis, the Likert scale was suitable for measuring answers and used due to these purposes (Kassim 2001):

- It gives greater reliability coefficients with lesser items than the scales formulated utilising other techniques (Hayes 1998)
- It is generally employed in a survey and has been largely proved in social science (Garland 1991).
- It presents a great chance of response that precisely reflects the participant's view under investigation (Burns & Bush 2002).
- It assists in increasing the variance of response, which successively yields a stronger measure of relationship (Aaker et al. 2000).

Concerning the number of scale points, there is no explicit guideline which indicates an ideal size.

Nonetheless, some investigators accept that ideas can be represented most excellently with 5 to 7-point scale (Ibid). Hence, a 5-point Likert scale was utilised in this analysis.

4.18.3. Reliability and Validity

Academic investigators should consider their research quality. For high-quality research to be achieved, investigators should note the relevance of reliability and validity. Bryman (2008) described that investigation is based on reliability for it to be valid.

Reliability:

Reliability implies that a separate investigator would obtain reliable results if they embraced similar study methods (Babbie, 1995). Furthermore, Amaratunga et al. (2002) described that it aims to limit study mistakes and unfairness. Additionally, Robson (2005, p.551) recognised reliability as:

The degree such that a total study project, would yield similar outcomes if applied in several cases with a related object of research. There are reliable methods to assess reliability in fixed design study. The problems are very complicated to solve in flexible design study, where some investigators would consider the idea as unsuitable.

The questionnaire was checked for scale reliability to avoid errors (Pallant, 2005). The author decided to examine the magnitude to which the items that form the scale are computing similar feature. This test was performed by utilising a low Cronbach's alpha (< 0.7) and may need eliminating a few questions.

In this recent research, the investigator seeks to increase reliability by taking the following consideration:

- Used a quantitative study technique
- Developed the conceptual model, several theories that looked into the major elements which influence users' acceptance of advanced technology were reviewed to raise the factors' reliability.

- The entire questionnaire sample was carried out by the investigator.
- Cronbach's alpha coefficient was employed to verify the reliability of the elements.
- SPSS and PLS were selected for the analysis of the quantitative data to avoid partiality.
- A five-point Likert scale choice was utilised for increasing the reliability, so participants needed to make a different decision conforming to their viewpoint.

Validity:

Validity relates to study findings, ensuring that the results are a reflection of what they are supposed to be (Saunders et al., 2007). Silverman (2001) described that in a quantitative and qualitative study, validity concerns are suitable. Additionally, Robson (2005, p.553) recognised reliability as follows:

The extent such that what is perceived or evaluated is similar to what was claimed to be observed or assessed. Simply put, this means the truth status of study reports.

The investigator boosted the study validity by pursuing different areas such as:

Questionnaire questions were designed following the study questions, aim and objectives to complete all parts of the research.

My thesis supervisor and Director of Studies were requested to review the questionnaire to establish its content validity, clarity, and readability (Straub, 1989).

My supervisory team ensured that the study procedure and results agree with the aim and objectives of this investigation and they also ensured the survey's validity.

Validity was actualised through a questionnaire survey technique for investigating the research questions.

Participants were told that their personal information would stay anonymous and utilised for research reasons only.

Questionnaires were developed by requesting follow-up questions in a negative pattern ensuring that the respondents respond to the questions precisely.

For the response rate to be increased towards achieving validity, a self-administered technique was used. The investigator administered the questionnaires directly to each participant and collected it afterwards.

Data entry was done after the questionnaires were cross-checked.

4.18.4. The stages needed to develop and administer a questionnaire

1. Describing the objective of the survey
2. Deciding the sample group
3. Drafting the questionnaire
4. Executing the questionnaire
5. Analysis of the results

4.18.5. Validating the Instrument:

The instrument for this study is a comprehensive tool created by Venkatesh et al. (2003) and has been utilised by scholars in IS such as Anderson & Schwager (2007) and Moran (2006).

The tool was developed using a Conceptual model with a hypothesised relationship of Customer usage intention – an approved process for designing an investigation tool.

The instrument was also critically examined and thoroughly discussed in supervisory sessions with my supervisory team to make sure that the statements were clear and comprehensiveness of the constructs measurements. Post inclusion of the feedback of experts, the instrument was finalised.

4.18.5.1. Validating Questionnaire:

For the validation of the questionnaire, a draft questionnaire was presented to my supervisory team to be corrected and revised. The revised copy was prepared for approval followed by a dry run and distribution to five experts to check for its clarity and objectivity.

4.18.5.2. Defining the Model Criteria:

The study objectives and hypotheses were answered based on the following statistical and model requirements:

- The number of indicators/items per construct > 2
- Under 10% missing data to be ignored
- Cronbach's alpha 0.7 and above
- Factor loading 0.7 and above
- Inter-item correlation 0.5 and higher
- AVE >0.5
- The path coefficients must generate significant t-statistic, $t > 2$

- R^2 must generate significant t-statistic $t > 2$

4.19. Data analysis strategy

Data analysis comprises of stages which are coding the responses, cleaning, data screening and making a choice of the suitable data analysis strategy (Churchill & Iacobucci 2004) as described below.

4.19.1. Coding of Questionnaire responses.

This response coding requires the researcher to identify, classify and assign a numeric symbol to data (Wong, 1999). In this research, most responses were pre-coded except for section 10 questions which needed post-coding. A number chosen from the responses list, relating to a specific choice was assigned. This procedure was done to all former questions that required this exploration. On completing this process, the data were then registered into SPSS version 23, for the following stages.

4.19.2. Cleaning and screening data.

Before data analysis, Stata was used to test for data precision, missing values, outliers and normality. In so doing four (4) questionnaires were found invalid due to unreliable responses. Two (2) questionnaires had insufficient data to qualify them for inclusion in the study. In total, data from 444 questionnaires were found valid and used for the research.

It should be observed from Table 5.0 (Participants' Occupation) that there were some discrepancies between the proposed proportional sample size allocations and the actual number of responses, especially among academic staff respondents. The study had estimated a sample of 107 members of academic staff. However, when data was screened after the questionnaires had been returned, cleaned and edited, 131 respondents had classified

themselves as academic staff. This discrepancy was because, in the sampled universities, some graduate students also carry on the duties of faculty academic staff. Thus, some graduate students responded to Q45 of Section 10 of the questionnaire, by categorising themselves as academic staff. Incidentally, the researcher did not envisage this anomaly. Most importantly, is the fact that respondents possessed the necessary qualities needed to answer the questions for academic staff. In research, oversampling does not make the findings invalid (Salkind, 1997) as long as it does not have a significantly ample impact on the outcomes. The investigator, therefore, could not find a reason to eliminate these respondents' data.

Data Input into Excel:

The questionnaires were coded, and data was inputted into an MS Excel for present and future analysis.

Data Input into SPSS:

The researcher reviewed all data collected and determined the codes essential for performing statistical analysis. The researcher kept the constructs extended, so the data was more meaningful.

4.19.3. Statistical Analysis Plan:

After data collection, the researcher edited, coded and classified the data commenced. Recording of the collected data was done in MS Excel and SPSS. The investigation employed these five separate SPSS features to establish further that the study data was true and logical, which include descriptive statistics, PCA, reliability and regression analysis (multiple regressions – model summary, ANOVA, coefficients).

Initial data preparation was done through the creation of the Code Book in MS Excel. Each respondent was assigned an identification number corresponding to specific information on each respondent.

4.19.4. Presentation of Analysis:

Before commencing the data analysis and performing Multiple Regression analysis using SPSS, the computing formulae employed for the moderating constructs were planned.

Multiple Regressions was regressed with behaviour intention as the dependent construct and each of the factor loadings for PE, Relevance, culture, technical support and trust/security, together with moderating constructs of age, gender, education level and awareness, which were utilised as moderator constructs in this thesis. This regression was essential to describe the general hypothesis in each independent construct model.

4.19.5. Choosing a data analyses strategy.

The last stage was selecting an appropriate analysis technique by taking into account the research question, objectives, data features and the features of the methods (Malhotra 1999). To achieve the aim of the investigation, univariate, bivariate and multivariate analyses were employed.

4.19.5.1. Statistical Data Analysis:

The model's data is proposed to involve various steps: Initially, the fresh data was estimated for statistical reliability for each of the item indicators to establishing the distribution of the item indicators under investigation; the next stage involved obtaining the internal consistency of the block of indicators that constitute the construct, the least loaded item indicator was dropped at this stage, leaving only those with loading of 0.7 or higher; the factor weights

were then established for those item indicators that demonstrated significant inclination to a factor. Using the technique of Venkatesh et al. (2003), the weights were then utilised with the retained item indicators to generate the model's constructs and the model itself.

The Stata, SPSS and PLS-Graph tools were utilised for analysing the study data. The tools were seen as the best because they can model observable and latent constructs under normal and abnormal distributions.

Stata was embraced as a statistical program because of its superiority in handling and manipulating data. Besides, the scientific schedule was flexible in giving statistical outputs in great detail and was employed in determining the internal reliability of the variables, to carry out covariance analysis on demographic data and to achieve the statistical reliability of the variable indicators.

SPSS was employed in generating generalised linear regression model results, a method suitable to model the dependence of a continuous construct on fixed factors and covariates with interactions as used by Venkatesh et al. (2003).

The study also employed PLS software as the most appropriate approach for handling path analysis and multiple equations modelling. PLS-Graph is statistical software used to generate factor loadings and covariance matrix based on SEM and had been employed by several investigators in system acceptance works (Moran, 2006; Venkatesh et al., 2003). The software was also employed in determining the validity of the different determinants or statements. PLS was also used to assess latent constructs and also to weigh the relationships between the comments applied in deciding non-observed model variables.

1). Descriptive Statistical Analysis is the conversion of fresh data into a form that would give information to explain a set of factors in a condition that will make them understandable

and interpretable (Kassim 2001). This analysis provides an explanation to data which are essential in identifying distinctness amidst groups.

The information supplied by the data developed from this study was analysed. Frequencies Statistics of Mean, Median, Standard Deviation, Minimum and Maximum were executed utilising SPSS. Frequency counts and descriptive statistics are essential in developing construct profiles of several subscales from the sample instrument and give the input for the computer graphics (Smith, 2004). Descriptive measures consist of the mean, standard deviation, variance, minimum, maximum, and range, and sum, standard error of the mean, kurtosis and skewness of a set of scores from the survey populace. Hence, summarising the data to ensure straightforward interpretation is a complete explanation of descriptive analysis.

2). Factor Analyses:

PCA was carried out on the dataset to decrease an extensive number of observed factors into a lesser number of factors which measures distinct variables (Tabachnick & Fidell, 2001).

The processes in PCA include:

Factor extraction. This stage consists of recognising factors that could be employed to illustrate an exclusive variable (Pallant 2001). However, there are several kinds of extraction methods the most typically utilised is PCA. Applying the Kaiser's specification, only components with an eigenvalue higher than 1 were chosen for additional analysis.

Rotation. Once the number of components has been recognised, the following stage is to establish the loading patterns for simple analysis. There are two principal rotation techniques: orthogonal and oblique. Orthogonal presumes that the constructs are uncorrelated and assists in maximising the factor loading variance by ensuring high scores and reducing the low ones: items that load more than 0.3 are maintained while low loading items are discarded (Pallant 2001). As a result of its ease of interpretation, the orthogonal approach is mostly employed in investigations and considered suitable for this study.

For the reason of this research, Varimax rotation was employed on the 47 questions developed from the ten variables established in UTAUT because it enabled the researcher to simplify the ten constructs by factor loading to obtain the essential items within each of the independent constructs to produce variables for each independent model. PCA was the technique employed for factoring.

The data obtained were measurable with high dimension, and each indicator may possess high dependence. Data analysis techniques are necessary to analyse this continuous growth of the large volume of high dimensional data. High dimensional data sometimes transform to lower dimensional data through the PCA such that patterns that are coherent can be detected.

PCA's central concept is the reduction of the dimensionality of a dataset where there is an extensive number of interrelated constructs while keeping the variation existing in the dataset. This reduction is attained by changing to a new set of constructs, the principal components, which are uncorrelated, and which are arranged so that the first few keep most of the variation present in all of the original constructs.

Communalities are the portion of each construct's variance that can be described by the principal components. The column of 'Initial' indicates that the initial value of the communality in a PCA is 1, while the values in the column of 'Extraction' means the portion of each construct's variance that can be described by the principal components.

There are various components extracted as there are constructs that are put into it. In this research, the investigator made use of ten constructs, so we have ten components. Eigenvalues are the variances of the principal components. Since the investigator carried out PCA on the correlation matrix, the constructs are standardised, which indicates that each construct has a variance of 1, and the total variance equals the number of constructs employed in the investigation, i.e., 10.

The investigator extracted three principal components whose eigenvalues were 1 or more, and the total variance explained was 85.336%.

3). Transform to Compute Moderating Constructs:

The moderator effects were addressed since the interaction of the construct changed the relationship between two original constructs, hence moderating the real association. Thus, the interaction terms were included as cross products of the standardised independents (Garson, 2006). The path to interrelationships is to perform different regressions for every level of the interacting construct.

4). Reliability:

Cronbach coefficient alpha was employed for reliability testing since it is mostly utilised to assess the reliability of a measurement scale with multi-point items (Hayes 1998). The coefficient, which is a reflection of homogeneity amongst a set of questions, varies from zero to one. Furthermore, acceptable reliability should be an alpha value of 0.70 or more (Pallant 2001).

5). Multiple Regressions:

Multiple regressions explored the predictive ability of a set of independent constructs (PE models, etc.) on the dependent variable (Behaviour Intention) and moderating effects (Age, Gender, Awareness and Education). Tests were done employing SPSS and the tables (model summary table).

An inferential analysis is the cause-effect associations between constructs. Inferential analyses employed for this study were *correlations*, *SEM* and *MANOVA*.

Correlation analysis: This was employed in testing the existence of associations between the investigated constructs. In achieving this, Spearman's rho correlation coefficient was employed.

Coefficient analysis established through the t-Statistic determines if the researcher can reject the null hypothesis and notifies the researcher if an interaction between the independent construct and the dependent construct occur. The B (eta) tells how the independent construct describes much change in the dependent construct.

SEM: This was utilised in measuring the associations between independent constructs and dependent constructs at the same and also for testing some of the research hypotheses. As this research needed the hypothesised models to be checked for the best-fit, SEM happened to be a suitable investigation technique because it gives a further detailed goodness-of-fit (Ramanathan 1989).

6) MANOVA (Multivariate Analysis of Variance) was employed to test some research hypothesis. *MANOVA* has the advantage of maximising the differences amongst group membership of constructs in total and assists in understanding groups' dimensions differences (Tabachnick & Fidell 2001).

4.19.5.2. Chi-Square Test is a broadly utilised non-parametric test in statistical work. This test (Gupta, 2003) is utilised as a goodness of fit test and can be employed in normal distribution as a test of independence. The analysis is performed whether two or more attributes are related (Beri, 2008).

Characteristics of a chi-square test

1. This test establishes on frequencies or events as against the “z” and the “t” test created on parameters such as the mean and standard deviation.
2. This test is applied to draw inference only.

3. This test has additive features so that when (X_1^2) and (X_2^2) are independent and have a chi-square distribution with n_1 and n_2 degree of freedom; it will also be distributed as a chi-square distribution with $n_1 + n_2$ degree of freedom.

Chi-square analysis can be utilised when data satisfy four conditions:

1. There must be two observed sets of data or one observed set of data and one expected set of data.
2. The two sets of data must be established on the same sampling size.
3. Each cell in the data consists of an observed or expected count of five or more substantial.
4. The different cells in a row or column must represent categorical constructs.

4.19.5.3. ANOVA

ANOVA means Analysis of Variance, and it is a set of techniques for analysing the cause and effect of one or more factors on a single dependent construct. Analysis of Variance approach is employed when the independent constructs are of nominal scale (categorical), and the dependent construct is metric (continuous), or at least interval scaled (Nargundkar, 2003). The logic of the ANOVA method states that if we analyse the variance between the groups and compare it with that within the groups, it makes a sound decision whether or not the means are significantly different (Hair et al., 2006).

ANOVA is how one tests the regression and establishes if the association amongst the constructs is probably occurring. The higher the F-Stat, the more possibly the researcher is to reject the null hypothesis.

4.19.5.4. Generalisation:

A generalisation of the results of research from a survey to a population is a part of an investigation relating to study validity (Byrne, 2002). Williams (2002) indicated that in an interpretive study, generalisation is a debatable issue since investigators have their way to think and measure the situation and he made clear that research generalisation can be classed into three kinds which are:

- Total generalisation: study findings from a survey are typical of a populace.
- Statistical generalisation: study findings which reflect the entire populace.
- Moderatum generalisation: study findings which could be generalised to other related communities.

Miller & Brewer (2003) highlighted that a quantitative study dealing with numbers through a survey which reflects the total populace is more suitable for statistical generalisation. Williams (2002) indicated that moderatum generalisation is greatly employed in a qualitative study as the findings from a specific investigation can be generalised to other studies, and described that total generalisation happens with quantitative research though it is possible that it exists in qualitative analysis.

This analysis used a quantitative approach in which statistical generalisation was employed in generalising the outcomes. In this research, a sampling technique was utilised in identifying a survey to explain the significant obstacles and elements affecting mobile payment acceptance in Nigeria. Hence, the study findings can be generalised to all customers in Nigeria. Furthermore, the study model and outcomes can be employed in other similar investigations relating to mobile payment adoption in other less-developed nations, since many less-developed countries have almost the same culture.

4.19.5.5. The Quantitative Data Analysis: employed SPSS 23 and SPSS Amos 20. For the identification of the main elements influencing acceptance of mobile payment in Nigeria, the investigation went through various phases. First, a descriptive study was used to review the collected data. Fink & Kosecoff (1988) described that descriptive research is a conventional statistical approach employed to evaluate data. The descriptive study used a range of analytical methods (e.g. frequency, percentage, average).

The following statistical analysis phases were for testing and evaluating the conceptual model (the research model of mobile payment acceptance) to build a suitable model. Secondly, as a supplement to the initial statistical analysis, an analysis of the conceptual model variables and moderating factors were used. This analysis was carried out by developing common variables. Following data collection features, the t-test was employed for distinguishing the scores of two groups while the ANOVA was used for comparing between one independent constructs possessing a different number of levels with various elements (Pallant, 2007).

Thirdly, the correlation coefficient amongst the variables and moderating factors were estimated to make sure the association connecting the variables and moderating factors were linear. This section was carried out with IBM SPSS software. Finally, path analysis was employed for identifying the final model variables and moderating factors association using IBM SPSS Amos in evaluating the model by testing the association connecting the model variables and moderating factors (Byrne, 2001). Figure 4.5 shows the questionnaire survey analysis technique.

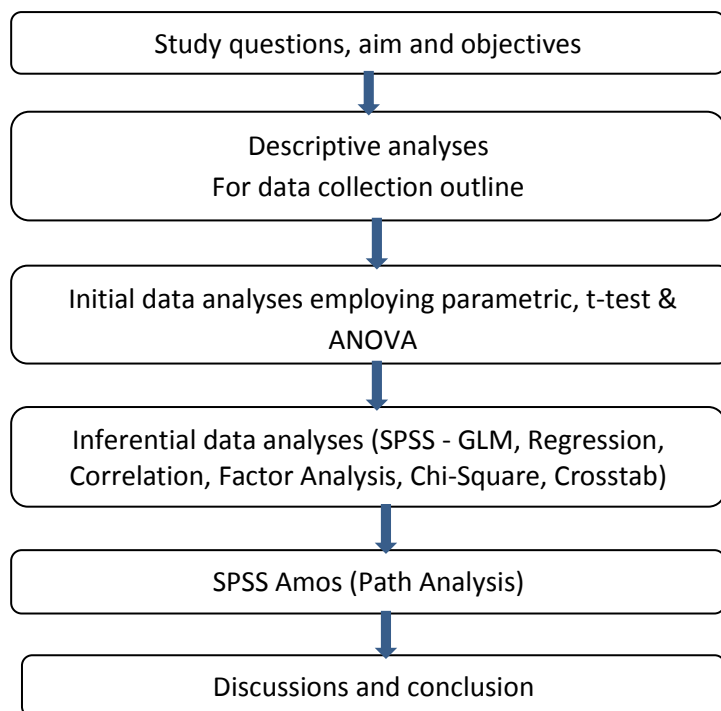


Figure 4.6: Quantitative data analyses stages (Source: Byrne, 2001)

4.20. Estimating the Validity of the Constructs

Validity is the magnitude an instrument evaluates what it is meant to determine (Mugenda, 2008). Validity creates the connections between the data and the variables within the analysis and assesses how exact the gathered data symbolises a given variable in the research. If the investigation data is an accurate reflection of the variable, then inferences based on that data would be accurate and meaningful. According to Mugenda, (2008), no data can have absolute validity.

Data can be validated in three ways namely; construct, content and criterion-related validity.

Content validity: This study's content was validated through the determination of the constructs which have been described and employed in prior literature (Churchill & Iacobucci 2004). This research acknowledged the constructs' dimensions from IS literature. After that, survey personnel's views were solicited in providing meaningful inputs in addition to what has been acknowledged from the literature.

Construct validity: This shows the degree to which the variables presumably associate with one another in measuring an idea based on theories underpinning an investigation (Zikmund 2000). For the benefit of this research, factor analysis was carried out in measuring a concept's dimensions and also to determine which items were suitable for each dimension. As this research intended to check the associations amongst constructs, a path analysis employing AMOS 20 was utilised.

This investigation used construct validity as explained in the following narrative.

Construct validity means the extent such that any measure assesses the underlying theoretical variable it is supposed to evaluate (Cronbach, 1951). The study assessed construct validity by carrying out PCA and factor analysis and results were presented in Tables 5.33, 5.34, 5.35, and 5.36 of chapter five. Besides that, during the preparation of the instrument, construct indicators were reviewed by the researcher together with his academic supervisory team. The survey indicators relied on most of the statements from the works of Moran (2006).

4.21. THE STRUCTURAL MODEL

The Structural Equation Modelling process comprises of 2 levels: measurement and the structural level. When the model has been specified, the next stage is to either reject or keep the presumed models by evaluating the goodness of fit indices of the models. In the structural level, the presumed causal associations between the latent variables in the theoretical model are analysed on theoretical propositions, which are either accepted or rejected by the data realised (Hair et al., 2006). This procedure is adjudged as the theory-testing phase where the theories posited and hypotheses formulated before data analysis are either rejected or accepted based on causal associations between elements (Bollen, 1989). The theoretical model in this research resulted in the formulation of a set of hypotheses on MP acceptance

and demographic impacts. These hypotheses were tested at the structural level with their extent of impact and significance level employed as the basis to analyse the paths and associations between elements. The outcomes from the structural level are displayed in Chapter six.

4.22. ETHICAL CONSIDERATION

Giving consideration to the administration of this study is appropriate. This investigation welcomed the tasks of protecting the survey participants and users.

Generally, social research focuses on exploring human thinking, emotions, experiences and a sense of purpose (Mauthner et al., 2002). Thus, there should be a productive association between the investigator and the respondents. This association is dependent on ethical considerations. Bell (2008) made it clear that ethical responsibility begins when the investigator builds a study plan and keep on developing an ethical approach to deal with the study respondents. Moreover, Miller and Brewer (2003, p.95) defined ethical consideration as:

Creating a mutual respectable, win-win association, such that respondents are pleased

The ethical considerations for this study by the researcher include:

Participants' identities were disclosed.

Detailed explanations were given to the participants about the research and consent was taken before inducting them in a group.

The researcher ensured participants' identities were kept confidential.

The researcher did not partake in the survey to avoid bias.

The participation was voluntary and was not forced on the participants.

Participants were given correct details about the study aim, objectives and possible outcomes.

No respondent was harmed or injured by taking part in the research.

All collected data were stored safely and securely.

Respondents were told that they might discontinue the survey at their convenience.

4.23. RISK ASSESSMENT

Risk of participants becoming stressed & upset in completing questionnaire: The researcher ensured that participants did not feel isolated or insecure about any of the research details, so he mitigated this risk by providing an avenue to support all participants in case they want to discuss any concerns they might have, by offering his contact phone number that all participants can access if required

The risk of data collection in an unfamiliar location with people not already known to the researcher: The researcher mitigated this risk by visiting research site before data collection to assess possible risks associated with a built & social environment. The study was conducted in natural settings of the study sites thereby reducing interference by the investigator with the usual workflow.

The risk of disclosure of confidential information: The researcher mitigated this risk by ensuring voluntary participation during the survey, informed consent, beneficence of participants, confidentiality, & privacy. The participants' details were kept confidential and protected by using encryption, code, and password safeguard. The researcher ensured that all completed questionnaires are kept in a safe and secure place.

The risk associated with reporting results: The researcher mitigated this risk by taking every precaution only to have code numbers on all research documents. The researcher was scrupulously honest and did not manipulate data during collection and interpretation, to ensure that the results were not compromised.

4.24. Conclusions

This chapter stated the philosophical perspective which underpins the research, then an explanation of the study process and the justification behind the purpose of using the methodology. Furthermore, the research demonstrates the design, defines the population, the sampling frame and the magnitude of the study with reasons to support the choice, procedures followed in administering the questionnaire and introducing the data analysis. The credibility of the findings relied on the use of quantitative techniques and the accepted value of the Cronbach Alpha to support its reliability and validity. Lastly, ethical considerations associated with data collection were discussed as well as risk assessment during the research survey.

The following chapter introduces the data analysis utilised in this investigation based on the identified quantitative approach to chapter 5.

CHAPTER FIVE: DATA ANALYSIS

5.1. INTRODUCTION

In this section, guided by the investigation objectives and following standards set in Chapter 4, detailed data analyses are presented.

After completing the comprehensive survey with the structured questionnaire, data was set in spreadsheet in a well-ordered manner. The full analyses were performed utilising SPSS 23. Reliability coefficients were employed to test their internal consistency and reliability, to analyse items within the study questionnaire. The study estimated how precise the gathered data represented a likely variable in the research using construct validity. Next, utilising the retained constructs, the study used PLS-Graph to examine the degree to which each variable in the model was distinct from the others and also to measure how much variance was shared between the constructs. Several tools and tests employed for analyses comprised of reliability, Cronbach's Alpha, PCA, correlation, regression, chi-square tests, etc.

The MP results indicate six factors that are basic to understand consumer behaviour concerning MP. The conceptual model developed is convenient as a critical framework to investigate other parts of technological novelty in Nigeria. The model possesses the capacity of being refined for use in other nations. The results from this analysis contribute to investigations with a concentration on technological business innovation in Nigeria.

5.2. DATA EVALUATION

Respondents for this study were members of university/college communities in Nigeria who were comprised of students, academic and non-academic staff.

5.3. The Study Population

To facilitate the selection of sites with sufficient information for this work, the researcher followed a systematic process.

In estimating the minimum sample size, the study took into account likely losses resulting because not all respondents would be available or willing to partake in the investigation. With a size of 35,000 people in the three institutions in Nigeria, and using a sample size calculator assuming a 95 per cent confidence level with a 4.35% margin of error, the investigator arrived at a sample size of 501. According to Bartlett, et al. (2001), evaluating response rates is not true science.

Five hundred questionnaires were administered to the study sample. 450 were filled and returned, representing 90% of the total administered questionnaires. The collected data was then cleaned, edited, and entered into Excel software for exportation to SPSS for examination.

5.4. Data analysis

According to Eisenhardt (1989), an analysis is an interactive procedure commenced with the development and presentation of an original set of theoretical assumptions based on fact from the first stage of gathering data, during fieldwork and the theoretical assumptions associated with the conceptual framework.

Data analysis process operations include:

- a. Editing: This process is done to examine the collected raw data for error detection and omissions and to correct these if necessary.
- b. Coding: This process is done to assign numerals to feedbacks so that responses could be placed in a restricted number of groups.

- c. Classification: This process is done to arrange data in groups/classes by standard features.
- d. Tabulation: This process is done by arranging data logically/concisely.

5.4.1. Data Analysis Charts, Tables, and Plots

This chapter relates to how the methodology works regarding analysis for the data gathered concerning the questionnaire.

Table 5.1: Gender

Table 5.1 shows that 268 respondents are males and 176 respondents are females who participated in this survey as shown below in percentages of 60.4 and 39.6 respectively.

What is your Gender?				
Gender	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Valid Male	268	60.4	60.4	60.4
Female	176	39.6	39.6	100.0
Total	444	100.0	100.0	

Table 5.2: Age

The table below indicates that 58 respondents are under 18 years of age group. 13 respondents belong to the 18-24 years age group. 172 respondents lie between 25-34 years age group. 149 respondents are of 35- 54 years of age. 48 participants are of 55-64 years of age and only 4 participants are of 65-70 years age group as shown in percentages of 13.06, 2.93, 38.74, 33.60, 10.81, and 0.90 respectively.

What is your age in Years?				
Age (in years)	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Valid Under 18	58	13.1	13.1	13.1
18-24	13	2.9	2.9	16.0
25-34	172	38.7	38.7	54.7
35-54	149	33.6	33.6	88.3
55-64	48	10.8	10.8	99.1
65-70	4	.9	.9	100.0
Total	444	100.0	100.0	

Table 5.3: Ethnic Group

Table 5.3 shows that there are 194 participants who belong to the Yoruba ethnic group, 87 respondents belong to Igbo. 72 respondents belong to Hausa, 42 respondents belong to the Middle Belt. 43 respondents belong to Niger-Delta whereas 6 respondents belong to other Ethnic Groups in this survey question as shown below in percentages of 43.70, 19.60, 16.20, 9.5, 9.7 and 1.40 respectively.

What is Your Ethnic Group?					
		Frequency	Per cent	Valid Per cent	Cumulative Per cent
Valid	Yoruba	202	45.3	45.5	45.5
	Igbo	92	20.6	20.7	66.2
	Hausa	68	15.2	15.3	81.5
	Middle Belt	41	9.2	9.2	90.8
	Niger-Delta	41	9.2	9.2	100.0
	Total	444	99.6	100.0	

Table 5.4: Education

Table 5.4 shows that there are 55 participants with Primary School Education as the highest educational level. 53 respondents are of High School Education. 250 respondents are of Undergraduate Education, and 86 respondents are of Postgraduate Education as shown in the pie chart below in percentages of 12.40, 11.90, 56.30 and 19.40 respectively.

What is your highest level of Education?				
Educational Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage (%)
Primary School Education	55	12.4	12.4	12.4
High School Education	53	11.9	11.9	24.3
Valid Undergraduate Education	250	56.3	56.3	80.6
Postgraduate Education	86	19.4	19.4	100.0
Total	444	100.0	100.0	

Table 5.5: Occupation

The table below indicates that 176 respondents are students, 131 respondents are Academic Staff and 137 respondents are Non-Academic Staff by occupation as shown in the pie chart below in percentages of 39.60, 29.50 and 30.90 respectively.

What is Your Occupation				
Occupation	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Valid Student	176	39.6	39.6	39.6
Academic Staff	131	29.5	29.5	69.1
Non-Academic Staff	137	30.9	30.9	100.0
Total	444	100.0	100.0	

Table 5.6: Level of Income

Table 5.6 shows that 116 respondents have low income, 144 respondents have medium income and 184 respondents have high income as shown below in percentages of 26.10, 32.40 and 41.40 respectively.

What is your Level of Income				
Income Level	Frequency	Per cent	Valid Per cent	Cumulative Percent (%)
Valid Low Income	116	26.1	26.1	26.1
Medium Income	144	32.4	32.4	58.6
High Income	184	41.4	41.4	100.0
Total	444	100.0	100.0	

Table 5.7: Marital Status

Table 5.7 shows that there are 274 who are single and 170 are married in this survey as shown below in percentages of 61.70 and 38.30 respectively.

What is your Marital Status?				
Marital Status	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Valid Single	274	61.7	61.7	61.7
Married	170	38.3	38.3	100.0
Total	444	100.0	100.0	

5.4.2. Demographic Characteristics of Respondents

It should be observed from Tables 5.4 and 5.5 that there were some discrepancies between the proposed proportional sample size allocations and the actual number of responses, especially among academic staff respondents. The study had estimated a sample of 107 members of academic staff. However, when data was screened after the questionnaires had been returned, cleaned and edited, 131 respondents had classified themselves as academic

staff because, in the sampled universities, many graduate students also carried out duties of faculty academic staff. Thus, some postgraduate students responded to Q45 of Section 10 of the questionnaire, by categorising themselves as a faculty academic staff.

Table 5.8: Demographic Descriptive Analysis

The demographic data in this research is not normally distributed, and it is non-parametric as familiar with other technology acceptance investigations (van der Heijden, 2004). The researcher had considered median a better measure of centrality than the mean in the descriptive analysis since the data are skewed, that is lopsided.

Table 5.8 shows that gender has a mean of 1.3964 and a median of 1 with a variance of 0.24 where $n = 444$. Age has an average of 3.2883 and a median of 1 with a variance of 1.321 where $n = 444$. Ethnic Group has an average of 2.1599 and a median of 2 with a variance of 1.787 where $n = 444$. Education level has an average 2.8266 and a median of 3 with a variance of 0.78 where $n = 444$. Occupation has a mean of 1.9122 and a median of 2 with a variance of 0.699 where $n = 444$. Income has an average of 2.1532 and a median of 2 with a variance of 0.654 where $n = 444$. Marital Status has a mean of 1.3829 and a median of 1 with a variance of 0.237 where $n = 444$.

The median values obtained described that the data are not centralised which is an illustration of non-normality distribution.

Statistics							
	What is your Gender?	What is your age in Years?	What is Your Ethnic Group?	What is your highest level of Education?	What is Your Occupation?	What is your Level of Income?	What is your Marital Status?
N Valid	444	444	444	444	444	444	444
Mean	1.3964	3.2883	2.1599	2.8266	1.9122	2.1532	1.3829
Median	1.0000	3.0000	2.0000	3.0000	2.0000	2.0000	1.0000
Variance	.240	1.321	1.787	.780	.699	.654	.237
Range	1.00	5.00	4.00	3.00	2.00	2.00	1.00

5.4.3: Descriptive Analysis of all variables/factors/sections

Table 5.9 shows that behaviour intention has an average of 2.5455, a range of 2.8 and variance of 0.482 with a standard deviation of 0.69425 where observations are 444. Performance expectancy has an average of 2.5479, a range of 3.43 and a variance of 0.68 with the standard deviation of 0.82446 where observations are 444. Culture has an average of 3.027, a range of 3.50 and variance of 0.867 with the standard deviation of 0.93124. Relevance has a mean of 2.4302, a range of 3.60 and variance of 0.755 with a standard deviation of 0.86918 where a number of observations are 444. Trust has a mean of 2.7808, a range of 2.67 and variance of 0.707 with a standard deviation of 0.84071. Security Risks and Obstacles has a mean of 2.2395, a range of 2.67 and variance of 0.559 with a standard deviation of 0.73 where $n = 444$. Technical support has a mean of 2.5401, a range of 1.60 with a standard deviation of 0.04534 where $n = 444$. Awareness has a mean of 2.3733, a range of 3.0 and variance of 0.559 with a standard deviation of 0.60 where $n = 444$. Security Risks and Likelihood has a mean of 2.6306, a range of 2.67 and variance of 0.239 with a standard deviation of 0.48911 where the number of observations is 444. Demographic factor has a mean of 2.1599, a range of 2.14 and a variance of 0.176 with a standard deviation of 0.41954.

Evaluation of indicators in the study constructs was carried out to analyse their reliability. Using Stata (Version 9), the study examined all items/indicators for the following: mean, standard deviation, skewness and Kurtosis statistic with the equivalent level of significance. By definition, the mean is the average of the measurements over the sample or the population.

The descriptive of the data sets was analysed having performed data cleaning and screening. From these statistics, the scores were tightly packed around the mean, signifying that most participants share the same views towards BI, PE, Culture, Relevance, Trust, Security Risk &

Obstacles, Technical Support, Awareness, Security Risks Likelihood and Demography. For instance, in this research, all of the *standard deviations* were < 1 , that is, the variations in participants' views were small.

As regards to *range*, an extensive range for each construct (greater than 2) was recognised, except for Technical Support as depicted in table 5.9 (descriptive analysis for all variables). This range value suggests a more significant spread in the system.

Normality: The first primary presumption about structural equation modelling is that all data have a multivariate normal distribution (Hooley & Hussey 1994). Multivariate normality comprises of both the distributions of individual constructs and that of combinations of constructs (Ibid). This presumption is essential to perform significance testing employing the t-test and *F* statistics (Tabachnick & Fidell 2001).

Skewness and Kurtosis are two ways utilised to assess normality, for validating an assumption. A distribution is normal when the values of skewness and kurtosis are equal to 0 (Tabachnick and Fidell (2001). Furthermore, there are standards relating to the extent non-normality is problematic. Several authors recommend that absolute values of univariate skewness indices larger than 3 seem to explain extremely skewed data sets (Chou & Bentler 1995). With regards to kurtosis, there seem to be fewer consensus, and a conservative compromise appears to be that absolute values of the kurtosis index more than 10 may propose an issue and values more than 20 may imply a more severe one (Kassim 2001).

The mean together with other statistics like Skewness and Kurtosis were applied purposively to establish the distribution of the indicators in this study. Normally distributed data establish the baseline for kurtosis. A kurtosis value that significantly deviates from 0 may indicate that the data are not normally distributed. From table 5.10, it is observed that most of the kurtosis values are negative (i.e. < 0) which signifies that the data for this investigation are not

normally distributed. This situation is the same as other investigations on technology adoption (van der Heijden, 2004).

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.1874	4.0078	2.5455	.69391	444
Residual	-.09207	.05354	.00000	.02179	444
Std. Predicted Value	-1.957	2.107	.000	1.000	444
Std. Residual	-4.182	2.432	.000	.990	444

a. Dependent Variable: BI

Table 5.9: Residual Statistics

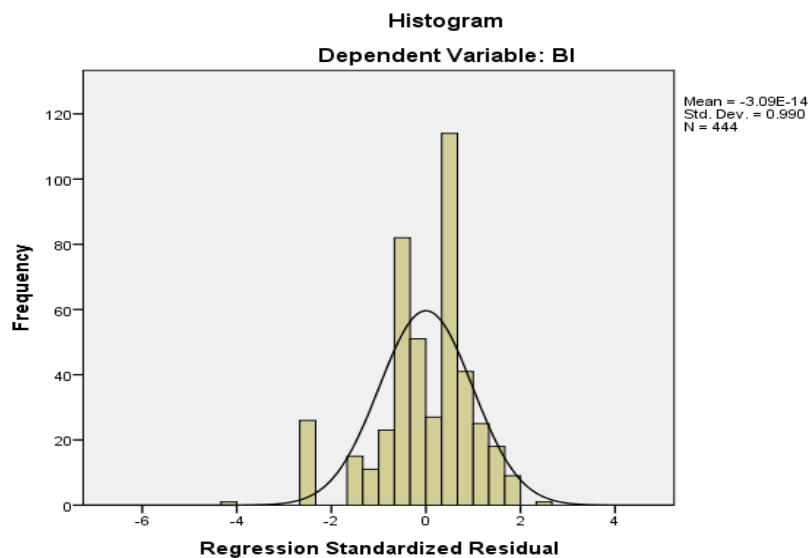


Figure 5.1: Histogram

Table 5.10: Descriptive Analysis for all variables

Descriptive Statistics											
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BI	444	2.80	1.20	4.00	2.5455	.69425	.482	-.022	.116	-.287	.231
PE	444	3.43	1.00	4.43	2.5479	.82446	.680	.460	.116	.001	.231
Culture	444	3.50	1.00	4.50	3.0270	.93124	.867	-.300	.116	-.323	.231
Relevance	444	3.60	1.00	4.60	2.4302	.86918	.755	.791	.116	.407	.231
Trust	444	2.67	1.33	4.00	2.7808	.84071	.707	.070	.116	-1.364	.231
SecurityRiskandObstacles	444	2.67	1.33	4.00	2.2395	.74751	.559	.703	.116	-.326	.231
TechnicalSupport	444	1.60	1.60	3.20	2.5401	.45364	.206	-.536	.116	-.838	.231
Awareness	444	3.00	1.00	4.00	2.3733	.74755	.559	.397	.116	-.296	.231
SecurityRiskLikelihood	444	2.67	1.33	4.00	2.6306	.48911	.239	.052	.116	-.170	.231
Demography	444	2.14	1.14	3.29	2.1599	.41954	.176	-.055	.116	-.644	.231
Valid N (listwise)	444										

5.4.4. Correlation Analysis

It is an evaluation of the relationship between 2 continuous constructs. Correlation evaluates both the magnitude and direction of associations between 2 constructs. The squared correlation is the evaluation of the tenacity of the relationship (Tabachnick and Fidell, 1989). Correlation is represented by “r”. The two constructs must normally be associated. “r” value always lies between -1 and +1.

Table 5.11: Correlation between the factors of BI to use MP

From the below correlation matrix, “I Intend to Use MP in the next Six Months” correlates significantly with “I Predict I shall use MP in the Next Six Months”. Further, it is strongly correlated with “I Plan to Use MP in the Next 6 Months” and “I already Use MP”.

Correlations			I Intend to Use MP in the next Six Months	I Predict I shall use MP in the Next Six Months	I Plan to Use MP in the Next 6 Months	I must use MP in the Next Six Months	I already Use MP
Spearman's rho	I Intend to Use MP in the next Six Months	Correlation Coefficient	1.000	.817**	.513**	.012	.624**
		Sig. (2-tailed)	.	.000	.000	.807	.000
		N	444	444	444	444	444
	I Predict I shall use MP in the Next Six Months	Correlation Coefficient	.817**	1.000	.702**	.282**	.715**
		Sig. (2-tailed)	.000	.	.000	.000	.000
		N	444	444	444	444	444
	I Plan to Use MP in the Next 6 Months	Correlation Coefficient	.513**	.702**	1.000	.543**	.522**
		Sig. (2-tailed)	.000	.000	.	.000	.000
		N	444	444	444	444	444
	I must use MP in the Next Six Months	Correlation Coefficient	.012	.282**	.543**	1.000	.268**
		Sig. (2-tailed)	.807	.000	.000	.	.000
		N	444	444	444	444	444
	I already Use MP	Correlation Coefficient	.624**	.715**	.522**	.268**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.
		N	444	444	444	444	444

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

Table 5.12: Correlation between the factors of Performance expectancy of MP

From the first column of Table 5.12, “Using MP would enhance my shopping experience” has the highest correlation is 0.785** and it correlates positively with 'Using MP is beneficial' indicating that there is a good relationship between the two indicators). From column 1, “I would Find MP Useful in Situations where I don't have Cash or My Credit Cards with Me” with me' has the weakest correlation of 0.284 and correlates positively with 'Using MP is beneficial' indicating that there is a relationship between the two indicators).

Correlations

			Using MP is Beneficial	Using MP would enable me Pay more Quickly	Using MP would Enhance my Shopping Experience	I would Find MP Useful in Situations where I don't have Cash or My Credit Cards with Me	MP is a Useful Mode of Payment as It Allows Me to Make Payments on the Go	Using MP Payments Makes the Handling of Payments Easier	By Using MP, My Choices of Payment Options as a Consumer are Improved
Spearman's rho	Using MP is Beneficial	Correlation Coefficient	1.000	.679**	.785**	.284**	.720**	.456**	.498**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000
		N	444	444	444	444	444	444	444
	Using MP would enable me Pay more Quickly	Correlation Coefficient	.679**	1.000	.637**	.633**	.638**	.537**	.670**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000
		N	444	444	444	444	444	444	444
	Using MP would Enhance my Shopping Experience	Correlation Coefficient	.785**	.637**	1.000	.586**	.854**	.695**	.764**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000
		N	444	444	444	444	444	444	444
	I would Find MP Useful in Situations where I don't have Cash or My Credit Cards with Me	Correlation Coefficient	.284**	.633**	.586**	1.000	.513**	.624**	.817**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000
		N	444	444	444	444	444	444	444
	MP is a Useful Mode of Payment as It Allows Me to Make Payments on the Go	Correlation Coefficient	.720**	.638**	.854**	.513**	1.000	.522**	.702**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000
		N	444	444	444	444	444	444	444
	Using MP Payments Makes the Handling of Payments Easier	Correlation Coefficient	.456**	.537**	.695**	.624**	.522**	1.000	.715**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000
		N	444	444	444	444	444	444	444
	By Using MP, My Choices of Payment Options as a Consumer are Improved	Correlation Coefficient	.498**	.670**	.764**	.817**	.702**	.715**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.
		N	444	444	444	444	444	444	444

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

Table 5.13: Correlation between the factors of Culture of mobile payment services

From the first column of Table 5.13, 'People that are important to me would recommend using MP' correlates positively with 'People that are important to me would find using MP a good idea' indicating that there is a relationship between the two indicators.

Correlations			People that are Important to me would Find Using MP a good Idea	People that are Important to me would Recommend Using MP
Spearman's rho	People that are Important to me would Find Using MP a good Idea	Correlation Coefficient	1.000	.267**
		Sig. (2-tailed)	.	.000
		N	444	444
	People that are Important to me would Recommend Using MP	Correlation Coefficient	.267**	1.000
		Sig. (2-tailed)	.000	.
		N	444	444

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

Table 5.14: Correlation between the factors of Relevance of MP

From the first column of Table 5.14, “My Interactions with MP is/will be clear and Understandable” has the strongest correlation of 0.817 and correlates positively with 'I can learn to do MP without any help' indicating that there is a good relationship between the two indicators). In column 1, “MP does/will not require a lot of Mental Effort” has the weakest correlation of 0.586 and correlates positively with 'I can learn to do MP without any help' indicating that there is a relationship between the two indicators).

Correlations			I can Learn to do MP without any Help	I Find/Expect it Easy to become Skillful at Using MP	My Interactions with MP is/will be Clear and Understandable	I Find/Expect it Easy to Perform the Steps Required to Use MP	MP does/will not Require a lot of Mental Effort
Spearman's rho	I can Learn to do MP without any Help	Correlation Coefficient Sig. (2-tailed) N	1.000 .444	.622** .000 444	.817** .000 444	.624** .000 444	.586** .000 444
	I Find/Expect it Easy to become Skillful at Using MP	Correlation Coefficient Sig. (2-tailed) N	.622** .000 444	1.000 .444	.715** .000 444	.997** .000 444	.690** .000 444
	My Interactions with MP is/will be Clear and Understandable	Correlation Coefficient Sig. (2-tailed) N	.817** .000 444	.715** .000 444	1.000 .444	.715** .000 444	.764** .000 444
	I Find/Expect it Easy to Perform the Steps Required to Use MP	Correlation Coefficient Sig. (2-tailed) N	.624** .000 444	.997** .000 444	.715** .000 444	1.000 .444	.695** .000 444
	MP does/will not Require a lot of Mental Effort	Correlation Coefficient Sig. (2-tailed) N	.586** .000 444	.690** .000 444	.764** .000 444	.695** .000 444	1.000 .444

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

Table 5.15: Correlation between the factors of Trust of MP

From the first column of Table 5.15, “The Risk of Abuse of Confidential Information is Low When Transactions” has the strongest correlation of 0.72** and correlates positively with 'the risk of an unauthorised third party overseeing the payment process is low' indicating that there is a good relationship between the two indicators).

Correlations					
			The Risk of an Unauthorized 3rd Party Over-Seeing the Payment Process is Low	The Risk of Abuse of Confidential Information is Low When Transactions	I would Find MP Secure in Conducting My Payment Transaction
Spearman's rho	The Risk of an Unauthorized 3rd Party Over-Seeing the Payment Process is Low	Correlation	1.000	.720**	.543**
		Coefficient			
		Sig. (2-tailed)	.	.000	.000
	The Risk of Abuse of Confidential Information is Low When Transactions	N	444	444	444
		Correlation	.720**	1.000	.684**
		Coefficient			
		Sig. (2-tailed)	.000	.	.000
	I would Find MP Secure in Conducting My Payment Transaction	N	444	444	444
		Correlation	.543**	.684**	1.000
		Coefficient			
		Sig. (2-tailed)	.000	.000	.
		N	444	444	444

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

Table 5.16: Correlation between the factors of Security Risks & Obstacles of MP

From the second column of Table 5.16, “Paying through MP would Involve more Personal Information Confidentiality Risk” has the highest correlation of 0.997** with “When Transaction Error Occurs, I Worry that I cannot Get Compensation from Banks” showing a strong relationship. In column 2, “Paying through MP would Involve More Security Risks when Compared to Other Ways of Payment has the weakest correlation of 0.091 with ‘When Transaction Error Occurs, I Worry that I cannot Get Compensation from Banks’ indicating that there is a relationship between the two indicators.

Correlations					
			Paying through MP would Involve More Security Risks when Compared to Other Ways of Payment	When Transaction Error Occurs, I Worry that I cannot Get Compensation from Banks	Paying through MP would Involve more Personal Information Confidentiality Risk
Spearman's rho	Paying through MP would Involve More Security Risks when Compared to Other Ways of Payment	Correlation	1.000	.091	.084
		Coefficient			
		Sig. (2-tailed)	.	.056	.077
	When Transaction Error Occurs, I Worry that I cannot Get Compensation from Banks	N	444	444	444
		Correlation	.091	1.000	.997**
		Coefficient			
		Sig. (2-tailed)	.056	.	.000
	Paying through MP would Involve more Personal Information Confidentiality Risk	N	444	444	444
		Correlation	.084	.997**	1.000
		Coefficient			
		Sig. (2-tailed)	.077	.000	.
		N	444	444	444

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

Table 5.17: Correlation between the factors of Technical Support of mobile payment services

From the third column of Table 5.17, “Possibility of Delays or Time-lag in Making MP Transactions is a Hassle to Me” has the strongest correlation of 0.456** with “Entering a Password or a PIN Code in order to Use MP is a Hassle to Me” indicating that there is a good relationship between the two indicators. In column 1, “I have the Skills Required to Use MP” has the weakest correlation of -0.294 with “Downloading an App to My Mobile Phone to Use is a Hassle to Me” indicating no relationship.

			Correlations				
			Downloading an App to My Mobile Phone to Use MP is a Hassle to Me	Registering an Account to Use MP is a Hassle to Me	Entering a Password or a PIN Code to Use MP is a Hassle to Me	The possibility of Delays or Time-lag in Making MP Transactions is a Hassle to Me	I have the Skills Required to Use MP
Spearman's rho	Downloading an App to My Mobile Phone to Use MP is a Hassle to Me	Correlation Coefficient	1.000	.193**	-.269**	.070	-.294**
		Sig. (2-tailed)	.	.000	.000	.143	.000
		N	444	444	444	444	444
	Registering an Account to Use MP is a Hassle to Me	Correlation Coefficient	.193**	1.000	.091	-.018	.041
		Sig. (2-tailed)	.000	.	.056	.712	.389
		N	444	444	444	444	444
	Entering a Password or a PIN Code to Use MP is a Hassle to Me	Correlation Coefficient	-.269**	.091	1.000	.456**	-.199**
		Sig. (2-tailed)	.000	.056	.	.000	.000
		N	444	444	444	444	444
	The possibility of Delays or Time-lag in Making MP Transactions is a Hassle to Me	Correlation Coefficient	.070	-.018	.456**	1.000	-.079
		Sig. (2-tailed)	.143	.712	.000	.	.098
		N	444	444	444	444	444
	I have the Skills Required to Use MP	Correlation Coefficient	-.294**	.041	-.199**	-.079	1.000
		Sig. (2-tailed)	.000	.389	.000	.098	.
		N	444	444	444	444	446

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

Table 5.18: Correlation between the factors of Awareness of mobile payment services

From the second column of Table 5.18, “My Colleagues and Friends Told Me about the Existence of MP Services” has the strongest correlation is 0.817** with “I knew about MP

Service because they are Very Relevant” indicating a strong relationship. In column 4, “I knew about MP Service because they are Very Relevant” has the weakest correlation of 0.513 with “I Came to Know about MP because of the Technical Support around It” indicating that there is no relationship between the two indicators).

Correlations			I Came to Know about MP because They are Very Relevant	I knew about MP Service because They are Very Relevant	My Colleagues and Friends Told Me about the Existence of MP Services	I Came to Know about MP because of the Technical Support around It.
Spearman's rho	I Came to Know about MP because They are Very Relevant	Correlation Coefficient	1.000	.624**	.715**	.522**
		Sig. (2-tailed)	.	.000	.000	.000
		N	444	444	444	444
	I knew about MP Service because They are Very Relevant	Correlation Coefficient	.624**	1.000	.817**	.513**
		Sig. (2-tailed)	.000	.	.000	.000
		N	444	444	444	444
	My Colleagues and Friends Told Me about the Existence of MP Services	Correlation Coefficient	.715**	.817**	1.000	.702**
		Sig. (2-tailed)	.000	.000	.	.000
		N	444	444	444	444
	I Came to Know about MP because of the Technical Support around It.	Correlation Coefficient	.522**	.513**	.702**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	444	444	444	444

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

Table 5.19: Correlation between the factors of Security Risks Likelihood in Mobile Payments

From the fifth column of Table 5.19, “How Likely would the Personal Information of Others be Stolen in MP Transaction?” has the strongest correlation of 0.498** with “How Likely are Others a Victim of Invasion of Privacy in MP?” indicating a strong relationship. In column 1, “How likely would the Personal Information of Others be stolen in MP Transaction?” has the weakest correlation of -0.043 with “How likely are you to become a Victim of an Invasion of Privacy in MP?” indicating that there is no relationship between the two indicators.

Correlations			How Likely are You to Become a Victim of an Invasion of Privacy in MP?	How Likely are You to Become a Victim of Transaction Error(s) in MP?	How Likely are that Your Personal Information will be Stolen in MP Transaction?	How Likely are Others a Victim of Transaction Error(s) in MP?	How Likely are Others a Victim of Invasion of Privacy in MP?	How Likely would the Personal Information of Others be Stolen in MP Transaction?
Spearman's rho	How Likely are You to Become a Victim of an Invasion of Privacy in MP?	Correlation Coefficient	1.000	-.011	.082	.016	.009	-.043
		Sig. (2-tailed)	.	.815	.086	.742	.858	.364
		N	444	444	444	444	444	444
	How Likely are You to Become a Victim of Transaction Error(s) in MP?	Correlation Coefficient	-.011	1.000	-.061	-.026	.070	-.011
		Sig. (2-tailed)	.815	.	.202	.580	.143	.819
		N	444	444	444	444	444	444
	How Likely are that Your Personal Information will be Stolen in MP Transaction?	Correlation Coefficient	.082	-.061	1.000	.021	.016	.049
		Sig. (2-tailed)	.086	.202	.	.659	.736	.301
		N	444	444	444	444	444	444
	How Likely are Others a Victim of Transaction Error(s) in MP?	Correlation Coefficient	.016	-.026	.021	1.000	.015	-.012
		Sig. (2-tailed)	.742	.580	.659	.	.749	.793
		N	444	444	444	444	444	444
	How Likely are Others a Victim of Invasion of Privacy in MP?	Correlation Coefficient	.009	.070	.016	.015	1.000	.498**
		Sig. (2-tailed)	.858	.143	.736	.749	.	.000
		N	444	444	444	444	444	444
	How Likely would the Personal Information of Others be Stolen in MP Transaction?	Correlation Coefficient	-.043	-.011	.049	-.012	.498**	1.000
		Sig. (2-tailed)	.364	.819	.301	.793	.000	.
		N	444	444	444	444	444	444

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

Table 5.20. Correlation Analysis for Demography variables

From the fifth column of Table 5.20, “What is your level of income?” has the strongest correlation of 0.876** with “What is your occupation?” indicating a good relationship. In column 7, “What is your level of income?” has the strongest correlation of 0.853 with “What is your marital status?” indicating that there is a good relationship between the two indicators.

Correlations			What is your Gender?	What is your age in Years?	What is Your Ethnic Group?	What is your highest level of Education?	What is Your Occupation	What is your Level of Income	What is your Marital Status?
Spearman's rho	What is your Gender?	Correlation Coefficient	1.000	.015	-.015	.119*	.024	.035	.025
		Sig. (2-tailed)	.	.745	.760	.012	.612	.456	.603
		N	444	444	444	444	444	444	444
	What is your age in Years?	Correlation Coefficient	.015	1.000	.015	.011	-.004	.013	.000
		Sig. (2-tailed)	.745	.	.746	.823	.930	.783	.993
		N	444	444	444	444	444	444	444
	What is Your Ethnic Group?	Correlation Coefficient	-.015	.015	1.000	-.023	.046	.047	.042
		Sig. (2-tailed)	.760	.746	.	.634	.328	.325	.377
		N	444	444	444	444	444	444	444
	What is your highest level of Education?	Correlation Coefficient	.119*	.011	-.023	1.000	-.027	.029	.015
		Sig. (2-tailed)	.012	.823	.634	.	.573	.542	.758
		N	444	444	444	444	444	444	444
	What is Your Occupation	Correlation Coefficient	.024	-.004	.046	-.027	1.000	.876**	.834**
		Sig. (2-tailed)	.612	.930	.328	.573	.	.000	.000
		N	444	444	444	444	444	444	444
	What is your Level of Income	Correlation Coefficient	.035	.013	.047	.029	.876**	1.000	.853**
		Sig. (2-tailed)	.456	.783	.325	.542	.000	.	.000
		N	444	444	444	444	444	444	444
	What is your Marital Status?	Correlation Coefficient	.025	.000	.042	.015	.834**	.853**	1.000
		Sig. (2-tailed)	.603	.993	.377	.758	.000	.000	.
		N	444	444	444	444	444	444	444

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

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

Table 5.21. Correlation for the whole of the constructs

From column 1 of the correlation matrix, “behaviour intention” is having a significant correlation with “performance expectancy” (strongest correlation of 0.954**), “culture”, “relevance”, “trust”, “security risk & obstacles”, “technical support”, “awareness” and “security risk likelihood” indicating a positive relationship. Behaviour intention has a negative correlation with demographic variables.

Correlations

			BI	PE	Culture	Relevance	Trust	SecurityRiskandObstacles	TechnicalSupport	Awareness	SecurityRiskLikelihood	Demography
Spearman's rho	BI	Correlation Coefficient	1.000	.954**	.765**	.951**	.792**	.702**	.563**	.943**	.542**	-.079
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.096
		N	444	444	444	444	444	444	444	444	444	444
	PE	Correlation Coefficient	.954**	1.000	.795**	.937**	.767**	.702**	.589**	.932**	.532**	-.074
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000	.118
		N	444	444	444	444	444	444	444	444	444	444
	Culture	Correlation Coefficient	.765**	.795**	1.000	.617**	.948**	.422**	.476**	.593**	.548**	-.056
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000	.240
		N	444	444	444	444	444	444	444	444	444	444
	Relevance	Correlation Coefficient	.951**	.937**	.617**	1.000	.627**	.811**	.579**	.986**	.473**	-.070
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000	.143
		N	444	444	444	444	444	444	444	444	444	444
	Trust	Correlation Coefficient	.792**	.767**	.948**	.627**	1.000	.391**	.474**	.591**	.575**	-.058
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000	.220
		N	444	444	444	444	444	444	444	444	444	444
	SecurityRiskandObstacles	Correlation Coefficient	.702**	.702**	.422**	.811**	.391**	1.000	.766**	.790**	.361**	-.002
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000	.961
		N	444	444	444	444	444	444	444	444	444	444
	TechnicalSupport	Correlation Coefficient	.563**	.589**	.476**	.579**	.474**	.766**	1.000	.573**	.524**	.035
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000	.461
		N	444	444	444	444	444	444	444	444	444	444
	Awareness	Correlation Coefficient	.943**	.932**	.593**	.986**	.591**	.790**	.573**	1.000	.472**	-.066
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000	.165
		N	444	444	444	444	444	444	444	444	444	444
	SecurityRiskLikelihood	Correlation Coefficient	.542**	.532**	.548**	.473**	.575**	.361**	.524**	.472**	1.000	.042
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.	.382
		N	444	444	444	444	444	444	444	444	444	444
	Demography	Correlation Coefficient	-.079	-.074	-.056	-.070	-.058	-.002	.035	-.066	.042	1.000
		Sig. (2-tailed)	.096	.118	.240	.143	.220	.961	.461	.165	.382	.
		N	444	444	444	444	444	444	444	444	444	444

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

5.4.5. Reliability Analysis for the whole of the constructs

After establishing the normality of the data, a reliability analysis was executed which was measured to show the internal consistency of the data for each variable. In research, reliability is affected by a random error (Mugenda, 2008; Amin, 2005). As the random error in the data increases, the reliability of the data decreases and *vice versa*. Errors arise from several factors such as inaccurate coding of data, ambiguous instruments used, investigator or respondents' fatigue and investigator's bias among others. For the study reliability findings to be increased, the current investigation minimised random errors by using multiple sampling procedures.

Forty-seven statements (herein also referred to as indicators) in the questionnaire, formed seven study constructs.

Following Peterson (1994), measurement scales with two or three items tend to have weaker reliability compared to the ones with over three items. In this respect, performance expectancy, relevance, technical support, trust, and awareness are considered reliable (see Teo et al., 1999).

5.5. Cronbach's Alpha

It evaluates the internal consistency of the questionnaire items. It varies between zero and one. An alpha value near 1 implies greater internal consistency of the questionnaire items. 47 questionnaire questions which include 40 LIKERT scale questions and seven others linked to demographic constructs. Therefore “N” is 40.

Table 5.22: Cronbach's Alpha-Reliability Test for all variables

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.956	.961	40

Table 5.22 depicts that the Cronbach’s Alpha is 0.956 which shows a high level of internal consistency in the case of chosen scale for this study overall concerning sampling size 444.

Table 5.23: Scale Statistics

Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
101.80631	606.111	24.619329	40

Conclusion: Cronbach’s alpha test was done to ascertain how reliable the questionnaire is.

The above tables show various results acquired. Cronbach’s alpha test was done, and it gave a total score of 0.956 establishing internal consistency of the questions in the questionnaire.

Table 5.24: Reliability Analysis for the Behaviour Intention Construct

Table 5.24 indicates that there is an acceptable level of internal consistency for the factor Behaviour Intention in the case of its scale chosen because Cronbach's Alpha is 0.771.

Reliability Statistics	
Cronbach's Alpha	N of Items
.771	5

Table 5.25: Reliability Analysis for the Performance Expectancy Construct

Table 5.25 indicates that there is an excellent level of internal consistency for the factor Performance expectancy in case of its chosen scale because Cronbach's Alpha is 0.923

Reliability Statistics	
Cronbach's Alpha	N of Items
.923	7

Table 5.26: Reliability Analysis for the Culture Construct

The table 5.26 shows that there is a low level of internal consistency for the factor Culture in the case of its scale chosen because Cronbach's Alpha is 0.319.

Reliability Statistics	
Cronbach's Alpha	N of Items
.319	2

Table 5.27: Reliability Analysis for the Relevance Construct

Table 5.27 indicates that there is an excellent level of internal consistency for the factor Relevance in the case of its scale chosen because Cronbach's Alpha is 0.927

Reliability Statistics	
Cronbach's Alpha	N of Items
.927	5

Table 5.28: Reliability Analysis for Trust Construct

Table 5.28 shows that there is an acceptable level of the internal consistency for the element of Trust in the case of its scale chosen because Cronbach's Alpha is 0.766

Reliability Statistics	
Cronbach's Alpha	N of Items
.766	3

Table 5.29: Reliability Analysis for Security Risks and Obstacle

Table 5.29 shows that there is a medium level of internal consistency for the element Security Risks and Obstacles in the case of its chosen scale because Cronbach's Alpha is 0.595

Reliability Statistics	
Cronbach's Alpha	N of Items
.595	3

Table 5.30: Reliability Analysis for the Awareness Construct

Table 5.30 shows that there is a medium level of internal consistency for the factor Awareness in the case of its scale chosen because Cronbach's Alpha is 0.035.

Reliability Statistics	
Cronbach's Alpha	N of Items
.865	4

Reliability Analysis: Computation for Cronbach's reliability coefficient was done for all dimensions to authenticate the internal consistency of the items that comprise dimensions. Reliability is the degree whereby any instrument gives similar outcomes when trialled repeatedly.

Various reliability techniques are utilised to confirm the reliability of an instrument. The internal consistency technique is widely accepted as it needs a single administration and therefore is meant to be most useful in survey research.

Internal consistency is examined employing Cronbach's alpha coefficient (Cronbach, 1951).

Bohrnstedt & Knoke (1994) suggested that investigators should aim for alphas of 0.70 or greater. The data below shows that all the scales are valid and logical. The data gathered from 444 questionnaires were analysed using SPSS version 23.

Reliability Testing: Testing and validation was done on each hypothesis in chapter 6. Preparing the contextual questionnaire needs operationalising the list of items to evaluate the ideas concerned with the research.

Participants' views on total factors: All critical factors were analysed using correlation, regression and PCA, depending on participants' views on total factors, to test and validate all hypotheses. Investigating the association between dependent and independent constructs is necessary. Statistical analysis is performed with dependent and independent constructs. This assists in verifying the association of outcome constructs with possible outcome. For this purpose, regression and correlation were employed besides PCA.

5.5.1. Regression Analysis

Regression analysis mathematically evaluates the common association between two or more constructs regarding the actual data units. Regression shows the cause and effect association between the constructs. In regression, the construct relating to a cause is considered as independent construct, and the construct pertaining to effect is considered as a dependent construct. Data analysis results are displayed in the research.

The regression equation is $y = a_0 + b_1 X$, where y is the dependent construct, a_0 is constant, b_1 is the slope, X is the independent construct.

Multiple regression is the association between the dependent construct and more than one independent constructs and is represented as $y = a_0 + b_1 X_1 + b_2 X_2 + \dots + b_n X_n$.

As assumptions are correct in case of multiple correlation coefficients, i.e. there is dependent variable (behavior intention) continuous scale, there are more than two independent categorical variables, there is independence of observations in terms of standard error of the estimates as shown in the table below, i.e. 0.0221, and data follow the condition of homoscedasticity, so table 5.31 indicates that the value 0.999 signifies a substantial level of forecast for association between dependent and independent constructs.

Table 5.31a: Multiple correlation coefficients (R)

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	1.000 ^a	.999	.999	.02201	.999	48903.412	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance

b. Dependent Variable: BI

The table summarises the model performance with a suitable investigation. R lies between -1 and 1. Since R is 0.999, it signifies behaviour intention is positively associated with performance expectancy, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

R^2 indicates the coefficient of determination and ranges between zero and one. Since R^2 is 0.999, 99.9% of the variation is improved by performance expectancy, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

The researcher agrees that a very high R^2 value (more than 0.80) is problematic as it indicates that some of the constructs are greatly associated, i.e. multicollinearity problem exists. But simply put, high R^2 values are not necessarily a sign of lousy model choices. It merely depends on the nature of the data. The researcher obtained an excellent Cronbach alpha value signifying that the data is valid and reliable.

R^2 and the perfect model:

There is nothing like an ideal model since models are simplifications of reality (King, 1999, p.1048). Every model is underpinned by some theory with a reflection of the specific emphasis of this theory. Every model can be faulted only from another competing theory and not from the size of the R^2 . Theoretical reasoning is the only means of deciding whether a model is good or bad and not by the coefficient of determination R^2 .

R² and explanatory power:

It is often heard that R² is an evaluation of the explanatory power of the constructs contained in a regression model. This statement is somewhat confusing, as it doesn't differentiate between substantive and statistical explanations. In research anticipated at prediction, a high R² value is often good news and most writers do appreciate a great R² as a necessity of strong prediction ((Lewis-Beck, 1993, p.16).

If the dependent construct is used itself as the independent construct, the researcher would be assured of getting an R² of 1, indicating that a perfect justification has been given. No one would say that anything had been interpreted; that there is closeness to a real understanding of the interesting phenomenon (Lewis-Beck, 1993, p.16; King, 1986, p.677).

R² and goodness of fit:

"These evaluations of goodness of fit have a fatal attraction. Nonetheless, it is wholly accepted that they imply nothing, high values of R² are still a source of admiration and achievement." (Cramer, 1987, p.253).

The most popular use of R² is to evaluate the goodness of fit. The R² value is entirely captured to show how well the regression model fits the data when applied in this way. However in investigations purposely to test a theory, this issue is of small importance, in analyses intentionally to test a prediction; the exactness of measures is of crucial significance.

Check for Multicollinearity

Multicollinearity issue occurs with regression analysis when there is a high correlation of at least one independent construct with a combination of the other independent constructs. In Multiple Linear Regression analysis, tolerance and VIF values for each variable are used to test for multicollinearity, where tolerance should be > 0.1 (or VIF < 10) for all constructs indicating that there is no multicollinearity problem.

Variance Inflation Factor (VIF) quantifies how much the variance is inflated. It is the inverse of tolerance.

Table 5.31b: Regression model – Coefficients (Before Multicollinearity check)

Coefficients ^a								
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	-.026	.010	-2.651	.008			
	PE	-.666	.011	-.791	-.60.801	.000	.013	74.595
	Culture	.214	.005	.287	46.592	.000	.060	16.725
	Relevance	.309	.011	.387	28.245	.000	.012	82.520
	Trust	.265	.004	.321	72.611	.000	.116	8.592
	SecurityRiskandObstacles	-.071	.005	-.076	-13.934	.000	.076	13.090
	TechnicalSupport	.044	.006	.029	7.527	.000	.157	6.387
	Awareness	.924	.008	.995	119.730	.000	.033	30.428
	SecurityRiskLikelihood	-.005	.003	-.003	-1.619	.106	.535	1.869
	Demography	.000	.003	.000	.057	.955	.980	1.020

a. Dependent Variable: BI

PE, Relevance and Awareness have extremely large VIF values (74.595, 82.520 and 30.428) respectively. Omitting these variables will reduce the VIF values for Culture, and Security Risk & Obstacles.

Table 5.31c: Modified Coefficient of Determination (R²)

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.932 ^a	.869	.868	.25253	.869	485.224	6	437	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Culture

The R² value obtained in table 5.31c is **0.869** indicating a total variance explained by the model.

Table 5.31d: Regression model – Coefficients (After Multicollinearity check)

Coefficients ^a								
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	.333	.097	3.424	.001			
	Culture	.038	.035	.051	1.092	.275	.136	7.369
	Trust	.454	.038	.550	11.888	.000	.140	7.160
	SecurityRiskandObstacles	.544	.025	.585	21.938	.000	.419	2.384
	TechnicalSupport	-.312	.043	-.204	-7.334	.000	.387	2.587
	SecurityRiskLikelihood	.189	.032	.133	5.880	.000	.582	1.720
	Demography	-.041	.029	-.025	-1.421	.156	.987	1.013

a. Dependent Variable: BI

The researcher dealt with the issue of multicollinearity by removing greatly associated constructs from the model, and also utilised PCA to limit the number of constructs to a smaller set of uncorrelated components.

Regression Analysis: Behaviour Intention

Table 5.32: ANOVA – Behaviour Intention

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	213.311	9	23.701	48903.412	.000 ^b
	Residual	.210	434	.000		
	Total	213.521	443			

a. Dependent Variable: BI

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance

The above ANOVA table shows that F is significant (sig value < 0.05). It implies dependent construct “BI” is more reliable.

Table 5.33: Regression model – Coefficients – Behaviour Intention

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.026	.010		-2.651	.008	-.045	-.007
	PE	-.666	.011	-.791	-60.801	.000	-.688	-.645
	Culture	.214	.005	.287	46.592	.000	.205	.223
	Relevance	.309	.011	.387	28.245	.000	.287	.330
	Trust	.265	.004	.321	72.611	.000	.258	.272
	SecurityRiskandObstacles	-.071	.005	-.076	-13.934	.000	-.080	-.061
	TechnicalSupport	.044	.006	.029	7.527	.000	.032	.055
	Awareness	.924	.008	.995	119.730	.000	.909	.939
	SecurityRiskLikelihood	-.005	.003	-.003	-1.619	.106	-.010	.001
	Demography	.000	.003	.000	.057	.955	-.005	.005

a. Dependent Variable: BI

The above table reports the coefficients for performance expectancy, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value < 0.05 for performance expectancy, culture, relevance, trust, security risk & obstacles, technical support, and awareness are strongly impacting behaviour intention to use MP. The regression equation for the data above is:

$$\text{Behaviour Intention} = -0.26 - 0.666 (PE) + 0.214 (Culture) + 0.309 (Relevance) + 0.265 (Trust) - 0.071 (Security Risk \& Obstacles) + 0.044 (Technical Support) + 0.924 (Awareness) - 0.005 (Security Risk Likelihood) + 0.000 (Demography)$$

The equation is the computed contribution for the tested factors to realise behaviour intention successfully. It is seen that except PE, Security Risk & Obstacles and Security Risk Likelihood, all the factors positively influence behaviour intention.

Regression Analysis: Performance Expectancy

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.999 ^a	.999	.999	.03126	.999	34188.596	9	434	.000

a. Predictors: (Constant), BI, Demography, TechnicalSupport, SecurityRiskLikelihood, Trust, SecurityRiskandObstacles, Culture, Relevance, Awareness

The above table summarises the model performance with a suitable investigation. R lies between -1 and 1. Since R is 0.999, it signifies performance expectancy is positively associated with behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

R² lies between 0 and 1. Since R² is 0.999, 99.9% of the variation is improved by behaviour expectancy, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

Table 5.34: ANOVA – PE

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	300.698	9	33.411	34188.596	.000 ^b
	Residual	.424	434	.001		
	Total	301.122	443			

a. Dependent Variable: PE

b. Predictors: (Constant), BI, Demography, TechnicalSupport, SecurityRiskLikelihood, Trust, SecurityRiskandObstacles, Culture, Relevance, Awareness

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “performance expectancy” is more reliable.

Table 5.35: Performance Expectancy - Coefficients

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-.081	.013		-5.984	.000	-.107	-.054
Culture	.320	.004	.362	73.777	.000	.312	.329
Relevance	.494	.011	.521	44.792	.000	.472	.516
Trust	.343	.009	.350	37.974	.000	.325	.361
SecurityRiskandObstacles	-.131	.006	-.119	-22.097	.000	-.143	-.119
TechnicalSupport	.101	.007	.056	13.752	.000	.087	.115
Awareness	1.259	.021	1.142	60.332	.000	1.218	1.300
SecurityRiskLikelihood	-.010	.004	-.006	-2.356	.019	-.018	-.002
Demography	.000	.004	.000	-.128	.898	-.007	.007
BI	-1.343	.022	-1.131	-60.801	.000	-1.387	-1.300

a. Dependent Variable: PE

The above model coefficient table reports the coefficients for behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value < 0.05 for behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, awareness and security risk likelihood are strongly impacting performance expectancy.

The regression equation for the data above is

$$PE = -0.81 - 1.343 (BI) + 0.320 (Culture) + 0.494 (Relevance) + 0.343 (Trust) - 0.131 (Security Risk \& Obstacles) + 0.101 (Technical Support) + 1.259 (Awareness) - 0.010 (Security Risk Likelihood) + 0.00 (Demography)$$

The equation is the computed contribution for the tested factors to realise performance expectancy successfully. It is seen that except BI, Security Risk & Obstacles and Security Risk Likelihood, all the factors positively influence performance expectancy

Regression Analysis: Culture

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.995 ^a	.990	.990	.09391	.990	4792.338	9	434	.000

a. Predictors: (Constant), PE, Demography, SecurityRiskLikelihood, TechnicalSupport, Trust, SecurityRiskandObstacles, BI, Relevance, Awareness

The above table summarises the model performance with a suitable investigation. R lies between -1 and 1. Since R is 0.995, it implies culture is positively associated with performance expectancy, behaviour intention, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

R^2 lies between zero and one. Since R^2 is 0.990, 99% of the variation is improved by performance expectancy, behaviour intention, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

Table 5.36: ANOVA - Culture

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	380.348	9	42.261	4792.338	.000 ^b
	Residual	3.827	434	.009		
	Total	384.176	443			

a. Dependent Variable: Culture

b. Predictors: (Constant), PE, Demography, SecurityRiskLikelihood, TechnicalSupport, Trust, SecurityRiskandObstacles, BI, Relevance, Awareness

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “culture” is more reliable.

Table 5.37: Culture - Coefficients

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.250	.040		6.173	.000	.170	.329
	Relevance	-1.436	.038	-1.341	-38.153	.000	-1.510	-1.362
	Trust	-.924	.035	-.834	-26.536	.000	-.993	-.856
	SecurityRiskandObstacles	.401	.017	.322	22.998	.000	.367	.435
	TechnicalSupport	-.317	.022	-.154	-14.655	.000	-.359	-.274
	Awareness	-3.636	.080	-2.918	-45.333	.000	-3.793	-3.478
	SecurityRiskLikelihood	.034	.012	.018	2.767	.006	.010	.059
	Demography	.002	.011	.001	.186	.852	-.019	.023
	BI	3.894	.084	2.903	46.592	.000	3.730	4.058
	PE	2.891	.039	2.559	73.777	.000	2.814	2.968

a. Dependent Variable: Culture

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, relevance, trust, security risk & obstacles, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value < 0.05 for behaviour intention, performance expectancy, relevance, trust, security risk & obstacles, technical support, awareness, and security risk likelihood are strongly impacting culture.

The regression equation for the data above is

$$\text{Culture} = 0.250 + 3.894 (BI) + 2.891 (PE) - 1.436 (Relevance) - 0.924 (Trust) + 0.401 (Security Risk \& Obstacles) - 0.317 (Technical Support) - 3.636 (Awareness) + 0.034 (Security Risk Likelihood) + 0.002 (Demography)$$

The equation is the computed contribution for the tested factors to realise culture successfully. It is seen that except Relevance; Trust, Awareness and Technical Support, all the factors positively influence culture.

Regression Analysis: Relevance

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.998 ^a	.996	.996	.05738	.996	11245.824	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Awareness, Culture, PE, BI

The above table summarises the model performance with a suitable investigation. R lies between -1 and 1. Since R is 0.998, it implies relevance is positively associated with performance expectancy, behaviour intention, culture, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

R^2 lies between zero and one. Since R^2 is 0.996, 99.6% of the variation is improved by performance expectancy, behaviour intention, culture, trust, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

Table 5.38: ANOVA - Relevance

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	333.247	9	37.027	11245.824	.000 ^b
	Residual	1.429	434	.003		
	Total	334.676	443			

a. Dependent Variable: Relevance

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Awareness, Culture, PE, BI

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “relevance” is more reliable.

Table 5.39: Relevance - Coefficients

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.146	.025		5.882	.000	.097	.195
	BI	2.098	.074	1.675	28.245	.000	1.952	2.244
	PE	1.664	.037	1.579	44.792	.000	1.591	1.737
	Culture	-.536	.014	-.575	-38.153	.000	-.564	-.509
	Trust	-.514	.024	-.497	-21.374	.000	-.561	-.467
	SecurityRiskandObstacles	.277	.009	.238	32.038	.000	.260	.294
	TechnicalSupport	-.217	.012	-.113	-17.556	.000	-.241	-.193
	Awareness	-1.836	.078	-1.579	-23.684	.000	-1.988	-1.683
	SecurityRiskLikelihood	.016	.008	.009	2.107	.036	.001	.031
	Demography	.001	.007	.000	.119	.905	-.012	.014

a. Dependent Variable: Relevance

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, trust, security risk & obstacles, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value of < 0.05 for behaviour intention, performance expectancy, trust, security risk & obstacles, technical support, awareness, and security risk likelihood are strongly impacting relevance.

The regression equation for the data above is

$$\text{Relevance} = 0.146 + 2.098 (BI) + 1.664 (PE) - 0.536 (Culture) - 0.514 (Trust) + 0.277 (Security Risk \& Obstacles) - 0.217 (Technical Support) - 1.836 (Awareness) + 0.016 (Security Risk Likelihood) + 0.001 (Demography)$$

The equation is the computed contribution for the tested factors to realise relevance successfully. It is seen that except Culture, Trust, Technical Support and Awareness, all the factors positively influence relevance.

Regression Analysis: Trust

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.996 ^a	.991	.991	.07991	.991	5399.322	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Culture, TechnicalSupport, Awareness, BI, Relevance, PE

The above table summarises the model performance with a suitable investigation. R lies between -1 and 1. Since R is 0.996, it implies trust is positively associated with performance expectancy, behaviour intention, culture, relevance, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

R² lies between zero and one. Since R² is 0.991, 99.1% of the variation is improved by performance expectancy, behaviour intention, culture, security risk & obstacles, technical support, awareness, security risk likelihood and demography.

Table 5.40: ANOVA - Trust

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	310.335	9	34.482	5399.322	.000 ^b
	Residual	2.772	434	.006		
	Total	313.107	443			

a. Dependent Variable: Trust

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Culture, TechnicalSupport, Awareness, BI, Relevance, PE

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “trust” is more reliable.

Table 5.41: Trust - Coefficients

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.044	.036		1.214	.225	-.027	.114
	BI	3.489	.048	2.881	72.611	.000	3.395	3.584
	PE	2.241	.059	2.198	37.974	.000	2.125	2.357
	Culture	-.669	.025	-.741	-26.536	.000	-.719	-.620
	Relevance	-.997	.047	-1.031	-21.374	.000	-1.089	-.906
	SecurityRiskandObstacles	.193	.020	.172	9.613	.000	.154	.232
	TechnicalSupport	-.093	.022	-.050	-4.228	.000	-.137	-.050
	Awareness	-3.219	.053	-2.862	-60.453	.000	-3.324	-3.114
	SecurityRiskLikelihood	.017	.011	.010	1.634	.103	-.004	.038
	Demography	-.003	.009	-.001	-.326	.745	-.021	.015

a. Dependent Variable: Trust

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, relevance, security risk & obstacles, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct the regression equation. A low sig value < 0.05 for behaviour intention, performance expectancy, culture, security risk & obstacles, technical support and awareness are strongly impacting trust.

The regression equation for the data above is

$$\text{Trust} = 0.44 + 3.489 (BI) + 2.241 (PE) - 0.669 (Culture) - 0.997 (Relevance) + 0.193 (Security Risk \& Obstacles) - 0.093 (Technical Support) - 3.219 (Awareness) + 0.017 (Security Risk Likelihood) + 0.003 (Demography)$$

The equation is the computed contribution for the tested factors to realise *trust* successfully. It is seen that except Culture, Relevance, Technical Support and Awareness, all the factors positively influence trust.

Regression Analysis: Security Risk & Obstacles

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.973 ^a	.947	.946	.17350	.947	865.412	9	434	.000

a. Predictors: (Constant), Trust, Demography, TechnicalSupport, SecurityRiskLikelihood, Relevance, Culture, Awareness, PE, BI

The above table summarises the model performance with a suitable investigation. R lies between -1 and +1. Since R is 0.973, it implies security risk & obstacles is positively associated with PE, BI, culture, relevance, trust, technical support, awareness, security risk likelihood and demography.

R² lies between zero and one. Since R² is 0.947, 94.7% of the variation is improved by PE, BI, culture, trust, technical support, awareness, security risk likelihood and demography.

Table 5.42: ANOVA – Security Risk & Obstacles

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	234.469	9	26.052	865.412	.000 ^b
	Residual	13.065	434	.030		
	Total	247.534	443			

a. Dependent Variable: SecurityRiskandObstacles

b. Predictors: (Constant), Trust, Demography, TechnicalSupport, SecurityRiskLikelihood, Relevance, Culture, Awareness, PE, BI

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “security risk & obstacles” is more reliable.

Table 5.43: Security Risk & Obstacles - Coefficients

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.633	.072		-8.827	.000	-.774	-.492
	BI	-4.382	.314	-.4070	-13.934	.000	-5.000	-3.764
	PE	-4.038	.183	-.4454	-22.097	.000	-4.398	-3.679
	Culture	1.369	.060	1.706	22.998	.000	1.252	1.486
	Relevance	2.535	.079	2.948	32.038	.000	2.379	2.690
	TechnicalSupport	.845	.027	.513	31.134	.000	.792	.899
	Awareness	4.045	.297	4.045	13.617	.000	3.461	4.628
	SecurityRiskLikelihood	-.103	.023	-.067	-4.553	.000	-.147	-.058
	Demography	.002	.020	.001	.122	.903	-.037	.041
	Trust	.910	.095	1.023	9.613	.000	.724	1.096

a. Dependent Variable: SecurityRiskandObstacles

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, relevance, trust, technical support, awareness, security risk likelihood, and demography. The model coefficients are employed to construct the regression equation. A low sig value < 0.05 for behaviour intention, performance expectancy, trust, relevance, technical support, awareness, and security risk likelihood are strongly impacting security risk & obstacles.

The regression equation for the data above is

$$\text{Security Risk \& Obstacles} = - 0.633 - 4.382 (BI) - 4.038 (PE) + 1.369 (Culture) + 2.535 (Relevance) + 0.910 (Trust) + 0.845 (Technical Support) + 4.045 (Awareness) - 0.103 (Security Risk Likelihood) + 0.002 (Demography)$$

The equation is the computed contribution for the tested factors to realise *security risk & obstacles* successfully. From the equation, it is seen that except BI, PE, and Security Risk Likelihood, all the factors positively influence security risk & obstacles.

Regression Analysis: Technical Support

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.928 ^a	.862	.859	.17057	.862	299.960	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, Awareness, Culture, PE, Relevance, BI

The above table summarises the model performance with a proper investigation. R lies between -1 and +1. Since R is 0.928, it implies technical support is positively associated with performance expectancy, behaviour intention, culture, relevance, trust, security risk & obstacles, awareness, security risk likelihood and demography.

R² lies between zero and one. Since R² is 0.862, 86.2% of the variation is improved by performance expectancy, behaviour intention, culture, trust, security risk & obstacles, awareness, security risk likelihood and demography.

Table 5.44: ANOVA – Technical Support

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	78.540	9	8.727	299.960	.000 ^b
	Residual	12.626	434	.029		
	Total	91.166	443			

a. Dependent Variable: TechnicalSupport

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, Awareness, Culture, PE, Relevance, BI

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “technical support” is more reliable.

Table 5.45: Technical Support - Coefficients

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.904	.063		14.328	.000	.780	1.029
	BI	2.633	.350	4.029	7.527	.000	1.945	3.320
	PE	3.006	.219	5.463	13.752	.000	2.576	3.435
	Culture	-1.045	.071	-2.145	-14.655	.000	-1.185	-.905
	Relevance	-1.916	.109	-3.670	-17.556	.000	-2.130	-1.701
	Trust	-.425	.100	-.787	-4.228	.000	-.622	-.227
	SecurityRiskandObstacles	.817	.026	1.346	31.134	.000	.765	.869
	Awareness	-2.523	.327	-4.157	-7.711	.000	-3.166	-1.880
	SecurityRiskLikelihood	.150	.022	.162	6.974	.000	.108	.193
	Demography	.017	.019	.015	.858	.391	-.022	.055

a. Dependent Variable: TechnicalSupport

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, trust, security risk & obstacles, relevance, awareness, security risk likelihood, and demography. The model coefficients are employed to construct the regression equation. A low sig value < 0.05 for behaviour intention, performance expectancy, trust, culture, relevance, security risk & obstacles, awareness, and security risk likelihood are strongly impacting technical support.

The regression equation for the data above is

$$\text{Technical Support} = 0.904 + 2.663 (BI) + 3.006 (PE) - 1.045 (Culture) - 1.916 (Relevance) - 0.425 (Trust) + 0.817 (Security Risk \& Obstacles) - 2.523 (Awareness) + 0.15 (Security Risk Likelihood) + 0.017 (Demography)$$

The equation is the computed contribution for the tested factors to realise *technical support* successfully. It is seen that except Culture, Relevance and Awareness, all the factors positively influence technical support.

Regression Analysis: Awareness

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	1.000 ^a	.999	.999	.02347	.999	49885.363	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, PE, Culture, BI, Relevance

The table summarises the model performance with a suitable investigation. R lies between -1 and +1. Since R is 1.000, it implies *awareness* is positively associated with performance expectancy, behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, security risk likelihood and demography.

R^2 lies between zero and one. Since R^2 is 0.999, 99.9% of the variation is improved by performance expectancy, behaviour intention, culture, trust, security risk & obstacles, technical support, security risk likelihood and demography.

Table 5.46: ANOVA – Awareness

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	247.322	9	27.480	49885.363	.000 ^b
	Residual	.239	434	.001		
	Total	247.561	443			

a. Dependent Variable: Awareness

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, PE, Culture, BI, Relevance

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “awareness” is more reliable.

Table 5.47: Awareness - Coefficients

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.036	.010		3.457	.001	.016	.056
	BI	1.050	.009	.975	119.730	.000	1.033	1.068
	PE	.710	.012	.783	60.332	.000	.687	.733
	Culture	-.227	.005	-.283	-45.333	.000	-.237	-.217
	Relevance	-.307	.013	-.357	-23.684	.000	-.333	-.282
	Trust	-.278	.005	-.312	-60.453	.000	-.287	-.269
	SecurityRiskandObstacles	.074	.005	.074	13.617	.000	.063	.085
	TechnicalSupport	-.048	.006	-.029	-7.711	.000	-.060	-.036
	SecurityRiskLikelihood	.007	.003	.004	2.152	.032	.001	.013
	Demography	.000	.003	.000	-.098	.922	-.006	.005

a. Dependent Variable: Awareness

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, trust, security risk & obstacles, relevance, technical support, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value < 0.05 for behaviour intention, performance expectancy, trust, culture, relevance, security risk & obstacles, technical support and security risk likelihood are strongly impacting awareness.

The regression equation for the data above is

$$\text{Awareness} = 0.036 + 1.050 (BI) + 0.710 (PE) - 0.227 (Culture) - 0.307 (Relevance) - 0.278 (Trust) + 0.074 (Security Risk \& Obstacles) - 0.048 (Technical Support) + 0.007 (Security Risk Likelihood) + 0.000 (Demography)$$

The equation is the computed contribution for the tested factors to realise *awareness* successfully. It is seen that except Culture, Relevance, Trust and Technical Support, all the factors positively influence awareness.

Regression Analysis: Security Risks Likelihood

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.684 ^a	.468	.457	.36039	.468	42.440	9	434	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance, BI

The above table summarises the model performance with a suitable investigation. R lies between -1 and +1. Since R is 0.684, it implies *security risks likelihood* is positively associated with performance expectancy, behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, awareness and demography.

R² lies between zero and one. Since R² is 0.468, 46.8% of the variation is improved by performance expectancy, behaviour intention, culture, trust, security risk & obstacles, technical support, awareness and demography.

Table 5.48: ANOVA – Security Risks Likelihood

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	49.610	9	5.512	42.440	.000 ^b
	Residual	56.369	434	.130		
	Total	105.979	443			

a. Dependent Variable: SecurityRiskLikelihood

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance, BI

The above ANOVA table shows that F is significant (sig value < 0.05). It implies “security risks likelihood” is more reliable.

Table 5.49: Security Risks Likelihood - Coefficients

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.533	.160		3.335	.001	.219	.847
	BI	-1.269	.783	-1.801	-1.619	.106	-2.809	.271
	PE	-1.295	.550	-2.183	-2.356	.019	-2.376	-.215
	Culture	.505	.183	.962	2.767	.006	.146	.864
	Relevance	.632	.300	1.123	2.107	.036	.043	1.222
	Trust	.353	.216	.606	1.634	.103	-.072	.777
	SecurityRiskandObstacles	-.443	.097	-.678	-4.553	.000	-.635	-.252
	TechnicalSupport	.671	.096	.622	6.974	.000	.482	.860
	Awareness	1.578	.733	2.411	2.152	.032	.137	3.019
	Demography	.059	.041	.050	1.424	.155	-.022	.139

a. Dependent Variable: SecurityRiskLikelihood

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, trust, security risk & obstacles, relevance, technical support, security risk likelihood, and demography. The model coefficients are employed to construct regression equation. A low sig value < 0.05 for behaviour intention, performance

expectancy, trust, culture, relevance, security risk & obstacles, technical support and security risk likelihood are strongly impacting awareness.

The regression equation for the data above is

$$\text{Security Risks Likelihood} = 0.533 - 1.269 (BI) - 1.295 (PE) + 0.505 (Culture) + 0.632 (Relevance) + 0.353 (Trust) - 0.443 (Security Risk \& Obstacles) + 0.671 (Technical Support) + 1.578 (Awareness) + 0.059 (Demography)$$

The equation is the computed contribution for the tested factors to realise *security risks likelihood* successfully. From the equation, it is seen that except BI, PE, and Security Risk & Obstacles, all the factors positively influence security risks likelihood.

Regression Analysis: Demography

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.140 ^a	.020	-.001	.41966	.020	.971	9	434	.464

a. Predictors: (Constant), SecurityRiskLikelihood, SecurityRiskandObstacles, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance, BI

The above table summarises the model performance with a suitable investigation. R lies between -1 and +1. Since R is 0.140, it implies *demography* is positively associated with performance expectancy, behaviour intention, culture, relevance, trust, security risk & obstacles, technical support, awareness and security risks likelihood.

R² lies between zero and one. Since R² is 0.020, 2% of the variation is improved by performance expectancy, behaviour intention, culture, trust, security risk & obstacles, technical support, awareness and security risks likelihood.

Table 5.50: ANOVA – Demography

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.538	9	.171	.971	.464 ^b
	Residual	76.435	434	.176		
	Total	77.973	443			

a. Dependent Variable: Demography

b. Predictors: (Constant), SecurityRiskLikelihood, SecurityRiskandObstacles, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance, BI

The above ANOVA table shows that F is insignificant (sig value > 0.05). It implies “demography” is not reliable.

Table 5.51: Demography - Coefficients

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.946	.164		11.887	.000	1.624	2.268
	BI	.052	.915	.086	.057	.955	-1.746	1.850
	PE	-.083	.644	-.163	-.128	.898	-1.349	1.184
	Culture	.040	.215	.089	.186	.852	-.382	.462
	Relevance	.042	.351	.087	.119	.905	-.648	.732
	Trust	-.082	.252	-.165	-.326	.745	-.578	.413
	SecurityRiskandObstacles	.014	.116	.025	.122	.903	-.214	.242
	TechnicalSupport	.101	.118	.110	.858	.391	-.131	.333
	Awareness	-.084	.858	-.150	-.098	.922	-1.771	1.603
	SecurityRiskLikelihood	.079	.056	.093	1.424	.155	-.030	.189

a. Dependent Variable: Demography

The above model coefficient table reports the coefficients for behaviour intention, performance expectancy, culture, trust, security risk & obstacles, relevance, technical support, security risk likelihood, and awareness. The model coefficients are employed to construct regression equation. A high sig value > 0.05 for behaviour intention, performance expectancy, trust, culture, relevance, security risk & obstacles, technical support, awareness and security risk likelihood are not impacting demography.

The regression equation for the data above is

$$\begin{aligned} \text{Demography} = & 1.946 + 0.052 (BI) - 0.083 (PE) + 0.040 (Culture) + 0.042 (Relevance) - \\ & 0.082 (Trust) + 0.014 (Security Risk \& Obstacles) + 0.101 (Technical Support) - 0.084 \\ & (Awareness) + 0.079 (Security Risks Likelihood) \end{aligned}$$

The equation is the computed contribution for the tested factors to realise *demography* successfully. It is seen that except PE, and Awareness, all the factors positively influence demography.

5.5.2. GLM Analysis

GLM (General Linear Model) is a technique that takes a dependent variable, measured as correlated, non-independent data. It replaces one-way MANOVA in SPSS. The independent variables may be categorical or continuous. It normally signifies if the difference between two groups most likely demonstrates a real dissimilarity in the average populace from which a sample is drawn.

GLM was analysed with the statistical inference testing of hypothesis by t-test. Table 5.52 shows that the calculated values $t = 77.258$ for behaviour intention, $t = 65.120$ for performance expectancy, $t = 68.493$ for culture, $t = 58.914$ for relevance, $t = 69.697$ for trust, $t = 63.128$ for security risks and obstacles, $t = 117.985$ for technical support, $t = 66.897$ for awareness, $t = 113.330$ for security risks likelihood, $t = 108.482$ for demography lies between the confidence interval 0.05 as well, as the p-value = 0 in each case is < 0.05 which is true, therefore, the H_0 is rejected and H_a is accepted. So it is deduced that there is a notable difference between all the constructs including dependent construct (BI) and all the independent constructs which include PE, culture, relevance, trust, security risks and obstacles, technical support, awareness, security risks and likelihood and demography. Moreover, all the other analysis models used for the analysis of GLM including regression and ANOVA also result as the same and satisfy t-test results as well, such that there is a

notable dissimilarity between all the constructs because the $p\text{-value} = 0.000$ in each case which is < 0.05 , and that is true, so the H_0 is rejected and H_a is accepted.

Table 5.52: GLM Analysis by t-test

	One-Sample Test					
	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BI	77.258	443	.000	2.54550	2.4807	2.6102
PE	65.120	443	.000	2.54794	2.4710	2.6248
Culture	68.493	443	.000	3.02703	2.9402	3.1139
Relevance	58.914	443	.000	2.43018	2.3491	2.5112
Trust	69.697	443	.000	2.78078	2.7024	2.8592
SecurityRiskandObstacles	63.128	443	.000	2.23949	2.1698	2.3092
TechnicalSupport	117.985	443	.000	2.54009	2.4978	2.5824
Awareness	66.897	443	.000	2.37331	2.3036	2.4430
SecurityRiskLikelihood	113.330	443	.000	2.63063	2.5850	2.6763
Demography	108.482	443	.000	2.15991	2.1208	2.1990

5.5.3. FACTOR ANALYSIS

It is a group of techniques employed to investigate how fundamental variables impact the responses on some evaluated constructs. Factor analysis was performed by applying investigative techniques. A factor is a crucial dimension accounting for various observed constructs. Factor Analysis is a data reduction method which assists to detect structure amongst the constructs and to study the underlying critical factors causing the maximum variation. It is performed to acquire elements with the highest factor loading value.

KMO- Bartlett's test (an evaluation of sampling adequacy) was done for testing how likely the data is. A KMO of $0.509 > 0.5$ was realised representing multivariate normality among constructs. Since the significant value found was < 0.005 , factor analysis was carried out afterwards.

Table 5.53: KMO Measure of Sample Adequacy.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.509
Bartlett's Test of Sphericity	Approx. Chi-Square	8585.899
	Df	45
	Sig.	.000

Factor analysis was employed in reducing an extensive number of constructs which result in data complexity to a few factors. It is a technique utilised in describing and analysing inter-association amongst a large number of constructs to a few elements. The procedure entails discovering a means of compressing the data present in some original constructs into a small set of elements with a minimal loss of data. It recognises the lowest number of common factors that describe most of the correlation among the indicators and it was utilised to reduce the dimensionality of study constructs without a major loss in information. Results of the analyses using the method were displayed in this section.

5.5.4. Factor Analysis of Variables for the Investigation/Pooled Model

Factor analysis is a technique employed to reduce data dimensionality without losing vital statistical information. It is also used to express some variables (observable variable) as linear combinations of factors (latent variables). Those constructs with eigenvalues less than 1.00 are unstable. They account for less variability than does a single variable and are not retained in the analysis. In this sense, the researcher ends up with fewer factors than the original number of variables (Girden, 2001). Methodologically, a linear factor model relates to the response variable (or the questions/indicators or item questions on a Likert scale) to the values of a limited number of factors. The dimensionality of the 47 indicators which made up the survey instrument used to determine the latent constructs were analysed.

PCA extraction technique was employed to determine the total variance.

Table 5.57 shows that three components were extracted using Principal Component Analyses. The cumulative variance of the extracted components is 85.336% which represents a good predictive power in mobile payment acceptance.

Table 5.54: Communalities

Communalities	
	Initial
BI	1.000
PE	1.000
Culture	1.000
Relevance	1.000
Trust	1.000
SecurityRiskandObstacles	1.000
TechnicalSupport	1.000
Awareness	1.000
SecurityRiskLikelihood	1.000
Demography	1.000

Extraction Method: Principal Component Analysis.

Table 5.55: Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.456	64.555	64.555	4.285	42.854	42.854
2	1.072	10.716	75.272	3.211	32.114	74.969
3	1.006	10.064	85.336	1.037	10.367	85.336
4	.691	6.915	92.250			
5	.447	4.469	96.719			
6	.195	1.953	98.672			
7	.091	.911	99.583			
8	.034	.339	99.922			
9	.007	.075	99.997			
10	.000	.003	100.000			

Extraction Method: Principal Component Analysis.

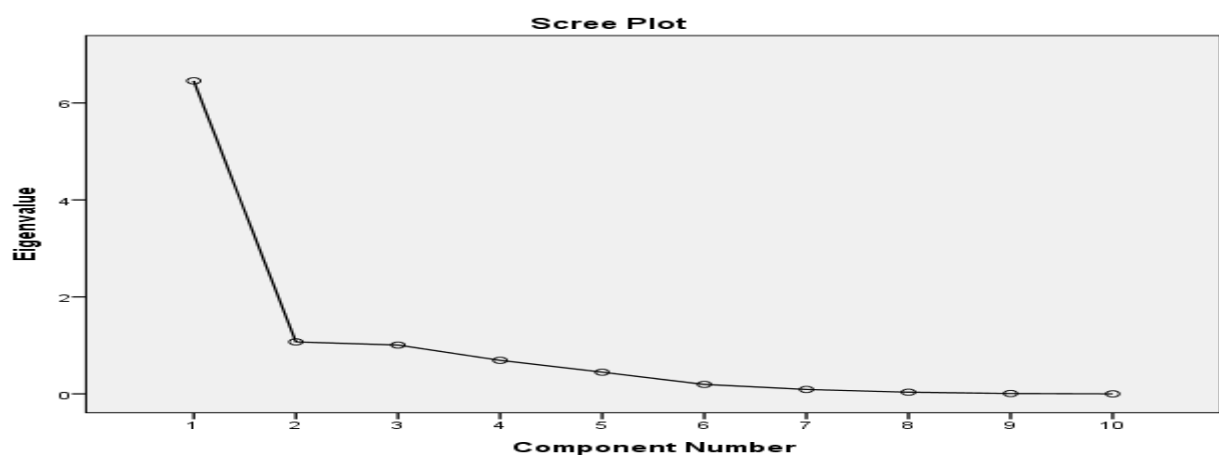


Fig 5.2: Scree Plot

Furthermore, the researcher used the latent root criterion, the most widely employed method to gain more knowledge of the number of factors recognised. Each construct supplies a value of 1 to the total eigenvalue.

Therefore only the factors with eigenvalues of 1 and above are essential. Following Hair et al. (1998) employing the eigenvalues to establish a cutoff is suitable for as high as 16 constructs. From Table 5.55, the number of components that have eigenvalue greater than 1.0 is three with total variance explained being 85.336%. In social sciences, where data is usually less accurate, results with total variance explained greater than 60 per cent are deemed suitable (Ibid).

Table 5.56: Component Matrix

Component Matrix ^a			
	Component		
	1	2	3
BI	.966	-.079	-.023
PE	.968	.022	-.073
Culture	.817	-.394	.256
Relevance	.930	.184	-.221
Trust	.782	-.454	.322
SecurityRiskandObstacles	.795	.406	-.269
TechnicalSupport	.709	.285	.033
Awareness	.934	.149	-.192
SecurityRiskLikelihood	.658	-.122	.357
Demography	-.037	.622	.739

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Table 5.57: Rotated Component Matrix

Rotated Component Matrix ^a			
	Component		
	1	2	3
BI	.717	.646	-.093
PE	.789	.563	-.067
Culture	.336	.878	-.077
Relevance	.897	.369	-.077
Trust	.253	.923	-.063
SecurityRiskandObstacles	.923	.129	.032
TechnicalSupport	.678	.299	.189
Awareness	.872	.406	-.077
SecurityRiskLikelihood	.309	.669	.179
Demography	-.006	-.012	.966

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Rotation of factors assists to interpret factors better. The first factor is observed to be heavily loaded with Security Risk & Obstacles. With a factor loading of 0.923 which is the largest in column 1, the factor one indicates Security Risk & Obstacles.

Since the second factor is seen to be heavily loaded with “Trust (0.923)”, factor two indicates Trust.

The third factor is seen to be heavily loaded with “Demography (0.966)”, the factor three indicates Demography.

The table below lists the final three variables which jointly accounts for 85.336% of the variance.

Components	Variables	Factor loading
1	Security Risk & Obstacles	0.923
2	Trust	0.923
3	Demography	0.966

Table 5.58: Extracted Variables/Indicators from Principal Component Analysis

5.5.5. Chi-Square Analysis

The investigator perceived that chi-square is best applicable and suitable to analyse categorical constructs in this particular analysis. A chi-square test is employed to analyse distinctness with categorical constructs. It is appropriate to estimate how carefully an observed distribution equals an expected one. Evaluations of significance levels were performed rightly employing chi-square tests in this particular analysis. For the avoidance of presumptions, non-parametric tests like chi-square analyses are carried out.

To test the significance of the interaction between two features among demographic construct and LIKERT scale constructs, chi-square is most suitable and can be performed to evaluate whether an association depicted by sample data in a crosstab happened by probability when

sampling from the populace where the two constructs are independent (that is, not associated).

Depending on the gathered data from completed questionnaires, total factors were set out in a table, and factor analysis was performed, and then all critical factors checked with crosstab and chi-square to test and validate all hypotheses.

Crosstab Analysis

Crosstab: A cross tabulation analysis makes it possible to compare 2 or more groups defined by the categories of a construct and analysed based on their frequency distributions across the categories of another construct. When differences in these frequency distributions are compared, one can evaluate if an association occurs between the two constructs or not.

For instance, to differentiate how men and women rank their health. The groups to distinguish are categories of the variable 'Gender'. One can also establish if this construct is associated with 'health rating' by differentiating gender distribution across the 'health ranking' categories.

For a crosstab to be an articulate display of an association between two constructs there should be limited categories for each construct (often 5 or lower).

5.6. CONCLUSIONS

The purpose of this section was to describe the methods embraced in this investigation elaborately.

With regards to research philosophy, the investigator embraced positivism because its features were most suitable for analyses that are quantitative. The qualities of this philosophy were described, justifying its use in this research.

Based on embracing positivism, the research emphasised its analyses on a quantitative technique which required exploring useful literature to design a theoretical model containing constructs of PE, Relevance, Culture, BI, Trust/Security, and Technical Support and also measurement items for the variables. The theoretical model then resulted in hypotheses generation that would be accepted or rejected depending on the model analysis on a structural level employing factor analysis and regression analysis.

Depending on its suitability and successful execution in past related investigations, the survey technique was adjudged an efficient tool to obtain data on personal views and perceptions, giving a notable way to gather data correlating to sampling groups. The questionnaire was designed based on previous useful investigation and assessed to validate which questions were suitably developed in association with the constructs preconceived for a survey. The investigator made sure that the questions were straightforward and readable.

Concerning data analysis, SPSS 23 was employed to investigate the quantitative data gathered. SPSS 23 is engaged by investigators in several areas of research and applied to produce descriptive statistic.

Employing AMOS, SEM was utilised to evaluate the theoretical model, the construct interactions and the hypotheses in association with the data obtained.

The measurement level, which evaluated the validity and reliability of variables were done by regression analysis and testing of the hypothesised associations between the constructs were supported with Chi-square analysis.

In the next chapter, the research model is presented along with findings from the analysis. The research model is employed to test the study hypotheses. Interpretations of the findings are given and discussions made of the study results in comparison to related previous studies.

CHAPTER SIX – FINDINGS AND ANALYSIS

6.1. INTRODUCTION

In the prior section following guidelines outlined in the methodology, the study data were analysed regarding reliability and validity. Also examined in the same chapter are the study constructs. Accordingly, indicators which did not meet the set standards were eliminated. Indicators that matched the established criteria were included in designing the research (pooled) model which is presented and validated in the current chapter.

In Chapter six, the research model designed from the pooled data (n=444) is presented. Using data extracts from the demographic information provided by respondents, the developed model was empirically validated. After the validation, the created model was utilised to test the hypotheses. The last part of this chapter explains and interprets the outcomes of the research findings which were done according to the constructs.

6.2. Participant Demographic Profile

Frequency distributions were examined and were outlined in Table 6.1 which includes data about gender, age, ethnic group, educational level, occupation, level of income and marital status.

Table 6.1: Frequency of Participant Profile

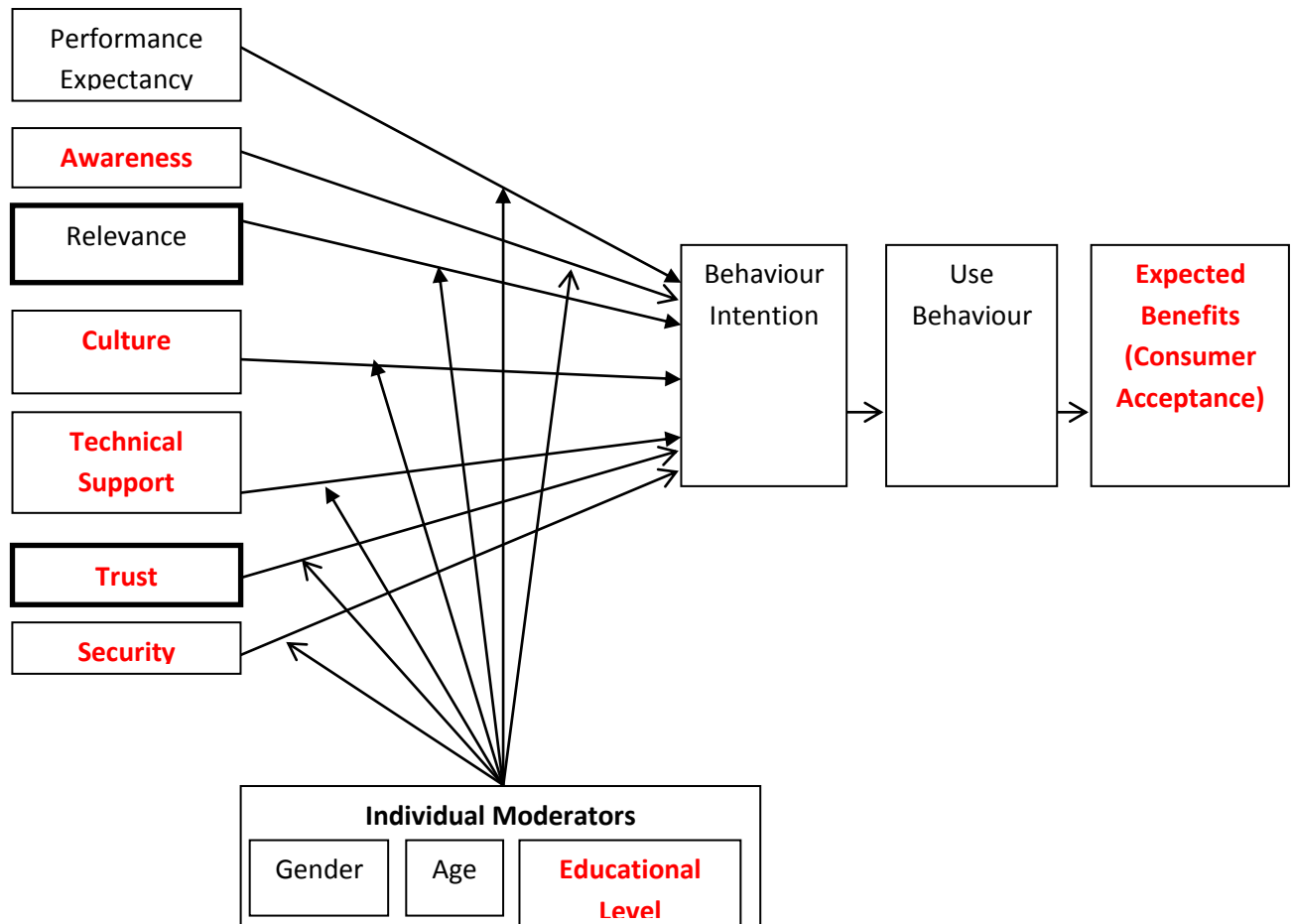
Demographic	Number of Participants	Percentages (%)
Gender		
• Male	268	60.4
• Female	176	39.6
Age		
• Under 18	58	13.1
• 18-24	13	2.9
• 25-34	172	38.7
• 35-54	149	33.6
• 55-64	48	10.8
• 65-70	4	0.9
Ethnic Group		
• Yoruba	202	45.5
• Igbo	92	20.7
• Hausa	68	15.3
• Middle Belt	41	9.2
• Niger Delta	41	9.2
Education Level		
• Primary School Education	55	12.4
• High School Education	53	11.9
• Undergraduate Education	250	56.3
• Postgraduate Education	86	19.4
Occupation		
• Student	176	39.6
• Academic Staff	131	29.5
• Non-Academic Staff	137	30.9
Level of Income		
• Low Income	116	26.1
• Medium Income	144	32.4
• High Income	184	41.4
Marital Status		
• Single	274	61.7
• Married	170	38.3
N = 444		

6.3. THE RESEARCH MODEL

In designing the new model, data analysis was carried out for testing the research framework. The study tested the model by analysing factors which influence mobile payment end-users' behaviours. This step yielded positive results. These results were further validated, and results presented.

The research model comprises of five latent variables, namely: independent variables of PE, relevance, culture, trust and technical support. The five determinants in the model either influence 'behavioural intentions' or 'usage behaviour'. In this study, usage behaviour was

postulated to determine the expected benefits (that is, consumer acceptance). And, like its original model, (the UTAUT), the designed new model's independent variables were moderated in different ways by gender, age, educational level and awareness. The concept of the model is shown in Figure 3.8 as culled from UTAUT. Figure 6.1 is a display of the study model.



Red colour indicates “modified UTAUT variables” while black colour indicates “original UTAUT variables.”

Figure 6.1: Mobile Payment Services Acceptance and Use Model

6.3.1. The Significance of the Research Model's Dependent Variable

The research employed PLS-Graph to evaluate R^2 for dependent constructs and the average variance, to establish the exactness of the designed research model (see Cohen 1988). The software confirmed how well the research model fits the hypothesised associations using R^2

for each construct in the model. GLM was employed to investigate the dependence of dependent variables on fixed factors and covariates.

Following Garrison (2005), a total examination of a model needs an investigation of the goodness of fit criteria employing R-square, adjusted R-square and factor loadings. The goodness of fit evaluates how well the model parameter estimates can predict the model performance and also create the sampling covariance matrix which allows a direct comparison of the variance explained from both estimation measures.

The significance of the model's constructs was obtained by analysing the t-test for the dependent construct. The t-ratio test is a one sample test employed towards the determination of the significance of the model predictive power under the null hypothesis that a particular R^2 value is 0 against the alternative hypothesis that the predictive value is significantly different from 0. By default, the H_0 is rejected if the computed t-statistic is more than the absolute t-statistic recorded at 2 (reflecting a 95 per cent level of significance).

Table 5.31c: Modified Coefficient of Determination (R^2) [recalled from page 223]

Model Summary										
Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
1	.932 ^a	.869	.868		.25253	.869	485.224	6	437	.000

a. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Culture

Note:

H_0 : The null hypothesis is that R-squared values are zeros against the alternative that R-squared values are higher than zeros. We reject H_0 if the t-statistics are more significant than 2.0 with a significant probability value.

It can be observed that all dependent constructs in ANOVA Table 5.32 (page 224) are significant ($0.000 < 0.05$) towards acceptance and usage of MP.

Table 5.32: ANOVA – Behaviour Intention [recalled from page 224]

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	213.311	9	23.701	48903.412	.000 ^b
	Residual	.210	434	.000		
	Total	213.521	443			

a. Dependent Variable: BI

b. Predictors: (Constant), Demography, SecurityRiskandObstacles, SecurityRiskLikelihood, Trust, TechnicalSupport, Awareness, Culture, PE, Relevance

As regards the t-test statistic results in GLM Table 5.52 (page 241), behaviour intentions variable recorded a computed t-statistic of 77.258 which is more than the absolute t-statistic recorded value of 2, and this signifies that the H_0 is rejected in support of the H_a . The same argument is developed for other variables and all the sample models throughout the research.

Table 5.52: GLM Analysis by t-test [recalled from page 241]

One-Sample Test						
	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BI	77.258	443	.000	2.54550	2.4807	2.6102
PE	65.120	443	.000	2.54794	2.4710	2.6248
Culture	68.493	443	.000	3.02703	2.9402	3.1139
Relevance	58.914	443	.000	2.43018	2.3491	2.5112
Trust	69.697	443	.000	2.78078	2.7024	2.8592
SecurityRiskandObstacles	63.128	443	.000	2.23949	2.1698	2.3092
TechnicalSupport	117.985	443	.000	2.54009	2.4978	2.5824
Awareness	66.897	443	.000	2.37331	2.3036	2.4430
SecurityRiskLikelihood	113.330	443	.000	2.63063	2.5850	2.6763
Demography	108.482	443	.000	2.15991	2.1208	2.1990

6.4. Correlation analysis of all ten variables

Table 5.21 indicates that the mean significance value of 0.000 is < 0.05 for correlations between the variables of BI with PE, culture, relevance, trust, security risk & obstacles, technical support, awareness and security risk likelihood, so conclusively the null hypotheses should be rejected while alternative hypotheses $H_1, H_2, H_3, H_4, H_5, H_6$ and H_7 are accepted.

The table also displays that the significance value of 0.096 is > 0.05 for correlation between the variable of BI with demography variable, so conclusively, the null hypothesis should be accepted while alternative hypothesis H_8 is rejected.

Table 5.21. Correlation Analysis for the whole of the variables [recalled from page 215]

			Correlations									
			BI	PE	Culture	Relevance	Trust	SecurityRiskandObstacles	TechnicalSupport	Awareness	SecurityRiskLikelihood	Demography
Spearman's rho	BI	Correlation Coefficient	1.000	.954**	.765**	.951**	.792**	.702**	.563**	.943**	.542**	-.079
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.096
		N	444	444	444	444	444	444	444	444	444	444
	PE	Correlation Coefficient	.954**	1.000	.795**	.937**	.767**	.702**	.589**	.932**	.532**	-.074
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000	.118
		N	444	444	444	444	444	444	444	444	444	444
	Culture	Correlation Coefficient	.765**	.795**	1.000	.617**	.948**	.422**	.476**	.593**	.548**	-.056
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000	.240
		N	444	444	444	444	444	444	444	444	444	444
	Relevance	Correlation Coefficient	.951**	.937**	.617**	1.000	.627**	.811**	.579**	.986**	.473**	-.070
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000	.143
		N	444	444	444	444	444	444	444	444	444	444
	Trust	Correlation Coefficient	.792**	.767**	.948**	.627**	1.000	.391**	.474**	.591**	.575**	-.058
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000	.220
		N	444	444	444	444	444	444	444	444	444	444
	SecurityRiskandObstacles	Correlation Coefficient	.702**	.702**	.422**	.811**	.391**	1.000	.766**	.790**	.361**	-.002
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000	.961
		N	444	444	444	444	444	444	444	444	444	444
	TechnicalSupport	Correlation Coefficient	.563**	.589**	.476**	.579**	.474**	.766**	1.000	.573**	.524**	.035
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000	.461
		N	444	444	444	444	444	444	444	444	444	444
	Awareness	Correlation Coefficient	.943**	.932**	.593**	.986**	.591**	.790**	.573**	1.000	.472**	-.066
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000	.165
		N	444	444	444	444	444	444	444	444	444	444
	SecurityRiskLikelihood	Correlation Coefficient	.542**	.532**	.548**	.473**	.575**	.361**	.524**	.472**	1.000	.042
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.	.382
		N	444	444	444	444	444	444	444	444	444	444
	Demography	Correlation Coefficient	-.079	-.074	-.056	-.070	-.058	-.002	.035	-.066	.042	1.000
		Sig. (2-tailed)	.096	.118	.240	.143	.220	.961	.461	.165	.382	.
		N	444	444	444	444	444	444	444	444	444	444

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

6.5. Path Analysis

Path analysis is used in statistics as a method to test the causal effect relationship. It is an extension of multiple regression models where the path analysis model gained by correlation matrix indicates the comparing causal models. The path is drawn with the help of arrows in which results of causation are where the model predicts the weight of regression. Table 5.33 shows the path estimates calculated by the regression model. Below is also a pictorial path model built with independent, moderating and dependent constructs which indicates the association between moderating constructs and dependent construct and even the correlation between more than two of those variables that have the values which are independent of the states of other variables in the system. The path model coefficients (a-to-t) are used to comparing the predicted path coefficients (refer to path diagram) below as computed with the help of correlation matrix which further can be demonstrated as tested for goodness of fit with the expected coefficient. The tracing rule at 'implied' correlation between all constructs in a model is the total of all valid paths between the other nine (9) variables including total effect and associational effects due to exogenous variables as a result of multiplying the correlation between the exogenous variables with respect to nine (9) of those exogenous variables' total effect on the target variable under consideration.

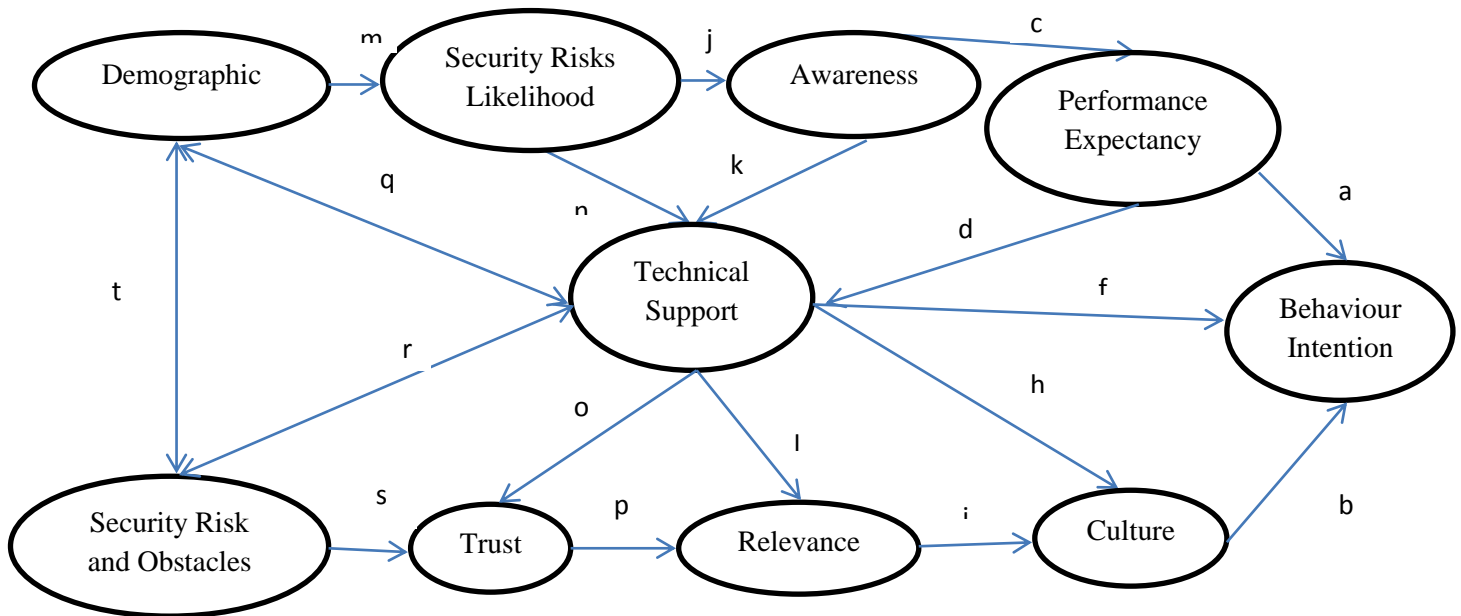
Table 5.33: Regression model – Coefficients – Behaviour Intention [recalled from page 224]

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.026	.010		-2.651	.008	-.045	-.007
	PE	-.666	.011	-.791	-60.801	.000	-.688	-.645
	Culture	.214	.005	.287	46.592	.000	.205	.223
	Relevance	.309	.011	.387	28.245	.000	.287	.330
	Trust	.265	.004	.321	72.611	.000	.258	.272
	SecurityRiskandObstacles	-.071	.005	-.076	-13.934	.000	-.080	-.061
	TechnicalSupport	.044	.006	.029	7.527	.000	.032	.055
	Awareness	.924	.008	.995	119.730	.000	.909	.939
	SecurityRiskLikelihood	-.005	.003	-.003	-1.619	.106	-.010	.001
	Demography	.000	.003	.000	.057	.955	-.005	.005

a. Dependent Variable: BI

The path diagram displays the association between the model's potential constraints and BI.

Figure 6.2. Path Diagram



The multiple regression equations along with their respective are as follows:

Equation 01:

Equation 1 indicates a positive correlation between behaviour intention and culture, relevance, trust, technical support, awareness and demography and they depend on each other as well, and it also reveals that there is a negative interaction between behaviour intention and PE, security risk & obstacles and security risk likelihood and they do not depend on each other.

\hat{Y} (*Behaviour Intention*)

$$\begin{aligned}
 &= -0.26 - 0.666 (PE) + 0.214 (Culture) + 0.309 (Relevance) \\
 &+ 0.265 (Trust) - 0.071 (Security Risk \& Obstacles) \\
 &+ 0.044 (Technical Support) \\
 &+ 0.924 (Awareness) - 0.005 (Security Risk Likelihood) \\
 &+ 0.000 (Demography)
 \end{aligned}$$

Equation 02:

Equation 2 indicates a positive correlation between performance expectancy and culture, relevance, trust, technical support, awareness and demography and they depend upon each other as well. There is also a negative interaction between PE and BI, security risk & obstacles and security risk likelihood and they do not depend on each other.

$\hat{Y}(\text{Performance Expectancy})$

$$= -0.81 - 1.343 (BI) + 0.320 (Culture) + 0.494 (Relevance) \\ + 0.343 (Trust) - 0.131 (Security Risk \& Obstacles) \\ + 0.101 (Technical Support) \\ + 1.259 (Awareness) - 0.010 (Security Risk Likelihood) \\ + 0.00 (Demography)$$

Equation 03:

Equation 03 indicates that a positive association occurs between culture and PE, behaviour intentions, security risks likelihood, securities risks and obstacles, technical support, security risk likelihood and demography and they depend upon each other as well. There is a negative interaction between culture and trust, technical support and awareness and do not depend upon on each other.

$\hat{Y}(\text{Culture})$

$$= 0.250 + 3.894 (BI) + 2.891 (PE) - 1.436 (Relevance) - 0.924 (Trust) \\ + 0.401 (Security Risk \& Obstacles) - 0.317 (Technical Support) - 3.636 (Awareness) \\ + 0.034 (Security Risk Likelihood) + 0.002 (Demography)$$

Equation 04:

Equation 04 indicates a positive correlation between relevance and behaviour intention, PE, securities risks and obstacles, security risk likelihood and demography and they depend upon each other but there is a negative interrelationship between relevance and culture, trust and awareness and they do not depend upon each other.

$$\begin{aligned}
&\hat{Y}(\text{Relevance}) \\
&= 0.146 + 2.098 (BI) + 1.664 (PE) - 0.536 (Culture) - 0.514 (Trust) \\
&+ 0.277 (Security Risk \& Obstacles) - 0.217 (Technical Support) - 1.836 (Awareness) \\
&+ 0.016 (Security Risk Likelihood) + 0.001 (Demography)
\end{aligned}$$

Equation 05:

Equation 05 shows a positive correlation between trust and BI, PE, security risk & obstacles, security risk likelihood and demography and depend upon each other whereas there is a negative interaction between trust and culture, relevance, technical support and awareness and they do not depend upon each other.

$$\begin{aligned}
&\hat{Y}(\text{Trust}) \\
&= 0.44 + 3.489 (BI) + 2.241 (PE) - 0.669 (Culture) - 0.997 (Relevance) \\
&+ 0.193 (Security Risk \& Obstacles) - 0.093 (Technical Support) - 3.219 (Awareness) \\
&+ 0.017 (Security Risk Likelihood) + 0.003 (Demography)
\end{aligned}$$

Equation 06:

Equation 06 indicates a positive correlation between security risk & obstacles and culture, relevance, trust, technical support, awareness and demography and depend on each other, whereas security risks and obstacles show a negative correlation between BI, PE and security risk likelihood and they do not depend on each other.

$$\begin{aligned}
&\hat{Y}(\text{Security Risk \& Obstacles}) \\
&= - 0.633 - 4.382 (BI) - 4.038 (PE) + 1.369 (Culture) \\
&+ 2.535 (Relevance) + 0.910 (Trust) + 0.845 (Technical Support) \\
&+ 4.045 (Awareness) - 0.103 (Security Risk Likelihood) \\
&+ 0.002 (Demography)
\end{aligned}$$

Equation 07:

Equation 07 indicates a positive correlation between technical support and BI, PE, security risk & obstacles, security risk likelihood and demography and they depend on each other,

whereas technical support shows a negative correlation between culture, relevance, trust and awareness and they do not depend on each other.

$\hat{Y}(\text{Technical Support})$

$$\begin{aligned}
 &= 0.904 + 2.663 (BI) \\
 &+ 3.006 (PE) - 1.045 (Culture) - 1.916 (Relevance) - 0.425 (Trust) \\
 &+ 0.817 (Security Risk \& Obstacles) - 2.523 (Awareness) \\
 &+ 0.15 (Security Risk Likelihood) + 0.017 (Demography)
 \end{aligned}$$

Equation 08:

Equation 08 indicates a positive correlation between awareness and BI, PE, security risk & obstacles, security risk likelihood and demography and they depend on each other, whereas awareness shows a negative correlation between culture, relevance, trust and technical support and they do not depend on each other.

$\hat{Y}(\text{Awareness})$

$$\begin{aligned}
 &= 0.036 + 1.050 (BI) \\
 &+ 0.710 (PE) - 0.227 (Culture) - 0.307 (Relevance) - 0.278 (Trust) \\
 &+ 0.074 (Security Risk \& Obstacles) - 0.048 (Technical Support) \\
 &+ 0.007 (Security Risk Likelihood) + 0.000 (Demography)
 \end{aligned}$$

Equation 09:

Equation 09 indicates a positive correlation between security risk likelihood and culture, relevance, trust, technical support, awareness and demography and they depend on each other, whereas security risk likelihood shows a negative correlation between BI, PE and security risk & obstacles and they do not depend on each other.

$\hat{Y}(\text{Security Risk Likelihood})$

$$\begin{aligned}
 &= 0.533 - 1.269 (BI) - 1.295 (PE) + 0.505 (Culture) \\
 &+ 0.632 (Relevance) \\
 &+ 0.353 (Trust) - 0.443 (Security Risk \& Obstacles) \\
 &+ 0.671 (Technical Support) + 1.578 (Awareness) \\
 &+ 0.059 (Demography)
 \end{aligned}$$

Equation 10:

Equation 10 indicates a positive correlation between demography and BI, culture, relevance, security risk & obstacles, technical support and security risk likelihood and they depend on each other, whereas demography shows a negative correlation between PE, trust and awareness and they do not depend on each other.

$$\begin{aligned}\hat{Y}(\textit{Demography}) &= 1.946 + 0.052 (\textit{BI}) - 0.083 (\textit{PE}) + 0.040 (\textit{Culture}) \\ &+ 0.042 (\textit{Relevance}) - 0.082 (\textit{Trust}) \\ &+ 0.014 (\textit{Security Risk \& Obstacles}) \\ &+ 0.101 (\textit{Technical Support}) - 0.084 (\textit{Awareness}) \\ &+ 0.079 (\textit{Security Risks Likelihood})\end{aligned}$$

6.6. Interpretation of the Principal Components

The interactions between the original data for each value and each principal component must be computed to interpret each component.

These correlations are obtained using the correlation procedure. In the variable statement, the researcher included the first three principal components, security risk & obstacles, trust and demography, and all the other original constructs. These interrelationships between the principal components and the original constructs were used to explain these principal components.

Illustration of the principal components is based on finding which constructs are most strongly associated with each component, i.e., which of these numbers are big in size, the most distant from zero in either positive or negative direction. Which numbers we assume to be big is, of course, a subjective choice.

First PCA – Security Risk & Obstacles

Security risk & obstacle is positively associated with nine of the constructs (BI, PE, culture, relevance, trust, technical support, awareness and security risk likelihood) and negatively associated with one of the constructs (demography). Security risk & obstacle rises with BI, PE, culture, relevance, trust, technical support, awareness and security risk likelihood which proposes that these nine criteria vary together. If one rises, then the remaining ones tend to as well. Security Risk & Obstacles component can be seen as an evaluation of the quality of BI, PE, culture, relevance, trust, technical support, awareness and security risk likelihood. Furthermore, it can be seen that security risk & obstacle interacts most strongly with “relevance”. In fact, the researcher stated that based on the correlation of 0.923 that security risk & obstacle is principally an evaluation of relevance.

Second PCA – Trust

Trust is positively associated with nine of the constructs (security risks & obstacles, BI, PE, culture, relevance, technical support, awareness and security risk likelihood) and negatively interacted with one of the constructs (demography). Trust rises with security risks & obstacles, BI, PE, culture, relevance, technical support, awareness and security risk likelihood. This trust can be seen as an evaluation of security risks & obstacles, BI, PE, culture, relevance, technical support, awareness and security risk likelihood. Furthermore, it can be seen that trust interrelates well with “culture”. In fact, the researcher stated that based on the correlation of 0.923 that trust is mainly an evaluation of culture.

Third PCA – Demography

Demography is positively associated with three of the constructs (security risk & obstacles, technical support and security risk likelihood) and negatively correlated with six of the

original constructs (BI, PE, culture, relevance, trust and awareness). The third principal component of demography increases with security risk & obstacles, technical support and security risk likelihood which propose that these three criteria vary together. If one rises, then the remaining ones tend to as well. Demography can be seen as an evaluation of the quality of security risk & obstacles, technical support and security risk likelihood. Furthermore, it can be seen that demography interrelates well with “technical support”. The researcher stated that based on the correlation of 0.966, demography is principally an evaluation of technical support.

6.7. Hypothesis Testing:

Hypothesis testing is the formal methods for accepting or rejecting statistical hypotheses (What is Hypothesis Testing, 2013). Statisticians use a formal process in determining whether to reject an H_0 , based on sampling data which is hypothesis testing, and it comprises four stages.

- a) **Draft the hypotheses** by indicating the H_0 and H_a in such a manner that they are mutually exclusive.
- b) **Establish the test statistic** by indicating the statistics that will be employed to evaluate the validity of the null hypothesis.
- c) **Draft a decision rule.** A decision rule is a process that the investigator utilises to conclude whether to reject the H_0 .
- d) **Test the null hypothesis** by choosing to examine the test statistic. If the statistic is reliable with the H_0 , you accept the H_0 ; otherwise, reject the H_0 .

6.7.1. Hypotheses testing – Chi-square test

Hypotheses H₂: There is a significant interrelationship between BI and PE which has an overall impact on mobile payment acceptance.

Table 6.3: BI and PE Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2427.422 ^a	77	.000
Likelihood Ratio	1265.492	77	.000
Linear-by-Linear Association	294.836	1	.000
N of Valid Cases	444		

a. 69 cells (71.9%) have expected count less than 5. The minimum expected count is .00.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H₀ and accept alternative hypotheses. Also, it implies there is a substantial association between BI and performance which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on performance expectancy. Furthermore, behaviour intention significantly impacts on performance expectancy. The implementation of consumer BI is entirely at the inclination of consumers' expected performance.

Hypotheses H₃

There is a significant interrelationship between behaviour intention and culture which has an overall influence on mobile payment acceptance.

Table 6.5: BI and Culture Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2427.422 ^a	77	.000
Likelihood Ratio	1265.492	77	.000
Linear-by-Linear Association	294.836	1	.000
N of Valid Cases	444		

a. 69 cells (71.9%) have expected count less than 5. The minimum expected count is .00.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H_0 and accept the H_a . Also, it implies there is a substantial association between BI and culture which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on culture. Furthermore, behaviour intention significantly impacts on culture. The implementation of consumer BI is entirely at the inclination of consumers' culture.

Hypotheses H4

There is a significant interaction between behaviour intention and relevance which has an overall influence on mobile payment acceptance.

Table 6.7: BI and Relevance Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3480.983 ^a	132	.000
Likelihood Ratio	1641.278	132	.000
Linear-by-Linear Association	373.479	1	.000
N of Valid Cases	444		

a. 140 cells (89.7%) have expected count less than 5. The minimum expected count is .00.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H_0 and accept the H_a . Also, it implies there is a substantial association between BI and relevance which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on relevance. Furthermore, behaviour intention significantly impacts on relevance. The implementation of consumer BI is completely at the inclination of consumers' relevance.

Hypotheses H5

There is a significant interrelationship between BI and trust which has an overall influence on mobile payment acceptance.

Table 6.9: BI and Trust Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2010.255 ^a	77	.000
Likelihood Ratio	1238.252	77	.000
Linear-by-Linear Association	281.270	1	.000
N of Valid Cases	444		

a. 66 cells (68.8%) have expected count less than 5. The minimum expected count is .06.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H_0 and accept the H_a . Also, it implies there is a substantial association between BI and trust which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on trust. Furthermore, behaviour intention significantly impacts on trust. The implementation of consumer BI is entirely at the inclination of consumers' trust.

Hypotheses H_6

There is a significant interrelationship between BI and technical support which has an overall influence on mobile payment acceptance.

Table 6.11: BI and Technical Support Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2472.429 ^a	88	.000
Likelihood Ratio	1312.071	88	.000
Linear-by-Linear Association	134.336	1	.000
N of Valid Cases	444		

a. 89 cells (82.4%) have expected count less than 5. The minimum expected count is .06.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is proof to reject H_0 and accept the H_a . Also, it implies there is a substantial association between BI and technical support which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on culture. Furthermore, behaviour intention significantly impacts on technical support. The implementation of consumer BI is entirely at the inclination of consumers' technical support.

Hypotheses H₇

There is a significant interrelationship between BI and awareness which has an overall influence on mobile payment acceptance.

Table 6.13: BI and Awareness Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3428.667 ^a	110	.000
Likelihood Ratio	1686.118	110	.000
Linear-by-Linear Association	391.496	1	.000
N of Valid Cases	444		

a. 116 cells (87.9%) have expected count less than 5. The minimum expected count is .06.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H_0 and accept the H_a . Also, it implies there is a substantial association between BI and awareness which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on awareness. Furthermore, behaviour intention significantly impacts on awareness. The implementation of consumer BI is entirely at the inclination of consumers' awareness.

Hypotheses H₈

There is a significant association between BI and demography which has an overall influence on mobile payment acceptance.

Table 6.15: BI and Demography Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	167.271 ^a	165	.436
Likelihood Ratio	154.217	165	.716
Linear-by-Linear Association	1.331	1	.249
N of Valid Cases	444		

a. 164 cells (85.4%) have expected count less than 5. The minimum expected count is .00.

From the above table, since the chi-square value is not significant (0.436 is > 0.05), there is a shred of evidence to accept H_0 . Furthermore, it implies there is no substantial

interrelationship between behaviour intention and demography which has an overall influence on mobile payment acceptance.

The deduction shows that behaviour intention is not dependent on demography. Furthermore, behaviour intention has no significant influence on demography. The implementation of consumer behaviour intention is not entirely at the inclination of consumers' demography.

Hypotheses H_{9a}

BI and Security Risk & Obstacles

There is a significant interaction between BI and security risk & obstacles which has an overall negative influence on mobile payment acceptance.

Table 6.16: BI and Security Risk & Obstacles Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2190.723 ^a	77	.000
Likelihood Ratio	1308.061	77	.000
Linear-by-Linear Association	232.811	1	.000
N of Valid Cases	444		

a. 69 cells (71.9%) have expected count less than 5. The minimum expected count is .06.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H₀ and accept the H_a. Also, it implies there is a substantial association between BI and security risk & obstacles which has an overall negative influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on security risk & obstacles. Furthermore, behaviour intention significantly impacts on security risk & obstacles negatively. The implementation of consumer BI is entirely at the inclination of security risk & obstacles.

Hypotheses H_{9b}

BI and Security Risks Likelihood

There is a significant association between BI and security risks likelihood which has an overall negative influence on mobile payment acceptance.

Table 6.17: BI and Security Risks Likelihood Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	444.396 ^a	176	.000
Likelihood Ratio	354.833	176	.000
Linear-by-Linear Association	144.772	1	.000
N of Valid Cases	444		

a. 180 cells (88.2%) have expected count less than 5. The minimum expected count is .00.

From the table, since the chi-square value is significant (0.000 is < 0.05), there is a shred of proof to reject H₀ and accept the H_a. Also, it implies there is a significant interaction between BI and security risks likelihood which has an overall negative influence on mobile payment acceptance.

The deduction shows that behaviour intention is dependent on security risks likelihood. Furthermore, behaviour intention significantly impacts on security risks likelihood negatively. The implementation of consumer BI is entirely at the inclination of consumers' security risks likelihood.

Below is an overview table of the Chi-square tests

Table 6.18: Display of results of hypothesis testing

Variables	Hypotheses	p-value	Status
B1	H1. Behaviour Intention, Use behaviour and Expected Benefit will have a critical effect on Customer adoption of MP.	0.000	Accepted
BI versus PE	H2. Performance expectancy will demonstrate a significant impact on Bi.	0.000	Accepted
BI versus Culture	H3. Culture will positively influence Bi	0.000	Accepted
BI versus Relevance	H4. Relevance will demonstrate a significant impact on Bi.	0.000	Accepted
BI versus Trust	H5. Trust will demonstrate a significant impact on Bi.	0.000	Accepted
BI versus Technical Support	H6. Technical Support will show a substantial influence on Bi.	0.000	Accepted
BI versus Awareness	H7. Awareness will moderate Culture which will positively influence Bi.	0.000	Accepted
BI versus Demography	H8. Demography (gender, age, education) will moderate PE, Culture, Relevance, Technical Support, Trust and Security which will positively influence Bi.	0.436	Rejected
BI versus Security Risks	H9. Security Risks will negatively influence Bi	0.000	Accepted

All the data points, relying on survey analysis, were analysed with chi-square for hypotheses testing. The study findings, relying on data analysis and interpretation, were described in the next chapter “Conclusions.”

6.7.2. The Importance of the Study Model’s Dependent Variables

The study used IBM SPSS tool to estimate R^2 for dependent constructs, to determine the exactness of the designed model (see Fornell & Larckel, 1981; Cohen, 1988). The tool established how well the research model fits the hypothesised relationships using squared multiple correlations, (R^2) for each variable. The GLM was utilised to evaluate the dependence of dependent factors on fixed factors and covariates.

According to Garrison (2005), a total analysis of a model needs scrutiny of the goodness of fit using R-square and adjusted R-square values. This total analysis enables the variance explained from both estimation measures to be directly compared. R^2 was utilised to measure the whole model and goodness of fit.

The significance of the constructs was obtained by calculating the t-test for the dependent variables. The t-ratio test is a one sample test for assessing the importance of the model predictive power under the null hypothesis that a particular R^2 value is 0 against the alternative that the predictive value is significantly different from 0. By default, the H_0 is rejected if the computed t-statistic is higher than the absolute t-statistic (reflecting a 95 per cent level of significance).

The study used significance measurement in determining the levels of influence the dependent variables have on acceptance and use of mobile payment. In summary, results from a 't-ratio' test statistical analysis on the dependent construct (BI) of the research/pooled model, was presented in Table 5.32 (chapter 5).

Worthy of further investigation is the differences arising from the modified moderating factors on the acceptance of MP services.

6.7.3. Results of Hypotheses from the Dependent Variables

a) Behaviour Intentions

Behaviour intention to use technology is a significant concept and can explain a big part of end-users' actual usage in that it is a driving factor towards the individual's usage behaviour. Consistent with studies (Davis, 1989; Ajzen and Brown, 1991; Taylor and Todd, 1995a) on intentions to use technology, behavioural intentions in this research significantly contributes toward MP use. Most respondents had adequate experience with the technology studied.

Analysis of relationships between independent constructs and behaviour intentions and usage behaviour showed that it is the availability of performance expectancy, trust, relevance, technical support, culture and awareness which result in significant positive relationships associated with MP adoption. Acceptance of MP can only be achieved if the environment is conducive enough for end-users.

b) Usage Behaviour

People will use mobile payment services on the perception that using such services will assist in achieving the desired goal (transactional payments). Usage behaviour is positively influenced by behavioural intention and usage behaviour positively affects expected benefits (consumer acceptance) in the research pooled model.

The researcher included the expected benefits (consumer acceptance) variable. The reason was to confirm any likely benefit consumers anticipated due to MP acceptance and usage.

c) Expected Benefits (Consumer Acceptance)

Expected benefits construct was found to be one of the factors which directly influence acceptance and MP usage. Consumers' MP usage is majorly related to the benefits they expect to gain from the service. The result from the above finding is that for services made possible utilizing ICT/IT to be accepted and used; they need to be perceived more beneficial to other rival services. To accelerate the acceptance of these services, there is a need to emphasize the benefits to be gained from using mobile payments.

The result of this finding is that mobile payment providers should be competent and productive in providing mobile payment in order not to disappoint consumers. It was discovered that the critical element contributing to MP non-acceptance was consumers not being made aware which indicated that mobile payments were poorly publicised. A great desire exists for mobile payment providers to create a proactive promotional and marketing strategy of mobile payment, making it very suitable for consumers.

6.8. Findings from Research Model

This study is a positive step towards applying the UTAUT model in the context of Developing Countries (DCs) and towards improving our understanding of mobile payment service acceptance in such countries. Outcomes of this investigation have vast consequences for DCs as most evaluation models are designed without considering different environments (Cheung and Burn, 1994; Mugenda, 2008), and yet studies in DCs tend to make such indicators wholesale. Conducting evaluation studies in Information Science (IS) without

taking into account the social conditions of other cultures could lead to misleading results (Kaba, N'Da & Mbarika, 2008; Oshlyansky et al., 2007).

6.9. Moderators' role to improve R^2

Technology acceptance studies have been denounced for insubstantial explanatory power and Sun, and Zhang (2006) recognised this restriction related to technology adoption studies and made suggestions that addition of moderating factors to the framework would better the explanatory power. Venkatesh et al. (2003) asserted that the expansion (moderating factors) to the several models recognised in past studies mainly improved the predictive validity of the several models above the original specification. The present research describes some underpinning results for the influence of moderators to increase explanatory power.

Worthy to point out this period was that the explanatory power was generated employing a separate statistical procedure. Venkatesh et al. (2003) applied PLS. The present research used the Regression, Chi-square and Factor Analysis/Principal Component Analysis. PLS seeks to maximise variance explained (obtaining large R-square). It yields parameter estimates optimizing explained variance; thus, the emphasis is more on the forecast.

The original UTAUT model yielded 70 per cent (adjusted R-square) of variance explained employing PLS (maximising R-square).

6.10. Results:

Structural equation modelling (SEM) has become the tool of the trade in survey-based research (Dijkstra & Henseler, 2015a). Multiple Regression Analysis, Principal Component Analysis (PCA) and Partial Least Square (PLS) methods were considered suitable for this

research situation (Henseler et al. 2009) because of four major purposes: (i) not all items in the researcher's data are distributed normally ($p < 0.01$ based on Kolmogorov-Smirnov's test), (ii) the research model has not yet been tested in the literature (Hair et al. 2011), (iii) it is supported by a complex model with several variables (Chin, 1998), and (iv) the minimum dimension of the sample employed is 10 times larger than the maximum number of paths directed to a variable (Gefen & Straub, 2005).

The SEM methods employed in this research introduced various improvements while maintaining all SEM's strengths and thus were utilized in this study. The analysis was performed in two steps, following Anderson & Gerbing's (1998) guidelines, beginning with the reliability and validity assessment of the measurement model, followed by the structural model assessment and hypotheses testing. All variables, with the exception of behavioural use, were modelled employing reflective indicators (Venkatesh et al. 2012).

On the whole, the variables of security risk & obstacles; trust and demography explained 85.336 % of the variance of intention to adopt MP as seen from the principal component analysis in table 5.55.

Table 5.55: Total Variance Explained [recalled from page 243]

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.456	64.555	64.555	4.285	42.854	42.854
2	1.072	10.716	75.272	3.211	32.114	74.969
3	1.006	10.064	85.336	1.037	10.367	85.336
4	.691	6.915	92.250			
5	.447	4.469	96.719			
6	.195	1.953	98.672			
7	.091	.911	99.583			
8	.034	.339	99.922			
9	.007	.075	99.997			
10	.000	.003	100.000			

Extraction Method: Principal Component Analysis.

By the R^2 values shown in Regression Table 5.31c (page 220) of the dependent variable (behaviour intention), the prediction of the model is 86.9 per cent variance, a key finding, which indicates that most of those sampled in the research were inclined towards acceptance

to use MP. This finding acknowledges the general purpose of this analysis which was to design a model to measure levels of consumer acceptance and use of MP. The result also caters to the second research objective and answers the study's first hypothesis to discover whether end-users in the research context intended to use MP service.

The association between experience with MP and age points out that most MP customers are in 18-34 age brackets which agrees with findings from other investigations (Tavilla, 2012). Interestingly, a little drop in usage within this age range exists, from 18-24 years. Also, the senior generation is unwilling to utilise MP.

Built on the premise that mobile payment security risks may be higher than traditional branch services (Koenig-Lewis et al. 2010), due to the natural effect uncertainty of the environment (Pavlou, 2003), and the fact that trust plays a significant factor mitigating the inherent risks in transactions (Ehavior & Pavlou, 2002), the researcher introduced security risks and trust variables in this thesis. Combining it with UTAUT2 intended to reinforce even more results significance and predictability, encapsulating in the same work positive and negative factors towards acceptance. There is limited empirical work which at the same time captures the success or positive and negative factors (Lee, 2009). This research fills in this gap in literature encapsulating both factors toward mobile payment acceptance. An additional contribution is also presented in this research; for the statistical analysis, the researcher employed Multiple regression, PLS and PCA analysis techniques, instead of using a single SEM technique.

6.11. Discussion

This thesis's study into mobile payment acceptance in Nigeria presents a look into the acceptance behaviour of consumers in the developing nation during the early phases of a new technology's diffusion into the populace. It also presents results, which the investigator considers as significant contributions to gaps in knowledge regarding technology acceptance in developing nations. The objective of this study was to determine the factors influencing consumer acceptance of mobile payment. In this research, the developed theoretical model aided the understanding of the factors which influence the intention to use mobile payment. These factors were analysed empirically and led to the authentication of hypotheses; presenting statistical evidence of the theorised influences existing between the factors in the model. These influences and the variables in the theoretical model, together with their related hypotheses were based on an extensive literature review where the mobile payment setting in Nigeria was discussed and suitable theories and frameworks in technology acceptance and the mobile payment setting in Nigeria were assessed. The review of these relevant works of literature helped provide an academic basis for this research and considering the results obtained, this section discusses the similarities and differences between this research's findings and existing literature while also highlighting aspects where this research makes significant contributions to prior academic literature. In discussing the results of this investigation, it is essential to know that this thesis successfully researched the factors influencing consumer acceptance of mobile payment based on data collected from a sample group size of 500 in Nigeria.

This affirms the investigator's notion that results obtained here are meaningful and generalizable because they were achieved from a reasonable cross-section of the population. It should also be noted that in analysing the significance of the association between variables,

the p-value was considered, and in analysing the strength of association between variables, the standardised regression weights are considered.

To design the new research model, robust data analysis was carried out to test the proposed research model. First, the researcher tested the model by analyzing factors which impact consumers' behavioural intention towards mobile payment. This step produced positive results which were further validated.

According to the R^2 value (coefficient of determination) of the dependent construct, the prediction of the model is 86.9 per cent variance. This is a key finding, stipulating that most of the sampled consumers in the study were inclined towards acceptance to use mobile payment. This finding responds to the general aim of this research which was to design a technology services model for measuring levels of consumer acceptance and use of mobile payment in a developing country context. The finding also caters for the research objective and answers the study's first hypothesis to discover whether consumers in the research context intended to use mobile payment.

Under the null hypothesis, a particular R^2 value is equal to zero against the alternative that the predictive value is significantly different from zero. By default, the alternative hypothesis is supported if the computed t-statistic is greater than the absolute t-statistic record of 2 (reflecting a 95 per cent level of significance). Accordingly and based on t-test statistic measures, a summary of the results of testing the research hypotheses with direct effects on the model is given in Table 6.18.

Trust in this research is supported as expected in hypothesis H₅ to have a positive association with behavioural intention. The result supports other previous investigations that trust positively impacts behavioural intention to accept mobile payment (Gu et al. 2009; Kim et al. 2009). A consumer's propensity to trust the service providers and the technology behind mobile payment services is important. It creates an opportunity for banks and telecommunication operators to innovate more services tailored to meet the needs of the consumers. The finding on trust also shows a potential for Nigerian consumers to achieve the same success in the acceptance of mobile payment as compared to Kenya (Llewellyn-Jones 2016).

Performance expectancy in this research was found to have a positive impact on the acceptance of mobile payment. This is in agreement with prior researches in mobile payment in which performance expectancy significantly impacts acceptance of mobile payment (Olasina 2015; Faniran & Odumeru 2015). This suggests that consumers in Nigeria intend to use mobile payment service based on its performance.

Prior studies on mobile payment have not completely understood the several factors that impact the behavioural intention to accept and the intention to endorse mobile payment services. To complete this study gap, this research employs a unique and innovative model that incorporates the strengths and variables from two well-known theoretical models, known as UTAUT and TAM, with security risks and trust variables, to describe mobile payment acceptance. The findings show that performance expectancy is significant for the behavioural intention to accept mobile payment (H₂), in line with previous studies (Morosan & DeFranco, 2016). This means that the degree to which mobile payment presents benefits in carrying out payment functions is significant to the acceptance of mobile payment.

Furthermore, the findings show the importance of culture (H₃) on the intention to accept mobile payment. This may mean that the belief and suggestion of those who are prominent and important may in fact expedite the acceptance of technologies devised for the mobile platform, consistent with some prior investigations that established that consumers are very well impacted by the beliefs in their social environment (Liébana-Cabanillas et al., 2014).

The results of this research thus show that the behavioural intention to use mobile payment may be higher when it fits the consumer's lifestyle. Another finding stressed by the results is the importance of security on the behavioural intention to accept mobile payment (H₉). The results show that for technologies requiring sensitive and personal data, the security capability to secure transactions is appropriate, and a direct determinant of the consumer's intention to accept the technology.

The consumer's intention to endorse mobile payment was also assessed. The research model explains 85.336% of the variance, and the findings justify the impact of behavioural intention construct over it (H₁). This is an essential contribution to this research.

6.12. Conclusion

This research devised and empirically tested an innovative model to explain the mobile payment acceptance at a consumer level, with data from three universities in Nigeria (a developing country). The results from the research indicate that the research model possesses substantial explanatory power (85.336%) and is robust under various circumstances.

Supported is the fact that the multiple regression analysis and principal component analysis (PCA) led to several statistical improvements, the results from prior mobile payment research should be recalculated, or new research should be performed, in light of this new fact. The researcher also proposes that future information technology SEM (Structural Equation

Modelling) research should employ PCA, as it increases model explanatory power. New associations between trust and security risks variables and use behaviour were evaluated. In terms of results, performance expectancy was found to be a statistically significant antecedent of behaviour intention.

Based on the investigation carried out, the acceptance level of end-users in Nigeria is optimistic, and this may be connected to various merits related to MP use, like performance expectancy, relevance, trust, etc. Nigerians also recognise the gains of the Cashless Economy introduction through MP, but there are still certain elements that can prevent its acceptance by Nigerians. Mobile operators should know that despite the insufficient infrastructure to cover the whole nation at start-up, there lies necessity to create associations with their potential users at the trial stage; they should enlist trusted agents that are handling the money. Due to the relevance of MP, the research findings signify how positively inclined Nigerian consumers are toward acceptance and usage of MP.

The findings of this investigation contributed well in theory towards an understanding of variables affecting acceptance of MP specifically in DCs. The research represents a foundation for other studies.

The next chapter, Chapter 7, presents the conclusion and original contributions leading to the achievement of the research objectives.

CHAPTER SEVEN – CONCLUSION AND ORIGINAL CONTRIBUTION

7.1. INTRODUCTION

The cross-sectional survey of 444 respondents that was carried out by this study was able to design and confirm a measurement for acceptance and adoption of MP services with samples from Nigeria (a developing country). In this chapter, the researcher summarised the outcomes of this investigation which are meant to be a contribution to academic work in MP adoption space, and he also summarised the significant milestones made by this study. A conclusion of the entire thesis pointing out the implications of the findings is presented in Section 7.9. This thesis summary is presented in Section 7.8. Research limitations of the analysis are highlighted in 7.4. Section 7.7 highlights on implications for future research while section 7.3.1 discussed practical implication. Section 7.5 proposes an agenda for areas for further research while Section 7.6 centred on discussions.

This research provides a practical contribution that can help organisations practising MP (e.g. financial institutions) to establish suitable strategies and develop a business model for the MP market space to encourage prospective customers to utilise MP and enhance its spread as a payment platform.

7.2. The actualisation of the Aim & Objectives of the Research:

The descriptive statistics of the data gathered were analysed before performing the path analysis. An essential finding of descriptive statistics analysis was the detection of non-normality in the data. To handle the detected non-normality, the data gathered was investigated using a structural equation modelling (SEM) application. This technique

attempts to maximize the explained variance of the indicators in the model instead of maximizing the co-variation among all indicators. This approach is useful for prediction-oriented analysis where the research aims to predict important target variables/essential driver variables or testing an extension of existing theory (Anderson & Gerbing, 1988; Hair, Ringle, & Sarstedt, 2011; Henseler, Ringle, & Sinkovics, 2009). These are in parallel with the aims of the current research. As the first step of SEM analysis, the validity and reliability of the measures in the research were analysed and the findings are presented. Firstly, all the internal consistency reliability of the model is tested using Cronbach's alpha, most of which were higher than 0.7 as proposed in the literature (Carmines & Zeller, 1979; Fornell & Larcker, 1981; Nunnally, 1978). This resulted in concluding that the internal consistency reliability conditions are met. These findings led to the conclusion that the convergent and discriminant validity conditions were satisfied.

After confirming the validity and reliability of the researched model, the path model results are analysed.

The study had four specific objectives outlined in Section 1.10 and highlighted below:

i. *To critically review the literature relevant to mobile payment acceptance in Nigeria.* This objective was met by the information provided in chapter two. The current research completes the gap in the literature by examining the situation of MP acceptance in Nigeria, determining adopter categories, and examining, in contrast, the behaviours, beliefs, and attitudes linked to MP acceptance across the adopter categories.

ii. *To identify the determinants influencing consumers' acceptance of MP in Nigeria by identifying the important elements which affect consumers' behavioural intentions.* This objective was addressed by designing a research model which was hypothesised as described

in Chapter One, conceptualised as depicted in Figure 3.1, developing a questionnaire, performing a comprehensive survey with potential MP end-users and collecting data from 444 respondents. The model was then validated and hypotheses tested against it in Chapter 6. The study model called the “Mobile Payment Acceptance and Use Model”, has the following features: independent variables of PE, relevance, culture, technical support, awareness and trust which were moderated by gender, age, and educational level but the demography variable and security risks did not positively influence BI to use MP.

The significant outcome is that the research model was influenced by the independent variables (PE, culture, relevance, trust, technical support, and awareness) as they correlated positively with the dependent variable behaviour intention. The predictive powers of dependent variables on the model were 85.336 per cent variance of end-user acceptance and MP usage. Because of the benefits they expect and society’s expectations, end-users in Nigeria will be positively inclined to accept to use MP.

iii. *To analytically establish the study framework against the acceptance and MP usage in Nigeria.* This objective was addressed in Chapter 6, including all the hypotheses testing, interpretations and discussions. Accordingly, the model was validated against the use of mobile payment services in three universities settings in Nigeria and found fit to be generalised to similar populations in DCs.

iv. *To develop recommendation in the way of encouraging MP acceptance.* This objective was accomplished through the provision of suggestions gathered from the data analysis, findings and hypotheses testing chapters.

This study shows the need for an understanding of consumer attitudes and preferences towards mobile payment acceptance. As more technological novelties are introduced in rapid

succession and an increased number of those innovations are failing, profound insights into the factors towards acceptance and use become more essential. The research problem was discussed and the investigator's assumptions of the influential effects on mobile payment acceptance and use are being explored. Also, the research questions that laid the foundations of this investigation were explained. The factors impacting consumer acceptance of mobile payment have been investigated, analyzed and tested.

7.3. Contribution:

The contributions of this research rest on different aspects of implementing and analysing empirically. First, in the issue of executing, the research explored how viable the UTAUT model is, which was discovered in developed countries, to explain the same behaviour in developing nations. Secondly, the study executed the model, which was conventional in an organisation setting and employed it to a non-mandatory kind of user behaviour. Thirdly, the investigation expanded UTAUT model accounting for the behaviour intention. The expansion consisted of modifications of effort expectancy to relevance variable, social influence to culture variable, and facilitating condition to technical support variable; and the introduction of new constructs of Trust and Security Concerns. Fourthly, the present research justified the UTAUT model as founded by its authors, together with aiding the inter-associations amongst the essential variables in technology acceptance study.

Generally, the present study showed that the customized research model might be applied to developed and developing countries and indicated it is transferable and can be used to investigate use behaviour in Nigeria. Past studies presented different results relating to TAM's transferability into other communities. This study indicates proof that UTAUT model can be as efficient in explaining use behaviour mainly in the mobile payment setting and model expansion.

While previous studies have emphasised on TAM's transferability and however the customized research model superseded TAM, few studies had employed UTAUT model or tried to test how viable it is in various perspectives than where it was discovered or for which it was tested. Based on this, this investigation made contributions to theory through the provision of a new context to UTAUT by unveiling that, formerly founded associations amongst TAM's variables are also justifiable between the essential variables in UTAUT model which is an added knowledge to UTAUT.

Lastly, the present study extends understanding of IT acceptance within developing countries, such as Nigeria, while employing the parsimonious version of UTAUT and its expansion.

In summary, the study is significant because:

- i. Preliminary study findings provided up to date information about mobile payment services in Nigeria.
- ii. It provides a transferable model for measuring the acceptability rate of consumer acceptance of mobile payment in Nigeria.
- iii. It contributes to the discussion on the acceptance of new technology with a specific remark to mobile payment services.

7.3.1. Academic Contribution:

For investigators, the thesis gives a full version of all constructs available and already studied at consumer level on mobile payment acceptance, providing a basis for further refinement of consumer models of acceptance, as a commencement point for future study.

This investigation adds to mobile payment acceptance literature by presenting a transferable model for evaluating acceptance of service to the extent the perceptions of consumers is

concerned. The critical contribution of this analysis is derived from the novelty of identifying UTAUT variables of acceptance and use, and after that using them to design a mobile payment services evaluation model. The **Mobile Payment Services Adoption and Use Model** (as depicted in Figure 6.1) designed by this research have filled a significant gap in understanding user acceptance of MP.

Furthermore, the investigation adds to the discussion on new technology acceptance, using the example of mobile payments in an African environment. The study is significant to Information Science (IS) because of the fresh ideas which have been used to design the theory. The research is also an addition to knowledge of MP (an aspect of mobile commerce) adoption in developing countries.

Also, the study provides insights into two of the socio-economic factors (gender and age) as they relate to MP use. Venkatesh et al. (2003) discovered that gender had attracted minimal awareness in technology acceptance studies literature; nevertheless, their study results show that it moderates some of the essential associations.

Lastly, the study increases understanding of mobile payment acceptance. The research report has the likelihood to lead to a revised understanding of the consequences of mobile payment usage. The study results could help consumers in less developed countries evaluate the success likelihood of an introduced new technology.

7.3.2. Industry Contribution:

For practitioners, knowing the main variables and associations between constructs is vital to design, refine and implement mobile payment that can attain high end-user acceptance, strengthening where possible current levels of acceptance. By understanding the major factors impacting consumer acceptance and use of mobile payment, constraints, and

particularities (namely those concerned with performance expectancy, trust, relevance, culture, technical support, and awareness), international and local financial institutions in Africa will be able to evolve, aligning functionalities with actual consumers' needs and cultural differences, transforming marketing strategies, service development, design and technology-based educational content, to provide benefits, to increase acceptance, and to strengthen use and channel penetration.

Mobile payment service providers in Africa should keep informing end users about the usefulness, convenience, and more immediate merits of the service (short term), enhancing user experience over usability. If end users appreciate their mobility or lack alternatives, as is the case for many people in African nations (especially those who do not live in a major city), we might expect them to bypass the Personal Computer period and go directly to the mobile one, strengthening the need for customized target acceptance campaigns.

In practice, this thesis serves to provide information to the business sectors concerned in assessing the market reaction allowing them to create segmentation and communication plans, from the knowledge of elements preceding adoption intention.

It is essential to indicate the complex nature of the payment business in Nigeria, with a defined regulatory environment, together with fragmented technology solutions and various participating segments of the economy. In this ecosystem, banks, corporations, e-transaction processing establishments, network providers, retailers, end-users and support service providers coexist.

MP growth in Nigeria relies on the characteristic knowledge of this market and how prepared the internal capacity of companies are keen in the business. There is telecommunication operators' interest in taking an essential space in this model, facilitated by increased mobile phone penetration rate. Since there are a lot of mobile devices than persons, network

operators have a likelihood of achieving the needs of MP for consumers, especially those not having a bank account.

MP provides advantages like the chance of gaining time, convenience and new end-user experience. Conversely, all participants who partake in the payment process can benefit from this new service offering.

7.4. THEORETICAL IMPLICATIONS

This research model is an evaluation of consumer acceptance of MP in Nigeria. Hence, results obtained could be referenced theoretically and empirically for future research, which could examine MP in Nigeria and comparison of the results obtained here with future findings. Research outcomes were obtained with the support of a consolidative model (UTAUT). The success of this model's implementation to study early acceptance in a developing nation is an indication that the theoretical model in this research displays appreciable theoretical proposition and practical significance. Hence, this model is a valid technology acceptance framework with theoretical justification and the ability to validate statistics in researching technology acceptance. This model is useful, not only to evaluate MP acceptance but in other technology acceptance investigations like e-learning and social media. Based on the implementation of this model, investigators can list the determinants of the system, associate it with the external variables like performance expectancy and trust and analyse how these variables dictate consumer acceptance behaviour while also examining the impact of demography on relationships.

This research model examined MP acceptance behaviour in a setting where consumers are unbanked in order to encourage cashless banking techniques being promoted by the Central Bank of Nigeria. Hence, the investigator finds this research model suitable to investigate

technology acceptance behaviour and recommend further utilisation of the model in future research areas.

7.4.1. Practical Implication:

The growth experienced in the last few years in electronic banking operations are mostly the outcome of the switch to mobile service business and the previous retail growth. Hence, the banking business is propelled by a slogan: almost every bank operations extend across channels. The present research focused on BI of MP in a DC's setting. Customers have a clue to banks' survival and keeping present ones is cheaper than engaging new ones (Kotler and Armstrong, 2008).

From the study outcomes, decision-making executives in finance industries can see the function of expectations in creating use behaviour. The results indicated that experienced users depend on their perceptions of PE to decide on system usage.

The present study has targeted consumers of mobile payment services with a report on the essential benefit acquired from findings regarding demographics, especially educational level and income level, which showed a moderating impact for the Nigeria market. A result like this can as well be used to streamline services and mobile payment channel qualities, to equate consumers' desires needs from varying income level.

7.4.2 Technology Implications

The Federal Republic of Nigeria's cash-heavy banking structure has been a demerit to the country (CBN, 2013), making banks look out for other banking techniques which can reduce the issues a cash-heavy economy presents in developing the economy and the nation. Furthermore, acceptance levels of MP are presently not satisfactory and with banks investing resources in developing and distributing MP services, knowing the purposes behind the

present user acceptance pattern towards MP will make banks to concentrate on primary areas of improving consumer acceptance of MP in Nigeria. A factor like trust was recognised as important in determining intention to accept MP. These findings are essential to MP application developers because they show that consumer acceptance of MP can be boosted by increasing their trust in MP. To achieve this, they must acknowledge the initiation and sustenance of MP integrity as a matter of importance for MP application advancement. MP reliability and transaction precision should be the priority on the design necessities of the application. As long as agents can make sure that MP services perform well and precisely, they must take into consideration their customer care procedures and the techniques employed to handle customer complaints and enquiries concerning MP use. Customers are more possibly to trust and accept MP if it performs reliably and queries could be attended to by agents in situations when it doesn't present well. Following the establishment of an application that presents well and maintaining acceptable business practices, consumer privacy protection and access control must be assured. Sufficient security procedures should be accessible to make sure that user financial detail is safe from unauthorised access. On achieving an acceptable integrity and confidentiality standards, non-repudiation and authentication are the next matter of importance. Agents must adjudge that users need assurance that those involved in transactions are real and won't deny taking part in a transaction after really showing involvement. Making sure that only legitimate and genuine users take part in transactions, customers' trust in MP and eventually their acceptance of MP should be boosted. Based on these recommendations, the study states that notwithstanding some variables such as performance expectancy and culture indicating a higher degree of impact on BI, it doesn't show that all other impacting variables should be viewed with little importance. The study shows that application developers make sure that when putting trust into consideration, other impacting variables should be accorded sufficient emphasis too to

create ideal MP products. These ideas can be looked into from a technological and managerial perspective by validating that the designing of MP software meets suitable benchmarks for all variables and with a guarantee that banks and mobile providers give sufficient assistance to designers in meeting these benchmarks. Adherence to all these will enhance the acceptance of MP.

In furtherance of trust's impact on intention to use MP; culture, PE, relevance, technical support and awareness were disclosed to significantly impact BI to use MP directly, and impacts user behaviour consequentially. The resultant effects imply that MP agents should endeavour to boost the usage of MP applications to aid service provided to users. Mobile Payment agents should develop strategies of relaying MP performance to the masses.

By initiating MP which conforms to the above-listed technology benchmarks, relaying its performance and relevance to consumers will in no doubt boost consumer intention to accept it. Furthermore, taking into consideration that BI is influenced by PE, Culture, Relevance and trust, application designers and banks must make sure that users trust their applications because, despite the relevance or its performance expectancy, trust in the technology will keep dictating consumers' real perception of both factors. The investigator is of the suggestion that MP vendors run extensive prototype to test MP applications for measuring consumers' perception of their applications performance and relevance. Banks and mobile network providers must make sure that benchmarks for performance expectancy, relevance and technical support are set and followed since these benchmarks will influence agents to create applications of an increased opportunity of being accepted by users.

The ultimate implication emphasises on awareness and sensitisation. As explained in chapter one, MP actualised about 147 million users in March 2016 (NBS 2016).

Furthermore, since this research has shown performance expectancy, relevance, culture, trust, security, technical support and awareness as significant factors that impact intention to accept MP, banks and mobile network providers must think of means of increasing acceptance employing the elements as motivating tools. The study takes into consideration ideas from Robinson (2009) with regards to strategies, which innovation agents ought to take on board to boost awareness and acceptance. When awareness is increased amongst potential users, agents should employ mass media outlets to make public the advantages of MP and engage influencers as representatives for mobile payment (MP) acceptance.

This strategy will facilitate MP and assist economic advancement which the cashless policy hopes to attain in Nigeria. Conclusively, the research results presented MP developers with a set of factors that will boost consumer trust in MP and result in increased acceptance rates.

7.5. Research Limitations

The further research of this study's framework can be useful to advance knowledge about factors which influence consumers' behaviour towards mobile payment in Nigeria. This investigation has two limitations. Firstly, in order to have a wider scope of consumer's perspective a larger population size could be considered and be increased so as to have a more generalised view and also the study could be expanded to reach more states in Nigeria, though this investigation is still valid having analysed the available sample size with close-ended questions. Secondly, it would be advantageous if this study could have used other statistical models such as exponential and polynomial regression model as this will help to recognize the highest extent of change in end users behaviour within Nigeria. Further studies could be carried out by taking a look at the end users' demographic characteristics and the acceptance of mobile payment in Nigeria. This investigation has been able to contribute to

the existing literature on end-user acceptance of mobile payment in Nigeria and has also bridged the gap which exists between developed nations and developing nations. Also, this research has been able to analyse the factors that impact the end user acceptance of mobile payment in Nigeria.

7.6. AREAS FOR FURTHER RESEARCH

This research had created a consolidated model that presented a methodical approach towards understanding MP acceptance in Nigeria. The design of this model has presented a means to apply it to other aspects of technology acceptance.

The investigator has proposed for additional exploration into other possible factors that can influence MP acceptance, and the investigator recommends the use of this model in several acceptance settings. By further investigating MP acceptance, additional facts will be obtained to validate the model.

The investigator proposes that additional analysis should also look at a more inclusive set of demographic profiles to investigate their effect on technology adoption. A total of seven demographic features were taken into consideration in this research.

Notwithstanding that this research showed no significant association between the demographic segmentations considered, analysing more demographic segmentations would yield data to compare with the outcomes of this research and result in a more integrated perspective on demographic data and technology adoption.

The principal component analyses indicated that the variables in the MP acceptance model describe only 85.336% of the variance of behaviour intention. Another 14.664% of variance

remains unexplained suggesting a need for more studies to incorporate additional variables in this model.

The validity of the research model could be enhanced by undertaking a longitudinal study design in a similar or different environment. Furthermore, a similar study could be carried out within Nigeria, using samples from more universities/locations than those in this study.

Accordingly, the research model needs to be assessed with another type of technology and in other nations for the reinforcement of its external validity. In line with this, large-scale research with a more significant sample from other developing countries should be researched.

Future work may be directed to investigating the socio-psychological foundation of gender for proper recognition of its function as a moderator in the model.

Future studies may employ surveys from other participants group or between various nations, where this system had been utilised or not, and confirm if the outcomes are in line. Amongst the propositions of similar investigations is the idea to use a model which includes a 'cost' variable, in nations where MP service is already operational to view the results related to this construct.

Future investigations may take into consideration, an introduction of additional constructs towards understanding technology acceptance. The study shows that the accomplishment of this research presents a proposition to a future investigation to comprehensively examine other variables and their association with technology acceptance, as a future investigation could determine indirect associations between independent and dependent variables.

7.7. Implications for Future Research

The research outcomes have some effects. The customised UTAUT model represents that of a less-developed country with a differing extent of explanatory power.

Nonetheless, there is still a need for more study, mainly when Nigeria model's explanatory power isn't as high as that in a developed country's context indicating a need to examine other possible constructs which may give more explanatory power in behaviour intention in developing nations. Furthermore, the customised UTAUT model may be used to explain other behavioural intention like e-shopping.

In addition, the analysis showed the need to investigate more into the function of experience in technology adoption, since a different model seemingly gave better explanatory power when 'experience' was connected to user behaviour. Furthermore, new study designs may build-up the knowledge of the clustered model. This research explored a cross-sectional study of consumers in mobile payment setting. Other research can investigate a more controlled subset of end-users and settings to recognise limitations and exceptions concerning user behaviour, and the aggregated model.

It would also be of benefit to carry out longitudinal investigation testing the associations as they emerge as time progresses. It would be of good advantage for the inclusion of other moderating factors.

A further area for additional investigation is the effect which the moderating factors like gender, educational level, income, and age have on BI. The present research outcomes relating to the non-moderators of gender and age, suggests additional studies for cases where gender equality may be well universal. Previous studies on technology adoption have been emphasised on gender dissimilarities in the workplace. Moreover, the acceptance of mobile payment on individual and work level needs further studies on gender as a basis of user behaviour in non-mandatory settings. Similarly, additional research is required regarding age-

range that might be taken into account when technology acceptance behaviour is examined, while most studies up till now concentrated on age-range within the workplace (especially older) which shows that further studies with younger and potential users are probably to be successful. Such demographic descriptions would permit merchants to target designated sections considering technology-based operations suitably.

UTAUT is a parsimonious model recognising that investigators have researched rigorously to expand TAM. The clustered model merits similar perceptive work, mainly because several existing studies are still concentrated on TAM in contrast to UTAUT.

Finally, considering the present economic situation globally, future studies could explore "Trust" fully in research within any monetary setting as this variable is assumed to have acquired significance due to the financial market crisis.

7.8. SUMMARY

This study's investigation into MP acceptance in Nigeria presents an inquiry into people's behavioural acceptance in Nigeria in the initial periods of a new technology's spread into the populace. It shows findings, which the investigator views as essential additions to gaps in knowledge relating to technology acceptance in DCs. This investigation aimed to design a conceptual model of the critical elements that impact consumer acceptance of MP in Nigeria. In this research, the designed theoretical model supported in knowing the complete impacts these factors had on behaviour intention.

These impacts were analysed empirically and resulted in the verification of hypotheses; presenting proof of the theorised effects which exist between the elements in the model. These impacts and the variables in the theoretical model, together with their associated hypotheses were based on a comprehensive literature review where the present MP setting in Nigeria was described, and useful theories in technology acceptance and the MP perspective

in Nigeria were evaluated. The discussion of these useful works of literature assisted in providing an academic proposition for this research and considering the outcomes obtained; this part examines the sameness and differences between this research's outcomes and extant literature while also emphasising aspects where this research makes crucial additions to prior literature. It is essential to be aware that to discuss the results of this research, this study successfully analysed technology acceptance based on data gathered from a sampling size of 500 participants.

Preceding investigations into technology acceptance had barely accomplished the sampling size of this scale. For instance, examine the works of Jeong and Yoon (2013) who researched customer adoption of mobile banking in Singapore and got outcomes for their research based on data collected from 165 participants. Nasri (2011) investigated the elements impacting the acceptance of internet banking in Tunisia with a sampling group size of 253 participants. Al-Jabri (2012) chose 330 customers for research on m-banking acceptance in Saudi Arabia. Lastly, Safeena's (2012) research into technology acceptance amongst end-users in India utilised the lowest sampling size of all the surveyed analysis with outcomes and research relying on data presented by 58 participants. By quoting these investigations, the investigator emphasises the relevant sampling size difference between comprehensive research and the present research which is useful as it asserts the investigator's impression that results obtained are relevant and can be generalised since they were derived from a broad cross-sectional sample of the populace. It is to be noted that in analysing the importance of the association between variables, the p-value was taken into consideration, and in examining the tenacity of association between variables, the standardised regression weights were taken into account.

The investigator carried out a PCA on the data set and obtained three principal components which could explain 85.336% variance of all indicators and those three principal components were defined into three dimensions. The researcher then updated the initially proposed model and got a more accurate evaluation model with three dimensions which captured the multidimensional and interdependent nature of the mobile payment. The updated evaluation model better assessed the end-user adoption of MP in Nigeria. For the validation of the success of the updated model, the researcher performed Correlation analysis on the study data and obtained the results which validated how accurate and useful the updated model and the evaluating indicators are.

The ultimate objectives of the thesis are to recommend and test the integrated model for the enhancement and improvement of consumer acceptance of MP in Nigeria. Also, lessons learnt from the empirical analysis had been extracted to assist in informing practice.

The research findings present critical theoretical implications together with implications for policy and technological propositions. This research evaluated the factors influencing MP acceptance in Nigeria by executing a model formulated based on adaptations from extant technology acceptance frameworks. This research also hypothesised associations of impacts between PE, Culture, Trust, Security risks, Relevance, Technical Support and Behaviour Intention. Additionally, this study presented more awareness into the associations between these variables by analysing the probable changes in interaction significance when socio-demographic elements were included.

Lastly, the importance of this research's addition to knowledge relies on its significant outcomes, implications and contributions to technology acceptance in developing nations.

Furthermore, this research disclosed that PE, Culture, Trust, Relevance, Technical Support and Awareness impacted Behaviour Intention positively, showing that these factors in MP

can affect their perception of the technology as well. Also, the ranking of elements impacting intention to use begins with behaviour intention.

This investigation showed that despite the demographic factors, these associations maintained significance, asserting that for all demography changes, PE, Culture, Trust, Awareness, Relevance and Technical Support decide consumers' BI to accept MP, and finally result in original or non-acceptance. These outcomes present crucial practical implications for MP in Nigeria.

The researcher described how the present study objectives were achieved taking into consideration past detailed discussions of the result, and the nature of the developing country's context, of the study.

The primary focus of this investigation was to address UTAUT's applications, which was prevalent in developed countries, to other developing countries. The general insight is that most technologies built and created in advanced nations are culturally-biased in supporting advanced nations' socio-cultural systems (Hill et al., 1998). This prejudice could challenge how these technologies are applied when moved to another culturally distinct environment. Furthermore, technology advancements sixteen years ago after the internet were commercialised and the materialised benefits of the revolutionised ICT made it not possible for establishments worldwide not to regard these merits or avoid the Internet medium. Two facts can be built in support of Nigeria as a present-day societal setting. Firstly, Nigeria prides herself of a free oriented-market with a dynamically developing ICT setting after deregulating the telecom sector in the year 2000 and complete liberalisation in the year 2004.

Secondly is the presence of dependable present-day infrastructures enabling the more extensive market coverage and instigates greater stiff competition with four mobile telecom operators and more than ten internet service providers. The competitiveness in price and government initiative projects, making ICT increasingly accessible, led to encouraging a nationwide acceptance of ICT.

Information and Communications Technology (ICT) developments were very easily transferable. If the globe is getting smaller due to the ICT revolution, then it is ideal that information flow freely transforms Nigeria's perception and expectation. Thus, where the digital divide is converging due to ICT spread; it is reasonable that the UTAUT model is employed to predict technology acceptance in a progressing nation like Nigeria.

Primarily, this thesis has contributed to the perception of technology acceptance in non-mandatory BI settings.

Summarily, this research encourages UTAUT applications in both developed and developing societies, though subject to some conditions relating to the generalizability of the measurement weight and moderator's effect.

From the research conducted on the consumer acceptance of MP in Nigeria, all research objectives have been established which include:

1. The literature relevant to mobile payment adoption and its acceptance in Nigeria has been critically reviewed.
2. The determinants influencing consumers' adoption of MP in Nigeria by identifying the important elements which affect consumers' behavioural intentions have been realised.
3. The study framework against the acceptance and MP usage in Nigeria has been empirically validated.

4. The recommendation on the way of encouraging MP acceptance has been developed.

7.9. CONCLUSIONS

This research designed and empirically tested a customized UTAUT model to explain the mobile payment acceptance at a consumer level, with data from three universities in Nigeria. The results from this study suggest that the customized research model possesses substantial explanatory power and is robust under several circumstances. Eight hypotheses are supported and one hypothesis has found to be not significant. Therefore, it supports the significance of the use of UTAUT for investigating the mobile payment service in Nigeria.

Supported in the fact that the SPSS, PCA and AMOS analysis introduced several statistical improvements to the results and new studies should be performed, in light of this new reality as it increases reliability and model explanatory power. New relationships between trust and security model variables and behaviour intention were analysed. In terms of results, performance expectancy, trust, relevance, culture, technical support and awareness were found to be statistically significant antecedents of behaviour intention.

Scholars might get inspiration from this research and perform a further study of UTAUT relating to the mobile payment service in Nigeria. Lastly, this research contributes to significant managerial implications in the mobile payment service provider in developing the service they provided.

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APPENDICES

APPENDIX I: Participant Information Sheet

Ethics Approval Reference number:

Title of Project: CONSUMER ACCEPTANCE OF MOBILE PAYMENTS IN NIGERIA - An Extended and Customised Technology Acceptance Model.

Mobile payments have been introduced in Nigeria by the Central Bank, and this investigation is about the level of adoption of this new payment method.

You are selected as a potential participant for this questionnaire survey which is part of academic research I am executing at Cardiff Metropolitan University under supervision by Prof. Dr Ibrahim Sirkeci and Dr Agnes Taylor.

Throughout the questionnaire, you will not be asked any personal and private questions, and all responses will be kept ***CONFIDENTIAL***.

The data and findings of the study will be solely utilised for academic and teaching intent. The outcomes might be published in an academic journal, books and delivered during seminars.

We are hoping this research will help us understand consumer attitudes towards mobile payments and identify techniques in which these services can be enhanced. Therefore your responses are crucial and very valuable for the accomplishment of this analysis.

The questionnaires will require 45 minutes in total.

The submission of a filled-in questionnaire implies that you have given your consent to engage in the survey.

Thanks for your time in engaging in this survey in advance, and an incentive of food voucher will be given to participants.

Please contact the research team if there are any questions regarding this research.

Kind regards,

Ismaila Ola Ogundega, Cardiff Met University (L0435SKSK0812@student.lslondon.co.uk)

Prof. Dr Ibrahim Sirkeci, London School of Commerce (e-mail: sirkeci@yahoo.com)

Dr Agnes Taylor, London School of Commerce (e-mail: agnes.taylor@lslondon.co.uk)

APPENDIX II: Acceptance & Usage of Mobile Payments in Nigeria – Survey
Questionnaire for Mobile Phone / Mobile Payment Users

In the subsections of **sections 1 to 8** that follows, please signify by way of ticking in the right column, the degree to which you agree with the given statement in relation to mobile payment services, where: 1 = strongly agree; 2 = Agree; 3 = Neutral; 4 = disagree; 5 = strongly disagree.

Section 1: Behavioural Intention to use mobile payments

	Likert Scale type questions	1	2	3	4	5
1	I intend using mobile payment services in the next six months.					
2	I predict I shall use mobile payment services in the next six months.					
3	I plan using mobile payments services in the next six months.					
4	I must use mobile payments in the next six months					
5	I already use mobile payments services					

Section 2: Performance expectancy of mobile payment services

	Likert Scale type questions	1	2	3	4	5
6	Using mobile payment services is beneficial					
7	Using mobile payment would enhance faster payment than using other payment methods (e.g. credit card, cash)					
8	Using mobile payments would enhance my shopping experience					
9	I would find mobile payments useful in situations where I do not have cash and my credit card (s) with me					
10	Mobile payments are a useful mode of payment as it allows me to make payments on the go (at anywhere and at any time)					
11	Using mobile payments makes the handling of payments easier					
12	By using mobile payments, my choices of payment options as a consumer are improved					

Section 3: Culture of mobile payment services

	Likert Scale type questions	1	2	3	4	5
13	People that are significant to me would find using mobile payments a good idea					
14	People that are significant to me would suggest using mobile payments					

Section 4: Relevance of mobile payment services						
	Likert Scale type questions	1	2	3	4	5
15	I can learn to make mobile payments without any help					
16	I find/expect it simple in becoming skilful at using mobile payments					
17	My interactions with mobile payments are / will be clear and easy to understand					
18	I find/expect it simple in performing the stages needed to use mobile payments					
19	Mobile payment does / will not need much of mental effort					
Section 5: Trust of mobile payment services						
	Likert Scale type questions	1	2	3	4	5
20	The risk of a non-authorized third party who oversees the payment process is low					
21	The risk of abuse of confidential information (e.g. credit card numbers, bank accounts details) is low when using mobile payments					
22	I would find mobile payments secure in performing payments transaction					
Section 6: Security Risks & Obstacles of mobile payments services						
	Likert Scale type questions	1	2	3	4	5
23	Paying through mobile payments would involve more security risks when compared to other ways of payment.					
24	When transaction error occurs, I worry that I don't get compensated by the banks, telecoms, or credit card companies.					
25	Paying through mobile payments would involve more personal information confidentiality risk when compared to other ways of payment.					
Section 7: Technical Support of mobile payment services						
	Likert Scale type questions	1	2	3	4	5
26	Downloading an app to my mobile phone to use mobile payments is a hassle for me.					
27	Registering an account to use mobile payments is a hassle to me.					
28	Entering a password and a PIN code to use mobile payments is a hassle for me.					
29	The possibility of delays or time-lag in making mobile payment transactions is a hassle for me.					
30	I have the skills required to use mobile payment services.					

Section 8: Awareness of mobile payment services

	Likert Scale type questions	1	2	3	4	5
31	I came to know about mobile payment services because of the critical role they play in financial transactions.					
32	I knew about mobile payment services because they are very relevant.					
33	My colleagues and friends told me about the existence of mobile payment services.					
34	I came to know about mobile payment services because of the technical support around it.					

Section 9: Security Risks Likelihood in Mobile Payments

In the subsections that follow, please indicate by way of ticking in the right column, the degree of likelihood with the given statement concerning mobile payment services, where:

1 = very unlikely; 2 = unlikely; 3 = neither unlikely or likely; 4 = likely; 5 = very likely

	Likert Scale type question	1	2	3	4	5
35	How likely are you to become a victim of an invasion of privacy in mobile payments?					
36	How likely are you to become a victim of transaction error (s) in mobile payments?					
37	How likely is it that your personal information will be stolen in mobile payments transactions?					
38	How likely are others a victim of transaction error (s) in mobile payments?					
39	How likely are others a victim of an invasion of privacy in mobile payments?					
40	How likely would the personal information of others be stolen in mobile payments transactions?					

Section 10: General questions about your background.

Please provide your details below.

41. What is your gender?

- ☐ Male
☐ Female

42. What is your age in years?

- ☐ Less than 18
☐ 18 – 24
☐ 25 – 34
☐ 35 – 54
☐ 55 – 64
☐ 65 - 70

43. What is your ethnic group?

- ☐ Yoruba,
- ☐ Igbo,
- ☐ Hausa,
- ☐ Middle Belt,
- ☐ Niger-Delta,
- ☐ Other Ethnic Groups (please specify)

44. What is your highest education?

- ☐ Primary education
- ☐ Secondary education
- ☐ Undergraduate education,
- ☐ Postgraduate education

45. What is your occupation?

- ☐ Student
- ☐ Academic Staff
- ☐ Non-Academic Staff

46. What is your level of income?

- ☐ Low income
- ☐ Medium income
- ☐ High income

47. What is your marital status?

- ☐ Single
- ☐ Married

Thank you.

APPENDIX III: Correlation tables for Crosstab Analysis

Table 6.2. BI and PE Crosstabulation

BI * PE Crosstabulation

Count

		PE													Total
		1.00	1.57	1.71	2.00	2.14	2.29	2.43	2.57	2.71	3.14	3.29	3.86	4.43	
BI	1.20	26	0	0	0	0	0	0	0	0	0	0	0	0	26
	1.40	0	26	0	0	0	0	0	0	0	0	0	0	0	26
	2.00	0	0	26	0	26	26	0	0	0	0	0	0	0	78
	2.20	0	0	0	26	0	0	0	0	0	0	0	0	0	26
	2.40	0	0	0	0	26	26	0	0	0	0	0	0	0	52
	2.60	0	0	0	0	0	0	52	0	0	0	0	0	0	52
	2.80	0	0	0	0	0	0	0	26	0	0	0	0	0	26
	3.00	0	0	0	0	0	0	0	0	26	26	0	26	0	78
	3.20	0	0	0	0	0	0	0	0	0	0	26	0	0	26
	3.40	0	0	0	0	0	0	0	1	0	0	26	0	0	27
	3.60	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	4.00	0	0	0	0	0	0	0	0	0	0	0	0	26	26
Total		26	26	26	26	52	52	52	27	26	26	53	26	26	444

Table 6.4. BI and Culture Crosstabulation

BI * Culture Crosstabulation

Count

		Culture								Total
		1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	
BI	1.20	0	26	0	0	0	0	0	0	26
	1.40	26	0	0	0	0	0	0	0	26
	2.00	0	0	0	52	0	26	0	0	78
	2.20	0	0	0	26	0	0	0	0	26
	2.40	0	0	0	26	0	26	0	0	52
	2.60	0	0	0	0	52	0	0	0	52
	2.80	0	0	0	26	0	0	0	0	26
	3.00	0	0	0	0	26	0	26	26	78
	3.20	0	0	0	0	0	0	26	0	26
	3.40	0	0	0	0	1	26	0	0	27
	3.60	0	0	1	0	0	0	0	0	1
	4.00	0	0	0	0	0	0	0	26	26
Total		26	26	1	130	79	78	52	52	444

Table 6.6. BI and Relevance Crosstabulation

BI * Relevance Crosstabulation

Count

		Relevance													Total
		1.00	1.40	1.60	1.80	2.00	2.20	2.40	2.60	3.00	3.20	3.80	4.40	4.60	
BI	1.20	26	0	0	0	0	0	0	0	0	0	0	0	0	26
	1.40	0	26	0	0	0	0	0	0	0	0	0	0	0	26
	2.00	0	0	26	26	26	0	0	0	0	0	0	0	0	78
	2.20	0	0	0	0	26	0	0	0	0	0	0	0	0	26
	2.40	0	0	0	0	26	25	0	1	0	0	0	0	0	52
	2.60	0	0	0	0	0	26	26	0	0	0	0	0	0	52
	2.80	0	0	0	0	0	0	0	0	26	0	0	0	0	26
	3.00	0	0	0	0	0	0	26	26	0	0	26	0	0	78
	3.20	0	0	0	0	0	0	0	0	0	26	0	0	0	26
	3.40	0	0	0	0	0	0	0	0	27	0	0	0	0	27
3.60	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4.00	0	0	0	0	0	0	0	0	0	0	0	0	26	26	
Total		26	26	26	26	78	51	52	27	53	26	26	1	26	444

Table 6.8. BI and Trust Crosstabulation

BI * Trust Crosstabulation

Count

		Trust								Total
		1.33	1.67	2.00	2.33	2.67	3.33	3.67	4.00	
BI	1.20	26	0	0	0	0	0	0	0	26
	1.40	0	26	0	0	0	0	0	0	26
	2.00	0	0	52	0	26	0	0	0	78
	2.20	0	0	0	26	0	0	0	0	26
	2.40	0	0	0	26	0	0	26	0	52
	2.60	0	0	0	26	0	26	0	0	52
	2.80	0	0	0	26	0	0	0	0	26
	3.00	0	0	0	26	0	0	26	26	78
	3.20	0	0	0	0	0	0	26	0	26
	3.40	0	0	0	1	0	0	26	0	27
	3.60	0	1	0	0	0	0	0	0	1
	4.00	0	0	0	0	0	0	0	26	26
Total		26	27	52	131	26	26	104	52	444

Table 6.10. BI and Security Risk & Obstacles Crosstabulation

BI * SecurityRiskandObstacles Crosstabulation

Count		SecurityRiskandObstacles								Total
		1.33	1.67	2.00	2.33	2.67	3.00	3.33	4.00	
BI	1.20	26	0	0	0	0	0	0	0	26
	1.40	26	0	0	0	0	0	0	0	26
	2.00	26	26	0	0	0	26	0	0	78
	2.20	0	0	26	0	0	0	0	0	26
	2.40	0	25	26	1	0	0	0	0	52
	2.60	0	26	0	0	26	0	0	0	52
	2.80	0	0	0	0	0	26	0	0	26
	3.00	0	0	52	0	26	0	0	0	78
	3.20	0	0	0	0	0	0	26	0	26
	3.40	0	0	0	26	1	0	0	0	27
	3.60	0	0	0	0	0	1	0	0	1
	4.00	0	0	0	0	0	0	0	26	26
Total		78	77	104	27	53	53	26	26	444

Table 6.12. BI and Technical Support Crosstabulation

BI * TechnicalSupport Crosstabulation

Count		TechnicalSupport									
		1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20	Total
BI	1.20	0	25	0	1	0	0	0	0	0	26
	1.40	0	0	0	0	0	26	0	0	0	26
	2.00	26	0	0	25	1	0	0	26	0	78
	2.20	0	0	0	0	0	0	26	0	0	26
	2.40	0	0	26	0	0	0	26	0	0	52
	2.60	0	0	0	26	0	0	26	0	0	52
	2.80	0	0	0	0	26	0	0	0	0	26
	3.00	0	0	0	26	0	0	52	0	0	78
	3.20	0	0	0	0	0	0	0	26	0	26
	3.40	0	0	0	1	0	0	0	26	0	27
	3.60	0	1	0	0	0	0	0	0	0	1
	4.00	0	0	0	0	0	0	0	0	26	26
Total		26	26	26	79	27	26	130	78	26	444

Table 6.14. BI and Awareness Crostabulation

BI * Awareness Crosstabulation

Count		Awareness											Total
		1.00	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	4.00	
BI	1.20	26	0	0	0	0	0	0	0	0	0	0	26
	1.40	0	26	0	0	0	0	0	0	0	0	0	26
	2.00	0	0	52	26	0	0	0	0	0	0	0	78
	2.20	0	0	0	26	0	0	0	0	0	0	0	26
	2.40	0	0	26	0	26	0	0	0	0	0	0	52
	2.60	0	0	0	0	26	26	0	0	0	0	0	52
	2.80	0	0	0	0	0	0	26	0	0	0	0	26
	3.00	0	0	0	0	0	52	0	0	0	26	0	78
	3.20	0	0	0	0	0	0	0	26	0	0	0	26
	3.40	0	0	0	0	0	0	0	0	27	0	0	27
	3.60	0	0	0	0	0	0	0	0	0	0	1	1
	4.00	0	0	0	0	0	0	0	0	0	0	26	26
Total		26	26	78	52	52	78	26	26	27	26	27	444