BEHAVIOURAL INTENTION TO ADOPT POINT OF SALES TECHNOLOGY IN NIGERIAN RETAIL INDUSTRY

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ABSTRAK

Tujuan kajian ini adalah untuk mengkaji pengaruh jangkaan prestasi, jangkaan usaha, sosial, suasana mendorong dan pertimbangan pelanggan terhadap niat tingkah laku untuk menggunakan terminal tempat jualan dalam industri peruncitan di Nigeria dan kesan perantara kesedaran teknologi. Data telah dikumpulkan menerusi 165 pemilik atau pengurus perniagaan runcit di Nigeria, dalam tinjauan keratan lintang dan dianalisis dengan menggunakan teknik kuasa dua terkecil separa teknik pemodelan persamaan struktur. Hasil ujian hipotesis mengesahkan bahawa jangkaan prestasi, pengaruh sosial, suasana mendorong dan pertimbangan pelanggan mempunyai pengaruh yang signifikan terhadap niat tingkah laku, manakala tidak bagi jangkaan usaha. Begitu juga, perantara hubungan kesedaran teknologi antara jangkaan usaha, niat sosial dan tingkah laku, tetapi tiada perantaraan hubungan antara jangkaan prestasi, pemudah keadaan dan niat tingkah laku. Model yang digunakan telah menjelaskan 56 peratus variasi yang terdapat dalam niat tingkah laku. Oleh kerana keterbatasan sumber, kajian ini memberi tumpuan kepada niat sahaja dan mengabaikan penggunaan disebabkan sebagaimana kajian ini menggunakan tinjauan keratan-lentang. Oleh yang demikian, kajian masa hadapan disarankan untuk memperluaskan skop kajian dengan mengkaji niat dan tingkah laku sebenar, mungkin dalam kajian longitud. Berdasarkan bukti empirikal, pertimbangan pelanggan dan kesedaran teknologi merupakan isu penting dalam penyebaran teknologi. Pengamal sektor ini perlu memberi perhatian yang lebih dalam aspek berkenaan khususnya pelaksanaan teknologi dalam perniagaan runcit. Penemuan baru penyelidikan ini menjadi perintis dalam integrasi pertimbangan pelanggan dan perantara kesan teknologi sebagai sumber rujukan dalam penggunaan teknologi. Oleh itu, kajian ini memberikan maklumat tambahan kepada kajian lepas yang sedia ada dan melanjutkan teori secara empirikal terhadap penerimaan dan penggunaan teknologi dengan perbimbangan pelanggan dan kesedaran teknologi.

Kata kunci: Niat tingkah laku, perniagaan runcit, pertimbangan pelanggan, kesedaran teknologi, terminal tempat jualan.

ABSTRACT

The purpose of this study is to investigate the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and customer concerns on behavioural intention to use point of sale terminal in the Nigerian retail industry and the moderating effect of technology awareness. Data were collected from 165 owners/managers of retail businesses in Nigeria, in a cross-sectional survey and were analysed using the partial least square structural equation modelling technique. The result of hypotheses testing confirmed that performance expectancy, social influence, facilitating conditions and customer concerns have a significant positive influence on behavioural intention, while effort expectancy does not. Similarly, technology awareness moderates the relationship between effort expectancy, social and behavioural intention, but does not moderate the relationship between performance expectancy, facilitating conditions and behavioural intention. The extended model explained 56 per cent of variance in behavioural intention. Due to resource limitations, this study focused on intention alone, neglecting the actual usage, thus the survey was cross-sectional. Therefore further studies should extend the horizon by capturing the intention and actual usage, perhaps in a longitudinal study. Based on empirical evidence, customer concerns and technology awareness are essential issues in technology diffusion, and therefore practitioners should pay more attention to them, particularly in the implementation of technology in retail business. The novelty of this research is pioneering the integration of customer concern and moderating effect of technology awareness in technology adoption litrature. Hence, it provides further explanation to the existing literature by empirically extending the unified theory of acceptance and use of technology with customer concerns and technology awareness.

Keywords: Behavioural intention, retail business, customer concerns, technology awareness, point of sale terminal

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LIST OF ABBREVIATIONS

AKA	Also Known As
ATM	Automatic Teller Machine
AVE	Average Variance Extracted
BPR	Business Process Reengineering
CBN	Central Bank Of Nigeria
CC	Concern For Customers
CEO	Chief Executive Officer
COT	Commission On Turnover
CR	Composite Reliability
C-TAM & TPB	Combined TAM And TPB
DTPB	Decomposed Theory of Planned Behaviour
EE	Effort Expectancy
EPS	Electronic Payment System
ERP	Enterprise Resource Planning
FAQ	Frequently Asked Questions
FC	Facilitating Conditions
GDP	Gross Domestic Product
GLO	Globacom Mobile Nigeria
GPB	Great Britain Pounds
HND	Higher National Diploma
ICT	Information and Communication Technology

IDT	Innovation Diffusion Theory
IMF	International Monetary Fund
IS	Information System
ISP	Internet Service Providers
IT	Information Technology
MCAR	Missing Completely At Random
MPCU	Model Of PC Utilisation
MTN	MTN Mobile Telecom
NGN	Nigerian Naira
OGB	Online Group Buying
PE	Performance Expectancy
PEOU	Perceived Ease Of Use
PLS	Partial Least Squares
POS	Point Of Sale
PPP	Purchasing Power Parity
PPRA	Petroleum Products Regulatory Agency
PU	Perceived Usefulness
Q & A	Questions and Answers
RM	Ringgit Malaysia
SCT	Social Cognitive Theory
SD	Standard Deviation
SE	Standard Error

SEM	Structural Equation Modelling
SI	Social Influence
SPSS	Statistical Package for Social Sciences
T.DIST	T Distribution
TA	Technology Awareness
TAM	Technology Acceptance Model
TMM	The Motivational Model
TPB	Theory Of Planned Behaviour
TRA	Theory Of Reason Action
TTF	Task Technology Fit
US	United States
USD	United States Dollar
UTAUT	Unified Theory Of Acceptance And Use Of Technology
VIF	Variance Inflated Factor
VOU	Voluntariness Of Use

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The rapidly ever-changing and yet technology-driven market place stresses a paradigm shift in the approach to managing businesses, thus requires the deployment of alternative management designs. Also, with the advancements in information and communication technology (ICT), such as e-commerce, business processes becomes much easier, but yet the competition from external environment remains or even stiffer (Ahmad, 2012). These necessitate the emergence of technology management approach to managing businesses.

Nigerian business environment is not in isolation in this regard, because of the emergence of business process technologies such as electronic payment system (EPS). Even more worrisome, the Federal Government of Nigeria through the Central Bank of Nigeria (CBN) has embarked on a serious monetary policy revolution it called "the cash-less policy", which entail payment processes to be done electronically, using various forms of e-payment systems. EPS is a form of a financial exchange that takes place between the buyer and seller facilitated by means of electronic communications (Turban, Lee, King, Liang, & Turban, 2009).

Based on the accounts of World Payments Report, 2011, the number of e-payments transactions is totalled 17.9 billion in 2010, and are projected to grow at a sustained 19.1 per cent a year to total 30.3 billion transactions in 2013, while the cumulative value of

global e-payments was €824 billion in 2010 and is expected to reach €1.4 trillion in 2013, a growth of about 70 per cent. Majority of these e-payment transactions uses credit, debit and prepaid to make the payments (Jean, Scott, & Patrick, 2011)

Despite its growth projections however, the enthusiasm and capability of consumers and businesses to accept and use e-payment systems depends largely on country's particular laws, economic condition, technological sophistication and social factors, thus affects the growth and adoption of these systems. (Jean *et al.*, 2011). The implementation and practicability of e-payment systems is currently more visible in the developed countries than the developing and under-developing economies. This is more because the former have the necessary infrastructure and internet penetration than the latter. However, if carefully implemented, e-payment system provides a secured and cost-effective way of cashless payments for goods and services. (Jean *et al.*, 2011).

Central Europe, Middle East, Africa (CEMEA) accounts for the highest expected growth in non-cash transaction of 37 per cent, while 23 per cent in Rest of Asia (excluding China and India), 14 per cent in Brazil, Russia, India, and China (BRIC) and Mature Asia-Pacific accounts for 14 per cent projected growth. Notwithstanding this development however, Nigeria through its Central Bank is projecting an increase in the volume and value of cash-based transactions. In the past few years, the retail payment systems in Nigeria experienced growth in technological developments, but on the contrary, it has not changed from cash-based nature and is associated with soaring inefficiency (Ogunleye, Adewale, & Alese, 2012).

According to CBN, only 10 per cent of Banks cash transactions are above ₦150,000, but they make-up 71 per cent of the value of cash transaction in the Nigerian banks. The CBN also puts the cost of cash management at ₦114 Billion in 2011 and may increase to ₦192 Billion in 2012 (Chima, 2011). Several efforts were made by the CBN to reduce the rate of cash based transaction, including limit of ₦150,000 cash-based transactions (withdrawal and deposits) for individual and ₦1,000,000 for corporate bodies.

In its further effort to reduce the volume and value of cash-based transactions, the Nigerian government through the CBN, roll-out a new policy called "cash-less economy", with a pilot project embarked upon in Lagos State, southeast of Nigeria. The project, which is tagged 'Cash-Less Lagos", was launched in January 2012. The policy according to CBN "aimed at reducing the amount of physical cash (coins and notes) circulating in the economy and encouraging more electronic-based transactions (payments for goods, services, transfers, etc.)'. Ayo and Ukpere (2012) emphasized that there is boost in the level of acceptance and use of information and communication technology (ICT), but ironically, there is raise in the amount of physical cash circulating in Nigeria, whereas safety, privacy, reliability and security of e-payment systems were fingered as the elements that are missing.

Point of Sale (POS) terminal has been targeted by the CBN as a means to address the excess cash-based economy. First Bank Nigeria (2012) defines POS as an electronic device which uses internet connection and credit/debit card (a.k.a ATM Card) to process payments for goods and services. However, there is high rate of resistant to change to electronic payment system by both consumers and merchants, as a recent survey puts

usage of the system at 6 per cent in Nigeria (Adepetun, 2012). On the other hand, Spain for example, with a population of 14 million people has 1.6 million active POS, an average of 1 POS for every 9 individuals, India records 36 million transactions per annum, with about 500,000 POS installed, while Nigeria with about 160 people, has only 3,000 active POS (Uzor, 2012). The largest users of POS terminals are the retailing industry (Tan, 2012).

On the contrary, there seems to be no fruitful results, even as the CBN itself lamented that the cost of cash management might increase in 2012. This phenomenon cannot be unconnected with the inability of businesses to deploy e-payment services at the retail industry. Furthermore, as declared by the CBN, that only 10 per cent of cash transactions in Nigerian banks are above N150,000.00, it is therefore expected that these customers used the money to pay for goods and services at retail markets and also proceeds of small businesses, going by the small amount involved. The phenomena can also be linked to non-adoption of non-cash payment systems in that sector.

In the field of technology management, several researchers have previously used the conventional theories; Innovation Diffusion Theory (IDT) (Rogers, 1962), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Technology Acceptance Model (TAM) (Davis, 1985), Model of PC Utilization (MPCU) (Thompson & Higgins, 1991), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Social Cognitive Theory (SCT) (Compeau & Higgins, 1995), The Motivational Model (TMM) (Davis, Bagozzi, & Warshaw, 1992), Task Technology Fit (TTF) (Goodhue & Thompson, 1995), Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), TAM2 (Venkatesh & Davis,

2000) and relatively broader model, The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003). These models and their extensions focused mostly on high-tech physical devices or software, consumers and merchants who already adopted these technologies mostly in developed economies. They did not account for other variables associated with developing economy. However, as cited in Rasheed and Shiratuddin (2009), "UTAUT has been tested against eight preceding technology acceptance models and it was found to outperform them" (Van Biljon & Kotzé, 2007; Venkatesh *et al.,* 2003; Wu, Tao, & YangJ, 2007).

Several studies however, used the UTAUT (Venkatesh *et al.,* 2003) to predict manager's intention to adoption a range of technologies. These studies were not without shortcomings; because they fall short of addressing some problems, as there is rarely a coherent attempt by previous researchers to simultaneously examine the influence of some important variables.

Researchers previously focused mostly on user adoption or actual usage of technology, they tend to neglect the larger portion of the context they were examining, that is the non-adopters of technology. This research will focus on the non-adopter of e-payment system. Another area where researchers did not pay much attention is the study of Managers' intention to embrace process change management of technology in their businesses; researchers pay much attention to customers', whereas consumers' usage behaviour can only be ascertained if there are these technologies deployed by merchants for consumers to use. This study will examine the merchant's side and focus will be

geared toward the non-adopters of e-payment systems in the retail industry of a developing country (Nigeria), specifically, testing the acceptability of POS terminals.

Based on the preliminary review of past literatures, it is evident that past studies attempted to study intention to use technology in a variety of contexts, using different set of variables (Abadi & Nematizadeh, 2012; Adeoti & Oshotimehin, 2011; Bertrand & Bouchard, 2008; Ho & See-To, 2010; Huh, Kim, & Law, 2009; Ifinedo, 2012; Kim, Ferrin, & Rao, 2008; Mangin, Bourgault, León, & Guerrero, 2012; Ogunleye *et al.*, 2012; Rasheed & Shiratuddin, 2009; Rouibah, 2012). However, these studies were not without theoretical, methodological, and contextual limitations. These limitations opens gap for researchers to fill.

1.2 Problem Statement

As highlighted in the background of the study earlier, managers of Nigerian economy has shown some great concerns on the high volume and value of cash circulating in the economy, which resulted in persistently high 'actual and projected' cost of cash management (Chima, 2011). CBN introduced the cash-less policy to curtail the excess cash (Agboola, 2012; Ilesanmi, 2012; Yaqub, Bello, Adenuga, & Ogundeji, 2013), however, there is resistance to change to the alternative electronic payment channels, such as the POS, as the usage was put as 6 per cent (Adepetun, 2012). Ironically, Change is an inevitable phenomenon for all businesses, to survive it, business enterprise must embrace change (Ahmad, 2012; Drucker, 1969; Hamel, 2000a; Mintzberg, 1988; Toffler, 1970). Interestingly, one of Kotter (2008)'s eight (8) steps to change is Sense of

Urgency (SU). It is argued that personal attributes such as behaviour should lead the execution of what the change brings (Belasco, 1990; Harari, 1996; Kotter, 1995, 1996). Furthermore, (Plouffe, Hulland, & Vandenbosch, 2001) defined behavioural intention as "respondent's sense of urgency for formally adopting an innovation after it becomes broadly available" (Plouffe *et al.*, 2001, p. 212). As SU is linked to behavioural intention (BI), thus calls for research to examined user BI.

Furthermore, Chiemeke and Evwiekpaefe (2011) related that the perception of several users of new electronic devices such as the POS, is that the system is somewhat difficult to use and are doubtful of its performance. Therefore the current study investigates the influence of performance expectancy and effort expectancy on behavioural intention to use POS. Similarly, Biola and Dan (2012) argued that behaviours of Nigerians are usually controlled by the actions of others, whom they have a high regard for, such as friends, parents, religious leaders, sports personalities, teachers, and politicians and celebrities. Their behaviours are also reactive to the influence of television, radio, internet, social media and print media. This therefore creates the opportunity (gap) to investigate the relationship between social influence and behavioural intention. Similarly, Nigeria is one of developing economies International Monetary Fund (2012) and it is therefore faced with such infrastructural deficiencies (Gholami, Ogun, Koh, & Lim, 2010). Despite huge potentials Nigerian market possessed (Uzonwanne, 2011) it is faced with severe shortage of supply of electricity (Onyema, 2011).

It is therefore appropriate to conclude that the resistant to change to e-payment systems by merchandise in Nigeria can be associated with lack of adequate infrastructure to

support the use of the system fear of uncertainty of the performance of the system and the required effort and influence of people who are important to others. Therefore there are substantial justifications to theorise that UTAUT constructs; performance expectancy, effort expectancy, social influence, and facilitating conditions are related to the Nigerian context, thus this study conceptualised that they are factors that influences the adoption of technology in the said context.

Similarly, information and communication technology experts in Nigeria believed that prospective users of POS are not aware of the system. If there is awareness, the penetration of the system will be high (Ilesanmi, 2012). It can be deducted here, that the higher the awareness, the higher the diffusion of the POS and vice-versa. Furthermore, previous studies yielded conflicting findings on the relationship between UTAUT constructs and behavioural intention (Alrawashdeh, Muhairat, & Alqatawnah, 2012; Birch & Irvine, 2009; Foon & Fah, 2011; Gao & Deng, 2012; Huang & Qin, 2011; Lai, Lai, & Jordan, 2009; Sumak, Polancic, & Hericko, 2010; Yamin & Lee, 2010). Accordingly, once there is conflicting findings, the same study can be replicated to expand the boundary of knowledge (Li, 2010; Mitchell & Jolley, 1992).

However, where there are inconclusive findings of previous research, Baron and Kenny (1986) suggested a test of moderation effect. Thus this study theorised that ‘Awareness’ moderates the relationship between the above UTAUT constructs and behavioural intention to use POS in Nigeria. Several researchers have found a significant relationship between awareness and behavioural intention (Charbaji & Mikdashi, 2003; Omar, 2011; Rehman, Esichaikul, & Kamal, 2012; Wan, Cheung, & Shen, 2012).

Behavioural intention is an important determinant of actual behaviour (Zhou, 2008), thus researchers have used several variables and models to examine similar phenomenon, for example; Abadi and Nematizadeh (2012), Mangin *et al.* (2012), Chen, Kuan, Lee, and Huang (2011), Ho and See-To (2010), Huh *et al.* (2009), Li and Huang (2009), Kim *et al.* (2008), Troshani and Rao (2007), Rigopoulos and Askounis (2007), Van Slyke, Belanger, and Comunale (2004), Chang and Cheung (2001), Chin and Gopal (1995) etc. Despite these attempts to explain the phenomena, however, there is need to further our understanding beyond what is known and understood (Venkatesh *et al.*, 2003). "future research should focus on identifying constructs that can add to the prediction of intention and behaviour over and above what is already known and understood" (Venkatesh *et al.*, 2003, p. 471).

Interestingly, customer concerns was neglected in the previous literature (Abubakar & Ahmad, 2014), despite their important roles to all businesses (Hammer & Champy, 1993a) and their exposure to numerous technological innovations such as the POS (Suki & Ramayah, 2010). Therefore, as crucial as customer is to businesses, it is expected that the merchandise is uncertain of the reaction of their customers would be once the merchandise adopted the new payment system, hence might be hesitant to accept it (Van Birgelen, de Ruyter, & Wetzels, 2003). Therefore, based on the researcher's knowledge, there is scarce of literature that incorporates customer concerns in manager's intention to adopt technology in business, thus create an opportunity (gap) for researchers to investigate.

1.3 Research Questions

Many researchers have studied and proposed theories and models of technology acceptance in order to predict and explain user behaviour. Each theory or model has been proposed with different sets of determinants and moderators and most of them have been developed in Developed Nations. It is therefore not clear whether the theories and models of technology acceptance that have been developed, modified, and extended in developed economies can be used in other countries such as Nigeria. It is also questioned whether there might be other determinants and moderators that also plays important roles in this specific environment. Furthermore, findings of studies that examined the influence of UTAUT constructs on behavioural intention remained inconclusive, hence the need for moderating variable to examine the phenomenon. Therefore, the following are the research questions of this study:-

1. What is the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intention to use POS?
2. Does technology awareness moderate the relationship between UTAUT constructs and behavioural intention to use POS
3. What is the relationship between customer concerns and behavioural intention to use POS?
4. What is the predictive relevance of the extended UTAUT model?

1.4 Research Objectives

The following are the objectives of this paper:-

1. To predict the influence of UTAUT constructs on behavioural intention to use POS in Nigerian retail industry
2. To examine the moderating effect of technology awareness on the relationship between UTAUT constructs and behavioural intention to use POS
3. To predict the relationship between customer concerns and behavioural intention to use POS in Nigerian retail industry
4. To determine the predictive relevance of the extended UTAUT model.

1.5 Scope of the Study

The vast amount of cash circulating within the Nigerian macroeconomic environment, which can be linked to retail industry in Nigeria, motivated the researcher to focus on retail industry alone. Retail industry is one of the major sectors that are contributing to the gross domestic product (GDP) of Nigeria. According to National Bureau of Statistics Nigeria (2012) retail and wholesale sectors contributed more than 20 per cent. This placed them as second contributor of the GDP. Similarly within the industry, the researcher's concern geared toward examining the non-adopters' intention to use e-payments systems in their businesses. Specifically, POS terminals will be used in this study as e-payment systems of reference. The targeted subjects of this study are the

decision makers in the retail industry, the owner, the manager or any other person who is responsible of making decision in the organization. The population of the respondents in this study comes from the data available from retail business trade associations across twelve (12) sectors of the industry namely; books stores, boutique, bureau de change, computer stores, electrical and electronics stores, hardware store, automobile, petrol stations, pharmaceutical stores, private medical clinics, private primary/secondary schools and travel agencies. Similarly, there are 36 states in Nigeria, which are divided into six geo-political zones. Therefore the respondents are selected from one state from each of the zones, proportionate to the number of retail business from respective selected states. In total, 377 questionnaires were administered.

1.6 Significance of the Study

The outcome of this study will be useful to regulatory agencies such as CBN, service providers such as banks, internet service providers and card service firms, academics and the retail stores businesses. The following is an outline of importance of this study;

The theoretical contribution of this study consists of two major parts. First, the study adapted Unified Theory of Acceptance and Use of Technology (UTAUT) as the underpinning theory and extended the theory with new independent variable; customer concerns', which previous studies have not explored. This is a significant contribution to the body of knowledge because the customer is an important stakeholder of any business, particularly the retail industry, in which there is frequent customer-merchant interaction. Regardless of the importance of customer to business and perhaps

merchants' implied consideration of the customer before implementing a new technology in their business, there is scarce of empirical studies that examined the impact of customer concern on managers' behavioural intention to adopt POS. Therefore the current study, upon consideration of unification of the most important factors of technology adoption in UTAUT, adopted and extended the theory with customer concern.

Secondly, the application of the unified theory was inconclusive due to inconsistent findings in the past studies. Therefore based on Baron and Kenny (1986) recommendation, a test of moderating effect of technology awareness was introduced to moderate the relationship between performance expectancy, effort expectancy, social influence and facilitating conditions and behavioural intention to use POS. The introduction of technology awareness was based on the consideration of the context of the study, which reveals that its stakeholder had lamented that lack of merchant's awareness hinders the implementation of e-payments systems, particularly the POS. For that reason, this study empirically tested these moderations, thus provided valuable insights of the interaction of technology awareness in predicting managers' behavioural intention. Further discussions on the theoretical contributions of this study are provided in chapter five, section 5.3.1.

Outcome of this research is expected to be interesting, thought provoking one, therefore industry players such as e-payment service providers, will use the outcome to provide services that are in-line with the users expectations. Similarly, the regulatory agencies that are charged with the responsibility of provision and enforcement of relevant

regulatory guidelines, will find the outcome of this research handy in designing regulatory framework that is in-line with the reality of the phenomenon. In the same way, using the outcome of this research by industry players and regulators will resulted in provision of efficient and secured e-payments gateways. In this regard, the retail merchants will indirectly benefit from the outcome of this research, by obtaining efficient and risk-free e-payment services. Finally, as the merchants migrate to the payment process, the environment will be free from using the natural resources to produce banknotes. It will also reduce in high crime rate related to cash handling. The government will also benefit from implementation of the system, by imposing tax to the earnings of businesses. This will ensure business sustainability and accountability.

1.7 Organization of the Thesis

This thesis will be composed of six chapters. The following is a synopsis of each chapter in this thesis;

Chapter one furnished the reader with a background of the study, where the researcher dwelled on the current issues in the payment system of Nigeria. The chapter also highlighted the current global developments in the information and communication technology as it relates to businesses. Research questions were raised and objectives of the study were set to answer the questions. Justification for research gaps, significant scope of the study and contribution to the body of knowledge as well as managerial contributions were also highlighted. Then chapter two discussed the general overview of payment systems in the world and particularly in Nigeria. It will further highlight the Nigerian economic profile as well as the state of infrastructure development, vis-a-vis

electricity, internet etc. The section will also touch on the level of e-payment penetration in Nigerian economy and stakeholders efforts in ensuring smooth transition from cash-based to cashless payments. A critical review of past literatures related to e-payment system in Nigeria is presented.

Chapter three presents critical of reviews past literature related to technology management, theories & models of technology acceptance and usage, and their limitations. Theoretical underpinning of the study, UTAUT Model, is also discussed, a theoretical framework and hypotheses is developed and operational definitions of variables are highlighted. Measurement Items for the variables and their source is presented. Then Chapter four explained the researcher's chosen methodology and provides justifications for such choices from the literature. The chapter also outlines components of the research design; population and sample size to be used, development of questionnaire instruments and measurement scales, data collection techniques and procedures. Finally, procedures and techniques for data analysis are enumerated.

Chapter five focused on the analysis of data that was gathered from the field. Data was analysed based on the techniques and procedures and in relation to the variables in the research framework. Results will be analysed and presented in a systematic format and also hypothesis will be tested. While chapter six presents the result of this study and discusses its implications for practitioners in the industry and researchers. It also evaluates the results of the study on the basis of hypothesis that was formulated in chapter 3 and on the basis of set objectives of the research. Conclusion, limitations, and suggestion for future research are also discussed in this part.

1.8 Summary

Chapter one is said to be a critical part of any research, thus it provides a comprehensive background to the real world phenomena, statement of problem in relation to theoretical issues, formulate research questions and set objectives as well as enumerate significance and scope of the study. It also outlines the organization of chapters in this study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter provides a detail discussion of extant literature related to the main focus of the study; behavioural intention to use technology. Also discusses the basis for extension of UTAUT theory with customer concerns. In addition, a moderating effect of technology awareness on the relationship between those constructs and behavioural intention are discussed based on the inconclusive findings of previous research on behavioural intention to use technology. Furthermore, a proposed theoretical framework, research hypotheses, direct path hypotheses, and moderating hypotheses of the study are formulated.

2.2 Technology Management Perspectives

Technology has become an interesting topic of research in the past century, perhaps because of its significance in streamlining processes in organizations, particularly business entities. This has led to an increasing attention to identifying key areas and components that technology is interrelated with. For example, there have been tremendous focus on the following areas; technology acquisition, implementation, diffusion and performance of technology in improving business process. Therefore the current research believed that technology remains an inexhaustible area of research that still requires attention, particularly in developing economies such as Nigeria, where technological advancement is still at its growth stage. Consequently, the current research deemed it necessarily important to investigate the diffusion of technology.

Technology is defined in this research as manipulation of existing procedures, tools and mental ability to improve process and/ or solve real world problems. This is in line with several scholars such as Arthur (2009) who defines it as a means by which human purpose is achieved. Similarly, Pilkington and Teichert (2006) argued that technology is a process, tools and machines needed to accomplish or improve a given task. The researcher therefore identified real-world problems in the context of Nigerian retail industry as the resistance to change to point of sale technology as means of improving payment process.

These technologies can be categorized into two (2) in the context of this research as 'hard and soft'. This is in line with Zhouying (2004)'s classification. According to him, hard technology refers to physical unit of technology in which an operation is carry out, whereas soft technology refers to a unit of technology which does not have any physicality. Based on the above definition of hard and soft technology, a typical example of hard and soft technologies is desktop computer device and Microsoft Office respectively. Zhouying (2004) further classified soft technology into eight different types. These are business technology, social technology, soft-life- technology, military technology, politic technology, culture technology, LPFE technology (therapeutic and diagnostic technology of human's breathing, mind and body in traditional oriental medicine), and Soft-engineering technology.

Narrowing down to business technology, Zhouying (2004) defines Business technology is any type of system and process that facilitate efficient implementation of all sort of economic activities. Business technology includes e-commerce, financial derived tools,

accounting technology, stock technology, advertisement technology, management technology, logistic technology, virtual technology, incubator, exchange technology, alliance technology etc. On the basis of this definition and example, it can be deducted that systems such e-payment system, enterprise resource planning (ERP) etc., are financial and management tools respectively. To further narrow down, this study focuses on e-payment systems.

The current research opined that business organisations have in the past decades, battled with rapid advancement in technologies such as e-payment system. This dilemma has necessitated managers to employ certain skills which are neither the conventional management approach, nor the extremely technical approaches. This is similar to the assertion in Pilkington and Teichert (2006). Consequently, the need for distinctive management approach emerged. Therefore the rapidly ever-changing and yet technology-driven market place stresses a paradigm shift in the approach to managing businesses, thus requires the deployment of alternative management designs. Also, with the advancements in information and communication technology (ICT), such as e-commerce, business processes becomes much easier, but yet the competition from external environment remains or even stiffer Ahmad (2012). These necessitate the emergence of technology management approach to managing businesses. Thus, over the last two decades technology management has gradually established itself as an academic discipline. For example, Drejer (1996) identifies four schools of thought as the discipline evolved from R&D Management, through Innovation Management and Technology Planning before developing as Strategic Management of Technology

(MOT). Under this classification, MOT is distinct from economics and public policy and is solidly located within the management field.

As stated above, technology management as a discipline emerged due the increasing demand for unique management skills that is in line with current reality of technological advancement, thus there is need for emblematic definitions that captured elements of conventional management as well as the technology elements. The current research therefore defined technology management as a planning, execution, implementation and evaluation of set of management tools, uniquely designed to streamline business process and technological capabilities of an organisation. This definition is consistent with a number of definitions of technology management. For example, a process, which includes planning, directing, control and coordination of the development and implementation of technological capabilities to shape and accomplish the strategic and operational objectives of an organization (BurgeSmani & Wheelwright, 2004).

2.3 Change Management Perspectives

Technology and change management are interwoven components, in which each of the components lead to one another. For example, technological advancement that make customers to be information technology savvy, will definitely stimulate an industry to redesign its processes or aligned the current process in reality with the trend in the market. In other words, the industry must respond to change because of the technological advancement. Similarly, in most instances, responding (change) to the ever increasing market demand requires acquisition and implementation of certain

technology for the change to be effectively implemented. For example, Suki and Ramayah (2010) argued that nowadays customers are technologically sophisticated, thus to respond to such development, managers are required to implement corresponding technologies that meets the needs and the nature of the market, otherwise the business receives poor patronage. Therefore technology is an indispensible element of change management and a vice-versa.

The above assertion concurred with several past researches. For example, Drucker (1969) and a number of scholars (Hamel (2000b); Mintzberg (1988)) who believed that it is the age of discontinuity, thus extrapolating from the past is completely useless. New technologies, cultural pluralism, knowledge capital, and globalization were recognized as causes of discontinuity. Similarly, Ahmad and Francis (2006) related that for businesses to endure the unending competition and turbulence nature of the market they operate, organizations must imbibe the culture of strategic change and make it a routine activity (John, 2002). Thus suggested a radical process change approach (change management) to the tumultuous business atmosphere businesses operate and the ever-changing demand and sophistication of the consumers.

Change management is a structured and strategic approach to initiate and manage the change process in the organization structure and culture as well as the individuals/teams behaviour and attitude towards the change transition in the field of the business processes, technology implementation, or any other policies of an enterprise. Therefore, since change constitutes technology and individual or group attitude, it is certainly essential to examine the behaviour of prospective users of technology. This is consistent

with the trend in technology diffusion research. For example, Davis (1985) drawn from psychology and sociology field and formulated the famous technology adoption model (TAM).

TAM postulates that individual intention and actual behaviour is determine by their perceived ease of use and perceived usefulness. This pioneering receives tremendous adoption in the information system research. However, due to its limitations, Venkatesh, et al. Venkatesh *et al.* (2003), Venkatesh, Thong, Chan, Hu, and Brown (2011b) combined and synthesised eight of TAM related theories and developed the unified theory of acceptance and use of technology. In all of these scenarios, the central emphasis was individual intention and actual use behavior in adopting new technology. Therefore this researcher believed that behavioral intention is an important determinant of successful implementation of technology in business.

As discuss earlier, technology stimulates change and vice-versa, it is evidently clear that information technology such as e-payment system is one of the key elements that trigger change and also help contribute immensely in change implementation. In other words, technology stimulates and streamlines change. Interestingly, the current research point of view is no in isolation. For instance, Ahmad, Francis, and Zairi (2007) established that that information technology (IT)/ information systems (IS) could be of tremendous value for an organisation in embarking on change, however, it should be apparent how to make IT/IS contribute to its success.

Similarly, Khong and Richardson (2003) defined change management as a management technique that radically rethinks and redesigns business processes to achieve dramatic improvements in business performance such as customer service and quality. Therefore, IT/IS makes a significant contribution to the success of the change management as well as triggering the change itself. Although the two term (IS and IT) are often referred to mean the same, the duo can be distinguished as thus. While IS refer to pulling together of hard and soft ware, infrastructure and skilled people to aid the effective management of an organisation, IT is a collection method, gadgets and procedures, to transform data into useful information (Jessup, Valacich, & Wade, 2008).

According to Al-Mashari and Zairi (1999), carrying out change entails five elements, which includes; management competence, change management system and culture, BPR project management, IT Infrastructure and organizational structure. They further stressed that the five elements are composed of a range of other elements. Davenport and Short (2003) identified five-step approach to initiating change. These are drawing out vision and mission, put the right process flow, be familiar with the existing process, choose best information technology that suits organization and review process implementation. Technology and change process are interweaved components, as technology is not a process or technique which helps in mending the old ways and improving them, but it actually breaks all the rules by bringing radical change and that is what BPR does as well.

Ahmad and Francis (2006) believed that in order to achieve a better result for the whole organization, it is necessary to identify core or key processes of an organization prior to

change implementations. The outcome of implementing the process change in the organization's core processes lead in customer satisfaction. Similarly, it was found that for successful implementation of Business process re-engineering to take place, seven key factors are important; the factors are teamwork and quality culture, quality management system and satisfactory rewards, effective change management, less bureaucratic and participative, information technology/information system, effective project management and adequate financial resources (Ahmad *et al.*, 2007).

Similarly, Montalvo (2006) identified nine reasons on what brought about change in an organization. These are; social outcomes, economic risk perception, perceived market pressure, perceived community pressure, perceived regulatory pressure, technological capabilities, organizational learning, strategic alliances and networks of collaboration. Therefore it is evident that change arises as result of the following; development of new product, entry of new competition, changing consumer taste & preference, shifting in socio-political, economic & cultural framework, advancement in technology and new emerging markets.

There is resistance to change to the alternative electronic payment channels in Nigeria, such as the POS. This is no doubt a phenomenon that characterized the typical retail businesses in Nigeria. For example, Adepetun (2012) reported that the usage at only 6 per cent. Ironically, change is an inevitable upsurge that every organization is faced with. This researcher believes that change can be related to internal processes or external factors. In any case, it is in the opinion of this researcher that every business organisation must embrace change in order to survive such upsurge. The above assertion

is consistent with position of several scholars, for example; Ahmad (2012), Hamel (2000a) etc.

Therefore change from conventional payment to an electronic payment mechanism requires the behavioural spirit of the prospective users. This spirit is in line with one of Kotter (2008)'s steps to change. He proposed eight steps to change; they are; (1) establish a sense of urgency, (2) create a guiding coalition, (3) develop a vision & strategy, (4) communicate changed vision, (5) empower broad based action, (6) create short term wins, (7) consolidate & produce change and (8) anchor new approaches (Kotter, 1996). Kotter further advised that change sense of urgency is necessary for other steps to take place; therefore it is important sense of urgency is created first.

In the past few paragraphs, the researcher has beyond doubt, identified complementarity of technological advancement and change management, while change management requires behavioral will. Similarly, behavioral intention and actual behavior have received considerable attention in the past few decades as fertile area of research. Furthermore, the change sense of urgency was proposed as one of the important steps in ensuring change is successful. Therefore, it is evident that behavior required a stimulant, which the current research believes that change sense of urgency is the key stimulant. Change sense of urgency is defined as assigning greatest importance to business and personal matters through attitude and process (Kotter, 2008).

At this juncture, it can be concluded that people behavioral pattern such as the intention, leads to execution of what change has unlocked. Therefore the researcher chooses to

investigate behavioural intention to use technology, in respect of business process change, particularly point of sale terminal, which the Nigerian government recently introduced a cashless payment program. The program is aimed at reducing the excess amount of cash being transacted in the Nigerian economy. The program have suffers a lot of set-backs, as merchants, who are the would-be custodians of the systems showed resistance to change to the new payment system.

As mentioned earlier in chapter one, the CBN targeted Point of Sale Terminal (POS) as a means to drain the system of excess cash-based transaction. According to recent reports, the adoption rate of POS stood at six per cent. This triggered the researcher to investigate behavioural intention. Interestingly, Plouffe *et al.* (2001) defined behavioural intention as "respondent's sense of urgency for formally adopting an innovation after it becomes broadly available" (Plouffe *et al.*, 2001, p. 212). Therefore the researcher believes that behavioral intention can lead to adoption of payment process change. The above justifications informed the researcher's decision to investigate behavioral intention to use technology.

There are primarily four types of variables namely; (1) dependent variable, which is the variable of primary interest to the researcher, (2) dependent variable, the ones open which the dependent variable reacts to changes in them, (3) Moderating and (4) Mediating variable, which are the contingent and intervening variables respectively. Sekaran and Bougie (2009) defined a variables as any object or person that can obtain a changeable value at different time for the same object/person or for different object/person at the same time (Sekaran & Bougie, 2009). For example, employee-job

satisfaction is a variable, because it can vary from high, low and no satisfaction at all. The value (satisfaction) varies for different people and at different times.

The main variable of interest to the researcher in this study is behavioral intention to use e-payments system. Several researchers asserted that behavioral intention is the most important determinant of actual behavior. For example, Zhou (2008) argued that the most important factor that determines user acceptance and use of technology such as e-payment, is obviously the user's intention. Behavioral intention has been widely researched, especially in the information system research, but there is need for further research based on the inconclusiveness of the previous findings. In the subsequent sections, an in depth discussion of the rationale for focusing on behavioral intention and review of previous studies on factors affecting it will be offered.

Literature review of previous studies has revealed a number of variables as factors that influences behavioral intention. For example, perceived risk and perceived relative benefit (Lu, Cao, & Yang, 2010), compatibility, perceived ease of use, perceived usefulness, perceived system quality and computer self-efficacy (Chang & Tung, 2008), variety of 3G services and service quality (Mardikyan, Beşiroğlu, & Uzmaya, 2012), attitude, subjective norm and self-efficacy (Lam, Cho, & Qu, 2007), impulse purchase orientation, quality orientation, brand orientation, online trust and prior online purchase experience (Ling, Chai, & Piew, 2010), perceived usefulness, perceived price, perceived security, perceived enjoyment, social influence, gender and income (Du, Zhu, Zhao, & Lv, 2012), recommendation sources, perceived trust and perceived risk (Lin, Tzeng, Chin, & Chang, 2010), perceived risk, privacy concerns and trust (Liao, Liu, & Chen,

2011), flexibility of WBT system, system interactivity system enjoyment, performance expectancy, effort expectancy, social influence and facilitating conditions (Alrawashdeh *et al.*, 2012), performance expectancy, effort expectancy, social influence and disturbance concerns (Lai *et al.*, 2009) etc.

Having consider the unification of greater number of these variable by Venkatesh *et al.* (2003) to theorized UTAUT and its subsequent performance in explaining about 70 per cent variance in behavioral intention (Van Biljon & Kotzé, 2007; Venkatesh *et al.*, 2003; Wu *et al.*, 2007). This study selected four main constructs of the UTAUT namely; performance expectancy, effort expectancy, social influence and facilitating conditions. Another major reason for selecting these variables is the conflicting findings found in the relationship between the variables and behavioral intention in several studies, which calls for test of moderating variable as discussed earlier.

On the other hand, the original theory hypothesized that age, gender, experience and voluntariness of use as moderators of relationships in the model, however the current study dropped them for the following reasons. First of all, the age, gender and experience were found to no significant moderating effect on the relationship between the performance expectancy, effort expectancy, social influence, facilitating conditions and behavioral intention (Al-Shafi & Weerakkody, 2009; Marchewka, Liu, & Kostiwa, 2007). Secondly, voluntariness of use was dropped as a moderator because it was not logical to be a moderator (Sekaran & Bougie, 2009). This is because the technology under focus in this study is not mandatory across all users in the Nigerian retail industry. Finally, one of the hallmarks of scientific research is its parsimony (Sekaran & Bougie,

2009). Therefore in order to maintain model parsimony Wang and Yang (2005) suggested that these moderators should be dropped to simplify the model.

However, the researcher's closed observation of the trend in technology adoption research in the consumer context has disclosed that several researchers have studied numerous factors which influences consumers or customers to accept and use technology (Liao *et al.*, 2011; Lu *et al.*, 2010; Suki & Ramayah, 2010) etc. Results of these studies revealed diverse views of the customers. Some expressed apprehensiveness towards use of the systems, while others are optimistic about the performance and security of the systems. Despite the importance of the customers to business and their subsequent divergent views about the use of information systems, there are limited or no study that examines the merchants' perception of the sensitivity of their customers toward technology. Therefore this study extends the UTAUT theory with customer concern variable, to test its relationship with behavioral intention. Therefore, this study comprises of the following variables;

Dependent variable (DV)

1. Behavioral Intention to Use POS

Independent variable

1. Performance Expectancy
2. Effort Expectancy
3. Social Influence
4. Facilitating Conditions
5. Customer Concern

Moderating variable

1. Technology Awareness

2.4 Behavioural Intention

Sekaran and Bougie (2009) defined dependent variable as the main focus of the researcher, thus the objective of the researcher is to predict or explain the variability in the dependent variable to provide answers to the research problems highlighted in the problem statement. Therefore the work of the researcher is to render this variable measurable and to identify the possible factors that affects or influence it. As stated above, Behavioural Intention to Use POS is the dependent variable in this study.

Kotter (1996) proposed eight steps to change; they are; (1) establish a sense of urgency, (2) create a guiding coalition, (3) develop a vision & strategy, (4) communicate changed vision, (5) empower broad based action, (6) create short term wins, (7) consolidate & produce change and (8) anchor new approaches (Kotter, 1996). Kotter further advised that change sense of urgency is necessary for other steps to take place; therefore it is important sense of urgency is created first.

Change sense of urgency is defined as assigning greatest importance to business and personal matters through attitude and process (Armenakis & Bedeian, 1999; Bacon, 2003; Covington, 2001; Kotter, 2008; Vakola, Tsaousis, & Nikolaou, 2004). Similarly, tolerating ‘business as usual’ notion is no longer fashionable, thus people must be taken out of their ‘comfort zones’, consequently, personal attributes such as behavior should spearhead the execution of what the change has suggested (Belasco, 1990; Harari, 1996;

Kotter, 1995, 1996). At this juncture, it can be concluded that people behavioral pattern such as the intention, leads to execution of what change has unlocked. Therefore the researcher believes that behavioral intention can lead to adoption of payment process change. The above justifications informed the researcher's decision to investigate behavioral intention.

About a century ago, Watson (1913) introduced into the American psychology, the concept of behaviorism. He posit that where the goal of research is predicting behavior, psychology should be seen as a subset of natural science, thus purely objective (Watson, 1913). The purpose of psychology as posited by Watson (1913), is to predict what causes particular reaction, given a particular stimulus or the vise-versa. Thus it is evident that stimulus resulted into behavior. Interestingly, Sundel and Sundel (2004) stressed that human behavior is a measurable, observable and positive event. These behaviors includes thoughts, perceptions, attitudes, intentions and beliefs. Interestingly, the objective of this study is to investigate the influencers of managers' behavioral intention to use POS.

Behavioural Intention has been defined in TPB and TRA as the willingness, plan and effort of an individual toward achievement of his/her objective (Ajzen, 1991; Bandura, 1997). Intention also signifies one's maximum likelyhood of engaging into performing an action as immideately as possible (Ajzen, 2002). Recently, Venkatesh *et al.* (2003), defined behavioral intention as "a person's subjective probability that he/she will perform a behavior" (p. 455). These definitions concurred with Prophet Muhammad (peace be upon him)'s Hadith as narrated by Omar bin Al-Khattab (R.A), who said he

heard the messenger of Allah (peace be upon him) said "Actions are but by intention and every man shall have but that which he intended....” (Al-Nawawi, 2001).

Several researchers studied behavioral intention in different context, using different synonym for it. For example, **adoption intention** (Zhu, Sangwan, & Lu, 2010), **intention to use** (Lallmahamood, 2007), **online purchase intention** (Sin, Nor, & Al-Agaga, 2012) etc. The most important key word is intention, and it appears in all the studies, whereas adopt, use or purchase are all behaviors or action. Thus this section will review extant literatures whose focus was any of these identical terms.

This study defines behavioral intention as human extrinsic/intrinsic behavior that eventually leads into an action for which the intention was initially made. Specifically, because the objective of this study is to understand the behavioral pattern of managers' intention to use information system, therefore the current study define it as thus; behavioral intention to use POS is the managers' extrinsic/intrinsic behavior which leads to effort and plan toward the actual use of POS. Our definition is in line with Fishbein and Ajzen (1975) assertion, that intention leads to action, whereas action is defined here as use of POS.

As stressed earlier in the definition of behavioural intention, that it leads to definite action, it will be interesting to prove this assertion with empirical evidences. For example, the work of Hill, Smith, and Mann (1987) established that behavioural intention is a significant predictor of actual usage. Similarly, Sheppard, Hartwick, and Warshaw (1988) found an average of 54 per cent correlation between behavioural

intention and actual system usage. This was found as a result of review of 86 related literature that used TRA. Davis, Bagozzi, and Warshaw (1989) also found that behavioural intention to use information system in particular, significantly correlated with actual usage. As cited in Lam *et al.* (2007), there is significant positive correlation between intention and actual use of information system. In another related study in the online shopping channel, actual purchase behavior was found to positively react to people's intention (Li & Huang, 2009). Also Yamin and Lee (2010), maintained that the strength of one's actual behavior is dependent on their intention. Further investigation of the determinants of adoption of e-payments system for traffic violation was carried out in Kuwait. It was found that intention to use significantly affects actual use of the system (Omar, 2011). Recently, Wu (2012) studied adoption of agricultural information technology among Chinese rural farmers. The study revealed that intention explained up to 68 per cent variance in actual use of the technology among rural farmers. This is nearly the 70 per cent variance explained achieved in Venkatesh *et al.* (2003) study.

This implies that whenever there is change in person's intention, there will be corresponding change in their actual behaviour or action, thus it becomes important to investigate intention to use the system, because the intention leads to actual usage. Interestingly, Nigeria is still at its early stage in POS adoption, as the usage rate was put at 6 per cent (Adepetun, 2012). Impliedly, 94 per cent of Nigerians are non-users, therefore it will be constructive if this study focuses on the non-users to find out what influences their intention to use POS. There are numerous studies that examined the factors that influence people's intention to use various systems, thus the current study

critically reviewed these studies on a timeline basis. This method gives the reader a clearer view of trend in information system research.

Several studies have investigated and found the factors that influence behavioural intention to use, which originated from the field of social psychology. However, different set of technologies and system were considered in these studies. Fishbein and Ajzen (1975)'s TRA pioneered the technology adoption literature, whose work was drawn from the social psychology. The main constructs proposed by the theory are attitudes, subjective norms as predictors of intentions which lead to behaviors. It that attitude was found to significantly affects intention in both mandatory and voluntary settings, while subjective norms only affects intention in mandatory settings (Venkatesh *et al.*, 2003). A subjective norm is synonymous with UTAUT's social influence (Zhou, 2008).

Chin and Gopal (1995) studied the adoption intention of GSS among undergraduate business students. The study investigates whether relative advantage, perceived ease of use, compatibility, and enjoyment can predict intention to use GSS. All the factors were significantly related to intention to use GSS. However, the population of the study was inappropriately determined, because the subjects were students, hence might not have the same valuation process as managers. Therefore alternative method of determining subject can be considered in order to make known the managers' behavioural intention.

Salisbury, Pearson, Pearson, and Miller (2001) applied TAM's perceived ease of use and perceived usefulness and extended it with web security construct to examine their

influence on web purchase intention. Web security was found to have greater influence on web purchase intention, whereas TAM construct were not significant to web purchase intention. TAM's perceived usefulness and perceived ease of use are similar to UTAUT's performance expectancy and effort expectancy respectively (Zhou, 2008). However, similar to Chin and Gopal (1995) study, Salisbury *et al.* (2001)'s study also sampled undergraduate students in the south-eastern US. Although students can also be categorized as frequent internet users, thus their computer appreciation knowledge is much higher than ordinary people (Van Slyke *et al.*, 2004), because the former was taking an introduction to computer course as at the time of the study. Accordingly, this becomes a setback for generalizability of the findings. The researchers also suggested future researches to test the influence of other variables.

In another related study, other variables' influence on intention and subsequent Web Board technology usage were examined by Limayem, Hirt, and Chin (2001). These variables are attitude, perceived consequences, habit and facilitating condition. The study was a longitudinal one, in which 144 undergraduate and postgraduate students in Hong Kong were sampled. Data for measurement of usage behaviour was collected one month after data for intention was collect on the same sample. Based on the result of the study, facilitating condition variable, which is one of UTAUT's constructs, was found to influence both intention and actual usage. Perceived consequences also influence intention to use Web Board while attitude does not. On the other hand, habit influenced usage behaviour as well as moderates the relationship between intention and usage behaviour. This implies that usage behaviour varies depending on one's habit. However,

Limayem *et al.* (2001)'s sample follow the trend in sampling university student, thus is vulnerable to generalizability issues.

Similar to the studies above, Van Slyke *et al.* (2004) expressed concern on the generalizability of their findings, because they also sample students at three public universities in North America, who the authors claimed are consumers. The study aimed to identify and understand the factors that influence intention to use business-to-business electronic commerce. The factors are trust in web merchant, relative advantage, compatibility, visibility, complexity, image, voluntariness, and result demonstrability. Contrary to Van Slyke *et al.* (2004)'s choice of subjects, business-to-business is defined as commercial transaction between firms whereas B2C is between business and consumers (Laudon & Traver, 2010). Therefore there was problem of wrong choice of subjects. Nevertheless the flaws, their findings revealed the importance of trust in web merchant to online consumers. They pave way for future researchers to consider other important variables such as security.

Another extension of TAM was proposed by Lu, Hsu, and Hsu (2005). They extended it with perceived risk variable and examined their influence on behavioural intention to use online antivirus applications. Although the variance explained by the extended model is quite high (62 per cent), the study is prone to generalizability problems because the sample selection was based on judgmental non-probability sampling technique, thus there might be bias in the sampling. Nevertheless the process flaws, result of the study revealed that perceived risk has an indirect impact on intention. Result also indicated

that perceived risk is crucial to continuous users group, while perceived usefulness is important to users who only trial and leave the application.

Unlike Van Slyke *et al.* (2004)'s study which sampled students for convenience reasons, El-Gayar and Moran (2006) appropriately sampled 263 students from Midwest university in the US, to assess, predict, explain and improve acceptance of tablet PC among the students. The researchers extended UTAUT model with attitude, self-efficacy, and anxiety to predict students' behavioural intention and usage behaviour. All of the variables were significantly correlated in the extended model except anxiety which did not influence intention to use tablet PC. The extended model explained 55 per cent of variance in behavioural intention. Although the variance is lower than Van Slyke *et al.* (2004)'s 62 per cent, the finding of this research is relatively reliable than the former.

In contrast to the frequent use of students as samples in information system research, (Lam *et al.*, 2007) sampled 788 users of IT hard and software. These are employees of 4 and 5-star hotels in the province of Hangzhou and Hong Kong, who uses the system to carry out their routine official work. Unfortunately, the researchers used convenience sampling technique in selecting their sample, thus cannot generalize the findings of the research. However, the study explored the influence of perceived IT beliefs on task-technology fit, perceived IT beliefs, task-technology fit and self-efficacy on attitude, and attitude, self-efficacy and subjective norm on behavioural intention to use IT in Chinese hotel industry. Findings indicated significant influence in all the paths.

Similar to Salisbury *et al.* (2001) and Van Slyke *et al.* (2004)'s recommendations for consideration of other important variables that might explain intention to use, Lallmahamood (2007) also offered such conclusion. The researcher extended TAM with perceived security and privacy variable to examine their impact on intention to use internet banking. Result of the study confirmed the impact of these variables on intention to use internet banking. This result contradicts Salisbury *et al.* (2001)'s study in which TAM's perceived ease of use and usefulness were found not to influence web purchase intention. Because TAM's perceived ease of use and perceived usefulness are synonymous to UTAUT's effort expectancy and performance expectancy respectively, it can be concluded that there is inconsistency in predicting behavioural intention.

To further substantiate the inconsistency claimed in the previous section, perceived ease of use and perceived usefulness were found to have significant positive relationship with behavioural intention in Rigopoulos and Askounis (2007) study. TAM model was also applied in the study to explain customer's behavioural intention to use online electronic payment system service. Although the study sampled bank customers that have credit card and uses internet banking, which are appropriate to the objectives of the study, the authors acknowledged small sample size issue in the study, thus the recommended future studies to consider bigger sample in different context and settings. Furthermore, there is need to consider physical delivery of questionnaire in future studies, as this study used e-mail delivery option in questionnaire distribution. This study also found behavioural intention to positively influence actual usage of the system.

In a conceptual paper authored by Troshani and Rao (2007), attitude construct was placed to mediate the relationship between user predisposition, perceived ease of use, perceived usefulness, social influence, and facilitating conditions and behavioural intention to use mobile service technology. This was done based on a critical review of technology acceptance literatures. Although there was no empirical evidence to support their findings, the study found these factors affecting behavioural intention. They recommend for empirical study to intensify understanding of the phenomena.

Just as recommended above, an empirical study was then carried out to understand students' perception using course management software. Marchewka *et al.* (2007) empirically tested the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy and anxiety as independent variables and behavioural intention as dependent variable. Also tested was the mediating effect of attitude toward using technology between the independent and dependent variables. Findings indicate a significant effect of effort expectancy and social influence on behavioural intention, while performance expectancy and facilitating conditions did not significantly affect behavioural intention. Age and gender were also found insignificant. In order to further test the fitness of UTAUT, the researchers recommend future research to include older student.

In another related study that involves online learning course website, Chang and Tung (2008) proposed a new hybrid technology acceptance model, by extending TAM model with compatibility, perceived system quality and computer self-efficacy constructs. They sampled 736 users of online learning course website among Taiwan undergraduate

students, they however received less than 34 per cent response rate. Result of the study shows all the independent variables as predictors of behavioural intention to use online learning course website. This result further magnifies the existing inconsistencies highlighted above. Further investigation was recommended by the researchers, to clearly discriminate between countries that are educationally and technologically progressing and those countries that are backward.

An additional conflicting answer in explaining the behavioral intention to use technology was presented in Zhou (2008) study. The researcher investigated the influence of UTAUT constructs and contextual offering on behavioral intention and subsequent use of mobile commerce among Chinese university students. Data from 250 students in three telecom service halls was obtained and analyzed using structural equation model (SEM). All the variables were found to have direct effect on behavioral intention, except effort expectancy, whose effect is indirect through performance expectancy. Behavioral intention was also significantly influencing use behavior. Overall, the model explained improved variance of 76 per cent in behavioral intention to use mobile commerce.

A SEM technique was also used in a survey study by means of paper and online questionnaire. Bertrand and Bouchard (2008) apply an extended TAM to predict clinical personnel intention to use Virtual Reality in clinical settings. Anxiety, motivation, attitude, perceived cost, self-efficacy and external control variables were added to the existing TAM constructs. Data were drawn from fifteen western countries, in which 141 adults were sampled. Outcome of the study shows that only perceived usefulness is

useful in predicting clinical staff intention to used virtual reality. The result is in disagreement with Lallmahamood (2007) reported above.

Kim *et al.* (2008) examined the role of trust, risk and benefit in predicting consumer online purchase intention. Result of the web survey indicated that trust and perceived risk have strong impact on online purchase intention. Although the findings were quite logical, there is concern for generalizing the result to other segment of the society, because students are the subjects of the study. Thus there is need to employ alternative approach and models to examine the relationship. These models could be as integrated technology adoption model of UTAUT.

UTAUT was integrated with satisfaction, trust, and quality with several dimensions to examine their influence on customer behavioral intention to use internet banking services in China. Subjects of the study were 313 postgraduate students of Renmin University of China who are also business executives. SEM was used to analyze the data collected using previously validated instruments. Findings reveal that performance expectancy, social influence and satisfaction have a significant positive relationship with behavioral intention, while effort expectancy has negative relationship with behavioral intention. Result of the study slightly took a different direction, as it rather confounded the existing inconsistency in the literature.

Away from the application of UTAUT to explain user acceptance and use of technology, Kuo and Yen (2009) extended TAM with personal innovativeness and perceived cost to understand their relationship on consumer behavioral intention to use value-added

services of 3G mobile. Data were gathered from 350 Taiwanese consumers via a 22 item questionnaire adapted from extant literature. A back-to-back translation of the questionnaire was provided for ease of understanding of the questions. Result of SEM analysis established that perceived usefulness does not correlate with behavioral intention, while perceived cost attitude significantly correlates with behavioral intention. The researchers recommended that future research should investigate similar phenomena using longitudinal research method. They also acknowledged that the research finding is prone to generalizability issues, because of use of students as respondents in the study.

Huh *et al.* (2009) compared two models of information technology acceptance theories; TAM and DTPB. The researchers aimed at investigating the best model that predicts and/or explains behavioral intention to use hotel information system among hotel employees in South Korea. Variables used to examine the phenomena are TAM's perceived ease of use, perceived usefulness as independent variable, DTPB' attitude toward use, subjective norms, perceived behavioral control as mediators. In addition, compatibility, peer influence, superior influence, self-efficacy and technical support were used as dependent variables. Although further studies needed in other organizational and individual settings, the result of the current study revealed that TAM and DTPB were found as best predictor and explainer of behavioral intention to use hospital information system respectively.

TAM was also applied along with perceived risk theory to explain their relationship with behavioral intention to use online shopping channels. Li and Huang (2009) conducted the survey study was by using previously validated instruments. Perceived ease of use

and perceived usefulness has significant influence on behavioral intention and behavioral intention on actual behavior. This study further strengthen previous researches' claim that behavioral intention leads to actual behavior (Davis *et al.*, 1989; Hill *et al.*, 1987; Li & Huang, 2009; Sheppard *et al.*, 1988; Venkatesh *et al.*, 2003). Also (Omar, 2011; Yamin & Lee, 2010) and recently, (Wu, 2012).

Similarly, in a survey research design that sampled 486 undergraduate students in Jordan, who uses e-learning system, Abbad, Morris, and De Nahlik (2009) also integrated TAM with subjective norms, internet experience, system interactivity, self-efficacy and technical support as antecedents to TAM perceived ease of use and perceived usefulness. SEM was used to analyse 470 completed and returned data sets. The study found that subjective norm and system interactivity are important factors affecting intention to use the system. Other factors interact with TAM constructs to explain the phenomena.

Lu *et al.* (2010) studied the factors influencing behavioural intention to use online banking in China. They examined the effect of perceived risk, perceived relative benefit, and internet experience on consumers' intention. Partial Least Square (PLS) analysis technique was used to analyse data collected from 180 postgraduate and undergraduate students in a China university. Items used to measure these constructs were previously validated in the literature, thus were adapted to suite the context of online banking in China. Outcome of the study concluded that perceived risk, perceived relative advantage influenced consumer intention to adopt online banking, while internet experience did not show any significant effect. This implies that it doesn't matter the internet experience of

a prospective user of online banking, thus it doesn't determined his/her intention or otherwise. For better explanation variance in behavioural intention, the researchers recommended for inclusion of other theoretical model such as UTAUT.

Using experimental study, Seneler, Basoglu, and Daim (2010) proposed internal influence, external influence, self-efficacy, user habits, user attitude, user anxiety, user involvement, enjoyment, risky-task characteristics and complex-task characteristics were integrated along with TAM perceived ease of use and perceived usefulness to explore their influence on behavioral intention to use online services. Linear regression analysis technique was employed to analyze data obtained from 150 e-group users. Of all the factors examined, only user anxiety did not influence user intention. Issues of generalizability were highlighted by the researchers.

Another generalizability concern was acknowledged in the work of Kwek, Tan, Lau, and Rahman (2010). This was due to convenience sampling technique they used. The study empirically examined the impact of impulse purchase orientation, quality orientation, brand orientation, shopping enjoyment orientation and convenience orientation on customer online purchase intention. Drawn from a large private university in Malaysia, the subjects of the study were 250 undergraduate students. Result found impulse purchase orientation, quality orientation, brand orientation, and convenience orientation to influence customer online purchase intention, while shopping enjoyment orientation does not show any impact on intention. Nevertheless the study's limitations, the study can be applauded based on its ability to look at the same phenomena differently, unlike the previous studies, whose view of the phenomena relied on TAM variables.

E-government is also a division of e-commerce, thus researcher in the information system research often examines it. A Malaysian e-government service was subjected to a study to identify the determinants of intention to use e-government services and systems. Contrary to Kwek *et al.* (2010)'s view from different angle, Suki and Ramayah (2010) studied the phenomena based on TAM construct, with a little modification of it. They first of all identified TAM constructs and compatibility as antecedent of attitude, interpersonal influence and external influence as antecedent of subjective norms, and self-efficacy and facilitating conditions as antecedents of perceived behavioral control. They then tested the influence of attitude, subjective norm and perceived behavioral control on intention to use e-government services. SEM was used to analyze data obtained from 200 employees of three different organizations in Penang, Malaysia. Although variance explained was 67 per cent, but only attitude and subjective norms perfectly influence intention to use, while perceived behavioral control did not.

In another related study which involves e-book, a division of e-learning, Lin *et al.* (2010) empirically examined the influence of recommendation sources, perceived risk and perceived trust on behavioral intention to use e-books. Multiple regression analysis (MRA) was used to analyze 382 dataset collected from undergraduate and postgraduate students in a northern Taiwan university. Findings revealed that perceived trust, perceived risk and recommendation sources strongly influence intention to use.

Özkan, Bindusara, and Hackney (2010) further studied the adoption of electronic payment system from different perspectives, using different combination of other variables. Security, perceived advantage, usability, perceived risk, trust and web

assurance seals are the independent variable, intention to adopt ad mediating and actual adoption as the dependent variable in the study. These variables are theoretically based from TRA and TAM. Data were obtained from 155 respondents in a web-based survey, using 23 items closed-ended questionnaire. Pearson's correlation analysis and MRA were used to analyze the data. Findings of the study proved that security, advantage, web assurance seals, perceived risk, trust and usability influence consumer intention to adopt e-payment system, while intention predicted use behavior.

On the other hand, attitude was positioned to mediate the relationship between perceived cost, perceived value and m-auction self-efficacy and adoption intention of innovation services. Zhu *et al.* (2010) proposed the mediation in an effort to introduce a new technology acceptance model that will better explain adoption intention of the customers. 487 valid responses via online survey were received and analysed using SEM technique. All the variables and their antecedents show significant influence on attitude, and attitude influences adoption intention. In the above scenario, the current study is interested in the relationship between attitude and behavioural intention, which the study has established.

Similarly, UTAUT constructs were seen through attitude, to mediate their relationship with behavioural intention. Also mobile phone browsing and game experience was positioned to moderate the same relationship. Chen *et al.* (2011) sampled 610 internet users in an online survey using validated instruments from Venkatesh *et al.* (2003) and others. The method of analysis used in the study was SEM. Due to the existence of a moderator, the results in the study were in two fold. First is the relationship between

UTAUT constructs and behavioral intention when the consumers have game and browsing experience and second without such experience. In the first circumstance, all the factors showed significant relationship with behavioral intention, while in the second scenario; all were significant except social influence, which doesn't show any significant relationship. The relationship between attitude and behavioral intention doesn't show any difference in experienced and inexperienced groups.

In an attempt to further understand the factors that can influence behavioural intention to adopt broadband in a developing country, Ooi, Sim, Yew, and Lin (2011) proposed 11 factors to explain the phenomena. These factors are; primary influence, hedonic outcomes, facilitating conditions resources, self-efficacy and relative advantage, which were positive in influencing consumers' intention to adopt broad band in Malaysia. On the other hand, service quality, perceived knowledge, perceive ease of use, perceived cost, utilitarian outcomes and. secondary influences does not influence consumers' intention in the said context. Although the findings may not be generalized due to homogeneity of the respondents, the study was able to articulate that there are other important variables that can influence intention behavior. Finding may not be applicable to other parts of Malaysia, because data was collected from one private university in Perak state.

Another expansion of the boundary of knowledge was seen in the work of Rouibah (2012). In TAM2, the constructs are perceived ease of use, perceived usefulness and subjective norms, thus the researchers extended it with image, job relevance, output quality and result demonstrability as antecedents to perceived usefulness, to explore

their applicability in Arab context of camera mobile phone adoption. Out of the 200 questionnaires send to students of Business administration department of Kuwait University, 151 were returned and analyzed using regression analysis technique. Findings reveled that there is significant relationship between subjective norm, job relevance and perceived usefulness, but the rest of the proposed antecedents does not show any significant relationship with perceived usefulness. On the other hand, all the TAM2 constructs perfectly correlates with behavioral intention to use camera mobile phone prior to shopping online. Generalizability concern was admitted by the researchers and the variance explained (33.4 per cent) was lower than Venkatesh *et al.* (2003)'s 70 per cent. Despite Rouibah (2012) attempt to expand the boundary of knowledge, it is clear that UTAUT's outstanding achievement stands out.

A study that nearly achieved UTAUT's 70 per cent variance explained in behavioral intention is the work of Liao *et al.* (2011), in which the variance explained by the factors is 58 per cent in intention to transact. The study proposes internet literacy and social awareness as antecedents of privacy concern and perceived risk and disposition to trust as antecedents of trust, while trust, perceived risk and privacy concern determines intention to transact and intention to retrieve information. A moderating effect of experience was also proposed. Results of SEM PLS analysis shows all paths to be significant for inexperienced shoppers and experienced shoppers, except for the relationship between internet literacy with privacy concern, and disposition to trust with trust were insignificant for experienced shoppers. Interested to our research is the

instrument used by the researcher to measure social awareness. An elaborate review of these items will be provided in the moderating variable section.

Maldonado, Khan, Moon, and Rho (2011) proposed a modification of UTAUT in a study that involves 240 students in Peru. The study examines the impact social influence and e-learning motivation on behavioral intention to use e-learning portal, then the influence of behavioral intention and facilitating conditions on use behavior was examined. Also gender and region were positioned as moderators. Instruments used in the study were adapted from previously validated (Glynn & Koballa, 2006; Porter & Brophy, 1988; Tuckman & Sexton, 1992; Venkatesh *et al.*, 2003). The 150 usable dataset was analyzed using PLS. Outcome of the study revealed a significant influence of e-learning motivation and social influence on behavioral intention and subsequently the influence of behavioral intention on actual use behavior. However, facilitating condition does not influence intention to use e-learning portal. Despite this, the modified model was able to explain 64 per cent and 60 per cent variance in intention and actual usage respectively. Nevertheless the huge variance explained, the study is prone to generalization problem because of small sample size issues.

Privacy concern and its dimensions were seen through perceived risk and trust, to explain behavioral intention to use location based services in China. In a study involving 210 university students from two different hostels, Zhou (2011) hypothesized that collection, secondary use, improper access and errors will affect perceived risk and trust. All were supported except the relationship between improper access and perceived risk, which was no significant. The author also hypothesized that there will be relationship

between trust and perceived risk, which was confirmed. Zhou (2011)'s study observed that trust and perceived risk significantly affects behavioral intention. The above affirmation was done through SEM analysis technique. The variance explained by the model is 30.3 per cent for behavioral intention. Based on the fact that there might be other variables which can better explain the phenomena, thus future researchers are therefore advised to further look into other important variables that can improve the explanation.

As parsimonious as it was described (Venkatesh *et al.,* 2003), Su, Tsai, and Chen (2012) relied on TAM model alone to investigate behavioral intention to use telecare system in Taiwan. Findings of the study indicated that perceived ease of use and perceived usefulness are the most critical factors influencing behavioral intention to use telecare. Despite the parsimony of the TAM model, all hypotheses in this study were accepted, thus the model fits well in explaining telecare usage intention.

All though it is rather surprising to establish that young and old people has no difference in adopting such type of technology, but this was the result in Mardikyan *et al.* (2012). In an attempt to further expand the boundary in explaining behavioural intention, the authors combined and extended TAM and UTAUT models to examine factors affecting adoption of 3G technology. Variables proposed to affect behavioral intention are price, variety of 3G services, service quality, perceived ease of use, perceived usefulness and social influence. Others are control variable; age, gender, occupation, education level, experience and payment type. Three analysis methods (ANOVA, t-test, regression) were employed to analyzed data collected from 150 current and prospective users of 3G

services in different districts in Istanbul, Turkey. The result shows that age, gender and payment type has no impact on behavioral intention to use 3G technology. Age might not play any role here, since the study samples are of comparable age bracket. Perceived ease of use and price also does not have impact on behavioral intention. However, education level, occupation, perceived usefulness, variety of 3G services, service quality and social influence were found to have influence on behavioral intention to use 3G technology.

Similarly, in another related study investigating 3G adoption in china, Du *et al.* (2012) proposed twelve factor which affects behavioral intention. They clustered these factors into six groups; general perceptions which includes perceived usefulness and perceived ease of use, sacrifice perceptions, which includes perceived price and perceived security, psychographics which includes perceived enjoyment and need for uniqueness, applicability which includes network context compatibility, use experience, demographics which includes gender, age, income social influence which has itself as the only dimension of the variable. SEM was used to analyze 826 valid data collected in North and Southern China, via a convenient sampling technique. Result of the study revealed that perceived ease of use, use experience and need uniqueness were not significant with behavioral intention, meanwhile other factors were. Because of the sampling technique used in this study, the result cannot be generalized to the whole Chinese population. However, the researchers were able to expand the boundary in information system research as suggested by several past researches.

Contrary to Du *et al.* (2012), Sin *et al.* (2012) used stratified sampling technique to draw samples of 297 in one of Malaysian public universities. Due to the fact that the sample was smaller than Du *et al.* (2012)'s 826, thus they used MRA to analyze the data, because SEM required large sample size. Nevertheless the sample size, the study concluded that three variables are predictors of online purchase intention among Malaysian young consumers. 33.1 per cent variance in intention was explained by the model, which signifies there are other factors that can be explored to explain the phenomenon. One interesting matter in this study is its ability to obtain 100 per cent response rate.

Synonymous to online purchase is e-shopping, which was also studied among Malaysian consumers. Lim and Ting (2012) applied Use and Gratification theory and explained the phenomenon. However, attitude toward e-shopping was placed to mediate the relationship between entertainment gratification, information gratification, web irritation and intention to shop electronically. Based on systematic sampling technique, 300 samples were drawn from Malaysia's Klang Valley. Data were analyzed using MRA and correlation analysis and the result shows a perfect correlation among the variables. Except for the relationship between web irritation and attitude, which is negative, the rest were positive. The researcher urged future researches to replicate the same study in another domain.

In the same way, customer attitude mediate the relationship of perceived credibility, perceived enjoyment, and demographic variables on behavioral intention in a further extension of TAM in Abadi and Nematizadeh (2012)'s work. They studied the level of

electronic banking acceptance among Iranian bank customers. T-test, correlation and regression analysis technique was use to analyze data collected from 188 subjects including staff of hospitals, customers of banks and school teachers. Although other variables were found to have positive significant effect on intention to use, perceived enjoyment emerged as the most important factor among other variables in influencing intention to use e-banking. However, gender shows insignificant variation for the two groups.

Additionally, customer trust, perceived enjoyment and perceived risk were proposed to mediate the influence of internet experience, propensity to trust, personal innovativeness, familiarity and third party seal on adoption intention. Also direct relationships between all the constructs and behavioral intention was proposed to study online payment system among Kuwaiti customers. The study employed online and offline survey method and gathered data from 350 responses from students and employees in Kuwait. Regression was used to analyze the data. Interestingly, the result of this study confirmed Abadi and Nematizadeh (2012)'s findings, where perceived enjoyment was found as the most important factor among other variables in influencing intention to use. However, other factors also showed a significant effect on behavioral intention, except the effect of customer trust on perceived security and intention, which was indirect.

In another related study, Mangin *et al.* (2012) extended the TAM model with innovation, control and enjoy as external variables to explore intention to use online banking services among customers of North American French bank. A mediation role of attitude

on the relationship between perceived ease of use and intention to use was also examined among other crossing and direct effects proposed in the model. Subjects of the study were 225 full time students of Quebec University and SEM was used to analyze the data collected by means of a survey questionnaire. Control variable was found to have significant effect on perceived ease of use and attitude, enjoy variable on perceived ease of use, attitude and intention to use, while innovation on intention to use respectively. Issues of generalizability were the concern of the researchers.

Cheng, Tsai, Cheng, and Chen (2012) sees perceived ease of use and website quality as antecedents to perceived usefulness, whereas perceived usefulness, perceived critical mass, sense of virtual community and perceived risk as factors influencing purchase intention on group buying website. Data were collected from 304 users of online group buying in Taiwan, using online survey and SEM was used to analyze the data. It is logical to assume that people who perceived risk of using a particular system are likely to form negative habit toward the system; interestingly this was the result here. The study revealed that perceived risk negatively influenced behavioral intention of OGB users. Other relationships proposed in the model were positive at different level of significance.

Numerous researches related to behavioral intention to use technology has been carried out by several scholars. These researches found hundreds of variables or factors influencing intention. It is useful to summarize these studies in form of a table, to enable readers to have a snap shot of state of affairs in the said research field. Table 2.1 below

summarizes literatures reviewed in this study, relating to factors that influences behavioral intention.

As mentioned earlier, there are five (5) independent variables in this study; hence this study reviewed related literatures that studied these variables. The following are highlights and findings of these studies with respect to the relationship between these variables and behavioural intention.

Table 2.1
Summary of Factors Influencing BI to use Technology

Author/Year	**Context**	**Independent Variables**	**Moderator(s) / Mediator(s)**
Huh *et al.* (2009)	Hotel info system in China	Perceived ease of use Perceived usefulness Compatibility Peer's influence Superior's influence Self-efficacy Technical support	
Abadi and Nematizadeh (2012)	E- banking in Iran	Perceived Usefulness Perceived Ease of Use Perceived Credibility Perceived Enjoyment Age /Income/education Customer Attitude	
Rigopoulos and Askounis (2007)	Online e-payment in Greece	Perceived Usefulness Perceived Ease of Use	**ME** BI
Ho and See-To (2010)	E-payment gateway in Hong Kong	Perceived E of Use Perceived Usefulness Trust Calculative Trust Familiarity Structural Assurance Situational Normality	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
		Disposition To Trust	
Rouibah (2012)	Online payment in Kuwait	Internet Experience Familiarity Propensity to Trust Third Party Seal Personal innovativeness	**ME** Customer Trust Perceived Risk Perceived Enjoyment
Özkan *et al.* (2010)	E-payment systems in Turkey	Perceived Risk Security Perceived Advantage Trust, Usability Using Web assurance seals	**ME** BI
Li and Huang (2009)	Online Shopping Channel in Taiwan	Perceived Risk Perceived Usefulness Perceived Ease Of Use	**ME** BI

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
Bertrand and Bouchard (2008)	Virtual reality	Usefulness Perceived ease of use Self-efficacy External control Anxiety Motivation Attitude Perceived Cost	
Chin and Gopal (1995)	Group support systems in UK	Relative advantage Perceived ease of use Compatibility Enjoyment	
Chuan-Chuan Lin and Lu (2000)	Website in Taiwan	Information quality Response time System accessibility Perceived Usefulness Perceived Ease of use Preference	
Nysveen, Pedersen, and Thorbjørnsen (2005)	Online learning in Taiwan	Perceived Expressiveness Perceived Enjoyment Perceived Usefulness Perceived Ease of use Normative pressure Behavioral control	**ME** Attitude

Author/Year	**Context**	**Independent Variables**	**Moderator(s) / Mediator(s)**
Salisbury *et al.* (2001)	WWW purchase in US	Perceived Usefulness Perceived Ease of use Web Security	
Troshani and Rao (2007)	XBRL in Australia	User predisposition Perceived Usefulness Perceived Ease of use Social Influence Facilitating conditions	**ME** Attitude **MO** Age
Mangin *et al.* (2012)	Banking technology in Canada	Perceived Usefulness Perceived Ease of use **External** Control Innovation Enjoy	**ME** Attitude toward using
Kim *et al.* (2008)	Electronic Commerce in US	Risk Trust Benefit	

Author/Year	**Context**	**Independent Variables**	**Moderator(s) / Mediator(s)**
Van Slyke *et al.* (2004)	Web-Based Shopping in US	Trust in Web Merchant Relative advantage Complexity Compatibility Result demonstrability Visibility, Image Voluntariness	
Lu *et al.* (2005)	Online applications in Taiwan	Perceived Risk Perceived Usefulness Perceived Ease Of Use	**ME** Attitude toward using
Tong (2009)	E-recruitment in Malaysia	**Perceived Usefulness** Perceived Privacy Risk Performance Expectancy Application-Specific Self-Efficacy **Perceived Ease of Use** Perceived Stress	

Author/Year	**Context**	**Independent Variables**	**Moderator(s) / Mediator(s)**
Zhu *et al.* (2010)	Mobile auction in China	**Perceived cost** **Perceived value** Functional value Social value Emotional value **M-auction self-efficacy** Subjective general Objective general	**ME** Attitude
Chtourou and Souiden (2010)	Technological products in France and Canada	Usefulness Ease Of Use	**ME** Attitude Toward Use Intention To Use
Abbad *et al.* (2009)	E-learning in Jordan	Subjective Norm Internet Experience System Interactivity Self-Efficacy Technical Support	Perceived Usefulness Perceived EOU
Su *et al.* (2012)	Telecare system in Taiwan	Perceived EOU Perceived Usefulness	
Cheng, Liu, Qian, and Song (2008)	Internet banking in China	SI , PE Personal innovativeness Trust Perception Trust – benevolence	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
		Trust – integrity Trust – ability EE Satisfaction Quality Attribute System quality - Information quality - System quality - Information quality - Service quality –	
Lu *et al.* (2010)	Online services in china	Perceived risk Perceived relative benefit Internet experience	
El-Gayar and Moran (2006)	Tablet PC in US	PE,EE,SI,FC, Attitude Anxiety self-efficacy	**MO** A, G, Ex, VoU **ME** BI
Limayem *et al.* (2001)	Web board in Hong Kong	Attitude Perceived Consequences Habit FC	**MO** Intention

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
Chang and Tung (2008)	Online learning course in Taiwan	Compatibility PEOU PU Perceived system quality Computer self-efficacy	
Kuo and Yen (2009)	3G Mobile value-added services in Taiwan	PEOU, PU Personal innovativeness Perceived cost	**ME** Attitude
Mardikyan *et al.* (2012)	3G technology in Turkey	PEOU, PU, SI Price Variety of 3G services Service quality	**MO** Gender Age Education Level Experience Occupation Payment type
Lam *et al.* (2007)	IT in Hotel in China	Attitude Perceived IT beliefs Task-technology fit Self-efficacy Subjective norm	
Seneler *et al.* (2010)	Online services UK/US	External influence Internal influence PU, PEOU	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
		User attitude Self-efficacy User Anxiety User habits User involvement Risky-task xtics, Complex-task xtics Enjoyment	
Chen, et al., (2011)	Online game in Taiwan	PE,EE,SI,FC	**ME** Attitude **MO** Experience
Lallmahamood (2007)	Internet banking in Malaysia	PEOU PU Perceived security & privacy	
Du *et al.* (2012)	3G value-added services in China	General perceptions Perceived usefulness Perceived ease of use Sacrifice perceptions Perceived price Perceived security Psychographics Perceived enjoyment Need for uniqueness	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
		Applicability Network context compatibility Use experience Social influence Social influence Demographics Gender, Age, Income	
Sin *et al.* (2012)	Online purchase in Malaysia	PEOU PU SN	
Ling *et al.* (2010)	Online purchase in Malaysia	Impulse Purchase Orientation Quality orientation Brand orientation Online Trust Prior Online Purchase Experience	
Kwek *et al.* (2010)	Online purchase in Malaysia	Impulse purchase orient Quality orientation Brand orientation Shopping enjoyment orient. Convenience orientation	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
Lim and Ting (2012)	Online shopping in Malaysia	Entertainment gratification Information gratification Web irritation	**ME** Attitude toward online shopping
Suki and Ramayah (2010)	E-Government in Malaysia	Attitude PU PEOU Compatibility subjective norms interpersonal influence, external influence Perceived behavioral control self-efficacy, FC	
Ooi *et al.* (2011)	Broadband in Malaysia	Primary Influences (PI) Secondary Influences Relative Advantage (RA) Utilitarian Outcomes Hedonic Outcomes (HO) Service Quality Perceived Knowledge PEOU Perceived Cost Facilitating Conditions Resources (FCR) Self-Efficacy (SE)	

Author/Year	Context	Independent Variables	Moderator(s) / Mediator(s)
Rouibah, Abbas, and Rouibah (2011)	E-commerce in Kuwait	SN, Image Job relevancy Output quality Result demonstrability PEOU, PU	
Cheng *et al.* (2012)	Online group buying (OGB) in Taiwan	PU PEOU Website Quality **SI** Perceived Critical Mass Sense Of Virtual Community (SOVC) Perceived Risk **DV** Purchasing Intention	
Liao *et al.* (2011)	Online transaction in Taiwan	Privacy Concerns Internet literacy Social awareness Trust Perceived risk Disposition to trust	**MO** Experience

Author/Year	**Context**	**Independent Variables**	**Moderator(s) / Mediator(s)**
Zhou (2008)	Mobile commerce in China	PE, EE, SI, FC Contextual offering	**ME** BI
Maldonado *et al.* (2011)	Educational portal in South America	**E**-learning motivation SI FC	**MO** Gender Region **ME** E-learning portal BI
Zhou (2011)	Location-based services (LBS) in China	Perceived Risk Trust Privacy Collection Improper access Errors, Secondary use	

2.4.1 Performance Expectancy

The construct can be rooted to five previous theories and models of technology adoption and usage. For example, performance expectancy is synonymous to TAM's perceived usefulness (Davis *et al.*, 1989), IDT's relative advantage, (Moore & Benbasat, 1991), C-TAM-TPB's extrinsic motivation (Davis *et al.*, 1992), MM's job-fit (Thompson & Higgins, 1991) and outcome expectation in SCT (Compeau, Higgins, & Huff, 1999; Compeau & Higgins, 1995). Venkatesh *et al.* (2003)'s work integrated these past models and proposed UTAUT as earlier discussed. They defined performance expectancy as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (p. 447). This study therefore defines it as the extent to which owners and managers in Nigerian retail industry perceived that using POS will enhance productivity, payment process efficiency and overall performance of their business processes.

A number of studies have previously examined the relationship between performance expectancy and behavioural intention, both in information system (IS) and non-IS contexts. These studies were however inconclusive. For example, subsequent to the unification of eight (8) theories and models of technology adoption as earlier discussed, Venkatesh *et al.* (2003) examined employee behavioural intention toward use of database application systems, virtual meeting, portfolio analyser, and proprietary accounting software, for both mandatory and voluntary settings. Although moderated effect of gender and age were observed among the relationship of performance expectancy and behavioural intention, a direct effect of performance expectancy on

behavioural intention was also found. However, the existence of interaction terms might render the effect not interpretable (Aiken & West, 1991).

Similar to Venkatesh *et al.* (2003), several other studies applied UTAUT to examine the adoption of various technologies in different context and countries. For example, Wang and Yang (2005) studied the adoption of online stocking in Taiwan, Carlsson, Carlsson, Hyvonen, Puhakainen, and Walden (2006) examined the adoption of mobile devices in Finland, Wu *et al.* (2007) explored 3G mobile use behaviour among Taiwan users and Cheng *et al.* (2008) etc. Findings in these studies indicated that performance expectancy is an important predictor of behavioural intention. Contrary to above findings however, Marchewka *et al.* (2007) found that performance expectancy was insignificant in influencing behavioural intention. They found this in a study which examines students' perception of courseware management software in Taiwan.

In the same way, performance expectancy was also found ineffective in predicting behavioural intention in Van Dijk, Peters, and Ebbers (2008)'s study which examined the factors influencing e-government adoption in Netherland. Other studies that confirmed the ineffectiveness of performance expectancy in predicting behavioural intention was; Birch and Irvine, (Birch & Irvine, 2009) which examined Canadian teachers' adoption of electronic based classroom and Sumak *et al.* (2010) which studied virtual learning adoption among Slovenian university students and faculty members.

Recently, there has been improvement in the influence of performance expectancy in predicting behavioural intention. For example, Foon and Fah (2011) studied behavioural

intention of internet banking users, Yahya, Nadzar, Masrek, and Rahman (2011) examined e-sharia portal usage among Shariah court Judges and Alrawashdeh *et al.* (2012) investigated the perception of entrepreneurs on information technology innovation. These studies concluded that performance expectancy significantly influenced behavioural intention. However, all the studies shared the same contextual/cultural similarities, as well as the same level of technological development and sophistication, because they were all conducted in Malaysia. Therefore, their conclusion might not be generalised to other context or countries such as Nigeria, whose technological sophistication is not up to Malaysia's (Anckar, 2003).

Notwithstanding the recent improvement however, studies in China and Taiwan yielded a contrasting findings to those obtained in Malaysia. Cheng, Yu, Huang, Yu, and Yu (2011) investigated the adoption of mobile devices for mobile learning in China and Wu, Yu, and Weng (2012)'s study on electronic ticketing adoption among Taiwanese train passengers. Their studies contradicts Foon and Fah (2011), Yahya *et al.* (2011) and Alrawashdeh *et al.* (2012)'s findings. Performance expectancy was found insignificant in influencing behavioural intention. Therefore, it was found that previous studies on the relationship between performance expectancy and behavioural intention remained inconclusive, hence required further investigation (Li, 2010).

Because the technology under investigation (POS) is relatively new in Nigeria (Chiemeke & Evwiekpaefe, 2011; Ogunleye *et al.*, 2012), owners, and managers of retail businesses might be sceptical about the performance of the system. They might also be of concerned, whether the system performance can be commensurate to its cost

of implementation. Therefore this study hypothesised that behavioural intention of owners or managers is dependent on their perception of the performance of POS. The more they felt the system can improve their business performance, the more they intend to use it. Interestingly, related studies conducted in developing country (Deng, Liu, & Qi, 2011) as well as developed country (Carter, Schaupp, & McBride, 2011) on Web-based Q&A in China and e-File in US respectively, have shown a significant positive relationship between performance expectancy and behavioural intention. Similarly, studies conducted on Interactive whiteboard in Australia (Wong, Russo, & McDowall, 2013), e-books in China (Gao & Deng, 2012), e-mail system in Malaysia (Yamin & Lee, 2010), e-Government in Qatar (Al-Shafi & Weerakkody, 2009), Mobile Device in Finland (Carlsson *et al.*, 2006), have all found significant positive relationship between performance expectancy and behavioural intention. Therefore the current study offered the following statement;

> **H1:** There is significant positive relationship between performance expectancy and behavioral intention to use POS.

2.4.2 Effort Expectancy

Similar to performance expectancy, effort expectancy can also be traced to TAM and TAM2. The construct is synonymous to perceived ease of use in TAM (Davis *et al.*, 1989) complexity in MPCU (Thompson & Higgins, 1991) and ease of use in Moore and Benbasat (1991)'s IDT. All of these constructs and their subsequent applications in IS research has proved their similarities both in measurement scales and definition

(Venkatesh *et al.*, 2003). The work of Venkatesh *et al.* (2003) combined these constructs in UTAUT, thus defined it as "the degree of ease associated with the use of the system" (Venkatesh *et al.*, 2003, p. 450). Therefore this study defines it as owners' and managers' the anticipated simplicity and/or difficulty of using POS in their businesses.

Upon introduction of UTAUT into IS research arena, several empirical studies have used it to examined the influence of effort expectancy on behavioural intention. These studies resulted in conflicting findings. For example, Wang and Yang (2005) examined the adoption of online stocking in Taiwan. Their findings indicated an insignificant effect of effort expectancy on behavioural intention. Similarly, Al-Gahtani, Hubona, and Wang (2007) studied the acceptance and use of desktop computer applications among Saudi Arabian knowledge workers. Outcome of their study was not different from Wang and Yang (2005). Similar conclusion was found in Wu *et al.* (2007)'s study, which explored usage behaviour of 3G mobile users in Taiwan, Cheng *et al.* (2008)'s study on customers' acceptance and use of internet banking in China and Zhou (2008)'s study which also examined the influence of effort expectancy on behavioural intention among Chinese mobile commerce users.

Although the above studies examined different technologies (online stocking, desktop computer application, 3G mobile and mobile commerce) in different countries (Taiwan, China and Saudi Arabia), all the results indicated an insignificant influence of effort expectancy on behavioural intention. Contrary to Wang and Yang (2005)'s findings, El-Gayar and Moran (2006) found behavioural intention to be significantly influenced by effort expectancy in a study that examined acceptance of tablet personal computer

among college students in faraway US. Similar counter was found in Carlsson *et al.* (2006)'s study, which explored the behaviours of Finnish mobile device users, Marchewka *et al.* (2007)'s study which determines the perception of US university student on acceptance and use of courseware management software, Wills, El-Gayar, and Bennett (2008)'s which examined adoption of electronic medical record systems among US healthcare professionals and Payne and Curtis (2008)'s study that examined Auditors' adoption of computer-aided audit systems also in the US. It can be observed that all these studies were conducted in US, where the technological and user sophistication might be higher than in Asia and Middle East.

A supposedly consistent influence of effort expectancy on behavioural intention was witnessed recently in the following studies; Wong *et al.* (2013) investigated adoption of interactive whiteboard among Australian early childhood teachers, Gao and Deng (2012) empirically investigate the determinant of Chinese users' acceptance of mobile e-books, Wu *et al.* (2012) studied the adoption of I Pass among Taiwan passengers, Deng, Liu, & Qi, Deng *et al.* (2011) examined acceptance of online question/answer service among Chinese users, Huang and Qin (2011) investigated the adoption of virtual fitting room in China, Yamin and Lee (2010) studied Malaysian students' acceptance of e-mail system Birch and Irvine (2009) examined the influence of effort expectancy on Canadian teachers' acceptance of e-learning portal, Van Dijk *et al.* (2008) studied e-government acceptance in Netherland and Lai, et al., (2009) studied mobile commerce adoption among Hong Kong consumers. Others are Alrawashdeh *et al.* (2012) study on e-learning in Jordan, Moghavvemi, Salleh, Zhao, and Mattila (2012) study on IT Innovation

adoption in Malaysia, Yahya *et al.* (2011) Pappas, Giannakos, Pateli, and Chrissikopoulos (2011), Foon and Fah (2011) and Al-Shafi and Weerakkody (2009).

The influence of effort expectancy on behavioural intention appeared to be consistent in the above listed studies; alas other similar studies disagree with these findings. For example, Sumak *et al.* (2010) conducted a study to identify the determinants of adoption of virtual learning in Slovenia. They found that student behavioural intention to adopt e-learning was not influenced by effort expectancy. Similarly, Cheng *et al.* (2011) investigated mobile e-learning adoption among employees of top enterprises in Taiwan. Their findings was not different from Sumak *et al.* (2010)'s. Further insignificant influence of effort expectancy on behavioural intention was found in Zhou (2012) and Yu (2012) studies on location-based service and mobile banking in China and Taiwan respectively.

As the definition of this construct depicts, the simplicity or difficulty of use of an information system can be associated with how experienced the user is. This can be seen in Venkatesh *et al.* (2003), in which data were collected longitudinally in three (3) different times. Effort expectancy was significant on behavioural intention in the first time period after training, but subsequently insignificant because of sustained usage. Similarly, the effect was seen in mandatory and voluntary settings, however only in the first time period was significant. Therefore the choice of non-users as subjects for the current research is expected to yield a significant result, going by their inexperience in the use of the system. Similarly, as Ogunleye *et al.* (2012) argued that POS is in its early stage of penetration in Nigeria, therefore owners and managers of retail businesses might

be concerned about the amount of physical, mental and material effort needed to operate the system. This, couple with the inconsistency of previous finding, required further investigation (Mitchell & Jolley, 1992), especially in Nigerian retail industry. Furthermore, significant positive relationship was found between effort expectancy and behavioural intention in the study on I-Pass adoption in Taiwan (Wu *et al.*, 2012). In the same way, Yahya *et al.* (2011) found significant positive relationship in e-sharia portal adoption study, just like Carter *et al.* (2011) also found in e-file adoption study in the US. These are in line with several other studies such as Al-Shafi and Weerakkody (2009), Payne and Curtis (2008), Carlsson *et al.* (2006) etc. Therefore this study hypothesised the following statement.

H2: There is significant positive relationship between effort expectancy and behavioral intention to use POS.

2.4.3 Social Influence

The construct is originated from Fishbein and Ajzen (1975)'s TRA. Identified as subjective norm, the construct was later adopted in Davis *et al.* (1989)'s TAM2, (Ajzen, 1991)'s TPB/DTPB and Taylor and Todd (1995)'s C-TAM-TPB. The three theories maintained the construct's name as subjective norm. However, it was subsequently modified in Thompson and Higgins (1991)' MPCU and Moore and Benbasat (1991)'s IDT as social factors and social norm respectively. Upon review of these theories and identification of their similarities, Venkatesh *et al.* (2003) named the construct social influence and defined it as 'the degree to which an individual perceived that others

believe he or she should use the new system" Venkatesh *et al.* (2003, p. 451). Thus the current study defines it as the degree to which the behaviour of owners and managers of retail business is subjected to their perception that other people who are important to them think that they should use POS and that its usage will enhance their business image.

Social influence was proposed as a direct determinant of behavioural intention to use technology, although there is difference of significance influence between users in mandatory and those in voluntary settings Venkatesh *et al.* (2003). Warshaw (1980) stressed that the explanation for such differences is, in mandatory settings, rewards and punishment could trigger the user to behave according to the beliefs of their superior executives. A further variation was detected among different gender and experience levels of users (Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).

Similar to performance expectancy and effort expectancy, the influence of social influence on behavioural intention was also widely researched in the past. However, there is rarely a definite conclusion in their findings. For instance, the work of Wang and Yang (2005) found that social influence significantly influenced behavioural intention to use online stocking among Taiwanese, however, Carlsson *et al.* (2006) found that it does not influence Finnish mobile e-learning users behavioural intention. Furthermore, El-Gayar and Moran (2006), Wu *et al.* (2007), Marchewka *et al.* (2007), Cheng *et al.* (2008), Wills *et al.* (2008) and (Zhou, 2008)'s studies have found significant influence of social influence on behavioural intention to use various set of technologies and systems and in different context and countries. Their findings were however refuted in

the works of Carlsson *et al.* (2006), Al-Gahtani *et al.* (2007) and Payne and Curtis (2008). It can be observed that the discrepancy happens simultaneously from the year 2006 through 2008. This indicates that researches were conducted within the same time frame, thus the difference cannot not be associated with technological advancement or time factor.

Further inconsistency in the relation between social influence and behavioural intention was also observed lately. Al-Shafi and Weerakkody (2009) found that there is significant relationship between the two constructs, while Birch and Irvine (2009) found no relationship between them. In addition, the works of, Lai *et al.* (2009), Sumak *et al.* (2010), Yamin and Lee (2010), Pappas *et al.* (2011), Huang and Qin (2011), Yahya *et al.* (2011), Cheng *et al.* (2011), Moghavvemi *et al.* (2012), Alrawashdeh *et al.* (2012), Yu (2012), Zhou (2012) and Wu *et al.* (2012) substantiate Al-Shafi and Weerakkody (2009)'s findings. On the other hand, the works of, Cheng and Wang (2010), Deng *et al.* (2011), Gao and Deng (2012) and Wong and Dioko (2013) found the relationship among the constructs as insignificant, which confirm Birch and Irvine (2009)'s earlier findings.

As Biola and Dan (2012) declared, social influence plays an important role in shaping the behaviors of Nigerians, it is therefore expected that social influence can affect behavioral intention of retail managers in Nigeria. Thus it is important to empirically test Biola and Dan (2012)'s assertion in order to confirm or reject their claim. Interestingly, previous studies have found significant positive relationship between social influence and behavioral intention. For example the studies on I- Pass in Taiwan (Wu *et al.*, 2012), IT Innovation in Malaysia (Moghavvemi *et al.*, 2012), Virtual Fitting room in China

(Huang & Qin, 2011), M-Commerce in Hong Kong (Lai *et al.*, 2009) and Network IT in Taiwan (Lin & Anol, 2008) respectively. Based on the above therefore, the following statement is made;

H3: There is significant positive relationship between social influence and behavioral intention to use POS.

2.4.4 Facilitating Conditions

Facilitating conditions is derived from TPB/DTPB, C-TAM-TPB (Ajzen, 1991; Taylor & Todd, 1995) known as perceived behavioural control, TPB/MPCU (Thompson, Higgins, & Howell, 1995) known as facilitating conditions and IDT (Moore & Benbasat, 1991) known as compatibility. Items measuring these constructs were similar, thus Venkatesh *et al.* (2003) combined them into one single construct. However, unlike in the theories the construct was derived, Venkatesh *et al.* (2003) hypothesized that facilitating condition is not a determinant of behavioural intention. The construct is thus defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system" (Venkatesh *et al.*, 2003, p. 453). This study therefore defines it as the degree to which owners and managers of retail business perceived that infrastructures such as electricity and internet services and skills and supports are available to ease the use of POS in their businesses.

Although the construct was not initially proposed as direct determinant of behavioural intention in UTAUT because the core concepts in the constructs were largely taken care

of by most of effort expectancy items (Venkatesh *et al.*, 2003), it was earlier established in MPCU, IDT, TPB and DTPB theories that facilitating condition is a direct determinant of behavioural intention to use technology. This forms the basis for researchers to test a direct causal relationship between the constructs. However, these studies produced contradictory findings. For example, Wang and Yang (2005) conducted a study on the adoption of online stocking system among Taiwanese investors. Although facilitating condition was seen through the moderating effect of personality traits (extraversion, openness, agreeableness, conscientiousness and neuroticism), it was found that the influence of facilitating conditions on behavioural intention was stronger for personality trait (neuroticism) with internet experience. Nevertheless the moderating effect, the finding was significant.

On the other hand, Marchewka *et al.* (2007) applied UTAUT model to understand the perception of US university students on courseware management software (Blackboard). Unlike Venkatesh *et al.* (2003), Marchewka *et al.* (2007) hypothesized a direct causal relationship between facilitating conditions and behavioral intention. Result of correlation analysis reveals that there is no relationship between the constructs. This further substantiate Venkatesh *et al.* (2003) claim, however contrary to Wang and Yang (2005)'s findings. The discrepancy might be associated with contextual difference. While Wang and Yang (2005)'s study was conducted among Taiwanese investors irrespective of their internet experience, Marchewka *et al.* (2007)'s study examined the perception of US students, whose internet experience is considerably higher Van Slyke *et al.* (2004) because of their frequent internet usage. It can be deducted here that,

facilitating conditions such as infrastructure was not an issue in developed countries, unlike in the developing countries (Gholami *et al.*, 2010; Rehman *et al.*, 2012; Yaqub *et al.*, 2013).

Consistent with the trend of findings in developed economies, Birch and Irvine (2009) conducted a study on ICT integration in classrooms, whose subjects were bachelor's degree students in one of Canadian universities. They found that facilitating condition was insignificant predictor of behavioural intention. Similarly in the e-learning context, Wong *et al.* (2013) examined the adoption of interactive white board among student-teachers in Australian university. The same result was obtained. It should observe that both studies were conducted in the education sector, particularly university; subjects of the studies were both undergraduate students taking degree in education and both countries are developed economies (International Monetary Fund, 2012).

Aside the explanation for the inconsistencies above, there are studies that shared contextual similarities, however they were unable to produce consistent findings with regards to relationship of the two constructs. For example, Foon and Fah (2011) studied the adoption of internet banking in Malaysia, the found that facilitating conditions significantly influence behavioural intention to use. To the contrary, Huang and Qin (2011) investigated the influence of facilitating conditions on behavioural intention to use virtual fitting room in China, the found no significant influence exists. However, Alrawashdeh *et al.* (2012) conducted a study on the adoption of e-learning in Jordan; they found a significant relationship among the constructs. China, Jordan and Malaysia are Asian countries and classified by International Monetary Fund (2012), as developing

countries, thus their infrastructure is not adequate compared to developed economy (Gholami *et al.*, 2010; Rehman *et al.*, 2012; Yaqub *et al.*, 2013).

As previously stated, Rehman *et al.* (2012) argued that developing economies are faced with inadequate ICT infrastructures. Nigeria is one of developing economies (International Monetary Fund, 2012) and it is therefore faced with such infrastructural deficiencies (Gholami *et al.*, 2010). Despite huge potentials Nigerian market posessed (Uzonwanne, 2011)) it is faced with severe shortage of supply of electricity (Onyema, 2011). Currently, Nigeria with over 170 million people generates 20.13 billion kWh of electricity, far below its contemporaries such as South Africa and Malaysia. South Africa, with 48.8 million people generates 238.3 billion kWh and Malaysia, with 29.1 million people generates 118.2 kWh respectively. Therefore it is expected that facilitating conditions will significantly influence managers' behavioural intention to adopt technology. Similarly, studies conducted in developing countries on Location-Based Service in China (Zhou, 2012), e-learning in Jordan (Alrawashdeh *et al.*, 2012), internet banking in Malaysia (Foon & Fah, 2011), m-Commerce in China (Zhou, 2008) and Tablet PC in developed economy US (El-Gayar & Moran, 2006) have all found significant positive relationship between facilitation conditions and behavioural intention. Therefore the current study offered the following statement;

H4: There is significant positive relationship between facilitating conditions and behavioral intention to use POS.

The differences in findings of previous studies relating the relationship between performance expectancy, effort expectancy and facilitating conditions on behavioural intention might be as results of different set of technologies and context involved in the studies. Also different countries with different level of technology penetration and sophistication might be one of the reasons. Li (2010) performed a meta-analysis of technology adoption literatures and suggested that more research needed to be conducted because of inconsistence conclusions in the literatures. Therefore further studies need to be conducted to broaden our understanding of the phenomenon. Table 2.2 summarises the findings of previous studies on UTAUT constructs.

The subsequent section attempt to propose an extension of UTAUT with another variable which, according to the researcher's knowledge, has not been tested in previous studies and it is an important variable worth inclusion in the model. The authority to expand or extend the theory can be seen in Venkatesh *et al.* (2003), when they suggested as thus; "future research should focus on identifying constructs that can add to the prediction of intention and behaviour over and above what is already known and understood" Venkatesh *et al.* (2003, p. 471). Lallmahamood (2007) argued that there might be other important variables that can better explain intention, which were not included in his study, thus other variables should be further investigated since UTAUT focused on performance expectancy, effort expectancy and social influence to predict intention (AbuShanab & Pearson, 2007; Oshlyansky, Cairns, & Thimbleby, 2007).

Table 2.2
Summary of Inconsistent Findings on UTAUT Constructs

SN	Author/Year	Context/Country	Independent Variables/Result			
			PE	EE	SI	FC
1	Wong *et al.* (2013)	Interactive whiteboard /	S	S	N	N
2	Gao and Deng (2012)	E-books /China	S	S	N	
3	Zhou (2012)	Location-Based Service/China	S	N	S	S
4	Wu *et al.* (2012)	I Pass in Taiwan	N	S	S	
5	Yu (2012)	Mobile Banking in Taiwan	S	N	S	
6	Deng *et al.* (2011)	Web-based Q&A/ China	S	S	N	
7	Huang and Qin (2011)	Virtual Fitting room/ China	S	S	S	N
8	Cheng and Wang (2010)	M-Commerce/ China			N	
9	Cheng *et al.* (2011)	IT / Taiwan	N	N	S	
10	Sumak *et al.* (2010)	Virtual Learning/ Slovenia	N	N	S	

11	Zhou (2008)	M-Commerce/ China	S	N	S	S
12	Yamin and Lee (2010)	E-mail System/ Malaysia	S	S	N	
13	Birch and Irvine (2009)	E-learning/ Canada	N	S	N	N
14	Payne and Curtis (2008)	Computer-aided Audit/ US	S	S	N	
15	Chang and Tung (2008)	Internet Banking/ China	S	N	S	
16	Van Dijk *et al.* (2008)	E-Gov./ Netherland	N	S	S	
17	Wu *et al.* (2007)	3G Mobile/ Taiwan	S	N	S	
18	Al-Gahtani *et al.* (2007)	IT/ Saudi	S	N	N	
19	Marchewka *et al.* (2007)	Courseware Mgt Software/ US	N	S	S	N
20	Carlsson *et al.* (2006)	Mobile Device/ Finland	S	S	N	
21	Wang and Yang (2005)	Online Stocking/ Taiwan	S	N	S	S
22	Alrawashdeh *et al.* (2012)	E-learning/ Jordan	S	S	S	S
23	Moghavvemi *et al.* (2012)	IT Innovation/ M'sia	S	S	S	
24	Carter *et al.* (2011)	e-File / US	S	S	S	

25	Yahya *et al.* (2011)	E-Sharia Portal/ Malaysia	S	S	S	
26	Pappas *et al.* (2011)	Online Purchase I Greece	S	S	S	
27	Foon and Fah (2011)	Internet Banking/ Malaysia	S	S	S	S
28	Lai *et al.* (2009)	M-Commerce/ Hong Kong	S	S	S	
29	Al-Shafi and Weerakkody (2009)	E-Gov./ Qatar	S	S	S	
30	Lin and Anol (2008)	Network IT I Taiwan		S	S	
31	Wills *et al.* (2008)	E-Medic Record/ US	S	S	S	
32	El-Gayar and Moran (2006)	Tablet PC/ US	S	S	S	S

"Extensions to the various models identified in previous research mostly enhance the predictive validity of the various models beyond the original specifications" (Venkatesh *et al.*, 2003, p. 445). Similarly, Chen *et al.* (2011) acknowledged that extending UTAUT has yielded some reasonable success in predicting intention and subsequent usage. For example, Gao and Deng (2012) extended UTAUT with 'perceived cost' construct. Their extension was able to explain 74 per cent of variance in intention, above the 70 per cent achieved in Venkatesh *et al.* (2003). It should be observed that Venkatesh *et al.* (2003), Oshlyansky *et al.* (2007) and AbuShanab and Pearson (2007)'s suggestions remained opened, provided that it can be argued that the proposed variable is an important one. Based on the above therefore, the current research proposed an extension of UTAUT with "Customer Concerns" construct to expand the body of knowledge of the phenomena under investigation.

2.4.5 Customer Concerns

Because the construct is the researcher's coinage, thus there is limited definition available in the literature. However, it can be defined by decomposing the phrase in to two parts; concern and customer, sought for their definition from the literature and then generate a definition out of them. A customer can be a person or business entity who receives goods and services from a vendor in exchange for a payment. The customer and vendor are likewise known as client, buyer, or purchaser and seller, or supplier respectively (Kendall, 2006a; Reizenstein, 2004). Similarly, a customer is defined as a recipient of goods, services or ideas, in exchange with money or other considerations (Kendall, 2006b). Ahmad and Francis (2006) further defined customers as individuals

who purchase service or product. The customer is at liberty to switch from one vendor or product to another in the event of service delivery failure. On the other hand, concern is synonymous with care, responsiveness, consideration, thoughtfulness etc. Therefore this study defines 'Customer Concerns' as the degree of merchant's consideration of their customers in every aspect of the merchant's business processes, particularly the decision to adopt new technology in business. However, unlike the variables discussed above, this construct was not studied previously, particularly in relation with behavioural intention. Therefore this study pioneered the exploration of the influence of customer concerns on behavioural intention. Hence, there is rarely a previous study to be reviewed.

Fillion, Hassen, and Jean-Pierre (2011) concluded that studies on adoption of technology among individuals has been widely researched in the last 20 years. Furthermore, Suki and Ramayah (2010) emphasised that nowadays customers are exposed to numerous technological innovations such as the POS. Acceptance or rejection of such technologies by the customers is certainly not dependent on whether they have used the device or not. Customers in this day and age also have access to information on other products and vendors, thus they have power over the vendors, because of access to alternative products. Therefore they assume control of the market (Hammer & Champy, 1993b). As essential as customer to businesses, it is expected that the merchandise are uncertain of the reaction of their customers would be once the merchandise adopted the new payment system, hence are hesitant to accept it (Van Birgelen *et al.*, 2003).

It should be noted that credit and debit cards are means through which POS payments are made (Agabonifo, Adeola, & Oluwadare, 2012). However, there is the problem of number of holders of credit or debit card among Nigerians. Chiemeke and Evwiekpaefe (2011) expressed concern that only few Nigerians are holders of credit/debit card despite its large population of over 170 million people. This study therefore conceptualises Customer Concerns will influence merchandise' behavioural intention to use POS. Therefore the following hypothesis is stated;

H5: There is significant positive relationship between Customer Concerns and behavioral intention to use POS.

2.4.6 Technology Awareness

A moderating variable is an interacting term which is said to emerge when the relationship between independent and dependent variables is surprisingly weak or inconsistent relationship or no relationship at all, thus the moderating variable is introduced to reduce or strengthen the relationship (Baron & Kenny, 1986; Sekaran & Bougie, 2009). The moderator variable can be inform of qualitative and quantitative; such as gender, race, level of awareness etc. and weight, salary, blood count etc. respectively (Baron & Kenny, 1986).

Based on the above definition and the inconsistencies that exist in the past literature, it is evident that a moderating variable can be introduced to moderate the relationship between these constructs. Furthermore, Venkatesh *et al.* (2003) unlocked ample of

opportunities for future researchers to enhance our understanding of technology acceptance and usage. They thus suggested;

> ***"****While the variance explained by UTAUT is quite high for behavioural research, further work should attempt to identify and test additional boundary conditions of the model in an attempt to provide an even richer understanding of technology adoption and usage behaviour. This might take the form of additional theoretically motivated moderating influences, different technologies (e.g., collaborative systems, e-commerce applications), different user groups (e.g., individuals in different functional areas), and other organizational contexts (e.g., public or government institutions). Results from such studies will have the important benefit of enhancing the overall generalizability of UTAUT and/or extending the existing work to account for additional variance in behaviour" (Venkatesh, Morris, Davis, & Davis, 2003, p. 470)*

Fortunately, whenever previous studies yielded inconsistent findings, Baron and Kenny (1986) suggested the introduction of moderating variable to discriminate between two or more groups whose differing characteristics might be the source of the inconsistencies in the literature. The moderator should be logically aligned with the phenomena under study (Sekaran & Bougie, 2009). This connection is therefore presented in the next paragraph.

Reffat (2003) observed that lack of knowledge of how government carry out its functions leads to citizens' not involvement to benefit from government services. Bamberg and Möser (2007) posited that awareness is an important requirement for the development of moral norm, unfortunately there is lack of awareness in developing countries, especially in respect of e-government services (Rehman *et al.*, 2012). Interestingly and specific to POS adoption in Nigeria, researchers and ICT experts

attributed the slow adoption of POS to lack of awareness. For example, Yaqub *et al.* (2013) believed that the reason for slow adoption of e-payment in Nigeria is lack of awareness of advantages of the system; hence there is need for awareness to aid the diffusion of POS in Nigeria (Ilesanmi, 2012). Also as cited in Chiemeke and Evwiekpaefe (2011), "The Economist Intelligence Unit, 2006 noted that the introduction of e-commerce services is hampered by a lack of public awareness on how to use the technologies" (p. 1723). It should be noted that these researcher beliefs were not empirically tested, especially the moderating effect of awareness on the relationship of UTAUT constructs and behavioral intention. Consequently, the current study proposes "Technology Awareness" as moderating variable to moderate the influence of performance expectancy, effort expectancy, social influence, and facilitating conditions on behavioural intention to use POS. It is expected that technology awareness construct will moderate the above mentioned relationships.

Although there is lack of exact definition the phrase 'technology awareness', it can be extracted from the following definitions. Mofleh, Wanous, and Strachan (2008) defines awareness as citizen's knowledge about the existence and advantages of using the e-government. Similarly, a variable related to awareness is 'technology cognizance', which was studied in Nambisan, Agarwal, and Tanniru (1999). As cited in the study, Rogers (1995) defined it as "user's knowledge about the capabilities of a technology, its features, potential use, and cost and benefits, i.e., it relates to awareness-knowledge" (p. 372). Based on the definition of awareness and technology cognizance, the current study coined and operationalized the construct as 'technology awareness' and define it as the

merchant's knowledge of the existence, features, costs, benefit and simplicity or otherwise of using POS in their businesses.

It is important to show evidence of established significant relationship between the proposed moderating variable (Awareness) and the dependent variable (behavioural intention) from previous studies. Although there are no much study that examines the relation between awareness and behavioural intention, the few ones are reviewed and found awareness as important predictor of behavioural intention. For example, Charbaji and Mikdashi (2003) empirically investigated the influencing e-government adoption factors among Lebanese postgraduate MBA students. Factors included in the study are knowledge, awareness, and feelings. Multiple regression analysis was used to analyse the data collected from 220 subjects. Although the variance explained by the model was rather small (12.9 per cent). Findings of the study indicated that awareness significantly influenced behavioural intention to use e-government.

Similarly, Rehman *et al.* (2012) empirically examined the adoption of e-government among internet users in Pakistan. The study was carried out in two folds. The first was to determine behavioural intention to get information and secondly, to determine the behavioural intention to transact. Results from regression analysis found that awareness significantly influence behavioural intention in both cases. In the field of environmental management, Wan, et al., (2012) coined the variable as 'awareness of consequences' and investigated its influence on behavioural intention to recycle among Hong Kong university staff and students. A PLS SEM analysis technique was employed to analyse

205 valid data sets obtained. Wan *et al.* (2012) found that awareness of consequence significantly influenced behavioural intention.

Moderating Hypotheses

Slightly different from above studies, the relationship between behavioural intention as exogenous variable and actual behaviour as endogenous variable was subjected to a moderation effect of awareness. 306 valid data were gathered from Engineers in Kuwait in Omar (2011)'s study. The study identified the determinants of Engineers intention and use behaviour to use traffic violation e-payment system. Awareness was found to perfectly moderate the relationship between the variables. Therefore this study distinguish itself by hypothesising the moderating effect of technology awareness on the relationship between UTAUT constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) and behavioural intention to use POS in Nigerian retail industry. Based on the above and experts assertion that lack of awareness in Nigeria is responsible for the dawdling adoption of e-commerce such as POS (Chiemeke & Evwiekpaefe, 2011; Ilesanmi, 2012; Yaqub *et al.*, 2013), the following moderating hypotheses are proposed.

H6: Technology Awareness moderates the positive relationship between performance expectancy and behavioral intention to use POS, such that the

relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H7: Technology Awareness moderates the positive relationship between effort expectancy and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H8: Technology Awareness moderates the positive relationship between social influence and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H9: Technology Awareness moderates the positive relationship between facilitating conditions and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

2.5 Theoretical Framework

Subsequent upon discussions of the main variables of interest of this study, a graphical view of the relationships among these variables, otherwise known as theoretical framework is hereby presented. A theoretical framework is defined as "a conceptual model of how one theorizes or makes logical sense of the relationships among several factors that have been identified as important to the problems"(Sekaran & Bougie, 2009). The proposed research framework in this study gives a picture of the whole idea

of the study and illustrates the schematic diagram in Figure 2.1. Furthermore, the discussions on these variables that lead to the development of hypotheses were discussed in previous sections, thus the summary of these hypotheses are also presented.

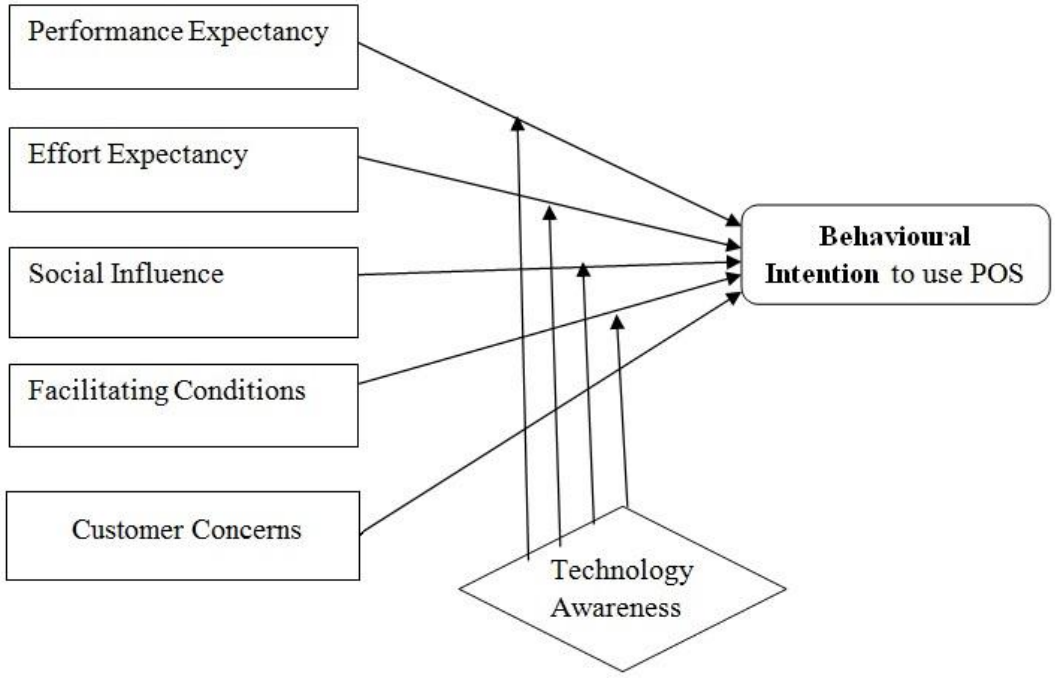

Figure 2.1
Theoretical Framework for this Study

2.6 Theoretical Underpinning

2.6.1 Evolution of Technology Adoption Theories

This section of the chapter discusses the underlying theory that form basis for the current study. The study is based on the unified theory of acceptance and use of technology (UTAUT) developed by (Venkatesh *et al.*, 2003). The theory combined eight preceding theories of technology adoption and usage; Theory of Reasoned Action (TRA) (Fishbein

& Ajzen, 1975), Social Cognitive Theory (SCT) (Bandura, 1986), Technology Acceptance Model (TAM) (Davis *et al.*, 1989), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Innovation Diffusion Theory (IDT) (Moore & Benbasat, 1991), Model of PC Utilization (MPCU) (Thompson & Higgins, 1991) The Motivational Model (TMM) (Davis *et al.*, 1992) and Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995). Interestingly, Venkatesh *et al.* (2003), Van Biljon and Kotzé (2007), and Wu *et al.* (2007) concluded that UTAUT is the best theory that explains user acceptance and usage of technology, having been tested alongside eight preceding technology acceptance theories and models.

2.6.2 Limitations of Other Theories and Models

Venkatesh *et al.* (2003) identified five shortcomings of the extant models as follows; (1) students were frequently used as subjects of these studies, (2) Cross-sectional measurement was generally used (3) Simple and individually related technologies were examined, (4) User's behaviour was measured after acceptance or rejection of the technology and (5) Voluntary settings were often used, thus may not be applicable to mandatory settings. These limitations were taken care of in Venkatesh *et al.* (2003)'s UTAUT study. Data was collected from individuals across four (4) different organisations, who recently introduced new technologies into their operations. This implies that the technologies introduced to these organisations are for mandatory usage.

To remedy the cross-sectional limitations of extant theories and models, a longitudinal study was then conducted to compare the eight models in an empirical study. Data was

collected in three (3) different times; after training, a month after implementation and three months after implementation respectively. The data was grouped into voluntary and mandatory settings as well as examining the effect of age, gender experience as moderators. Findings of their study revealed seven variables out of the 32 variables from the eight theories as factors influencing behavioural intention and use behaviour. These are; performance expectancy, effort expectancy, social influences, facilitating conditions, attitude, computer self-efficacy, and anxiety. Although initially performance expectancy, effort expectancy, social influences and facilitating conditions were proposed as direct determinants of intention and attitude, computer self-efficacy, and anxiety as determinants of use behaviour, the result of the study rejected facilitating condition as a determinant of intention, rather a direct determinant of use behaviour. Attitude, computer self-efficacy, and anxiety were found not significant determinants of intention, hence were dropped in the final model (Venkatesh *et al.*, 2003).

2.6.3 The Theory - Unified Theory of Acceptance and Use of Technology

Prior to introduction of UTAUT into the information system (IS)/information technology (IT) research field, researchers were prompted with dilemma of choice among numerous variables proposed and tested in previous models and researches respectively (Venkatesh *et al.*, 2003). Hence important of other alternative variables are often ignored. In order to avoid such disregard to important variables, a unified view of user acceptance and use of technology was proposed by Venkatesh *et al.* (2003). They reviewed, compared and synthesised the eight (8) proceeding theories and models of technology acceptance and usage in order to have a better understanding of user usage

behaviour. These theories and models are TRA, SCT, TAM, TPB, IDT, MPCU, TMM and C-TAM-TPB. These were discussed in previous sections

Finally, the authors formulate The Unified Theory of Acceptance and Use of Technology. The theory postulates that performance expectancy, effort expectancy and social influences are direct determinants of behavioural intention, while behavioural intention and facilitating condition were theorised as determinant of use behaviour. Similarly, age, gender, experience and voluntariness of use were positioned to moderate the relationship between the constructs as follows; gender moderates the relationship between performance expectancy, effort expectancy, social influences and behavioural intention. Age moderates the relationship between performance expectancy, effort expectancy, social influences and behavioural intention, behavioural intention to use behaviour respectively. Experience moderates the relationship between effort expectancy, social influences and behavioural intention, facilitating condition and use behaviour respectively. Voluntariness of use moderates the relationship between social influence and behavioural intention. The schematic diagram of the theory is therefore presented in Figure 2.2.

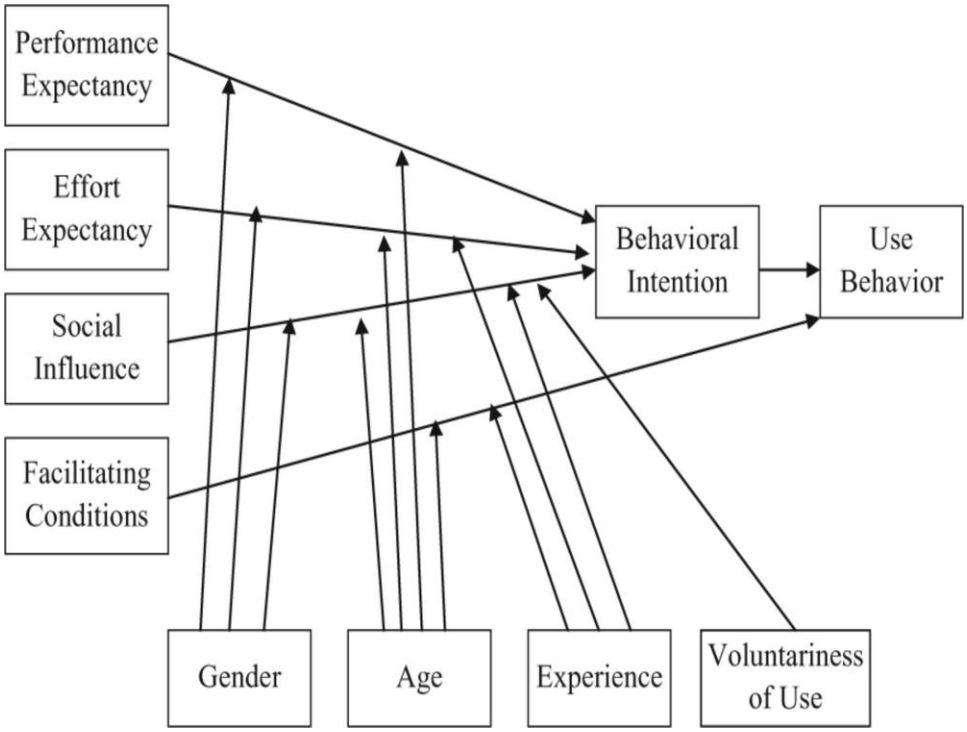

Figure 2.2
The Unified Theory of Acceptance and Use of Technology
Source: Venkatesh *et al.* (2003)

2.6.4 Determinants and Moderating Variables in UTAUT

Definition and origin of four determinants of behavioural intention and use behaviour in UTAUT are hereby discussed as follows:

1. **Performance Expectancy (PE) "**is the degree to which an individual believes that using the system will help him/her to attain gains in job performance" (Venkatesh *et al.*, 2003, p. 447). The constructs that are similar to performance expectancy in the past models and theories are perceived usefulness of TAM, relative advantage in DOI, job-fit in MPCU, outcome expectancy in SCT and

extrinsic motivation in TMM. The effect was stronger in male younger workers (Venkatesh *et al.*, 2003). Interestingly, empirical evidences from past literatures confirmed that age and gender plays very important moderating effect on the influence of performance expectancy on behavioural intention.

2. **Effort Expectancy (EE) "**is the degree of ease associated with the use of system" (Venkatesh *et al.*, 2003, p. 450). Origins of the construct can be traced in TAM as perceived of use, DOI and MPCU as complexity. According to Venkatesh *et al.* (2003), evidences from past literature indicated that the influence of effort expectancy on behavioural intention is stronger in older workers and young women, thus they hypothesised gender, age and experience to moderate the relationship between the constructs.

3. **Social Influence (SI) "**is the degree to which an individual perceives that important others believe he/she should use the new system" (Venkatesh *et al.*, 2003, p. 451). This construct is synonymous to subjective norms in TRA, TAM, TPB and C-TAM-TPB. It can also be traced to MPCU and DOI as social factors and image respectively. Similarly, age, gender, experience and voluntariness of use were theorised to moderate the influence of social influence and behavioural intention, because past literatures has proven that the effect was stronger in women and those with experience in mandatory situation (Venkatesh *et al.*, 2003).

4. **Facilitating Conditions (FC)** "is the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh *et al.*, 2003, p. 453). Similar to UTAUT's facilitating conditions in the past models and theories are TPB/DTPB's perceived behavioural control, DOI's compatibility and TAM-TPB's facilitating conditions. Ironically, presence of performance expectancy and effort expectancy diminishes the influence of facilitating conditions on behavioural intentions. However, empirical evidence proved that the influence is stronger for experienced older workers, thus age and experience are hypothesised to moderate the effect (Venkatesh *et al.*, 2003).

2.6.5 Limitations of UTAUT

Previous models were able to explain a maximum of 40 per cent variance in behavioural intention, while UTAUT performance in explaining variance in intention was outstanding, as it account for 70 per cent. Nevertheless the huge variance explained, the theory has some limitations. Firstly, the measurement scales used to test the theory are exposed to content validity issues because the measures were validated and pruned based on some statistical thresholds (Chin, Marcolin, & Newsted, 2003; Nunnally & Bernstein, 1978) thus new measures should be used to extend the theory (Venkatesh *et al.*, 2003). Therefore the current study adapted a more refined, improved and validated measures from extant literature (Chang & Tung, 2008; Du *et al.*, 2012; Moghavvemi *et al.*, 2012; Nambisan *et al.*, 1999; Susskind, Kacmar, & Borchgrevink, 2003). Secondly, UTAUT's generalizability is quite limited given the facts that its authors have acknowledged that future research should identify more theoretically and contextually

motivated constructs that adds to the predictions of behavioural intention and actual usage across different context. This is therefore an opportunity for the current research to improve upon the limitations of the existing theory.

Similarly, although facilitating conditions was not theorised as direct determinants of behavioural intention in UTAUT, several studies have tested the relationship between the two constructs. However, their findings were inconsistence. For example, Wang and Yang (2005), El-Gayar and Moran (2006), Zhou (2008) Foon and Fah (2011), Zhou (2012), Alrawashdeh *et al.* (2012) found that facilitating condition is a significant determinant of behavioural intention. On the other hand, Marchewka *et al.* (2007), Birch and Irvine (2009), Huang and Qin (2011) and Wong *et al.* (2013) examined the influence of facilitating conditions on behavioural intention and found not significant. Similarly, Burton-Jones and Hubona (2006), Marchewka *et al.* (2007), Al-Shafi and Weerakkody (2009), Venkatesh, Sykes, and Zhang (2011a) found the moderating variables not significant. Therefore, to simplify the model, age, gender, experience, and voluntariness of use should be excluded (Wang & Yang, 2005).

Based on the robustness of UTAUT and its' relevance to the current study, it is therefore been found suitable to underpin this study. However, moderating variables in UTAUT will not be considered in this study, based on Wang and Yang (2005) suggestion. Justification of inclusion of each variable in this study is discussed in theoretical framework section of this study.

2.7 Summary of Research Hypotheses

Consequent upon discussion on the conceptualisation of the study and subsequent presentation of schematic diagram (research framework) that represents the whole concepts in the study, direct path and moderating hypotheses are formulated as follows;

Direct Path Hypotheses

H1: There is significant positive relationship between performance expectancy and behavioral intention to use POS.

H2: There is significant positive relationship between effort expectancy and behavioral intention to use POS.

H3: There is significant positive relationship between social influence and behavioral intention to use POS.

H4: There is significant positive relationship between facilitating conditions and behavioral intention to use POS.

H5: There is significant positive relationship between Customer Concerns and behavioral intention to use POS.

Moderating Hypotheses

H6: Technology Awareness moderates the positive relationship between performance expectancy and behavioral intention to use POS, such that the

relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H7: Technology Awareness moderates the positive relationship between effort expectancy and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H8: Technology Awareness moderates the positive relationship between social influence and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

H9: Technology Awareness moderates the positive relationship between facilitating conditions and behavioral intention to use POS, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness.

2.8 Context Overview

This section discusses in general, an overview of payment systems in the world and particularly in Nigeria. It further discussed and highlights the Nigerian economic profile as well as the state of infrastructure development, vis-à-vis electricity, internet etc. The section also touched on the level of e-payment penetration in Nigerian economy and stakeholders efforts in ensuring smooth transition from cash-based to cashless payments. Finally, a critical review of past literatures related to e-payment system in Nigeria was

presented. The inclusion of separate section for an overview of the context of study is informed by several emphases on the importance of context in theory advancement/development (Bamberger & Pratt, 2010; Johns, 2006; Whetten, 2009). For example, Hong, Chan, Thong, Chasalow, and Dhillon (2014), argued that "researchers should familiarize themselves with the setting under study, so as to make better use of empirical material as input for theorizing" (p. 112) (Alvesson & Kärreman, 2007).

2.8.1 Global Payment Systems

The world has in the past witnessed series of transitions from one payment mechanism to another. For example, the transition from barter system to paper and coins as medium of payments for goods and services from seventeenth to nineteenth century (Graeber, 2001; Humphrey, 1985; Humphrey & Hugh-Jones, 1992). Recently, a payment system which neither uses goods for goods as in barter system, nor it uses paper nor coins money to exchange goods and services surfaced. The system is known as e-payment system. There are several types of electronic payment gateways such as online payment, e-wallet, mobile payment, point of sale terminal, e-banking etc. (Appiah & Agyemang, 2006; Laudon & Traver, 2007). The diagram in Figure 2.3 illustrates typical scenery of how electronic payment transaction is performed. In the diagram, authorized.net is a payment gateway provider, thus is shown as an example.

There has been considerable rate of growth of non-cash payments globally. Jean *et al.* (2011) reported that the payment system recorded a 5 per cent and 7.8 per cent growth in 2009 and 2010 respectively. While the global volume of transaction in e-payment

system stood at 22.5 billion transactions in 2010 and is expected to grow to 30.3 billion transactions in 2013, the most preferred non-cash payment gateway is credit and debit cards. Most of the economies recorded more than 40 per cent cards market share, while Canada recorded as high as 68 per cent cards market share.

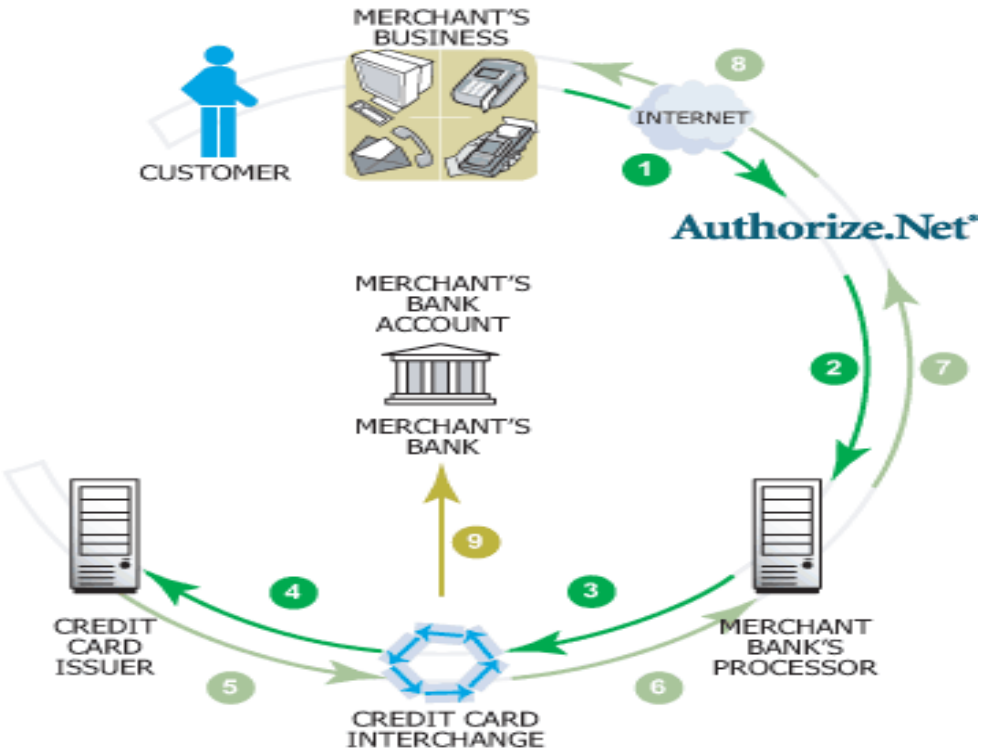

Figure 2.3
How an Electronic Payment Process Takes Place
Source: Service Related Credit Cards Processing (2012)

2.8.2 Nigeria and its Economic Background: An Overview

After years of colonization by the British, Nigeria gained its independence in 1960, precisely 1st October. Nigeria occupies a total land of 923,768 square kilometres. As shown in Figure 2.4, Nigeria is consisting of six geo-political zones, thirty six states and the federal capital territory of Abuja. Although there are conflicting figures about Nigeria's current population as according to United Nations statistics, Nigeria's population is estimated at 170 million people. however, based on 2006 National Population Commissions' census, there were 140 million people in Nigeria (Makama, 2010).

The main source of revenue to Nigeria is petroleum resources. The country is the 8th largest producer of oil, in which the sector contributes 80 per cent and 40 per cent of national earnings and gross domestic product (GDP) respectively. Although oil is the main source of revenue to the government, Nigeria is also known for its rich deposit of other mineral resources such as coal, iron, lead, limestone, niobium, ore, tin, and zinc. Despite the turbulences in the economy, International Monetary Fund (IMF) projections placed Nigeria's growth at stable position. Nigerian economic indicators in the year 2013 shows the GDP at purchasing power parity is $465 billion, consumer expenditure is $168 billion, annual gross and disposable income are $206 billion and $176 billion respectively (Euromonitor International, 2012). Nigeria's unit of currency is Naira (₦) or (NGN) and it currently exchanges with United States Dollar ($), Great Britain Pound (GBP) and Malaysian Ringgit (RM) at ₦202.55 to $1, ₦312.16 to £1 and ₦55.92 to RM1 respectively.

2.8.3 State of Infrastructures in Nigeria

It is generally believed that developing countries are facing infrastructural depicit (Rehman *et al.*, 2012). Although Nigeria is also a developing country like China, Brazil, Turkey and South Africa, the latter's infrastructures are far more developed than Nigeria's (Gholami *et al.*, 2010). These infrastructure ranges from electricity, internet, regulatory mechanism etc. Nigeria is not immune in this regard, because its information system and information technology infrastructures are said to be underdeveloped (Ojiako, Chipulu, Maguire, Akinyemi, & Johnson, 2012). According to Gholami *et al.* (2010), these inadequacies in the infrastructures resulted in slow adoption of e-payment system in Nigeria.

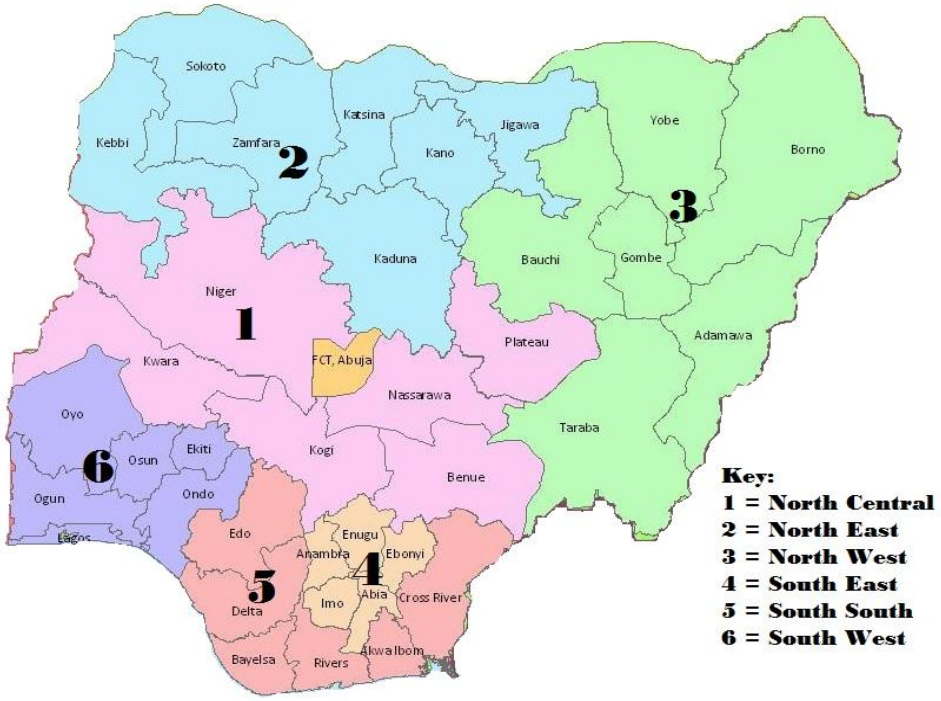

Figure 2.4
Map of Nigeria Showing the Six Geo-Political Zones
Source: Naibbi and Healey (2014)

While its counterpart country like South Africa is generating 238 billion kWh, Nigeria is generating 20 billion kWh. According to population estimates, Nigeria's population is nearly four-times South Africa's. A provision of sufficient electricity guarantees the survival of electronic and non-electronic based businesses. With the insufficient and epileptic electricity supply, e-business suffer serious setback in Nigeria (Chiemeke & Evwiekpaefe, 2011). However, recently Yaqub *et al.* (2013) reported that developing countries are improving their infrastructures, especially the one that supports e-payment systems, which subsequently facilitate the adoption of non-cash payments.

2.8.4 Electronic Payment Systems

Electronic payment system (EPS) is a form of a financial exchange that takes place between the buyer and seller facilitated by means of electronic communications. EPS facilitate the most important action after the customer's decision to pay for a product or service – to convey payments from customers to merchant in a most effective, efficient and problem-free way. The role of e-commerce electronic payment systems is pivotal for future of ecommerce, whose further growth depends on the timely development of EPSs (Agabonifo *et al.*, 2012). E- Payment play a very vital role in today's ever-growing technology driven marketplace, however, lack of successful adoption and implementation of the system hinder its success in Nigeria (Gholami *et al.*, 2010; Nwankwo & Eze, 2013; Nwaolisa & Kasie, 2011). Debit cards, credit cards, electronic funds transfers, direct credits, direct debits, internet banking are instruments through which e-payments transactions such as online payment, point of sale terminals etc. are carry out (Agabonifo *et al.*, 2012). Similarly, First Bank Nigeria (2012) defines POS as

an electronic device which uses internet connection and credit/debit card (a.k.a ATM Card) to process payments for goods and services. It is mostly found in retails stores, hotels restaurants, boutique, etc. The device (picture shown in Figure 2.5) is usually placed at the cashiers counter in the shop. Customers, who want to pay for goods or services, supply their card to the cashier to swipe it in the device. The cashier checks the card, pull it through the reader and enter the transaction amount. On the part of the customer however, s/he will enter their PIN number to authorize the payment.

Figure 2.5
Point of Sale Terminal (POS)
Source: First Bank Nigeria (2012)

The cashier will then issue 2 printed receipts to the customer. The customer signs one copy and returns it to the cashier and keeps the other copy. The cashier will then compare the signature to that on the card and return the card to the customer. The transaction amount will then be debited from the customer's account and be credited to the merchant's account. Usually, the process takes less than 1 minute to complete. The whole payment process in the above scenario is cashless.

2.8.5 Cashless Policy and the State of e-Payment Systems in Nigeria

Nigerian economy is characterised by huge amount of money in circulation, thus majority of its transactions are cash based. Unlike in the developed economies like UK and US, where the total cash in circulation is 9 and 4 per cent respectively (Oladejo & Akanbi, 2012), in Nigeria the story is different. As shown in Figure 2.6, the Central Bank of Nigeria (Central Bank of Nigeria, 2011) said that the total amount of cash in circulation in Nigeria as at August 2011 stood at ₦1.42 trillion. This costs the apex bank huge amount of money as cost of cash management. Chima (2011), reported that the CBN also puts the cost of cash management at ₦114 Billion in 2011 and may increase to ₦192 Billion in 2012. This is due to the huge cash that circulates the economy, as only 10 per cent of Banks cash transactions are above ₦150,000, but they make-up 71 per cent of the value of cash transaction in the Nigerian banks (Chima, 2011). If the said cost of cash management could be saved, it will be useful in solving many problems facing the country (Sanusi, 2011).

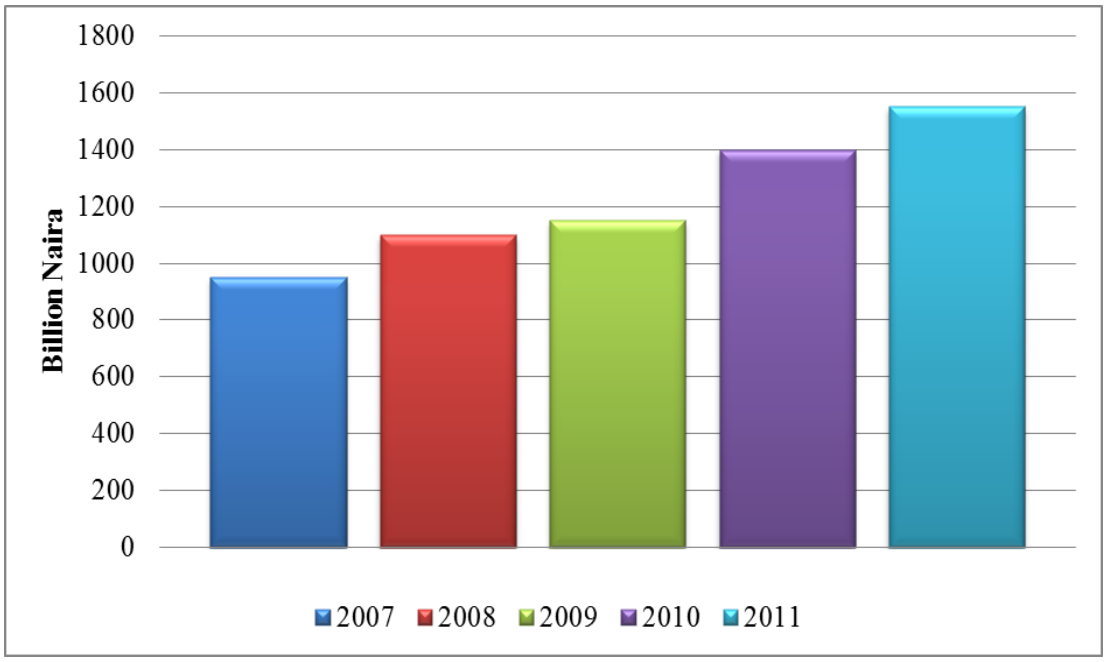

Figure 2.6
Cash in Circulation in Nigeria (2007-2011)
Source: Central Bank of Nigeria (2011)

Due to the emergence of technologies such as e-payment, the whole world embraced the change to cashless payment (Sanusi, 2011), through the deployment of various cashless payment mechanisms such as POS, e-banking, mobile payment etc., ironically, developing countries such as Nigeria is lagging behind (Odumeru, 2012). Technological breakthroughs and product designs have led to the emergence of e-banking services which, in recent time has become globally popular except in developing countries including Nigeria. However, because of the importance of payments system to every economy and the need to get rid of the excess cash-based economy, Nigeria's apex bank, the CBN took revolutionary measures toward improving the existing payment mechanism in the country. One of such is the 'Cashless policy'. The policy is aimed at reducing the amount of physical cash circulation in the economy. "The cashless system

of payment is defined as a society where transactions is functioning, operated, or performed without using coins or banknotes for money transactions but instead using credit cards or electronic transfer of funds" (Nwankwo & Eze, 2013, p. 141).

Table 2.3
Market Share of e-Payment Gateways in 2008 – 2011

e-Payment	**Volume (Millions)**				**Value (Naira Billion)**			
Segments	**2008**	**2009**	**2010**	**2011**	**2008**	**2009**	**2010**	**2011**
ATM	60.1	109.6	186.2	347.6	399.7	548.6	954.0	1561.8
% of Total	91.0	95.3	95.1	97.9	9.5	85.0	88.9	93.4
Web (Internet)	1.6	2.7	7.2	3.6	25.1	84.2	99.5	58.0
% of Total	2.4	2.3	3.7	1.0	5.7	13.1	9.3	3.5
POS	1.2	0.9	1.1	2.1	16.1	11.0	12.7	31.0
% of Total	1.8	0.8	0.6	0.6	3.7	1.7	1.2	1.9
Mobile	3.2	1.8	1.9	1.9	0.7	61.3	6.7	20.5
% of Total	4.8	1.6	0.5	0.5	0.1	0.2	0.6	1.2
Total	**66.1**	**115.0**	**195.7**	**335.2**	**441.6**	**645.1**	**1072.9**	**1671.4**

Source: Central Bank of Nigeria (2011)

Tan, (2012) maintained that POS is popular in the retail industries, due to its capabilities to effect transfer of funds through debit and credit card from customer to merchant account. Therefore the device was targeted by CBN as a means to get rid of the excess cash-based economy. Unfortunately, the device is not popular in Nigeria, because the CBN reported that, of the four avenues for e-payment (mobile payment, ATM, web payment and POS) POS have only 0.6 per cent and 1.9 per cent volume and value of the

market share, whereas ATM dominates 97.9 and 93.4 percent of the volume and value of the market share respectively, as shown in Table 2.3 and Figures 2.7 and 2.8.

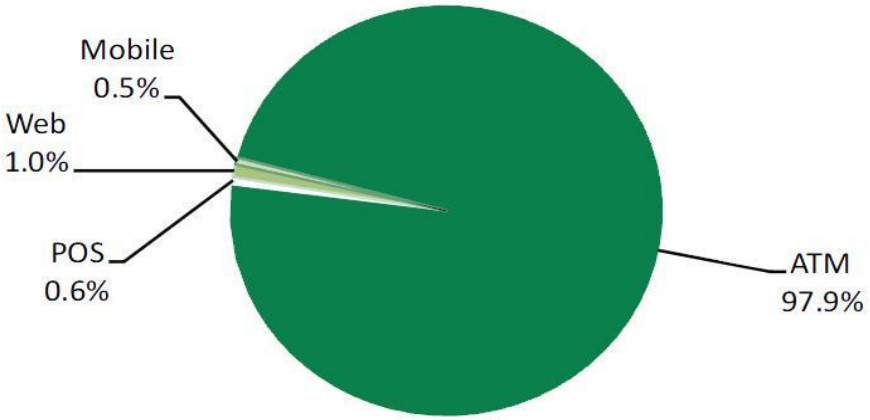

Figure 2.7
Volume of Electronic Card-based Transactions in 2011
Source: Central Bank of Nigeria (2011)

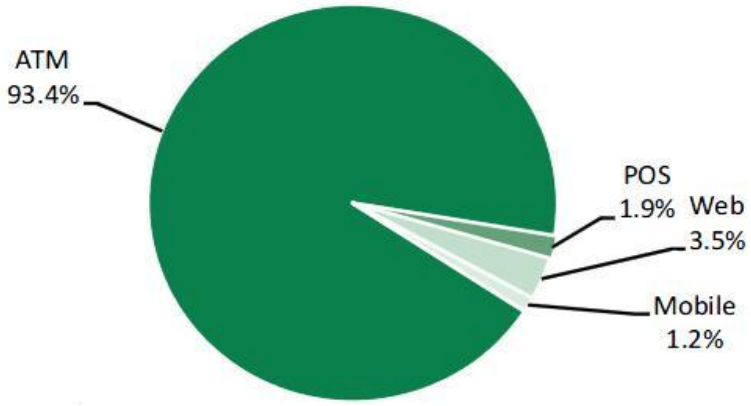

Figure 2.8
Value of Electronic Card-based Transactions in 2011
Source: Central Bank of Nigeria (2011)

The cashless policy was first introduced in Lagos, southeast Nigeria as a pilot program. There has been resistance to acceptance of e-payment systems in Nigeria (Dankwambo,

2009), especially the merchants, to install the system in their business, as recent survey puts the use of the system at 6 per cent (Adepetun, 2012). Prior to commencement of the pilot project, the CBN put some necessary regulatory framework on ground, including issuance of operating licence to six providers of payment terminals. These are Citi Serve, Easy Fuel, ETOP, ITEX, Paymaster, and ValueCard (Central Bank of Nigeria, 2012).

2.8.6 Retail Industry and Point of Sale Terminals

The transfer of goods and services from merchant to the final consumers for a pay is known as retailing (Cox & Brittain, 2004), whereas industry is a group of companies whose business activities is similar to each other (Ahmad, 2012). Therefore a group of businesses, whose primary activity is the sales of goods and services to the final consumer, is known as retail industry. It should be noted that retailing is not limited to the sales of goods only; it also involves provision of services such as travel agency, bureau de change, educational services etc. (Cox & Brittain, 2004).

Classifying retail business will help researchers to effectively engage in studying a phenomena related to the retail business (Guy, 1998). Therefore, Duncan (1952) classified retail business according to product and location. He grouped as thus; gasoline service stations, raw food, eating and drinking places, apparels, furniture, electrical stores, book stores, automobile, hardware, drugs stores, second-hand stores, general stores, and other retail store. This classification was further decomposed into several related product offering of the particular group. It should be noted that these

classification does to take services into consideration. Products can be categorize into tangible and physical good and intangible services (Phau & Poon, 2000), for example car and barbing respectively.

With rapid growth in technology, consumer preference and sophistication have seen Duncan (1952)'s classification has been restructured. For example, (Guy, 1998) further added more classification to the existing ones. Apart from Duncan's, Guy included retails which are mostly service related such as hiring, medical, and educational services. Similarly, Cox and Brittain (2004) defined service retail as any intangible product offering that satisfy consumer needs, citing example of travel agency and bureau de change etc.

Therefore drawing from the above classifications and definition of retail outlets and the researcher's observation, the following lists in Table 2.4 describes the Nigerian retail industry based on goods and services classifications and trade association clustering. However, the classification might not be exhaustive, as it was based on information available to the researcher. Ojiako *et al.* (2012), argued that there is the poor research culture in Nigeria; therefore such data are rarely available for researchers. Thus the in-exhaustiveness problem might not be unconnected with the unavailability of data. Hence the researcher resorted to trade unions to base their classification.

There are few modern shopping centres in Nigeria (Uzonwanne, 2011). Both the international and local retail chain presently in Nigeria namely; Woolworths, Mr Price, Hawes & Curtis, Shoprite, Spar & Game have few retail stores in few Nigerian cities,

namely Abuja, Lagos, Port-Harcourt (Euromonitor International, 2012). It was very recently some world known retailer outlet; Tesco, Wal-Mart and Carrefour indicated their interest to enter Nigeria (Aiyevbomwan, 2013), which till this moment remained intention. Thus the formal/modern shopping centres in Nigeria might not give sufficient population to carry out empirical research. Uzonwanne (2011) further stressed that the retail industry is dominated by open air markets; in which majority of the Nigerian people make purchase of their grocery and other household needs. Therefore there are very few formal shopping centres found in other developing countries such as Malaysia, for example; Mydin, Giant or SevenEleven etc.

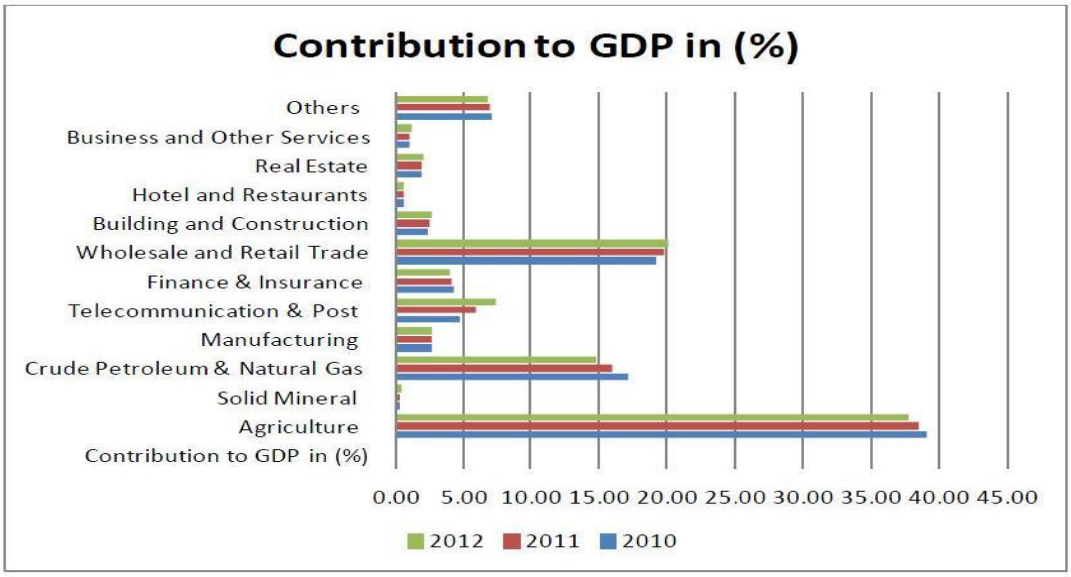

Figure 2.9
Percentage of Contribution to GDP by Sector
Source: National Bureau of Statistics Nigeria (2012)

Retail industry has been in the forefront in contributing to the gross domestic product of Nigeria. Data available from National Bureau of Statistics Nigeria (2012) as in Figure

2.9, the industry, along with wholesale, as second contributor of the GDP, where they contributed more than 20 per cent. Within the industry, there are several other sub-sectors, such as petroleum resources retails, known as petrol stations and pharmaceutical products retail known as community pharmacists. These sub-sectors contributed immensely to the development of the economy. For example, Product Pricing Regulatory Agency (PPPRA), the agency in charge of regulating price of petroleum products, maintained that the daily volume of petroleum product in Nigeria is 38.298 million litres, whereas each litre is sold at N97. Therefore the daily sales is approximately N3.7 billion (Tunde & Medinat, 2013). Similarly, pharmaceutical retail sector is well regulated by regulatory and professional bodies such as Ministry of health and Pharmaceutical Society of Nigeria. The industry, according to Lowe and Montagu (2009), 18.2 per cent of the total expenditure on health is spent on pharmaceutical products.

Retail industry worldwide has witnessed improvements in payment process with the introduction and use of electronic payment systems, specifically the POS, which directly involves consumers. Humphrey, Kim, and Vale (2001) argued that e-payment system has brought a lot of benefits to both the merchants and consumers, such as ease of use, secured and reliable transactions. Specifically to Nigeria, Nwankwo and Eze (2013) highlighted some benefits of using e-payment systems for consumers, organizations and the government. These benefits are ease and convenience of use, minimizing rate of crimes related to handling cash, less cost of cash management; reduce financial fraud, avenue for collection of tax and overall efficiency

Table 2.4
Key Sectors in Nigerian Retail Industry

SN	Type of Business	Product	Type of Product
1	Pharmaceutical Stores	Drugs	Goods
2	Computer Stores	Computer and Accessories	Goods
3	Books Stores	Books and Stationeries	Goods
4	Boutique	Apparels	Goods
5	Hardware Store	Equipment and Materials	Goods
6	Electrical & Electronics Stores	Electronics	Goods
7	Motor Vehicle	Car/Motorcycle	Goods
8	Bureau de Change	Currency Exchange	Services
9	Travel Agencies	Travel Services	Services
10	Private Schools	Educational Services	Services
11	Private Medical Clinics	Health Services	Services
12	Petrol Stations	Petroleum Products	Goods & services
13	Open Markets	Sundry Goods and Services	Goods & services

2.8.7 Critical Review of Literature on e-Payment Adoption in Nigeria

In order to prevent a situation whereby this study might be seen as a repetitive of other studies conducted in the same or similar context, for the same or similar phenomena, it is important to critically review related past literatures, with a view of distinguishing the current study from the past studies. Therefore this section reviews literatures that studied adoption of e-payment systems in Nigeria.

Although a number of studies have attempted to examine the adoption of e-payment and the likes, but these studies were fragmented, thus different from the current study in various aspect, such as methodology used, theories applied, and the specific context in which the studies were carried out. For example; Rasheed and Shiratuddin (2009) applied UTAUT to study behavioural intention to use iris authentication system among Nigerians. They surveyed 351 individual ATM users in Lagos, through stratified random sampling. The study investigated the moderating effect of gender on the relationship between UTAUT constructs and behavioural intention, however, the effect was not established. Although Rasheed and Shiratuddin (2009) applied UTAUT to examine technology in Nigeria, their study was limited to Lagos, one of 36 states in Nigeria. Also the study examined the behaviours of bank customers, contrary to that Venkatesh *et al.* (2003)'s UTAUT, which was primarily developed for organisational context.

Similar to Rasheed and Shiratuddin (2009), Gholami *et al.* (2010) also applied UTAUT and examined the factors that affects e-payment adoption is Nigeria. The choice of subjects for the study was also contrary to UTAUT's rule of thumb. In addition, the study focused generally on e-payment systems, not specific to a particular system, thus respondents might be making reference to different set of systems, therefore the reliability of the findings is questioned (Sekaran & Bougie, 2009). Notwithstanding the flaws in their methodology, results of the study indicated that individual intention is affected by effort expectancy, social influence, perceived benefits, awareness, and trust. In another related study, Chiemeke and Evwiekpaefe (2011) extended UTAUT theory to account for variables that they called "Nigerian Factors". They were able to come up with the variables based on critical review of literatures that argued these variables are

of course peculiar to Nigeria. However, there study stopped at a conceptual stage, they did not empirically test the relationships between these variables. However, they recommended further research to focus on empirical validation and reliability of the conceptual framework.

Away from application of UTAUT to study the adoption of technology in Nigeria, Adeoti and Oshotimehin (2011) studied the phenomena differently, although their focus was individual consumers just like Rasheed and Shiratuddin (2009) and Gholami *et al.* (2010) studies. Even though, there is similarity between the current study and Adeoti and Oshotimehin (2011)'s in terms of the particular device that was studied (POS), each study examines different set of variables. While Adeoti and Oshotimehin (2011) investigated the influence of ease of use, convenience, complexity, availability, nativity, security, time, age and gender on intention to use, the current study will investigate the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and Customer Concerns on behavioral intention, as well as the moderating effect of technology awareness on the relationship among the constructs.

In a study related to Rasheed and Shiratuddin (2009)'s study, Ifinedo (2012) extended TAM with five new variables; top management support, organizational readiness, information system (IS) vendor support, financial resources support and government support, to examine their influence on intention to use e-payment among Nigerian small firms. The study was however prone to generalization question, as the author acknowledge that since the survey covered Lagos only, the result cannot be generalized to the whole country, thus suggested future research to collect data from other parts of

the country. Moreover, the current research will applied the relatively newer and unified theory of technology adoption (UTAUT). Nevertheless the limitation of the study, result indicated that perceived usefulness, top management support, organizational readiness, IS vendor support was found to have positively influence intention to use e-payment, while perceived ease of use, financial resources support and Government support were not significant.

Additionally, Ogunleye *et al.* (2012) explored the adoption of electronic payment system in Nigerian retail industry. Although the study appeared to have adopted the qualitative method, it did not specifically indicate the methodology they followed. However, they identified some variables as barriers to successful adoption of retail payment system in Nigeria. These variables are awareness and expertise, confidence and security, attitude toward new products and inadequate telecommunication infrastructure. Findings were not empirically tested, therefore cannot be generalised. Furthermore, the current study will be different from Ogunleye *et al.* (2012)'s, as it focuses on behavioural intention, using different set of variables and apply quantitative approach to empirically investigate the subject matter.

2.9 Summary

Theoretically, there are numerous studies that examined intention to use technology. However, despite the importance of customer to business (Hammer & Champy, 1993a), there is little or no studies that empirically integrate 'Customer Concerns' along with UTAUT constructs, to simultaneously examine their influence on intention to use e-

payment system. Secondly, previous researches on technology adoption using UTAUT theory have yielded conflicting findings, and based on Baron and Kenny (1986) suggestion, a test of moderation effect of 'technology awareness' on the relationship between UTAUT constructs and behavioural intention to use technology is hereby proposed. Thus the current study extends UTAUT with customer concern as independent variable and 'technology awareness' as moderating variable.

Methodologically, most of these studies lack basis for generalization because the sample is not representative of the population they studied, (American Educational Research Association, 2006; Freeman, Preissle, Roulston, & Pierre, 2007; Ifinedo, 2012; Kitchenham & Pfleeger, 2002; Tsang & Willliams, 2012). They also frequently sampled university students or employees and customers of banks, who are typically familiar with internet technologies. However, this study samples owners and managers of retail business. Finally, the context this study aimed to investigate is retail industry in Nigeria, which past studies have not explored. Also previous studies focused on subjects that have already adopted the particular technology, while the current study investigates the non-adopters of POS in Nigerian retail industry. .

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In the previous chapters and sections, background, problem statement, research question and objectives of this study were presented. Also related literatures were reviewed, research framework was presented and research hypotheses were developed. Thus it is indispensable to put forward the process through which the research questions will be answered and objectives be achieved. It is also important to discuss how the variables in this study will be operationalized and hypotheses will be tested (Daniel & Bush, 2002). Therefore this chapter discusses the research design, population, unit of analysis and sampling technique that was used for the study. Measurements instruments and their sources will be discussed. Questionnaire design, data collection procedure, proposed analysis technique and summary of the chapter was also presented.

3.2 Philosophical Approach

Research is a process of knowing what is not known, thus it should not be like a 'fishing expedition'. Therefore it is important for researchers to map out their way of acquiring the knowledge. This brought us to the age of philosophical principle which help researcher to know the root of knowledge and how it is known. This is otherwise known as epistemology. Epistemology is a terminology that can be traced to the field philosophy, which concerns with what constitutes knowledge, how to attain knowledge and the degree of likelihood to which a certain entity is known (Bates & Jenkins, 2007;

Guarino, Oberle, & Staab, 2008; Marsh & Stoker, 2002). Ontology on the other hand is also a branch of philosophy which concern with knowing the likely unit of knowledge that exist, the relationship of each unit to one another within a group or a particular order and what similarity or otherwise can be said to exist among the units (Guarino *et al.*, 2008; Viinikkala, 2003). It is therefore necessary to know the origin of knowledge, how it can be acquired, and the possible branches within which a particular entity exist.

According to Mingers (2001), it is essential for researchers to identify the philosophical approach that gives direction to their research, because social and behavioral sciences are naturally burdens with values. Background beliefs and assumptions are going to guide this research's selected methodology as recommended by (Geyer, Kuhn, & Schmid, 1996). Philosophically, the world appears to offer binary choices of research paradigm, these paradigms are positivism and realism. Although there is a fairly new philosophical paradigm called 'Critical Realism'. It is an approach pioneered by Bhaskar (1975) which according to Pather and Remenyi (2004), is capable of integrating the gigantic discrepancy among the solely objective on one end, and entirely subjective realism on the other. However, Burrell and Morgan (1980), opined that both ontologically and epistemologically, the discrepancies between the two paradigms cannot be harmonized.

This research examines the behavioural intention to use information system among decision makers in the retail market, thus it is crucial to demonstrate whether the phenomena is an observable event or otherwise. The purpose of psychology as posited by Watson (1913), is to predict what causes particular reaction, given a particular

stimulus or the vise-versa. Thus it is evident that stimulus resulted into behavior. Interestingly, Sundel and Sundel (2004) stressed that human behavior is a measurable, observable and positive event. These behaviors include thoughts, perceptions, attitudes and beliefs. Positivism approach allows a researcher to investigate a given phenomenon using hypothetico-deductive methodology (Jankowicz, 2005), hence this study adopts positivism paradigm through empirical evidence. In addition, if a study has obvious problem statements and precised hypotheses, a descriptive research is best way to go (Malhotra, Kim, & Agarwal, 2004).

3.3 Research Design

There are basically two universal approaches to research; qualitative (inductive) and quantitative (deductive) research approaches. However, there is a third one, which is the combination of both, otherwise known as triangulation. The procedure in inductive approach is that in-depth examination of the phenomena is carried out to deeply be acquainted with, and then conceptualize what is known into theory or variables. While in deductive approach, such theories and variables are operationalized and empirical test be conducted to establish association among these variables (Neuman, 2004).

To begin a scientific research project, it is expected of the researcher to make some supposition of what is to be known and how to know it (Creswell, 2009) otherwise known as philosophical assumptions, epistemology and ontology, research paradigm or generally referred as methodology (Crotty, 1998; Neuman, 2004) respectively. As discussed in detailed earlier in philosophical approach section, based on the research

objectives and hypotheses, the current research adopts the quantitative method, to examine the relationship between independent variables and dependent variable, as well as the moderating effect of an interacting term. One of the hallmarks of scientific research is its generalizability, accordingly, quantitative method enables research findings to be generalized (Sekaran & Bougie, 2009).

Other than the above reasons, the researcher chooses quantitative research approach based on the following reasons; first and foremost, the current research is based on a known theory (UTAUT) and the researcher aims to test it in another context. Interestingly, deductive approach starts with a previously developed theory and examines the relationship among variables in the theory (Casebeer & Verhoef, 1997). Secondly, in order to get satisfactory level of confidence and statistical significance, there is need for sufficient samples (Hopkins, 2000), hence quantitative approach gives the researcher the ability to gather sufficient data. Thirdly, several recent studies in the technology adoption literature have used the quantitative approach. For example, Wong *et al.* (2013), Moghavvemi *et al.* (2012), Alrawashdeh *et al.* (2012), Gao and Deng (2012), Zhou (2012), Wu *et al.* (2012), Yu (2012), Deng *et al.* (2011), Carter *et al.* (2011), Yahya *et al.* (2011), Pappas *et al.* (2011), Foon and Fah (2011), Huang and Qin (2011), Cheng *et al.* (2011), Sumak *et al.* (2010), Yamin and Lee (2010), Cheng and Wang (2010) etc., thus the current research adopted the same path to examine the phenomenon.

To answer the research question of this study, survey research design was used; which involves gathering of primary data via a questionnaire. Furthermore, a cross-sectional

survey was used to gather the data at one point in time because it is cheaper, although reliable (Bryman & Bell, 2007).

3.4 Population

The population of the study is all registered members of retail business trade unions in Nigeria. The trade unions cut-across twelve (12) different sectors of the retail industry. The sectors chosen might not be exhaustive, it is based on the definitions of retail business (Cox & Brittain, 2004), classifications of retail industry (Duncan, 1952; Guy, 1998; Phau & Poon, 2000) and the availability of sampling frame the researcher can get access to (Parmjit, Chan, & Gurnam, 2006). Table 3.1 summarised the sectors in the retail industry, source of information and sampling frame.

3.5 Unit of Analysis

The context for this study is retail industry in Nigeria. This study chooses to examine the industry because it is the second largest contributor of Nigerian gross domestic product (GDP) of 20 per cent after agriculture (Kale, 2012). Decision makers in this industry are selected to be participants in this study; either the owner, manager or any other person who is responsible of making decision for the retail business.

Table 3.1
Population of Study from Retail Sectors in Nigerian

SN	Type of Business	Place of POS	Product	Type of Product	Source of Information
1	Books Stores	Payment Counter	Books and Stationeries	Goods	Trade Union
2	Boutique	Payment Counter	Apparels	Goods	Trade Union
3	Bureau de Change	Payment Counter	Currency Exchange	Services	Trade Union
4	Computer Stores	Payment Counter	Computer and Accessories	Goods	Trade Union
5	Electrical & Electronics Stores	Payment Counter	Electronics	Goods	Trade Union
6	Hardware Store	Payment Counter	Equipment and Materials	Goods	Trade Union
7	Automobile	Payment Counter	Car/Motorcycle	Goods	Trade Union
8	Petrol Stations	Payment Counter	Petroleum Products	Goods and services	Independent Petroleum Marketers Association of

					Nigeria (IPMAN)
9	Pharmaceutical Stores	Payment Counter	Drugs	Goods	PSN, ACPN
10	Private Medical Clinics	Payment Counter	Health Services	Services	Nigerian Medical Association (NMA)/ Health Care Providers Association of Nigeria
11	Private Primary/Secondary Schools	Bursary	Educational Services	Services	Ministry of Education/ Trade Union
12	Travel Agencies	Payment Counter	Travel Services	Services	Trade Union

3.6 Sampling Technique

Collecting data from all the members of the population which the researcher is studying is not always feasible according to Hair, Money, Samouel, and Page (2007a), thus the researcher uses a sample out of the whole population under investigation. "A sample is a relatively small subset of the population" (Hair *et al.,* 2007a). To ensure there is objectivity in the sampling procedure, a probability sampling technique was used in this study and selected a representative sample from the total population, as this is often used in quantitative research. Because the population is spread across wide geographic area, collecting data from such a wide area can be very expensive (Trochim & Donnelly, 2008). However, to conclude findings of research, there is need to obtain sample from the whole population (Raj, 1968). The solution here is to determine the appropriate size of a cluster from the population (Cochran, 2007).

Therefore the current study draws its sample using cluster sampling technique. Specifically, the type of cluster sampling; area sampling was used as it not dependent on sampling frame and is less expensive to execute (Sekaran & Bougie, 2009). There are 36 states in Nigeria and the federal capital territory, which are divided into six (6) geo-political zones. The population of the registered retail business is clustered into 6, based on the geo-political zones because there is intra-cluster heterogeneity and inter-cluster homogeneity. Therefore one state was selected based on the states with highest population of registered retail business from each of the six zones as evidenced in Table 3.2. Then all units in the selected states were sampled. This was executed using by

selecting the samples proportionately to the size of the total number of elements in each cluster as evidenced in Sekaran and Bougie (2009).

Table 3.2
Population Frame of Registered Retail Businesses

Zones	SN	Selected States	Number of elements	Proportionate sample
	1	**Niger**	**1,225**	16
	2	Plateau	555	7
	3	Nassarawa	520	7
North Central	4	Kogi	394	5
	5	Kwara	442	6
	6	Benue	475	6
	7	**Bauchi**	**2,130**	27
	8	Adamawa	340	4
	9	Gombe	295	4
North East	10	Maiduguri	835	11
	11	Yobe	198	3
	12	Taraba	241	3
	13	**Kano**	**3,610**	46
	14	Kaduna	1,045	13
North West	15	Jigawa	266	3
	16	Sokoto	442	6
	17	Kebbi	395	5

	18	Zamfara	320	4
	19	Katsina	380	5
	20	**Anambra**	**1,301**	17
	21	Abia	710	9
South East	22	Ebonyi	463	6
	23	Imo	445	6
	24	Enugu	495	6
	25	**Rivers**	**2,921**	38
	26	Edo	285	4
	27	Delta	405	5
South-South	28	Bayelsa	255	3
	29	Cross-River	350	4
	30	Akwa-Ibom	395	5
	31	**Lagos**	**4,136**	53
	32	Oyo	925	12
	33	Ogun	1050	13
South West	34	Osun	450	6
	35	Ekiti	285	4
	36	Ondo	382	5
Total		**36**	**29,361**	377

3.7 Sample Size

The elements under investigation in this study are owner or managers of retail businesses in Nigeria. According to the data available to the researcher from various sources mentioned above, the total population of registered retail businesses is 29,361, thus this study draws its sample size based on Krejcie and Morgan (1970). According Krejcie and Morgan (1970), for a population exceeding 20,000 elements, a minimum sample size of 377 elements is enough, thus this study adopt Krejcie and Morgan (1970)'s suggestion.

The total numbers of registered retail businesses in the six states are 15,323. This is the sum of all the elements in the six selected states. Hence the required samples were proportionately to the number of elements in each selected state. This was calculated by dividing the total sample required by the total number of elements from the selected states, then multiplied by the number of elements in each state respectively. Based on the following formula;

$$nz = (Nz / N) \times n$$

Where nz is the sample size for cluster z, Nz is the population size for cluster z, N is total population size, and n is total sample size. Therefore 377 questionnaires were prepared and administered to the respondents based on the proportion for respective States as shown in Table 3.3.

Table 3.3
Proportionate Sample Size Computation

SN	Zones	Selected States (z)	Number of Elements (Nz)	Total Population (N)	Number of Elements Divide by Total Population (Nz/N)	(Nz / N) x n	Proportionate sample (nz)
1	North Central	Niger	1,225	15,323	0.080	30.139	30
2	North East	Bauchi	2,130	15,323	0.139	52.406	52
3	North West	Kano	3,610	15,323	0.236	88.819	89
4	South East	Anambra	1,301	15,323	0.085	32.009	32
5	South South	Rivers	2,921	15,323	0.191	71.867	72
6	South West	Lagos	4,136	15,323	0.270	101.760	102
	Total	6	15,323				**n = 377**

3.7.1 Sample Size Determination Using Power Analysis

Even where exist model complexity or small sample size, PLS is capable of producing high level of statistical power (Hair, Hult, Ringle, & Sarstedt, 2014). Though, one may question; how small is small? The frequently cited Hulland (1999)'s "10 times rule" answered this enquiry. They recommended that a minimum sample size should be 10 times the number of structural paths pointing at one latent variable in the structural model. Similarly, Tabachnick and Fidell (2007) as cited in Pallant (2011) recommended thus; n=50+(# of independent variables x 8). However, Hair *et al.* (2014) argued that the above guidelines offers an ambiguous rules, therefore data and model characteristics should be considered (Hair, Ringle, & Sarstedt, 2011). Alternatively, Cohen (1992) has earlier provided an efficient way determining sample size by means of power analysis. This is essential because "it is important to determine the sample size necessary to achieve reasonable power" (Lowry & Gaskin, 2014, p. 133). Using a priori power analysis "the necessary sample size is computed as a function of user-specified values for the required significance level, the desired statistical power, and the to-be detected population effect size" (Faul, Erdfelder, Buchner, & Lang, 2009, p. 1149). G*Power 3.1 (Erdfelder, Faul, & Buchner, 1996) was used and conducted a priori power analysis assuming a significance level of 0.05 and medium effect sizes (0.15) as recommended and demonstrated in Lowry and Gaskin (2014) and Hair *et al.* (2014) respectively. The result indicated that, to achieve the statistical power of 80 per cent, a minimum of 118 samples are required as shown in Figure 3.1. Similarly, based on 10 times rule (Barclay, Higgins, & Thompson, 1995) and Tabachnick and Fidell (2007)'s recommendation, this

study requires a minimum of 80 and 90 samples respectively. Therefore the usable cases in this study (165 as discussed in the next section) are adequate to achieve the statistical power of 80 per cent.

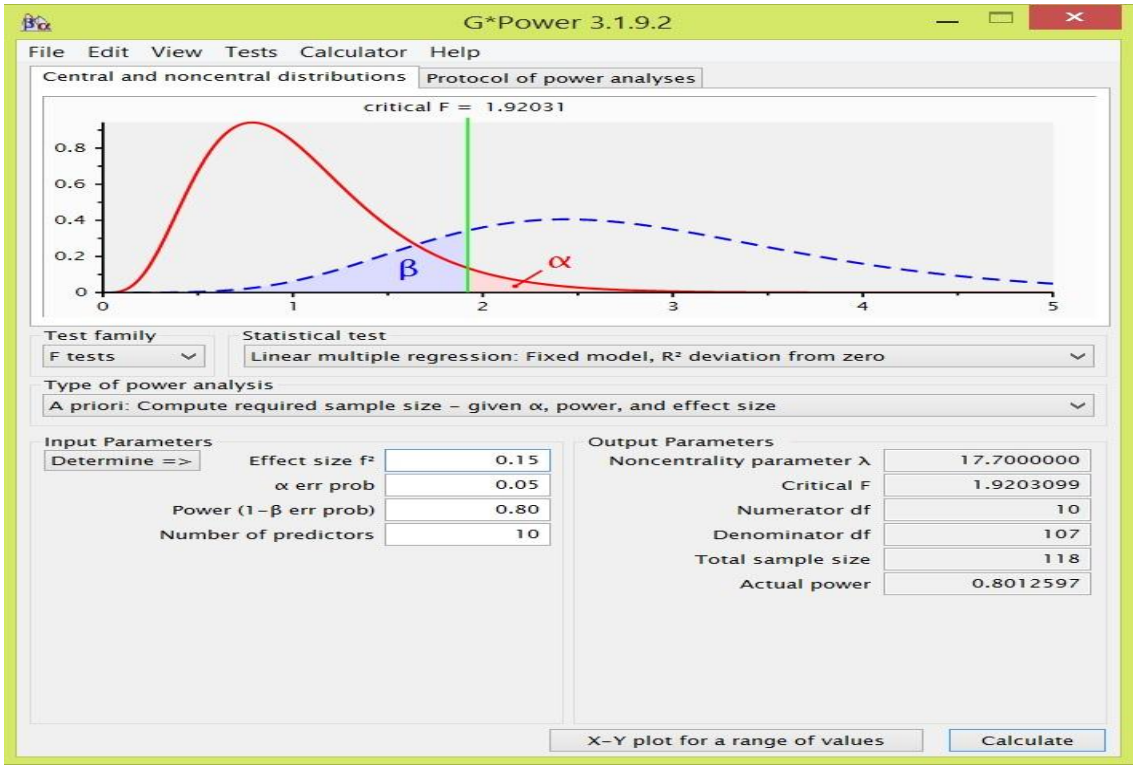

Figure 3.1
*Output of Power Analysis Using G*Power 3.1*

3.8 Operational Definition and Measurement Instruments

All the latent constructs in this study are operationalized reflectively based on the fact that the direction of causality comes from the constructs to their respective indicators (Hair *et al.*, 2014). The measurement items for Customer Concern and Technology Awareness constructs are reflective indicators. Because, although the source of the

measurement (Nambisan *et al.*, 1999; Susskind *et al.*, 2003) did not clearly disclosed if the indicators were reflective or formative, however based on the statements, the direction of causality are from the constructs to the indicators (Diamantopoulos & Winklhofer, 2001). See Table 3.4. In the same way, all the adapted UTAUT constructs in this model were also measured reflectively, see (Venkatesh *et al.*, 2003; Venkatesh *et al.*, 2011b). Consequently, the variables in this study are defined as follows;

1. Behavioural Intention: human extrinsic/intrinsic behaviour that eventually leads into an action for which the intention was initially made

2. Performance Expectancy: the extent to which owners and managers in Nigerian retail industry perceived that using POS will enhance productivity, payment process efficiency and overall performance of their business processes.

3. Effort Expectancy: owners' and managers' anticipated simplicity and/or difficulty of using POS in their businesses.

4. Social Influence: the degree to which the behaviour of owners and managers of retail business is subjected to their perception that other people who are important to them think that they should use POS and that its usage will enhance their business image.

5. Facilitating Conditions: the degree to which owners and managers of retail business perceived that infrastructures such as electricity and internet services and skills and supports are available to ease the use of POS in their businesses.

6. Customer Concerns: the degree of merchant's consideration of their customers in every aspect of the merchant's business processes, particularly the decision to adopt new technology in business.

7. Technology Awareness: the merchant's knowledge of the existence, features, costs, benefit and simplicity or otherwise of using POS in their businesses.

Similarly, all the constructs in this study are one-dimensional as they were in Venkatesh *et al.* (2003). Although the study is underpinned by Venkatesh *et al.* (2003)'s UTAUT, their items were fewer, thus the researcher opted to source measurement items from other different studies that improved these items, to enable the researcher tap more information from the respondents. The improvement which yielded a better result than Venkatesh *et al.* (2003)'s 70 per cent variance explained in behavioural intention. For example, Deng *et al.* (2011) found 74 per cent variance in behavioural intention. Therefore, the instruments are adapted from several previous studies. These items were modified by the researcher to suit the context in which the study is carry out.

Five (5) items for the dependent variable behavioural intention to use POS are adapted from Du *et al.* (2012), over and above the three (3) items in Venkatesh *et al.* (2003). Similarly, independent variables; performance expectancy and effort expectancy will be measured with six (6) items each, adapted from Cheng *et al.* (2008). There are also five (5) items each for social influence and facilitating conditions, adapted from Cheng *et al.* (2008) and Moghavvemi *et al.* (2012) respectively. In Venkatesh *et al.* (2003), there are four (4) items in each of the above mentioned four (4) independent variables. Finally, for

the newly introduced variable of 'Customer Concerns' and the moderating variable of 'technology awareness', five (5) items were used to measure each of the variables. The items are adapted from Susskind *et al.* (2003) and Nambisan *et al.* (1999) respectively. Although these items were subjected to a pilot testing, the coefficient alphas of the items in these studies exceeded the recommended threshold of 0.7 set by Nunnally and Bernstein (1978). Table 3.4 summarised the modification of the original items and source.

3.9 Questionnaire Design

As discussed earlier, the items in the questionnaire are adapted extant literature. There are six parts in the questionnaire namely (1) introduction, (2) what is point of sale terminal (POS), (3) exclusion/inclusion questions, (4) respondent's particulars, (5) particulars of business and (6) variables in the study. The introductory part is a well formatted official letter written and addressed to the respondent. The letter contains the researcher's program of study and the purpose of the research, then some persuasive words to convince the respondents to answer the questionnaire. Part two demonstrates to the respondents what is and how POS works, with some images of the device. Part three asks questions about the respondents' personal information such as age and gender. Part five asks questions such as location and nature of business of the organization or retail store which the respondent is representing.

Table 3.4
Modification of the Instruments

SN	SOURCE	VARIABLES/ITEMS	
		ORIGINAL FROM SOURCE	**MODIFIED BY THE RESEARCHER**
		Behavioural Intention To Use	**Behavioural Intention To Use POS**
1	Du *et al.* (2012)	I intend to use 3G value	I intend to use POS in my business in the next three months
2	Du *et al.* (2012)	I will spend more time to pay attention on 3G value	I will spend more time to pay attention on POS
3	Du *et al.* (2012)	It is necessary to use 3G value	I feel it is necessary to use POS in one's business
4	Du *et al.* (2012)	I will recommend 3G value	I will recommend POS to others
5	Du *et al.* (2012)	I am willing to use 3G value	I am willing to use POS in my business
		PERFORMANCE EXPECTANCY	**PERFORMANCE EXPECTANCY**
6	Cheng *et al.* (2008)	I would find Internet banking useful in my daily life.	I would find POS useful in my business.
7	Cheng *et al.* (2008)	Using Internet baking would enable me to conduct transactions more quickly.	Using POS would enable me to perform transactions more quickly.
8	Cheng *et al.* (2008)	Using Internet banking would increase my productivity.	Using POS would increase my business productivity.
9	Cheng *et al.* (2008)	Using Internet banking would improve my performance.	Using POS would improve my business performance.
10	Cheng *et al.* (2008)	Using Internet banking would enhance my transaction quality.	Using POS would enhance my business transaction quality.
11	Cheng *et al.* (2008)	Using Internet banking would multiply my efficiency.	Using POS would multiply my business process efficiency.
		EFFORT EXPECTANCY	**EFFORT EXPECTANCY**
12	Cheng *et al.* (2008)	I would find my interaction with the Internet clear and understandable.	I would find my interaction with the POS clear and understandable.
13	Cheng *et al.* (2008)	Learning to use Internet banking would not take much of my time.	Learning to use POS would not take much of my time.
14	Cheng *et al.* (2008)	I would find Internet banking easy to use.	I would find POS easy to use.

15	Cheng *et al.* (2008)	It would be easy for me to become skillful at using Internet banking.	It would be easy for me to become skilful at using POS
16	Cheng *et al.* (2008)	I would find Internet banking to be flexible to interact with.	I would find POS to be flexible to interact with.
17	Cheng *et al.* (2008)	Working with the Internet is not complicated; it is easy to understand what is going on.	Working with the POS is not complicated; it will be easy to understand the process.
		SOCIAL INFLUENCE	**SOCIAL INFLUENCE**
18	Cheng *et al.* (2008)	People who supervise me (e.g., leaders, teachers, etc) think that] should use Internet banking.	People who supervise me (e.g., regulatory agencies' officials etc) think that I should use POS.
19	Cheng *et al.* (2008)	People who are important to me (e.g., family, friends) think that I should use Internet banking.	People who are important to me (e.g., family, friends) think that I should use POS.
20	Cheng *et al.* (2008)	The senior management of the bank has been helpful in the use internet banking.	Central Bank of Nigeria will be helpful in the use POS
21	Cheng *et al.* (2008)	The bank has supported the use of Internet banking.	My bank will support the use of POS.
22	Cheng *et al.* (2008)	People around me who use Internet banking have high status and prestige.	Businesses around me that use POS have high status and prestige.
		FACILITATING CONDITIONS	**FACILITATING CONDITIONS**
23	Moghavvemi *et al.* (2012)	I have resource necessary to use the IT innovation in my business.	I have resource necessary to use the POS in my business.
24	Moghavvemi *et al.* (2012)	I have the knowledge necessary to use the IT innovation.	I have the knowledge necessary to use the POS in my business.
25	Moghavvemi *et al.* (2012)	There is external/internal support group available for assistance with IT innovation difficulties.	There is external/internal support group available for assistance with POS difficulties.
26	Moghavvemi *et al.* (2012)	New innovation is not compatible with other IT systems I use*.	POS is compatible with other systems I use
27	Moghavvemi *et al.* (2012)	There are special allocations (i.e. loan, intensive) for using IT innovation for entrepreneurs, from government	There are special incentives from the government for using POS in business

		CUSTOMER ORIENTATION	CUSTOMER CONCERN
28	Susskind *et al.* (2003)	When performing my job, the customer is most important to me.	When performing business, the customer is most important to me.
29	Susskind *et al.* (2003)	It is best to ensure that our customers receive the best possible service available.	It is good to ensure that our customers receive the best possible service available.
30	Susskind *et al.* (2003)	If possible, I meet all requests made by my customers.	If possible, I meet all requests made by our customers.
31	Susskind *et al.* (2003)	As an employee responsible for providing service, customers are very important to me.	As the owner or manager of this business, our customers are very important to me.
32	Susskind *et al.* (2003)	I believe that providing timely, efficient service to customers is a major function of my job.	I believe that providing timely, efficient service to customers is a major function as the owner or manager of this business
		TECHNOLOGY COGNIZANCE	**TECHNOLOGY AWARENESS**
33	Nambisan *et al.* (1999)	I know the features of the technologies	I am aware of the features of POS
34	Nambisan *et al.* (1999)	I am aware of the cost of deploying the technologies	I am aware of the cost of deploying POS
35	Nambisan *et al.* (1999)	I don't know the type of benefits that can be derived by deploying the technologies*	I know the type of benefits that can be derived by deploying POS
36	Nambisan *et al.* (1999)	I know the extent of benefits that can be derived by deploying the technologies	I know the extent of benefits that can be derived by deploying POS
37	Nambisan *et al.* (1999)	I don't know the type of business activities in which these tech. have been/can be deployed*	I know the type of business activities in which these POS have been/can be deployed

Note: * Negatively worded statements were reversed

Finally, part six, which are statements (items) about the variables in the study namely; behavioural intention to use POS, performance expectancy, effort expectancy, social influence, facilitating conditions, customer concerns and technology awareness. This part, which contained thirty seven (37) items, asked the respondents to indicate their level of agreement or disagreement about the statements drawn to represent each of the variables. Since there has been widely adoption of five-point Likert scale in social science research (Martins & Garland Jr, 1991) and because it was argued that they produce nearly similar precision with other Likert scales (Dawes, 2008; Sekaran & Bougie, 2009), and the fact that Likert scale above five point often confuses the respondents (Ackfeldt & Coote, 2005), the current research items was measured using a five-point Likert scale. Furthermore, the questionnaire was formatted professionally, so that it appeals the respondents. A complete set of the questionnaire is hereby attached as Appendix A.

3.10 Pilot testing

This part of the study examined the reliability and validity of the instrument, which is proposed to measure an extended Unified Theory of Acceptance and Use of Technology (UTAUT) model. As earlier discussed in the literature review section, the extended model has a total of six exogenous variables namely; performance expectancy, effort expectancy, social influence, facilitating conditions and customer concerns and one endogenous variable; behavioural intention. 37 items that measure the variables are adapted from extant literature, thus modified to suit the Nigerian retail context. Therefore the instrument required a series of validity and reliability assessment to ensure

completeness and clarity of the measures. Thus the items were subjected to face validity and factor analysis. Therefore the adapted items were modified, designed the questionnaire, and conducted the face validity. 26 valid data were gathered in a pilot survey, from owners/managers of retail businesses in Nigeria. 26 valid data is considerably adequete for a pilot study. Chin and Newsted (1999) confirmed that PLS-SEM technique tolarate fewer sample size for analysis, Similarly see (Chiu, Chang, Cheng, & Fang, 2009) and (Ngai & Gunasekaran, 2004). The data were analysed using SmartPLS 2.0 software. Result of Partial Least Square – Structural Equation Modeling (PLS-SEM) measurement model indicated a good validity and reliability of the measures. All the values for Average Variance Extracted (AVE), Composite Reliability, Discriminant and Convergent Validity and Factor Loadings met and exceeded the minimum threshold; therefore the current measures are retained for a full-scale study of the extended model.

3.10.1 Procedure

An exhaustive literature review was carried out, following which the measurement instrument were identified. These items are modified to suit the Nigerian retail context. The questionnaire was tested for face validity through experts review. 50 questionnaires were prepared and personally administered to retail owners/managers in Bauchi metropolis. 26 valid data were obtained. PLS-SEM was used to analyse the data as it is a predictive technique (Sanchez-Franco, 2006). PLS-SEM is an analyses technique that allows simultaneous test of multiple variables for predictive models (Wold, 1974, 1982). Chin (1998a) maintained that PLS-SEM can be used for both confirmation and

development of theory. Recently, there has been widespread use of PLS-SEM technique as a main analysis technique for multivariate research in various business and management fields (Wold, 1982). Ringle, Wende, and Will (2005) argued that the robustness of PLS-SEM enable a test of several relationships simultaneously, thus produces an enhanced, valid and reliable conclusion better than covariance based analysis technique. PLS-SEM can be run with fewer sample size and non-normal data (Chin, 1998a; Chin & Gopal, 1995; Compeau & Higgins, 1995; Lohmöller, 1989). Therefore, SmartPLS 2.0 software (Ringle *et al.*, 2005) was used to analysed the data.

3.10.2 Pilot Instrumentation

Although the study is underpinned by Venkatesh *et al.* (2003)'s UTAUT, their items were fewer, thus the reseracher opted to source measurement items from other different studies that improved these items, to enable us tap more information from the respondents. The improvement which yielded a better result than Venkatesh *et al.* (2003)'s 70 per cent variance explained in BI. For example, Du *et al.* (2012) found 74 per cent variance in BI. Therefore, the instruments are adapted from several previous studies. These items were modified by the researcher to suit the context in which the study is carry out. Five (5) items for the dependent variable behavioural intention to use POS are adapted from Du *et al.* (2012), over and above the three (3) items in Venkatesh *et al.* (2003). Similarly, independent variables; PE and EE will be measured with six (6) items each, adapted from Cheng *et al.* (2008). There are five (5) items each for SI and FC, also adapted from Cheng *et al.* (2008) and Moghavvemi *et al.* (2012) respectively. Finally, for the newly introduced variable, CC and AW, five (5) items will be used to

measure each of the variables. The items are adapted from Susskind *et al.* (2003) and Nambisan *et al.* (1999) respectively.

3.10.3 Pilot Questionnaire Design

As discussed earlier, the items in the questionnaire are adapted from extant literature. There are six parts in the questionnaire namely (1) introduction, (2) what is point of sale terminal (POS), (3) exclusion/inclusion questions, (4) respondent's particulars, (5) particulars of business and (6) variables in the study. The introductory part is a well formatted official letter written and addressed to the respondent. The letter contains the researcher's program of study and the purpose of the research, then some persuasive words to convince the respondents to answer the questionnaire. Part two demonstrates to the respondents what is and how POS works, with some images of the device. Part three asks questions about the respondents' personal information such as age and gender. Part five asks questions such as location and nature of business of the organization or retail store which the respondent is representing.

Finally, part six, which are statements (items) about the variables in the study. This part, which contains thirty seven (37) items, asks the respondents to indicate their level of agreement or disagreement about the statements drawn to represent each of the variables. Since there has been widely adoption of five-point Likert scale in social science research (Martins & Garland Jr, 1991) and because it was argued that they produce nearly similar precision with other Likert scales (Sekaran, 2003b). Therefore,

the current research items will be measured using a five-point Likert scale. Furthermore, the questionnaire will be formatted professionally, so that it appeals the respondents.

3.10.4 Pilot Testing

It is important to assess the goodness of measure of the instrument prior to full scale study thus the instrument of the current study undergoes item analyses namely; reliability and validity. Reliability is the assessment of the consistency of instrument in measuring the concept it is intended to measure (Sekaran & Bougie, 2009), while validity is the assessment of how well the instrument measure the concept (Creswell, 2012; Sekaran & Bougie, 2009). There are several forms of reliability and validity. For the purpose of this research, face, discriminant and convergent validity and internal consistency are assessed through experts' reviews and factor analysis respectively.

3.10.5 Face Validity

In order to ensure completeness and clarity of the measures a suggested by Creswell, (2009) the questionnaire was presented to experts to determine the face validity of the questions. First, the questionnaire was presented to a visiting senior lecturer at the Othman Yeop Abdullah Graduate School of Business, University Utara Malaysia, who is an expert in statistics, gave his comments, which were adopted. The questionnaire was then presented to a senior lecturer at Abubakar Tafawa Balewa University, Nigeria and a Professor at College of Business, University Utara Malaysia, who are experts in technology management and organizational behaviour respectively. They also reviewed

and gave some useful feedbacks, which were considered in the refinement of the questionnaire.

3.10.6 Results of Pilot Testing

PLS Factor Analysis Results

The PLS standard algorism was calculated in SmartPLS software 2.0 (Ringle *et al.*, 2005) and obtained the factor loadings and cross-loadings. The result indicated that loadings for all the items ranged from 0.622 to 0.943, which is consider acceptable in exploratory research (Hair *et al.*, 2014). However, BI3, EE1-3 and FC5 items loaded 0.583, 0.535, 0.567, 0.528 and 0.466 respectively as shown in Figure 3.2. These values appeared to be low based on (Fornell & Larcker, 1981b) criterion, however, indicators for every construct loaded higher in their respective construct above the cross-loadings in other constructs. This indicates a good internal consistency of the measures.

Internal Consistency and Convergent Validity (CV)

Composite reliability (CR), AVE and factor loadings were used to evaluate the internal consistency based on Hair, Black, Babin, and Anderson (2010) criteria. CV is a degree of agreement among multiple items in measuring a particular concept. Factor loading for each item should be greater than 0.7 (Fornell & Larcker, 1981b). However, Hair *et al.* (2014) argued that indicator loading above 0.4 can be retained, unless if its deletion can improve the AVE or CR loadings. Interestingly, the AVE and CR values have exceeded the 0.5 (Bagozzi & Yi, 1988; Fornell & Larcker, 1981a; Hair *et al.*, 2010) and 0.7

(Gefen, Straub, & Boudreau, 2000; Hair *et al.*, 2010) benchmarks respectively as depicted in Table 3.5. Furthermore, all the items are significant at ranging from p. value 0.000 to 0.035, except for FC5, which is also significant, however at 10 per cent significance level.

Discriminant validity

This is the extent of how indicators actually represent a construct and how they are different from other construct (Hair *et al.*, 2014). According to Venkatesh and Morris (2000), the square root of AVE value for each construct should be greater than the value of correlations with other construct. The highest correlation among the construct is 0.771 between behavioral intention and social influence, while the lowest value of square root of AVE is 0.823 for performance expectancy. Table 3.6 illustrates that the square root of the constructs' AVE are above the value of correlations of the respective constructs with the rest of them. This is in line with Compeau *et al.* (1999)'s criteria.

This section discussed how the researcher sought and validated measurement instruments which are proposed to measure constructs in the extended UTAUT model, for a full scale study in Nigerian retail industry context. The instrument passed through series of assesments of validation namely; face validity, convergent validity, discriminant validity and reliability. The assesment became necessary in order to ascertain if the instruments will measure what it is intended to measure (Sekaran, 2003a) and because an instrument that was developed and tested in one context may not suit another context (Brett, Tinsley, Janssens, Barsness, & Lytle, 1997).

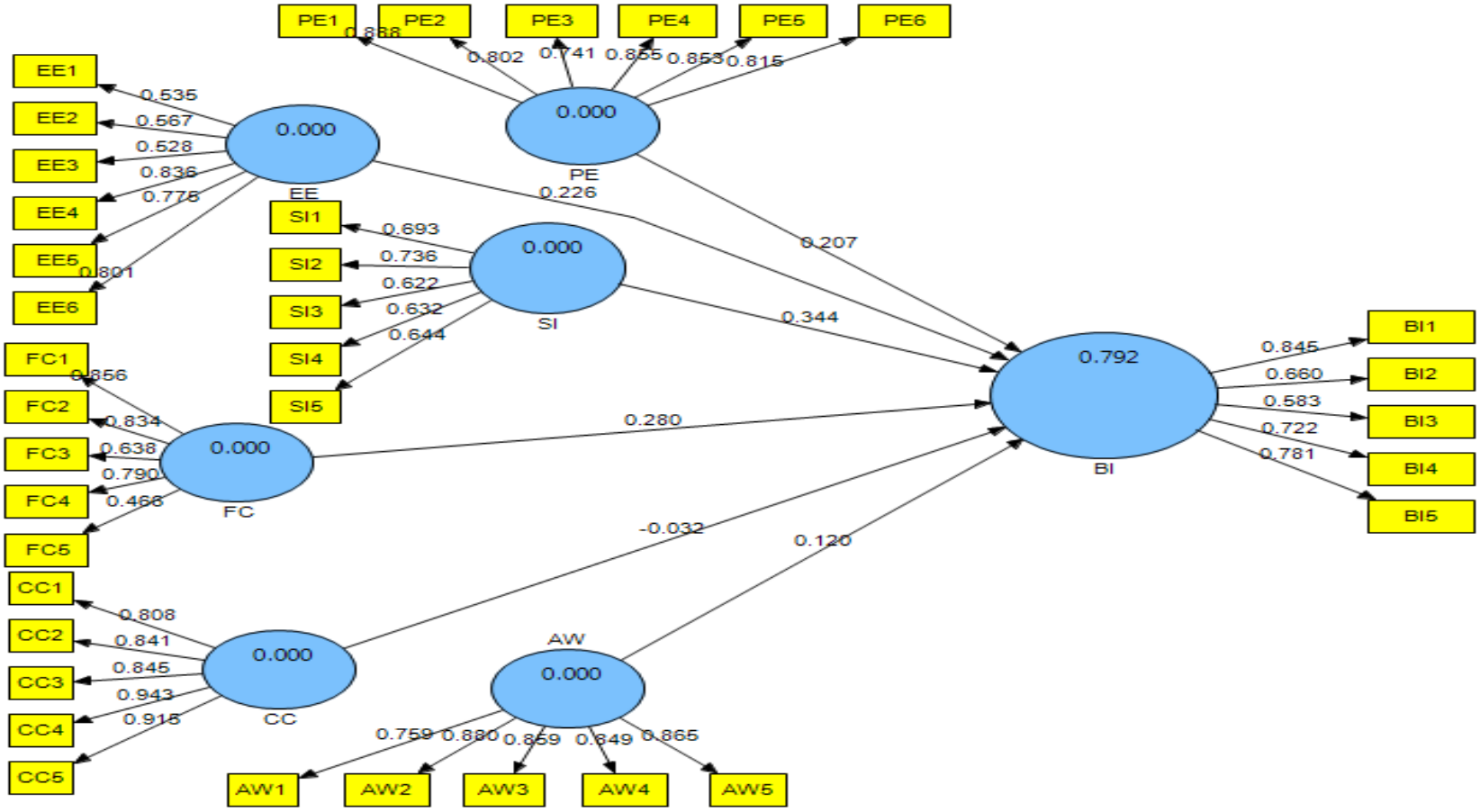

Figure 3.2
The Measurement Model

Table 3.5
Convergent Validity, Reliability and Significance of the Loadings

Construct	Items	Loadings	T Value	P Value	CR	AVE
1) Technology Awareness	AW1	0.759	7.243	0.000	0.925	0.711
	AW2	0.880	10.303	0.000		
	AW3	0.859	15.003	0.000		
	AW4	0.849	15.080	0.000		
	AW5	0.865	8.319	0.000		
2) Behavioral Intention	BI1	0.845	10.652	0.000	0.865	0.681
	BI2	0.660	2.683	0.007		
	BI3	0.583	2.939	0.004		
	BI4	0.722	5.085	0.000		
	BI5	0.781	9.547	0.000		
3) Customer Concerns	CC1	0.808	3.132	0.002	0.940	0.760
	CC2	0.841	2.435	0.011		
	CC3	0.845	2.518	0.009		
	CC4	0.943	3.639	0.001		
	CC5	0.915	3.654	0.001		
4) Effort Expectancy	EE1	0.535	3.097	0.002	0.890	0.730
	EE2	0.567	2.761	0.005		
	EE3	0.528	2.862	0.004		
	EE4	0.837	11.173	0.000		
	EE5	0.775	5.866	0.000		

	EE6	0.801	10.765	0.000		
5) Facilitating Conditions	FC1	0.856	7.885	0.000	0.872	0.694
	FC2	0.834	5.369	0.000		
	FC3	0.638	1.890	0.035		
	FC4	0.790	3.714	0.001		
	FC5	0.466	1.168	0.127		
6) Performance Expectancy	PE1	0.888	6.810	0.000	0.926	0.678
	PE2	0.802	3.061	0.003		
	PE3	0.741	3.181	0.002		
	PE4	0.855	5.548	0.000		
	PE5	0.853	6.248	0.000		
	PE6	0.815	3.152	0.002		
7) Social Influence	SI1	0.693	3.841	0.000	0.915	0.843
	SI2	0.736	4.702	0.000		
	SI3	0.622	3.678	0.001		
	SI4	0.632	3.463	0.001		
	SI5	0.644	4.272	0.000		

Table 3.6
Discriminant Analysis Result

Latent Variables	AW	BI	CC	EE	FC	PE	SI	AVE
1) Technology Awareness	**0.843**							0.711
2) Behavioural Intention	0.641	**0.825**						0.681
3) Customer Concerns	-0.128	0.224	**0.872**					0.760
4) Effort Expectancy	0.455	0.679	0.550	**0.855**				0.730
5) Facilitating Conditions	0.671	0.672	-0.009	0.302	**0.833**			0.694
6) Performance Expectancy	0.361	0.557	0.337	0.578	0.199	**0.823**		0.678
7) Social Influence	0.440	0.771	0.232	0.615	0.585	0.380	**0.918**	0.843

Note: The values in the diagonals cells **(bold)** are the square root of the AVE while the un-bolded values are the correlations

37 items measures were adapted from extant literature and modified them in accordance with Nigerian retail context. Out of the 50 questionnaire that was administered to the participants, 26 were returned as usable. The mesurement model was estimated and the result indicated a sufficient statistical justification that the items are doing the job they ought to do. However, the loadings in some of the items are relatively low, eg E1-E3 and FC5, but the values reliability and validity of the construct, for example, Composite Reliability and Average Variance Extracted have met and exceeded the minimum recommended values for acceptable measures (Compeau *et al.*, 1999; Gefen *et al.*, 2000; Hair *et al.*, 2010). Thus the measures are retained for the full-scale study, because their removal will not enhance the AVE (Hair *et al.*, 2014). Furthermore, while the objective the pilot study was not to calculate the structural model, however, upon calculating the PLS algorism, the model was able to explain 79.2 per cent variance in behavioral intention, which is substantial (Chin, 1998a).

3.11 Recruitment of Enumerators

According to National Youth Service Corps decree No.24 of 1973, in Nigeria, it is mandatory for every bachelor's degree graduate, who is under the age of thirty as at time of graduation, to undergo a one-year national service called National Youth Service Corps (NYSC). About 200,000 graduates are randomly posted across the thirty six (36) states of Nigeria and FCT to serve at various government establishments and private sector organizations (National Youth Service Corps, 2013). Being in a new place other than their state of origin, the corps members form various voluntary organizations, which include the Christian and Muslims organizations. The Muslims organization is

called Muslim Corpers' Association of Nigeria (MCAN). MCAN is highly organized and respected organization, with a branch across all 774 local governments' areas in the 36 states of the country and FCT.

The researcher collaborated with MCAN executives, who assist in recruiting enumerators from the pool of their honest and competent members. Three enumerators for each of the selected state in each of the six geo were recruited to facilitate the distribution of questionnaires, assisted the respondents in filling the questionnaires, follow-up deferred collection and gathered all the filled questionnaires. The researcher trained the enumerators on how to carry-out the data collection. At the end of the exercise, the enumerators were paid a stipend, based on negotiation mediated by MCAN. Recruitment of enumerators for survey research can be seen in David-West (2012), Guriting and Ndubisi (2006) etc.

3.12 Data Collection Procedure

Data for the study was collected face-to-face through the use of survey questionnaires. A total of 377 questionnaires were sent to each of the selected state from the six (6) geo-political zones. The researcher personally monitored the distribution of the questionnaire to the respondents by the enumerators. This study adapts the survey procedures employed by Chin and Gopal (1995) and Chuan-Chuan Lin and Lu (2000). The researchers demonstrated to the intended participants of their studies how the particular system they were conducting study on functions. The procedure includes hands-on training session on the use of the system, a written page of description of the system

under study and/or a videotape show describing the system. The above method is valuable for its ease of execution (Chin & Gopal, 1995). A one page of description of POS was presented to the participants of the survey to familiarized themselves with the function and 'how it works' of the system, with pictures of different types, colours and sizes of the device displayed on the first page of the questionnaire. The period of the data collection lasted for three (3) month.

3.13 Analysis Technique

Partial Least Square - Structural Equation Modeling (PLS-SEM) was used to analyse the data as it is a predictive technique (Sanchez-Franco, 2006). PLS-SEM, a second generation multivariate analysis technique, is a variance based structural equation modeling (VBSEM) technique developed by Herman World in 1975. Similar to covariance based structural equation modeling (CBSEM), PLS-SEM is multiple regression analyses that allows simultaneous test of multiple variables for predictive models (Wold, 1974, 1982). (Chin, 1998a) maintained that PLS-SEM can be used for both confirmation and development of theory.

3.13.1 Descriptive Statistics

The analysis of the data begins with descriptive statistical analysis in two fold; descriptive statistics of the demographic variables and statistical analysis of measurement items. Demographic variables describes the respondents based on their age, gender, educational level etc., thus the descriptive statistics provides a frequency of

distribution of the respondents. Also the profile of the retail stores involved in the study was analysed. Finally, the statistics of the measurement items was also analysed.

3.13.2 Measurement Model: Construct Validity Analysis

Construct validity is the degree to which a set of measured items actually reflect the theoretical latent construct they are designed to measure (Sekaran & Bougie, 2009). The measurement model assessment was carried out using the confirmatory factor analysis (CFA) to assess the (1) convergent validity, (2) discriminant validity and (3) reliability. One of the leading advantages of CFA/SEM is its ability to assess the construct validity of a proposed measurement theory. The convergent validity was assessed through the factor loadings and composite reliability as well as average variance extracted AVE. Then the square root of the AVE was computed to assess the discriminant validity. This is in line with Lee, Petter, Fayard, and Robinson (2011) recommendations. Furthermore, Venkatesh *et al.* (2003) suggested the assessment of reliability by internal consistency reliability (ICR).

3.13.3 Structural Model

As the objective of the study depicts, the model is set to predict owner/manager's behavioural intention to use POS, interestingly, PLS-SEM is an appropriate analysis technique for model prediction (Sanchez-Franco, 2006), thus the analysis was conducted through the use of SmartPLS V2.0 M3 software package Ringle *et al.* (2005). In testing the hypothesis a significant level of 0.05 (Stigler, 2008) is set based on Fisher (1925)'s

recommendation of statistical significance level. First of all, a direct hypotheses were tested then a moderating effect. The model was assessed based on the values of path coefficient, standard error, t-value and p-value. Decision for supported or not supported hypothesis was based on the path coefficient value and p-values. T-value greater than 1.96 and p-value less than 0.05 were considered significant and supported respectively.

Recently, there has been widespread use of PLS-SEM technique as a main analysis technique for multivariate research in various business and management fields (Wold, 1989). For example, Henseler, Ringle, and Sinkovics (2009) in international business, Lee *et al.* (2011) in accounting, Hair, Sarstedt, Ringle, and Mena (2012) in marketing and Peng and Lai (2012) in operations management. Specifically in the domain of management information systems research, several researchers used the PLS-SEM. For example, Wills *et al.* (2008) electronic medical records, Lai *et al.* (2009) mobile commerce, Lu *et al.* (2010) online services, Fillion *et al.* (2011) enterprise resource planning and Yu (2012) mobile banking etc.

Unlike other analysis techniques in which a number of separate analyses must be run, Ringle *et al.* (2005) argued that the robustness of PLS-SEM enable a test of several relationships simultaneously, thus produces an enhanced, valid and reliable conclusion better than covariance based analysis technique. Furthermore multicollinearity problem is not an issue in PLS-SEM, as factors are orthogonal. In addition, PLS-SEM technique works perfectly even with as fewer as 20 sample size (Chin, 1998b; Chin & Gopal, 1995; Compeau & Higgins, 1995). However, Hulland (1999) suggested the ‘rule of 10’ in order to determine sample size. Also in PLS-SEM, the multivariate normality

assumption is not necessarily required to be met (Lohmöller, 1989). Interestingly, PLS was found to have outweighed CBSEM (Qureshi & Compeau, 2009). Similarly, due to the assumptions of CB-SEM such as large sample size, normality etc., which might not necessarily be met, PLS is preferred. It is therefore recommended that "if CB‐SEM assumptions cannot be met, or the research objective is prediction rather than confirmation of structural relationships, then variance-based PLS‐SEM is the preferred method" (Hair *et al.*, 2011, p. 139). Incidentally, the objective of this study is to predict managers' behavioural intention to adopt payment process change, as well as extending UTAUT.

3.14 Summary

This chapter discussed the research design through which the research questions were answered and objectives achieved. Quantitative research design is opt for in order to explain the phenomenon. Operationalization of the variables in the study was discussed. Furthermore, the chapter discussed the population, unit of analysis and sampling technique used for the study. The population of the study is registered retail businesses in Nigeria, while unit of analysis is the owner or manager of the retail business. The proposed analysis technique is PLS-SEM, thus SmartPLS V2.0 M3 was used to analyse the data. Based on the available records of registered retail businesses in Nigeria, cluster random sampling technique is considered appropriate. Questionnaire design, data collection procedure was also discussed.

CHAPTER FOUR
DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter described the procedure the researcher followed to analyze the data and the justification for using the particular analysis technique. First of all, the returned questionnaires were checked for incomplete or straight-line responses, and then keyed into SPSS data editor. These screenings are in line with procedures recommended in a number of texts such as Sekaran and Bougie (2009), Kumar, Talib, and Ramayah (2013), Creswell (2002) etc. Data were then checked for missing values, outliers, normality and multicollinearity. Demographic characteristics of the data were obtained through descriptive statistics, to help describe the composition of respondents and the retail business they represented. The model was assess in two stages, measurement and structural models, as suggested in various literature, for example Henseler and Fassott (2010), Hair *et al.* (2014), Diamantopoulos and Siguaw (2006) etc. The measurement model was assess using convergent and discriminant validity, composite reliability and Average Variance Extracted (AVE), based on Fornell and Larcker (1981a), Chin (1998a), Gefen *et al.* (2000), Bagozzi and Yi (1988) etc. criteria. While the structural model was assess using coefficient of determination (R^2), effect sizes (f^2), predictive relevance (Q^2) and effect sizes (q^2) based on Chin (1998a), Cohen (1988) and Fornell and Cha (1994) criteria respectively. Finally, hypothesis was tested for direct and moderating paths using bootstrapping procedure as described in Hair *et al.* (2014). Summary of the whole chapter was highlighted at the end of the chapter.

4.2 Data Collection and Responses

The data collection begun in early November, 2013, then after several follow ups for retrieval of the questionnaire (see Appendix B), the survey was called off at the end of January, 2014. Out of the 600 hundred questionnaires distributed across six states from six geo-political zones in Nigeria namely; Bauchi (North East), Kano (North West), Niger (North Central), Lagos (South West) Anambra (South East) and Porthacourt (South South), 198 were returned. The retrieved questionnaires represents 53 per cent response rate. Interestingly, according to Iacobucci and Churchill (2009), O'Sullivan and Abela (2007), response rate of 12 to 20 per cent is satisfactory. Furthermore, the retrieved responses are considered sufficient for the following reasons. First of all, considering the costs associated with more follow ups (Armstrong & Overton, 1977), because the survey locations are scattered across six geo-political zones in Nigeria as mentioned above. Furthermore, the fact that the respondents are retailers, therefore are always busy with customers thus could not give time to answer the questionnaire even after several follow up visits (See Appendix B for schedule of survey visits). As a result of that, the survey had to be called off. Secondly, the retrieved responses (198) is adequate because the analysis technique tolerate small sample size (Hair *et al.*, 2014), in line with (Chin & Newsted, 1999; Hui & Wold, 1982)'s earlier studies, and more recently Reinartz, Haenlein, and Henseler (2009), which confirmed well performance of PLS-SEM analysis with small sample. Further justification for the sample size is based on power analysis as discussed in sample size section.

4.4 Data Preparation and Screening

The responses were checked to ascertain if there are omissions, inconsistency, straight line response or ambiguity. Out of the 198 retrieved questionnaires, 165 are valid while 33 are dropped because of the following reasons; six (6) of them have inconsistent information (for example, see Appendix C2), eleven (11) have substantial part with missing values, while sixteen (16) of them are significantly straight line responses. In such instances, Kumar *et al.* (2013) recommended that such cases to be thrown out.

4.4.1 Data Coding and Detection of Entry Error

Statistical Package for Social Sciences (SPSS) version 19 was used for coding and data entry. The SPSS variable view was customized to suit the analysis objectives. First of all, each case was given a serial number to help in detecting outlier cases easily. Then the demographic variables are labeled accordingly, while all the items in the questionnaire are label with a code as follows; performance expectancy items are labeled as PE1-PE6, effort expectancy as EE1-EE6, social influence as SI1-SI5, facilitating conditions as FC1-FC5, Customer Concerns as CC1-CC5, technology awareness as AW1-AW5 and behavioral intention as BI1-BI5, all in separate columns respectively. The decimal, width, values, type are also specified in accordance with data coding and entry procedure demonstrated in (Coakes & Steed, 2009; Green & Salkind, 2010). After the data was keyed-in, a frequency was run to detect data entry error. There were 3 errors detected, which are ‘out of range’ entry error. The errors were corrected accordingly.

4.4.2 Analysis of Missing Values

A number of analysis technique do not tolerate data with missing value (Hair *et al.*, 2010),. Therefore two sets of analysis were conducted; first, to verify if the missing data has a definite pattern or is missing arbitrarily, otherwise known as missing at random (MAR) or completely i.e. missing completely at random (MCAR) and secondly, to ascertain the rate of the missing data . It was found that the missing values have no specific pattern, therefore it is MCAR (Hair *et al.*, 2010).

Performance expectancy variable item number 5 (PE5) was found with the highest cases of missing value among the variables in the theoretical framework. Three (3) missing values were detected in the variable. This was followed by facilitating conditions (FC1 and FC5) and technology awareness (AW3) with two (2) missing values each, while social influence (SI4) has one (1) missing value. No missing value was detected in behavioral intention, which is the dependent variable in this study, customer concern and effort expectancy as shown in Table 4.1. Cohen and Cohen (1983) argued that a missing might be problematic, if the total value of missing value is above 10 per cent. Interestingly, the total missing value in this study is less than five (5) per cent; (see Appendix D) therefore it was remedied using mean replacement as suggested in (Kumar *et al.*, 2013). Daily sales demographic factor have eight (8) missing values, which is the highest among the demographic variables. The retailers might be hesitant to disclose their daily sales in order to evade tax (Fagbemi, Uadiale, & Noah, 2010) or due to fear of financial fraud, which are of frequent occurrence in Nigeria (Gbegi, 2013; Hamilton & Gabriel, 2012). Other demographic variable related to the businesses recorded no

missing value. However, demographic information related to personal information of the respondents such as gender, age, marital, status, education and position recorded two (2), seven (7), six (6), six (6), and two (2) missing values respectively. This might be due to privacy issues, however, the respondents were assured on the questionnaire, that their identity will be anonymous (see Appendix A).

Table 4.1
Missing Value Analysis

		Particulars of Respondents					
		Gender	Age	Marital Status	Education	Position	
N	Valid	163	158	159	159	163	
	Missing	2	7	6	6	2	
Particulars of Retail Business							
		Location	Age	Daily Sales	# of Staff	Sector	
N	Valid	165	165	157	165	165	
	Missing	0	0	8	0	0	
Performance Expectancy							
		PE1	PE2	PE3	PE4	PE5	PE6
N	Valid	165	165	165	165	162	162
	Missing	0	0	0	0	3	0
Effort Expectancy							
		EE1	EE2	EE3	EE4	EE5	EE6
N	Valid	165	165	165	165	165	165
	Missing	0	0	0	0	0	0

Social Influence

		SI1	SI2	SI3	SI4	SI5
N	Valid	165	165	165	164	165
	Missing	0	0	0	1	0

Facilitating Conditions

		FC1	FC2	FC3	FC4	FC5
N	Valid	163	165	165	165	163
	Missing	2	0	0	0	2

Customer Concern

		CC1	CC2	CC3	CC4	CC5
N	Valid	165	165	165	165	165
	Missing	0	0	0	0	0

Technology Awareness

		AW1	AW2	AW3	AW4	AW5
N	Valid	165	165	163	165	165
	Missing	0	0	2	0	0

Behavioral Intention

		BI1	BI2	BI3	BI4	BI5
N	Valid	165	165	165	165	165
	Missing	0	0	0	0	0

4.4.3 Analysis of Outliers

Outliers are said to occur when there are extreme scores for some cases, which are substantially different from the rest of the respondents. This can adversely affect the outcome of statistical data analysis (Hair *et al.*, 2014; Iacobucci & Churchill, 2004; Kumar *et al.*, 2013). Although having outlier(s) in one's dataset is not an issue in PLS, as it handles a non-normal data (Hair *et al.*, 2011), it is equally important to examine data for such cases and provide remedy if they exist. Out of the numerous approaches of detecting univariate and multivariate outliers, the Mahalanobis Distance D^2 approach was followed (Pallant, 2011; Tabachnick & Fidell, 2007), as it "evaluates the position of each observation compared with the center of all observations on a set of variables" (Hair *et al.*, 2007a, p. 77). In IBM SPSS 20, the linear regression was used to compute the Mahal distance. SPSS creates a new column in the data set called 'MAH_1' for each case, which was compared with Chi square value. The rule of thumb for detecting multivariate outlier is that, any case whose D^2 is greater than the Chi square value is an outlier (Pallant, 2011). Walker (2014)'s online Chi square Calculator was used to compute the chi square value. Table 4.2 shows that the maximum Mahal. Distance as 114.310, while the Chi square value is 188.666, based on the online computation (See Appendix E). Based on the above therefore, it can be concluded that there is no presence of multivariate outliers in this dataset.

Table 4.2
Residuals Statistics from SPSS Output

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-4.77	124.75	83.00	23.061	165
Std. Predicted Value	-3.806	1.811	.000	1.000	165
Standard Error of Predicted Value	10.117	39.868	22.085	5.755	165
Adjusted Predicted Value	-28.67	139.69	84.05	27.254	165
Residual	-75.087	78.532	.000	41.841	165
Std. Residual	-1.579	1.652	.000	.880	165
Stud. Residual	-1.898	2.032	-.009	1.011	165
Deleted Residual	-119.170	118.845	-1.052	55.986	165
Stud. Deleted Residual	-1.918	2.058	-.008	1.014	165
Mahal. Distance	**6.432**	**114.310**	**36.776**	**18.981**	**165**
Cook's Distance	.000	.083	.010	.013	165
Centered Leverage Value	.039	.697	.224	.116	165

a. Dependent Variable: SerialNumber

4.4.4 Test of Normality

Normality refers to “symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle with smaller frequencies towards the extremes” (Gravetter &

Wallnau, 2007, p. 48). Most statistical test requires that data is normally distributed, particularly covariance based structural equation modelling (Chin *et al.*, 2003; Hair *et al.*, 2007a). Although PLS-SEM does not require data to be normally distributed (Lohmöller, 1989), it is important to assess and be acquainted with the distribution of the data prior to inferential statistics (Hair *et al.*, 2007a) . The procedure provided in Pallant (2011) was followed to assess the normality of data in this study. Accordingly, Tabachnick and Fidell (2007) recommended that normality should be tested using graphics and statistics; such as normal probability plots (Q-Q Plot), boxplot, scattered plot etc and Kolmogorov-Smirnov and Shapiro-Wilks, Skewness and Kurtosis respectively.

The two statistical approaches were adopted in this study to assess the distribution of the data. For skewness and kurtosis, a data is not normally distributed, if the z-value exceeded -/+2.58. (Hair *et al.*, 2007a). The z-score is calculated by dividing the skewness and kurtosis' statistics by the standard error (Pallant, 2011). Therefore these values were extracted from the SPSS Explore menu output (see Appendix F2). Table 4.3 revealed that the z-values for almost all the variables (un-bolded) exceeded the benchmark, thereby indicating the data have departed from normality. Similarly, the Kolmogorov-Smirnov and Shapiro-Wilks Statistics was adapted. Result of the test in Table 4.4 indicated that all the variables are significant at <0.001, an indication of violation of normality assumption. Finally, the graphical plots were observed and all have showed that the data are not normally distributed. Therefore based on the aforementioned examination of the data distribution, it is concluded that the data for this

study is not normally distributed, hence providing further justification for the use of PL-SEM in this study as discussed in section chapter four.

Table 4.3
Skewness and Kurtosis Analysis

			Skewness			Kurtosis		
Item	**Mean**	**SD**	**Statistics**	**SE**	**z-value**	**Statistics**	**SE**	**z-value**
PE1	4.25	.746	-1.255	.189	-6.639	2.735	.376	7.277
PE2	4.26	.896	-1.516	.189	-8.0225	2.556	.376	6.80161
PE3	4.00	.924	-.892	.189	-4.7206	.555	.376	**1.47645**
PE4	4.02	.991	-1.370	.189	-7.2489	1.964	.376	5.22633
PE5	4.10	.934	-1.439	.189	-7.615	2.612	.376	6.95083
PE6	4.18	.836	-1.052	.189	-5.5656	1.164	.376	3.09668
EE1	3.97	.822	-.943	.189	-4.991	1.487	.376	3.95584
EE2	4.10	.767	-.824	.189	-4.3601	.819	.376	**2.18012**
EE3	4.15	.701	-.855	.189	-4.5235	1.496	.376	3.98026
EE4	4.16	.814	-1.272	.189	-6.7309	2.486	.376	6.61627
EE5	3.84	.930	-.922	.189	-4.8805	.906	.376	2.41077
EE6	4.05	.896	-1.435	.189	-7.5941	2.783	.376	7.40635
SI1	3.29	1.184	-.271	.189	**-1.4317**	-1.067	.376	-2.8381
SI2	2.74	1.229	.212	.189	**1.1193**	-1.140	.376	-3.0324

SI3	3.83	1.010	-1.415	.189	-7.4858	2.021	.376	5.3772
SI4	4.01	.901	-1.584	.189	-8.3826	3.461	.376	9.20881
SI5	3.14	1.194	-.273	.189	-1.4432	-.779	.376	**-2.0722**
FC1	3.62	1.066	-1.142	.189	-6.045	.897	.376	**2.387**
FC2	3.87	.912	-1.308	.189	-6.9211	2.179	.376	5.79925
FC3	3.32	1.103	-.349	.189	-1.8458	-.652	.376	**-1.7341**
FC4	3.50	.992	-.599	.189	-3.171	-.248	.376	**-0.6597**
FC5	2.42	1.278	.404	.189	2.13747	-1.147	.376	-3.0521
CC1	4.56	.806	-2.577	.189	-13.637	7.912	.376	21.0538
CC2	4.78	.498	-3.382	.189	-17.898	19.074	.376	50.7558
CC3	4.56	.821	-2.447	.189	-12.949	6.606	.376	17.5776
CC4	4.75	.464	-1.502	.189	-7.9494	1.150	.376	3.06013
CC5	4.81	.517	-3.190	.189	-16.879	11.540	.376	30.7078
TA1	3.73	.938	-1.283	.189	-6.7872	1.609	.376	4.28167
TA2	3.10	1.061	-.134	.189	**-0.7067**	-1.168	.376	-3.1071
TA3	3.65	.927	-.913	.189	-4.8324	.517	.376	**1.37596**
TA4	3.65	.928	-.924	.189	-4.8899	.522	.376	**1.38984**
TA5	3.76	.938	-1.022	.189	-5.4093	1.209	.376	3.21598
BI1	3.58	1.060	-.854	.189	-4.5189	.339	.376	**0.90296**

BI2	3.69	.979	-.962	.189	-5.0907	.635	.376	**1.69087**
BI3	3.82	1.032	-1.112	.189	-5.8837	.838	.376	**2.22998**
BI4	3.90	.843	-.990	.189	-5.2388	1.638	.376	4.35994
BI5	4.09	.787	-1.149	.189	-6.0813	2.066	.376	5.49629

Table 4.4
Kolmogorov-Smirnov and Shapiro-Wilks Statistics

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
PE1	.276	165	.000	.750	165	.000
PE2	.262	165	.000	.744	165	.000
PE3	.270	165	.000	.833	165	.000
PE4	.311	165	.000	.777	165	.000
PE5	.286	165	.000	.773	165	.000
PE6	.256	165	.000	.797	165	.000
EE1	.309	165	.000	.815	165	.000
EE2	.298	165	.000	.794	165	.000
EE3	.309	165	.000	.761	165	.000
EE4	.293	165	.000	.770	165	.000
EE5	.301	165	.000	.837	165	.000
EE6	.327	165	.000	.760	165	.000
SI1	.259	165	.000	.879	165	.000

SI2	.241	165	.000	.884	165	.000
SI3	.355	165	.000	.756	165	.000
SI4	.346	165	.000	.736	165	.000
SI5	.189	165	.000	.907	165	.000
FC1	.324	165	.000	.800	165	.000
FC2	.349	165	.000	.775	165	.000
FC3	.230	165	.000	.901	165	.000
FC4	.294	165	.000	.864	165	.000
FC5	.212	165	.000	.859	165	.000
CC1	.391	165	.000	.577	165	.000
CC2	.468	165	.000	.462	165	.000
CC3	.399	165	.000	.579	165	.000
CC4	.466	165	.000	.554	165	.000
CC5	.495	165	.000	.424	165	.000
TA1	.376	165	.000	.760	165	.000
TA2	.263	165	.000	.855	165	.000
TA3	.338	165	.000	.816	165	.000
TA4	.348	165	.000	.810	165	.000
TA5	.317	165	.000	.825	165	.000
BI1	.286	165	.000	.853	165	.000
BI2	.333	165	.000	.822	165	.000
BI3	.340	165	.000	.800	165	.000

BI4	.316	165	.000	.816	165	.000
BI5	.327	165	.000	.763	165	.000

a. Lilliefors Significance Correction

4.4.6 Test of Multicollinearity

Hair *et al.* (2010) defines multicollinearity as the relationship between multiple independent variables. However, the ideal situation is that high linear correlation holds between the independent and dependent variable, whereas little correlation is anticipated between the independent variables. In multiple regression analyses such as SEM, the independent variables are assumed not to be linearly related. Because the higher the linear multicollinearity, the more interpretation of relationships becomes difficult. Thus determining the influence of each predictor variable on the outcome variable is vague, because of the compounded inter-predictor relationships (Field, 2009; Hair *et al.*, 2010). Furthermore, Field (2009) and Tabachnick and Fidell (2007) argued that, with the presence of multicollinearity, the size of path coefficients (beta) decreases, while the standard error increases, therefore reduce the statistical significance (t-value). Based on the above, it is evident that multicollinearity poses a potentially untrustworthy results and conclusion.

In order to detect if multicollinearity exist in the data, first of all it is suggested that inter construct correlation matrix be examined if there are any two predictor variables that are highly correlated (Hair *et al.*, 2010; Tabachnick & Fidell, 2007). They recommended a

benchmark of >0.9 as yardstick that suggests there is multicollinearity. The correlation matrix in Appendix I4 showed no inter-predictor correlation that is up to the threshold value. In fact, the highest correlation is 0.545; between behavioral intention and performance expectancy. Secondly, Hair *et al.* (2007a) further recommended the examination of tolerance values and variance inflated factor (VIF). The threshold values that suggested a serious multicollinearity are <0.10 and >10 for tolerance values and VIF respectively (Amoroso & Cheney, 1991; Hair *et al.*, 2010). As provided in IBM SPSS, the collinearity diagnostic was run. Accordingly, there is no indication of presence of multicollinearity as the lowest tolerance value is 0.167, while the highest VIF is 5.973 as evidenced in Appendix G.

4.4.7 Common Method Variance

The data in this study were generated from single source (owners/managers of retail businesses), both for dependent and independent variables. Therefore a common method bias might occur as a result (Simonin, 1999). To check for the magnitude of common method bias in the data, Podsakoff, MacKenzie, Lee, and Podsakoff (2003) suggested scale reordering measure, correlation procedure and Harman's single-factor test among other remedial approaches. From the questionnaire design, the order at which the items appeared is independent variables proceed, while the depended variable appeared at the end of the questionnaire. Furthermore, the items were left untitled, such that it may not prejudices the respondents answers. See Appendix A. Similarly, Bagozzi, Yi, and Phillips (1991) argued that a very high inter-construct correlation of 0.90 causes common method bias. Interestingly, the correlation matrix in Appendix I4 indicated that

there is no evidence of any two constructs being highly correlated. The highest correlation saw among the construct was between between behavioral intention and performance expectancy, which is 0.545. Finally, the Harman's single-factor test was also conducted in SPSS 19, by loading all indicators as single factor. Therefore all the measurement items were subjected to un-rotated principle component factor analysis. In this case, if one factor distinctively explained majority of the variance, then common method bias becomes problematic (Podsakoff & Organ, 1986). Accordingly, there is also no evidence of method bias, as all the eleven factors extracted have an eigenvalues more than 1.0. In the same way, the first factor accounts for 19.24 per cent, while the largest is 72.33 per cent. See Appendix H.

4.5 Descriptive Statistical Analysis

About three-quarter of the respondents are male, while female constitutes 26.9 per cent. This signifies that the retail business in Nigeria male-dominated. 15.7 per cent of the respondents aged between 1-23 years, 23.9 per cent are 26-30, 15.7 per cent are 31-35, 16.8 per cent are 36-40, 10.2 per cent are 41-45, 6.9 per cent are 46-50, 5.1 per cent are 51-55, 5.3 per cent are 56-60, while only 0.5 per cent of respondents are above 60 years of age. 61 per cent of them are married; half are educated to secondary school level, while only about 10 per cent each have bachelors and masters degree. 45 and 40 per cent of them are owners and managers respectively. As discussed earlier in the methodology section, the data was drawn from six (6) geo-political zones in Nigeria; these are North Central, North East, North West, South East, South South and South West. The distribution of responses from these zones is 28, 42, 39, 16, 18 and 22,

representing 17, 25.5, 23.6, 9.7, 10.9 and 13.3 per cent respectively. Other demographic related to the businesses can be seen in Table 4.5

Table 4. 5
Demographic Variables

Demographics		Category	Frequency	per cent	Valid per cent
Respondent	Valid	Male	109	66.1	66.9
Gender		Female	54	32.7	33.1
		Total	163	98.8	100
Respondent Age	Valid	18 - 25	30	18.2	19
		26 - 30	41	24.8	25.9
		31 - 35	22	13.3	13.9
		36 - 40	20	12.1	12.7
		41 - 45	21	12.7	13.3
		46 - 50	9	5.5	5.7
		51 - 55	8	4.8	5.1
		56 - 60	7	4.2	4.4
		Total	158	95.8	100
Respondent	Valid	Single	61	37	38.4
Marital Status		Married	77	46.7	48.4
		Separated	10	6.1	6.3
		Widowed	3	1.8	1.9
		Others	8	4.8	5

		Total	159	96.4	100
Respondent	Valid	Secondary Certificate	20	12.1	12.6
Educational		Diploma	39	23.6	24.5
Qualification		Degree/HND	82	49.7	51.6
		Masters	11	6.7	6.9
		PhD	1	0.6	0.6
		Others	6	3.6	3.8
		Total	159	96.4	100
Respondent	Valid	Owner/CEO	76	46.1	46.6
Position		Manager	57	34.5	35
		Others	30	18.2	18.4
		Total	163	98.8	100
Business Location	Valid	North Central	28	17	17
		North East	42	25.5	25.5
		North West	39	23.6	23.6
		South East	16	9.7	9.7
		South South	18	10.9	10.9
		South West	22	13.3	13.3
		Total	165	100	100
Age of the Retail	Valid	Less than 1 year	11	6.7	6.7
Business		1 - 5 years	25	15.2	15.2
		6 – 10	45	27.3	27.3

		11- 15	39	23.6	23.6
		16 - 20	25	15.2	15.2
		21 - 25	18	10.9	10.9
		Above 45	2	1.2	1.2
		Total	165	100	100
Daily Sales (NGN)	Valid	Less than 10,000	31	18.8	19.7
		10,000 - 50,000	63	38.2	40.1
		50,001 - 100,000	29	17.6	18.5
		100,001 - 200,000	5	3	3.2
		200,001 - 300,000	8	4.8	5.1
		300,001 - 500,000	4	2.4	2.5
		500,001 - 1,000,000	12	7.3	7.6
		1,000,001 - 2,000,000	2	1.2	1.3
		Above 2,000,000	3	1.8	1.9
		Total	157	95.2	100
Number of Staff Working in the Business	Valid	No, Only Me	32	19.4	19.4
		Less than 15	97	58.8	58.8
		15 - 20	16	9.7	9.7
		21 - 25	6	3.6	3.6
		26 - 30	5	3	3
		31 - 35	5	3	3
		Above 40	4	2.4	2.4

		Total	165	100	100
Sector of Retail Business		Electronics	11	6.7	6.7
		Boutique	31	18.8	18.8
		Computer Store	7	4.2	4.2
		Private School	20	12.1	12.1
		Automobile	7	4.2	4.2
		Pharmacy	34	20.6	20.6
		Bookstore	10	6.1	6.1
		Equipments	11	6.7	6.7
		Travel Agency	5	3	3
		Bureau De Change	2	1.2	1.2
		Petrol Station	14	8.5	8.5
		Private Medical Clinic	5	3	3
		Others	8	4.8	4.8
	Valid	Total	165	100	100

4.6 Assessment of Measurement Model (Outer Model)

Similar to covariance based structural equation modeling (CB-SEM), in which the assessment of model is done in two (2) stages; the Goodness-of-Measure (GoM) and the Goodness-of –Fit (GoF) assessments (Hair, Tatham, Anderson, & Black, 2007b), in PLS-SEM, there are also two stages as well; the measurement model and the structural model (Deal, 2006; Hair *et al.,* 2012; Henseler *et al.,* 2009). Measurement model,

otherwise known as outer model is a structural relationship between latent constructs and their indicators (Anderson & Gerbing, 1988; Tabachnick & Fidell, 2007). According to Henseler, et al. (2009), measurement model should be assessed based on convergent and discriminant validity by the values of Average Variance Extracted (AVE) and Composite Reliability. Furthermore, the indicator reliability was assessed using outer loadings and cross loadings. All of these were assessed based on certain threshold set in the literature, for example (Fornell & Larcker, 1981b), (Hair *et al.*, 2014; Hair *et al.*, 2010), Hair *et al.* (2014) Hair *et al.* (2011), Henseler *et al.* (2009) etc. The discussions of respective assessment are provided under each sub-heading and the results tables are presented where necessary.

4.6.1 Indicator Reliability

In order to obtain the loading of the indicators, cross-loadings, composite reliability and AVE, the standard PLS algorism was calculated (Figure 4.1) in SmartPLS software 2.0 (Ringle *et al.*, 2005). Conventionally, the value for individual item loading should be greater than 0.70 (Hair *et al.*, 2011; Henseler *et al.*, 2009), however, Hulland (1999) offered a cut-off point of 0.4; that any indicator with outer loading less than 0.4 should be removed from the measurement model. Similarly, Hair et al., (2014) posited that "indicators with outer loadings between 0.40 and 0. 70 should be considered for removal from the scale **only when** deleting the indicator leads to an increase in the composite reliability or the average variance extracted above the suggested threshold value" (p. 103). See Convergent Validity section for the acceptable threshold value of composite reliability and AVE.

For the first time the PLS algorism was calculated, there were items that loaded extremely poor, for example Social Influence 2 (SI2) was 0.157 and Effort Expectancy 3 (EE3) was 0.300 etc. See Appendix I1. The poorly loaded items were deleted based on the criteria mentioned. Table 4.6 depicts the entire retained items and their respective loadings. It should be noted that item BI4 (0.407) is retained, while item TA1 (0.668) was deleted, although the latter is higher. This is because deletion of TA1 lead to increase in composite reliability and average variance extracted of Technology Awareness construct to the minimum acceptable value, thus TA1 was removed. This applies to other affected items, which is consider acceptable in exploratory research (Hair *et al.,* 2014).

4.6.2 Internal Consistency Reliability

Conventionally, the internal consistency reliability is assessed based on Cronbach Alpha (Cronbach, 1951). The estimation here is based on indicators of manifest variables inter correlations, whereby all the indicators are assumed to have the same outer loadings (Hair *et al.,* 2014). However, the main concern in PLS-SEM is indicator's individual reliability. Therefore due to the drawbacks of Cronbach Alpha, a more robust measure of assessing internal consistency reliability, known as composite reliability is proposed as discussed in Starkweather (2012). On the criteria for assessment of internal consistency reliability using composite reliability, Hair *et al.* (2011) suggests based on Nunnally and Bernstein (1994) that the composite reliability value should be greater than 0.70, although they have provided a slack of 0.60-0.70 as acceptable in exploratory research. Internal consistency reliability is deemed deficient when the values of composite

reliability of less than 0.60, however, values above 0.90 might suggests an invalid measure, as this indicates the indicators are measuring the same concept (Hair *et al.*, 2014). The composite reliability for all the latent construct in this study was calculated in SmartPLS standard algorism and the result indicated that all the latent constructs have met and exceeded the minimum threshold value of 0.70 (Hair *et al.*, 2011; Henseler *et al.*, 2009). Table 4.7 depicts the dependent variable behavioral intention composite reliability is 0.824 and the independent variables performance expectancy (0.910), effort expectancy (0.800), social influence (0.794), facilitating conditions (0.779) and customer concerns (0.837), while the moderating variable technology awareness has 0.852. It should be observed that performance expectancy (0.910) have exceeded the 0.90 benchmark for desirable value, but is not a 'definite' undesirable value, as it did not exceed 0.95 as suggested in Hair *et al.* (2014).

4.6.3 Convergent Validity

Convergent Validity is a degree of agreement among multiple items in measuring a particular concept (Hair *et al.*, 2014). Average Variance Extracted AVE was used to evaluate the convergent validity based on Hair *et al.* (2010), Fornell and Larcker (1981a) criteria. According to Hair *et al.* (2014), latent construct should at least explain half of the variance of the indicators. That's why Hair *et al.* (2010) suggested that factor loading should be above 0.708, because its square root is equal to 0.5. Result of the PLS algorism reveals that AVE values for all the constructs have met and exceeded the minimum threshold value discussed above.

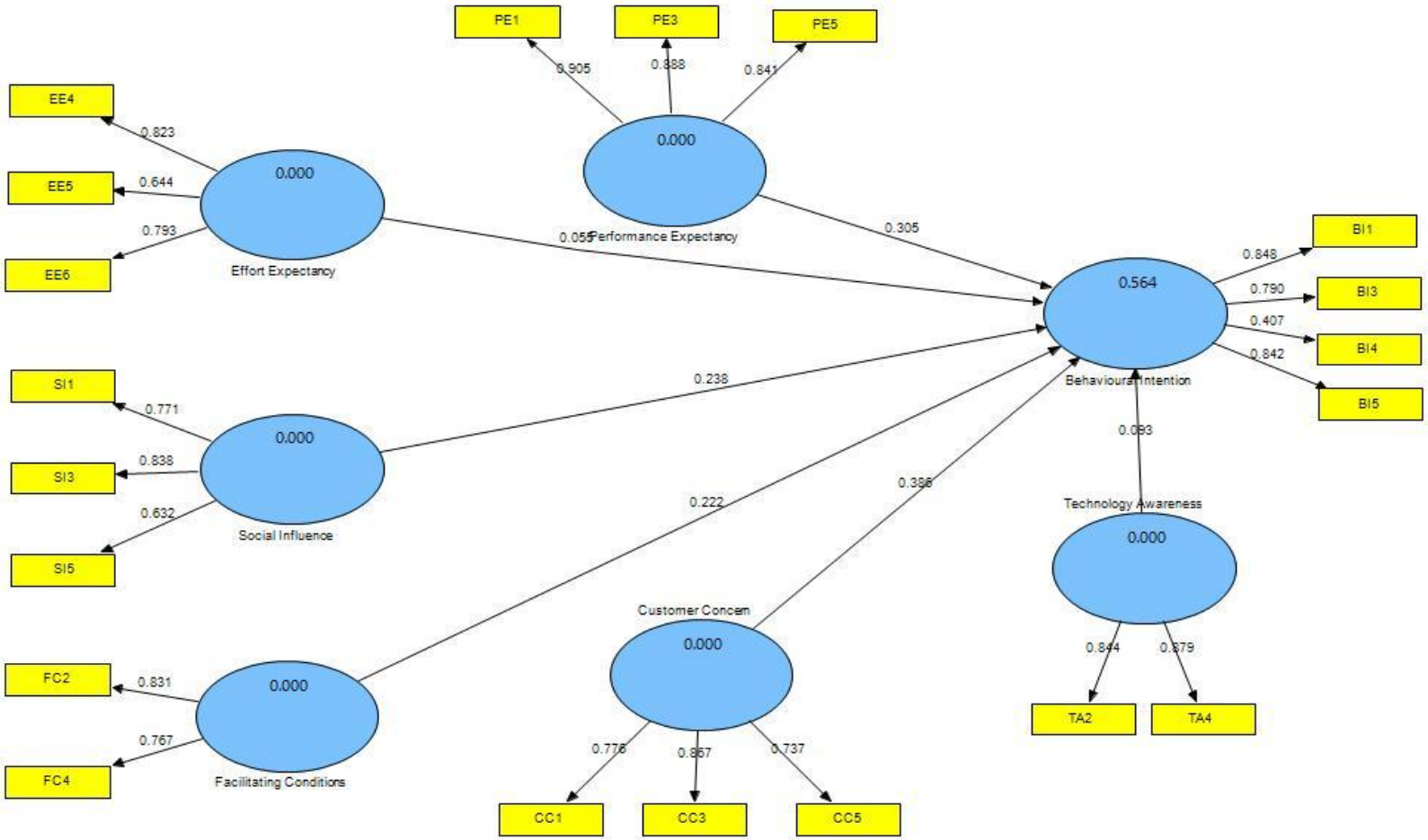

Figure 4.1
Measurement Model

Table 4.6
Cross Loadings

Indicators	Behavioral Intention	Customer Concern	Effort Expectancy	Facilitating Conditions	Performance Expectancy	Social Influence	Technology Awareness
BI1	**0.848**	0.398	0.447	0.413	0.451	0.358	0.243
BI3	**0.790**	0.402	0.247	0.282	0.419	0.314	0.162
BI4	**0.407**	0.210	0.280	0.221	0.164	0.125	0.152
BI5	**0.842**	0.439	0.288	0.375	0.501	0.440	0.153
CC1	0.310	**0.776**	0.207	0.183	0.130	0.036	0.263
CC3	0.468	**0.867**	0.182	0.146	0.259	-0.016	0.146
CC5	0.392	**0.737**	0.164	0.161	0.127	0.056	0.065
EE4	0.311	0.117	**0.823**	0.170	0.285	0.262	0.203
EE5	0.347	0.258	**0.644**	0.376	0.457	0.293	0.277
EE6	0.265	0.119	**0.793**	0.156	0.300	0.215	0.128
FC2	0.378	0.154	0.325	**0.831**	0.233	0.410	0.381

FC4	0.327	0.170	0.186	**0.767**	0.174	0.117	0.212
PE1	0.584	0.183	0.393	0.249	**0.905**	0.428	0.240
PE3	0.470	0.222	0.512	0.306	**0.888**	0.393	0.364
PE5	0.304	0.199	0.326	0.063	**0.841**	0.171	0.151
SI1	0.272	-0.137	0.240	0.417	0.300	**0.771**	0.298
SI3	0.420	0.086	0.299	0.145	0.358	**0.838**	0.109
SI5	0.272	0.077	0.238	0.282	0.239	**0.632**	0.274
TA2	0.190	0.220	0.244	0.310	0.253	0.232	**0.844**
TA4	0.214	0.111	0.240	0.340	0.260	0.241	**0.879**

Table 4.7
Internal Consistency Reliability and Convergent Validity

Construct	Indicators	Loadings	AVE	Composite Reliability
Behavioral Intention	BI1	0.848	0.554	0.824
	BI3	0.790		
	BI4	0.407		
	BI5	0.842		
Customer Concern	CC1	0.776	0.632	0.837
	CC3	0.867		
	CC5	0.737		
Effort Expectancy	EE4	0.823	0.574	0.800
	EE5	0.644		
	EE6	0.793		
Facilitating Conditions	FC2	0.831	0.639	0.779
	FC4	0.767		
Performance Expectancy	PE1	0.905	0.771	0.910
	PE3	0.888		
	PE5	0.841		
Social Influence	SI1	0.771	0.565	0.794
	SI3	0.838		

	SI5	0.632		
Technology Awareness	TA2	0.844	0.743	0.852
	TA4	0.879		

The AVE value for the dependent variable Behavioral Intention is 0.554, while the independent variables Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Customer Concern have AVE values of 0.771, 0.574, 0.565, 0.639 and 0.632 respectively, while the moderating variable of Technology Awareness has an AVE value of 0.743.

4.6.4 Discriminant Validity

This is the extent of how indicators actually represent a construct and how they are different from other construct (Hair *et al.*, 2014). The discriminant validity was assessed based on Fornell and Larcker (1981a), in which they demonstrated that the square root of average variance extracted for a particular construct should be higher than the correlation of the subject construct with any other construct in the model. Similarly according to Venkatesh and Morris (2000), the square root of AVE value for each construct should be greater than the value of correlations with other construct. Secondly, the discriminant validity was also evaluated by the value of latent variable indicator loadings and cross-loading, in which the loading for a particular indicator should be higher in its own construct above its shared loading with other constructs. This is in accordance with Chin (1998a) criteria.

Table 4.8
Discriminant Validity

Constructs	1	2	3	4	5	6	7	AVE
1) Behavioral Intention	**0.744**							0.554
2) Customer Concern	0.501	**0.795**						0.632
3) Effort Expectancy	0.417	0.228	**0.758**					0.574
4) Facilitating Conditions	0.442	0.201	0.325	**0.799**				0.639
5) Performance Expectancy	0.545	0.226	0.474	0.257	**0.878**			0.771
6) Social Influence	0.442	0.027	0.348	0.342	0.405	**0.752**		0.565
7) Technology Awareness	0.235	0.188	0.280	0.378	0.297	0.274	**0.862**	0.743

Note: The values in the diagonals cells (**bold**) are the square root of the AVE while the un-bolded values are the correlations

The highest correlation among the construct is 0.545 between behavioral intention and performance expectancy, followed by behavioral intention – customer concern (0.501), performance expectancy – effort expectancy (0.474), facilitating condition/social influence – behavioral intention (0.442) respectively. On the other hand, the values of square root of average variance extracted for all the constructs (the bold diagonal) are all above the correlation among other constructs (the off- diagonal). Table 4.8 showed that the lowest value of the square root of AVE is 0.744 for behavioral intention, which is above the value of correlations of any constructs in the model. This is also in line with Compeau *et al.* (1999)'s criteria.

In the same way, the discriminant validity was assessed by the extent of correlation among the individual items. Table 4.6 shows the loadings and cross-loadings of the indicators. Similar to the latent variable correlation result, the individual items correlation indicated good discriminant validity, as there is no indicator that loaded higher in another construct other than its mother construct. For example, the lowest loading among all the retained indicators is behavioral intention BI4, whose loading is 0.407, however, its highest cross-loading (with effort expectancy) is as low as 0.280. Similarly, the highest cross-loading is between performance expectancy PE1 and behavioral intention, but interestingly, PE1 item loaded the highest loading among all the items (0.905). Based on Chin (1998a), Fornell and Larcker (1981b) the above suggests the items are more loyal to their mother construct than in any other construct. Table 4.9 also shows that all the items loadings are significant ($p<0.001$).

Table 4.9
Significance of the loadings

Construct	Indicators	Loadings	Path Coefficient	Std. Error	T. Value	P. Value
Behavioral Intention	BI1	0.848	0.377	0.023	16.432	0.000
	BI3	0.790	0.336	0.031	10.711	0.000
	BI4	0.407	0.170	0.057	2.974	0.002
	BI5	0.842	0.411	0.031	13.362	0.000
Customer Concern	CC1	0.776	0.331	0.052	6.307	0.000
	CC3	0.867	0.501	0.056	8.883	0.000
	CC5	0.737	0.419	0.073	5.753	0.000
Effort Expectancy	EE4	0.823	0.451	0.066	6.791	0.000
	EE5	0.644	0.503	0.105	4.806	0.000
	EE6	0.793	0.384	0.079	4.839	0.000
Facilitating Conditions	FC2	0.831	0.669	0.081	8.208	0.000

	FC4	0.767	0.580	0.093	6.224	0.000
Performance Expectancy	PE1	0.905	0.486	0.049	9.830	0.000
	PE3	0.888	0.391	0.036	10.928	0.000
	PE5	0.841	0.253	0.036	6.984	0.000
Social Influence	SI1	0.771	0.370	0.071	5.183	0.000
	SI3	0.838	0.573	0.072	7.979	0.000
	SI5	0.632	0.371	0.092	4.017	0.000
Technology Awareness	TA2	0.844	0.545	0.136	4.009	0.000
	TA4	0.879	0.614	0.147	4.164	0.000

4.7 Assessment of Structural Model

Following successful assessment of the measurement model, which is a prerequisite for the successive analyses in PLS, the structural model is also assessed. This section therefore describes the method, procedure and criteria that are used in assessing the structural model. First, the significance and relevance of the structural model was evaluated based on the value of path coefficient, statistical t-values and standard error. Therefore the hypothesis were tested and assessed based on (Chin, 1998a; Hair *et al.*, 2011).This was done through bootstrapping procedure in SmartPLS 2.0 (Ringle *et al.*, 2005) for both main effect model and moderating effect. Similarly, coefficient of determination (R^2) was also used, based on Chin (1998a) and Cohen (1988), to assessed the variance explained in the outcome variable, by the predictor variables. The effect sizes (f^2) of each of the exogenous variable as well as the effect size of the moderator was calculated and evaluated using Cohen (1988) criteria. Furthermore, the blindfolding procedure was used to determine the predictive capability (Q^2) and effect size (q^2) by means of (Chin, 1998a; Fornell & Cha, 1994; Hair *et al.*, 2011; Henseler *et al.*, 2009) benchmarks.

4.7.1 Hypothesis Testing

There are nine hypotheses in this study; five (5) direct effect and four (4) moderating hypotheses as stated in the literature review chapter. Statistical t-values that are substantially different from 0 is said to be almost always statistically significant, however, it is largely defending on the degree of freedom, confidence interval and

directionality of hypothesis, thus p. value is used to ascertain if the paths are significant (Hair *et al.*, 2014). In order to obtain the statistical t-values and the standard error, the PLS bootstrapping resampling (Chin, 2010) was run with 500 bootstrapping samples. The bootstrapping sample is considered adequate, going by Henseler (2012) study. Similarly, Wilson (2011) set his bootstrapping samples as 500. Even though 5000 was also suggested, for example (Hair *et al.*, 2011), this study could not bootstrapped with 5000 samples due to the failure of the computer to process. Prior to that, PLS standard algorism was also calculated during measurement model assessment, thus the path coefficients and the directionality of the relationship (positive or negative) was obtained. SmartPLS 2.0 does not directly provide the p-value, therefore it was manually calculated in Microsoft Excel Spreadsheet using the 'T.DIST' function as illustrated in (Hair *et al.*, 2014). The p-value was calculated based 95 per cent confidence interval, as it is acceptable in social science research (Bickel, 2012; Cox & Hinkley, 1979; May, 2011; Tacq & Tacq, 1997).

Table 4.10 depicted the result of the direct hypothesis testing. Customer Concerns – Behavioral Intention path, which forms the extension of UTAUT in this study, have the highest value of path coefficient (beta 0.386) and lowest standard error (0.050), thus have the highest t. value (7.705). Consequently the p. value was calculated and the path is significant at less than 1 per cent <p 0.001, therefore the hypothesis is accepted. Performance Expectancy is also significant with (beta 0.305), standard error (0.081), t. value of 3.772, hence is significant at less than 1 per cent (<p 0.001). Then Facilitating Conditions has a path coefficient value of 0.222 and standard error of 0.076.

Consequently, the t. value and the p. value are 2.903 and 0.002 respectively; hence the paths are also significant, however, at less than 5 per cent (p 0.002).

Finally, Social Influence has the same significance level with Facilitating Conditions (p 0.002), however, the path coefficient (0.238) and standard error (0.080) varies. On the other hand, the result indicated that Effort Expectancy – Behavioral Intention path is not significant (p. 0.255).

4.7.2 Result of Moderating Hypotheses

As explained in the literature review section, according to Baron and Kenny (1986), a moderating variable is an interacting term which is said to emerge when the relationship between independent and dependent variables is surprisingly weak or inconsistent relationship or no relationship at all, thus the moderating variable is introduced to reduce or strengthen the relationship. Similarly, according to Henseler and Fassott (2010), "moderating effects are evoked by variables whose variation influences the strength or the direction of a relationship between an exogenous and an endogenous variable" (p. 713). As cited in Henseler and Chin (2010) there are basically four (4) approaches to analysing moderation effect in PLS SEM; they are product indicator approach (Chin *et al.*, 2003), a 2-stage approach (Chin *et al.*, 2003; Henseler & Fassott, 2010), a hybrid approach (Wold, 1982), and an orthogonalizing approach (Little, Bovaird, & Widaman, 2006). Because the moderator variable in this study (Technology Awareness) is a continuous variable, the product indicator approach was followed to analyse the moderating effect, as illustrated in Henseler and Fassott (2010) and Hair *et al.* (2014).

Table 4.10
Result of Direct Hypotheses

Hypotheses	Direct Relationship	Path Coefficients	Std Error	T. Value	P. Value	Decision
H1	Performance Expectancy -> Behavioral Intention	0.305	0.081	3.772	0.000***	Supported
H2	Effort Expectancy -> Behavioral Intention	0.055	0.084	0.661	0.255	Rejected
H3	Social Influence -> Behavioral Intention	0.238	0.080	2.982	0.002*	Supported
H4	Facilitating Conditions -> Behavioral Intention	0.222	0.076	2.903	0.002*	Supported
H5	Customer Concern -> Behavioral Intention	0.386	0.050	7.705	0.000***	Supported

***p<0.001, **p<0.01, *p<0.05

The p values were calculated as demonstrated above. However, as illustrated in Henseler and Fassott (2010) and Hair *et al.* (2014), the interacting terms for all the moderating paths were created in the PLS structural model (Figure 4.2). As shown in Table 4.11, out of the four (4) moderating hypotheses, two (2) are supported, while the other half did not show any evidence of moderating effect. For the supported paths, namely Effort Expectancy -Technology Awareness -> Behavioral Intention and Social Influence - Technology Awareness -> Behavioral Intention, the paths coefficients are 0.165 and 0.186 respectively. Subsequently, the bootstrapping procedure provided the standard error and t. values as 0.085 and 1.943 and 0.111 and 1.677 respectively. Accordingly, the p. value was calculated, hence the moderating effect of Technology Awareness on both relationships is significant at less than 5 per cent each (p. 0.027) and (p. 0.048) respectively.

On the other hand, Technology Awareness does not show any evidence of moderating influence on the relationship between Facilitating Conditions, Performance Expectance and Behavioral Intention. Also as depicted in Table 4.11, the value of path coefficient for Facilitating Conditions - Technology Awareness -> Behavioral Intention is 0.119, standard error (0.107), while the t. value is 1.114, subsequently; the p. value was computed (p. 0.133). Similarly, the Performance Expectancy - Technology Awareness -> Behavioral Intention path was calculated and the beta value, t. value and p. value stood as 0.038, 0.079, 0.475 and 0.318 respectively. Therefore it is concluded that a moderating effect of Technology Awareness does not hold for the two paths.

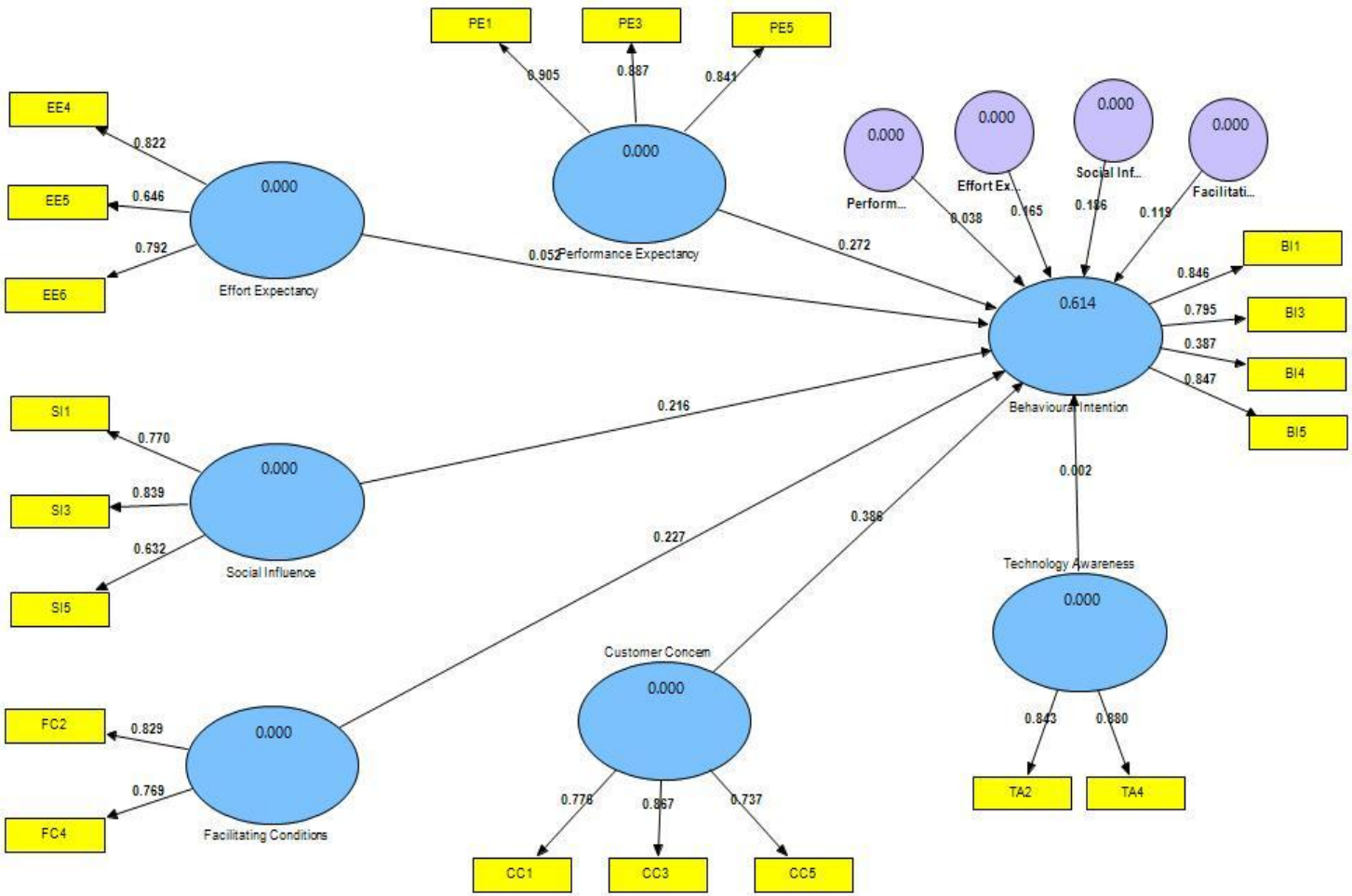

Figure 4.2
Interacting (Moderating) Effect Model

Table 4.11
Result of Moderating Hypothesis

Hypotheses	Moderating Paths	Path Coefficients	Std Error	T. Value	P. Value	Decision
H6	Performance Expectancy * Technology Awareness -> Behavioural Intention	0.038	0.079	0.475	0.318	Rejected
H7	Effort Expectancy * Technology Awareness -> Behavioural Intention	0.165	0.085	1.943	0.027	Supported
H8	Social Influence * Technology Awareness -> Behavioural Intention	0.186	0.111	1.677	0.048	Supported
H9	Facilitating Conditions * Technology Awareness -> Behavioural Intention	0.119	0.107	1.114	0.133	Rejected

***p<0.001, **p<0.01, *p<0.05

4.7.3 Assessment of Coefficient of Determination (R^2)

Coefficient of determination (R^2) is the variance explained in the endogenous latent variable by exogenous latent variables (Henseler *et al.*, 2009). Therefore is an alternate means of assessing structural model quality in variance-based structural equation modeling, just as goodness-of-fit is in covariance based structural equation modeling (Götz, Liehr-Gobbers, & Krafft, 2010). Three different evaluation criteria were recommended. According to Falk and Miller (1992), an R^2 is deemed satisfactorily if it exceeds 1.5 per cent. However, Cohen (1988) and Chin (1998a) recommended three levels of structural model quality as; substantial (0.26 and 0.67), moderate (0.13 and 0.33) and weak (0.02 and 0.19) respectively. During the assessment of measurement model for this study, the standard PLS algorism was calculated for the main effect model. The R^2 value is 0.564, and so is satisfactorily based on (Falk & Miller, 1992). It is precisely a substantial, yet moderate according to Cohen (1988) and Chin (1998a) respectively.

4.7.4 Effect Size (f^2) of the Main Effect Model

Drawing from Cohen (1988), Henseler and Fassott (2010) suggested that further analysis should be carried out to evaluate the effect size (f^2) of the exogenous variable in the main effect model as well as the moderating effect model. The procedure, as illustrated in Hair *et al.* (2014), is to eliminate an exogenous variable in the PLS model and calculate the PLS standard algorism to obtain the coefficient of determination (R^2). Then the R^2 (excluded) is compared with the R^2 (included) of the model that includes all

the variables in the study. Accordingly, the values are substituted in a formula below (Callaghan, Wilson, Ringle, & Henseler, 2007; Cohen, 1988).

$$f^2 = (R^2 \text{ included} - R^2 \text{ excluded}) / (1 - R^2 \text{ included})$$

Effect sizes are evaluated as small (0.02), medium (0.15) or large (0.35) respectively, according to Cohen (1988). Although Chin *et al.* (2003) posited that even a small effect size should not be neglected, arguing thus; "Even a small interaction effect can be meaningful under extreme moderating conditions, if the resulting beta changes are meaningful, then it is important to take these conditions into account" (Chin *et al.*, 2003, p. 211). Consequently, the result of the effect sizes as depicted in Table 4.12. The result shows that Customer Concern, which forms the contribution of this study, has the biggest (medium) effect size among all the exogenous constructs in this study, with effect size value of 0.303. This is followed by Performance Expectancy, Social Influence, Facilitating Conditions and Technology Awareness. They all have small effects with values; 0.144, 0.096, 0.085 and 0.016 respectively. As one would expect, Effort Expectancy, which has not shown any significant influence on Behavioral Intention (beta 0.055) in the main effect model, has also no effect (0.002). This value is less than the threshold value for meaningful effect size, because the beta value is also not significant as well (Chin *et al.*, 2003).

Table 4.12
Main Model Effect Sizes (f^2)

Endogenous Construct	Exogenous Constructs	R^2 Incl.	R^2 Excl.	R^2 Inc - R^2 Excl	1- R^2 Incl.	Effect Size
Behavioral Intention	Customer Concern	0.564	0.432	0.132	0.436	0.303
	Facilitating Conditions	0.564	0.527	0.037	0.436	0.085
	Performance Expectancy	0.564	0.501	0.063	0.436	0.144
	Social Influence	0.564	0.522	0.042	0.436	0.096
	Technology Awareness	0.564	0.557	0.007	0.436	0.016

4.7.5 Effect Size (f^2) of the Moderating Effect Model

Further computation was also carried out to evaluate the effect size (f^2) of the moderator model against the main effect model (Cohen, 1988; Henseler & Fassott, 2010). The procedure is to compare the coefficient of determination (R^2) of the main effect model (without interacting term) and the moderating effect model (all variable plus interacting terms). Therefore, similar to the exogenous variables' effect size described above for the main effect model, the same formula and evaluating criteria was followed to assess the effect size of the moderating effect.

The R^2 value in the main effect model is 0.564 (Figure 4.1). However, when the interacting terms were created and calculated the standard PLS algorism, the R^2 value increased to 0.614 (Figure 5.3). Therefore the R^2 included and the R^2 excluded were substituted in the f^2 formula. The result in Table 4.13 reveals that the moderating effect model has small effect size (0.115), based on Cohen (1988). The effect size is, although small, however important considering Chin *et al.* (2003)'s assertion above.

Table 4.13
Effect Size of the Moderating Effect (f^2)

R^2i	R^2m	R^2i-R^2m	1-R^2i	Effect Size (f^2)
0.614	0.564	0.050	0.436	0.115

The Moderator Plots

Bearing in mind the definition of a moderator; "variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or

criterion variable," (Baron & Kenny, 1986, p. 1174), Henseler and Fassott (2010) argued that "the idea of a moderating effect is that the slope of the independent variable is no longer constant, but depends linearly on the level of the moderator" (p. 718). Interestingly, Hayes (2013) argued that visual presentation of moderating effect can be an excellent way of interpreting an interaction. Therefore in order to produce such visual, Hayes (2013) recommended the use of any available graphic program. One of such programs is Lowry and Gaskin (2014)'s template for visualizing moderation effect, thus it was adapted. Therefore graphical illustrations of the two significant moderating paths were plotted as depicted in Figures 4.3 and 4.4. The Microsoft Excel template uses path coefficient values of the independent, predictor and the moderating variable, as well as the interacting term, to calculate and deliver the graphical slopes (see Appendix K). Technology awareness has evidently strengthened the positive relationship between effort expectancy and behavioral intention and social influence and behavioral intention respectively.

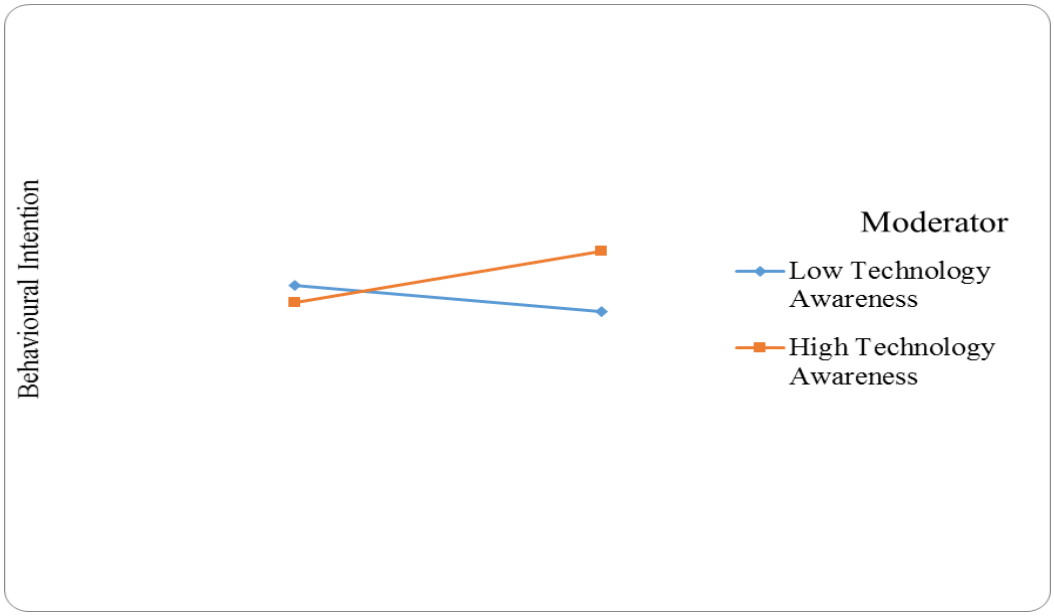

Figure 4.3
Visual Presentation of Moderating Effect 1

Note: Technology Awareness strengthens the positive relationship between Effort Expectancy and Behavioural Intention.

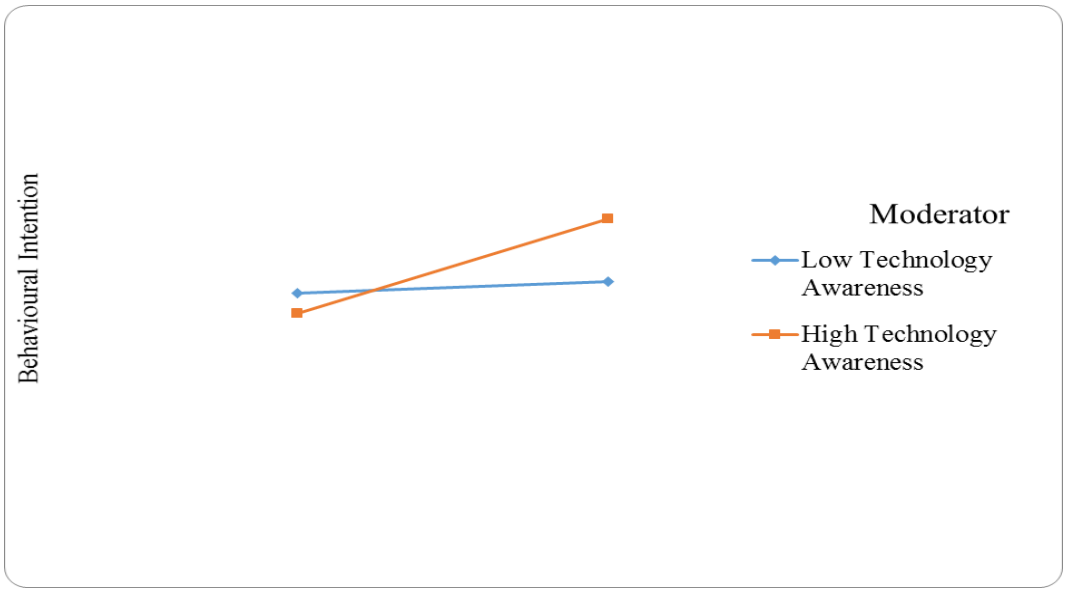

Figure 4.4
Visual Presentation of Moderating Effect 2

Note: Technology Awareness strengthens the positive relationship between Social Influence and Behavioural Intention.

4.7.6 Predictive Relevance (Q^2)

Apart from examining the degree to which the model explained (R^2) variance in the depended variable as a condition for predictive accuracy, Hair *et al.* (2014) recommended that Stone-Geisser's Q^2 should be used to examine the predictive relevance of a model (Geisser, 1974; Stone, 1974). A blindfolding procedure in Smart-PLS allows re-estimation of the model, as each point of the data is being omitted (Chin, 1998a; Henseler *et al.*, 2009). This procedure is done for only endogenous reflective latent variable in the model and it is evaluated as having predictive relevance, if the Q^2 value for the endogenous latent construct is greater than 0 (Hair *et al.*, 2014). The Q^2 value was estimated via a blindfolding procedure and the cross-validated redundancy approach was used as shown in Figure 4.5 (Hair *et al.*, 2014). As depicted in Table 4.14, there is substantial evidence of robust predictive relevance, because the value of the Q^2 exceeds 0 (0.283).

4.7.7 Effect Sizes (q^2)

Finally, similar to the procedure and criteria for calculating and assessing effect sizes (f^2), the effect size of the predictive relevance (q^2) was also calculated. This procedure was suggested in Hair *et al.* (2014). However, value of predictive relevance Q^2 was used instead of R^2 values and thus substituted in the following formula;

$$q^2 = (Q^2 \text{ included} - Q^2 \text{ excluded}) / (1 - Q^2 \text{ included})$$

Table 4.14
Predictive Relevance (Q^2)

Endogenous Latent Variable	R Square	CV Red	CV Com
Behavioral Intention	0.564	0.283	-

Table 4.15 depicted the results of the q^2 calculations. Like in the f^2 result, Customer Concerns also has the largest effect size compared to other constructs in the model, with q^2 value of 0.098. Although the effect is small (Cohen, 1988), however, Chin *et al.* (2003) argued that even a small effect is important, as long as the resultant beta is significant. Except for Effort Expectancy which has a negative q^2 effect size (-0.004), all other constructs in the model also have small q^2 effect sizes; Facilitating Conditions (0.027), Performance Expectancy (0.045), Social Influence (0.026). The non-effect exhibited in Effort Expectancy can be attributed to its non-significant beta (Chin *et al.*, 2003).

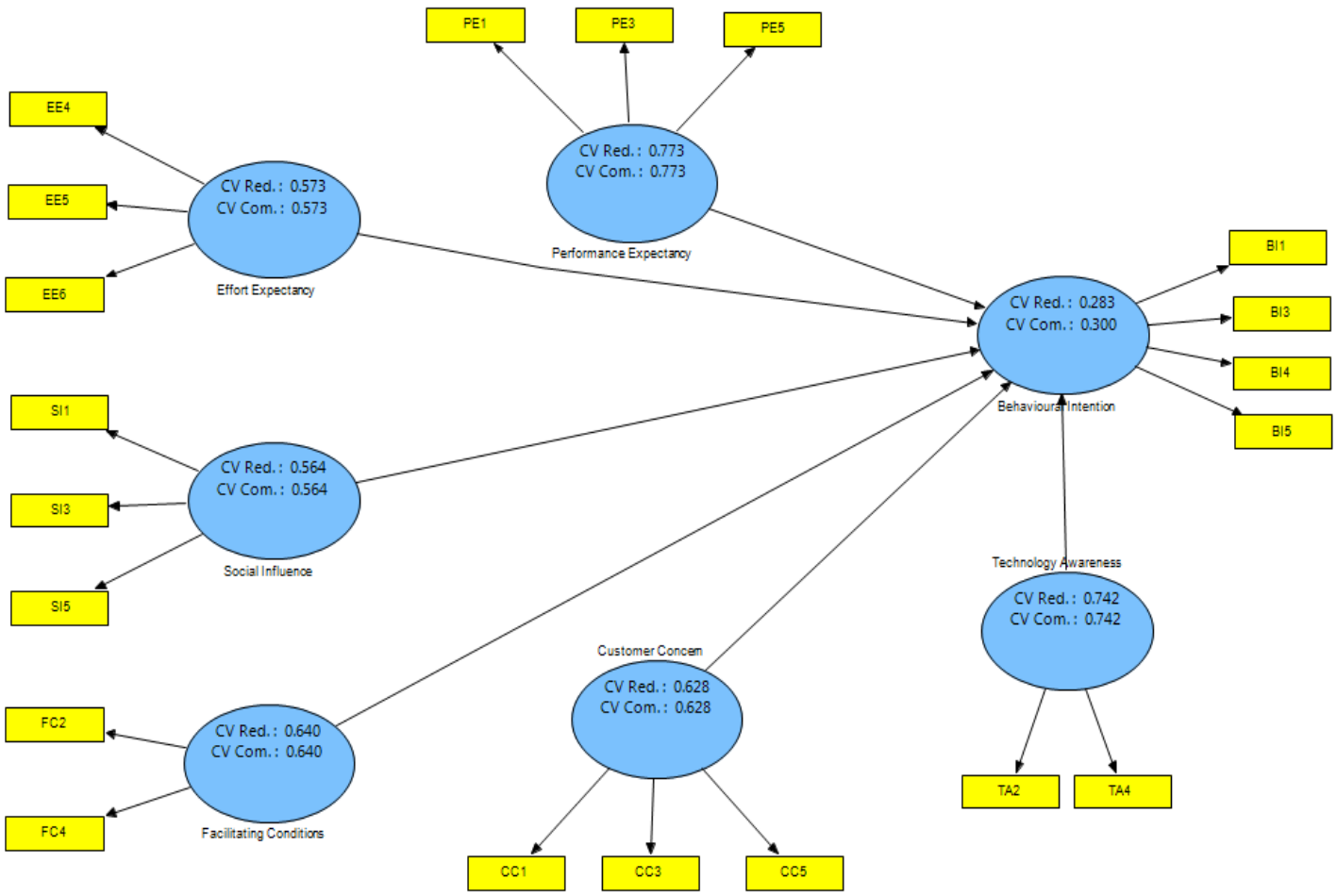

Figure 4.5
PLS Blindfolding Procedure

Table 4.15
Effect Sizes (q^2)

Endogenous Construct	Exogenous Constructs	Q^2 Incl.	Q^2 Excl.	Q^2 Inc- Q^2 Excl.	1- Q^2 Incl.	Effect Size
Behavioral Intention	Customer Concern	0.283	0.213	0.070	0.716	0.098
	Effort Expectancy	0.283	0.286	-0.003	0.717	-0.004
	Facilitating Conditions	0.283	0.264	0.019	0.717	0.027
	Performance Expectancy	0.283	0.251	0.032	0.717	0.045
	Social Influence	0.283	0.265	0.018	0.717	0.026
	Technology Awareness	0.283	0.282	0.001	0.717	0.002

4.8 Summary

This chapter demonstrated the procedure and results of the data analysis technique earlier proposed in chapter four (PLS-SEM). As usual, this chapter began with data preparation and screening, where data was subjected to coding and data imputation in SPSS 18 software. Thereafter, the data was screened for entry error, where a few entry errors were detected and corrected. Then the data was checked for missing values. It was found that the missing values have no specific pattern (MCAR) and are less than five (5) per cent, therefore were treated using mean replacement as suggested in (Kumar *et al.*, 2013). The data were then checked for outliers, normality and multicollinearity using Mahalanobis distance, skewness and kurtesis z-scores and Variance Inflated Factor respectively. The data demonstrated a non-normal distribution. However, there is no evidence of high correlation among the exogenous constructs in the model. The demographic variables characteristics were then examined using descriptive statistics.

Therefore the model was assessed in two folds; measurement and structural model assessments. The measurement model was assessed by the reliability of constructs indicators, internal consistency reliability, convergent and discriminant validity. Accordingly, all the assessment criteria set in the literature (Hair *et al.*, 2014; Hair *et al.*, 2011; Henseler *et al.*, 2009; Hulland, 1999), have been met and exceeded, which allows for the assessment of structural model. Consequently, direct and moderating hypotheses were tested, using a bootstrapping procedure (Hair *et al.*, 2014). Six out of the nine hypotheses were accepted, while three were rejected. Additionally, the model was assessed by the value of coefficient of determination (R^2). The R^2 of endogenous

variable is 0.564, and so is satisfactorily based on (Falk & Miller, 1992). It is precisely a substantial, however moderate according to Cohen (1988) and Chin (1998a) respectively. Furthermore, the effect sizes (f^2), predictive relevance and effect sizes (q^2) were also calculate and the results are satisfactorily (Chin, 1998a; Chin *et al.*, 2003; Cohen, 1988).

An elaborate discussion of the results of this study vis-à-vis its theoretical and methodological contributions as well as its implication to research and practice is hereby discussed in chapter six.

CHAPTER FIVE
DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter highlights and summarizes all the chapters in the entire thesis and discusses it implications, contribution and offer recommendations. It begins with summary of the findings vis-à-vis review of measurement model and structural model. The discussions highlighted the source of the measurement theory and the criteria used in assessing its reliability and validity, followed by the justification for retaining and/or deleting poorly loaded items. The discussions on review of the structural model featured the discussions on the results of direct and moderating hypotheses testing. Furthermore, the research objectives are reviewed to assess whether they have been achieved. Then the research implications as well as theoretical, methodological and practical contributions are discussed. Finally, limitations of the study are enumerated and future research opportunities are highlighted.

5.2 Summary of Findings

As mentioned in the methodology chapter, Partial Least Squares – Structural Equation Modeling was used to analyze the data, as it's a predictive technique and have fewer assumptions in terms of distribution of the data and sample size. As the practice in SEM, the model was assessed in two folds; measurement model and structural model. In the measurement model, the indicator variables were examined to ascertain whether they are measuring the concept they are intended to measure. While in the structural model,

hypotheses were tested, effect sizes were assessed and the predictive capability of the model was calculated. Therefore this section review and discuss the findings of analysis of measurement and structural models

5.2.1 Review of Measurement Model Assessment

The main variable of interest (dependent variable) in this study is behavioral intention to use POS, thus an extensive literature review was carried out and investigated the factors which were examined in the past literature as determinants of behavioral intention. Based on the unification of those determinants in UTAUT and the research opportunities offered (Venkatesh *et al.*, 2003), this study seeks to investigate the phenomena using the determinants of behavioral intention in UTAUT, while extending it with an independent and moderating variables. These concepts that made up the extended UTAUT (see Figure 2.2), which are proposed as determinants of behavioral intention are latent variables, therefore cannot be measured directly. Thus must be measured by means of a proxy called measurement items. The measurement items are either developed, adapt or adopt. Adaption of measurement items entails slight modification of the statement's wordings to suit the context of the current study. This study therefore adapted the measurement items from extant literature for both the dependent, independent and moderating variables (see chapter four, section 4.1.7). Consequently, the items are assessed for their validity and reliability in the measurement model.

As discussed in chapter four of this study, the measurement model is the relationship between constructs and their respective indicators. Therefore an assessment was carried

out based certain criteria recommended in the literature. First of all, the dependent variable is measured with five (5) items, adapted from Du *et al.* (2012). The independent variables Performance Expectancy, Effort Expectancy and Social Influence are measured with six and five items respectively, adapted from Cheng *et al.* (2008), while Facilitating Conditions is measured with five (5) items adapted from (Moghavvemi *et al.*, 2012). Finally, the newly introduced independent and moderating variables are measured with five items each, adapted from Susskind *et al.* (2003) and Nambisan *et al.* (1999) respectively. These items are measured reflectively and are assessed using the output from standard PLS algorism calculations (see Appendix I2).

Four out five items used to measured behavioral intention are retained, while one (BI4) was dropped, because the individual item loading is blow the accepted threshold of >0.40 (Hair *et al.*, 2014; Hulland, 1999). This suggests that the item is not important in measuring the concept in the context of the study. However, although there is no ambiguity in the BI4 statement (I will recommend POS to others), the item might be insignificant in measuring the concept, because the composition of the subjects of the study are non-adopters of POS, therefore they might want to experience the technology before thinking of recommending it to others. The four retained items produced composite reliability of 0.824, which have exceeded the 0.7 threshold value (Hair *et al.*, 2011; Henseler *et al.*, 2009). This is an indication of good internal consistency reliability. Similarly, the average variance extracted for behavioral intention (0.554), which is a measure convergent validity, have met and exceeded the benchmark of 0.5(Fornell & Larcker, 1981b). This is an indication that items have converged and

worked together in measuring the concept. Finally, discriminant validity was assessed for the dependent variable, using the correlation matrix. The square root of AVE for behavioral intention was greater than the value of its correlation with other constructs in the model. This suggests that the indicators have actually represented the concept and are distinct from others.

Similarly, the same criteria for deletion or retaining of the remaining items in relation to their respective construct were followed. Thus, of total of 37 items, 17 were drop, while 20 were retained as summarized in Table 5.1. It should be observed that only two items were retained out of the original five items each for facilitating conditions and technology awareness respectively. Although four items are often been used as minimum, two items are however sufficient. Precisely, few best indicators are recommended (Hayduk & Littvay, 2012) "One or two indicators are often sufficient, but three indicators may occasionally be helpful. More than three indicators are rarely warranted because additional redundant indicators provide less research benefit than single indicators of additional latent variables"(Hayduk & Littvay, 2012, p. 1).

Table 5.1
Original and Retained Indicators

			Number of Indicators	
SN	**Latent Variables**	**Source**	**Original**	**Retained**
1	Behavioral Intention	Du *et al.* (2012)	5	4
2	Performance Expectancy	Cheng *et al.* (2008)	6	3
3	Effort Expectancy	Cheng et al. (2008)	6	3

4	Social Influence	Cheng, et al. (2008)	5	3
5	Facilitating Conditions	Moghavvemi *et al.* (2012)	5	2
6	Customer Concern	Susskind *et al.* (2003)	5	3
7	Technology Awareness	Nambisan *et al.* (1999)	5	2
	Total		**37**	**20**

5.2.2 Direct Determinants of Behavioral Intention to use POS

Based on exhaustive literature review and consideration of the context of current study, five direct determinants of behavioral intention were proposed. Four of the direct determinants are adapted from UTAUT; Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions, while Customer Concerns is added to the UTAUT model as an extension of the model. All of these direct determinants are hypothesized to have significant positive relationship with behavioral intention. Consequently, the result of the hypothesis testing revealed that all except effort expectancy have significant positive relationship with behavioral intention. The following discussion compared the results in respect of past studies' results and highlights contextual similarities as well as differences.

5.2.2.1 Performance Expectancy as Determinant of Behavioural Intention

Performance Expectancy is defined in the context of the current study as the extent to which owners and managers in Nigerian retail industry perceived that using POS will enhance productivity, payment process efficiency and overall performance of their

business processes. Therefore a hypothesis was put forward and subsequently tested. The result indicated that performance expectancy has a significant positive relationship with behavioural intention (p.0.000). This result is in line with several past studies that examined this relationship. For example, in the context of educational technology acceptance and usage, Wong *et al.* (2013) examined student-teacher adoption of interactive whiteboard in Australian higher education. The result indicated a significant positive relationship performance expectancy and behavioural intention. Interestingly, the study shares a contextual similarity considering both POS and interactive whiteboard are innovative technologies that comes with business process improvements benefits. However, the context might differ in terms of subjects of the studies (students vs. managers) and economic status of the countries where these studies were conducted.

In the same manner, performance expectancy was also found to have significant positive relationship with behavioural intention in the context of e-book and web-based Q&A adoption studies (Deng *et al.*, 2011; Gao & Deng, 2012) respectively. Similar to Wong *et al.* (2013), the technologies and the subjects examined in the study are educational technology and students were the respondents. Also consistent with these studies, Yamin and Lee (2010) presented empirical evidence that suggests performance expectancy has a significant positive relationship with behavioural intention in the context of Malaysian students' e-mail adoption. Although the context might differ in terms of voluntariness of use, because POS is voluntary, while the students' e-mail is mandatory, the two contexts share some similarities. For example, POS in Nigeria and students' e-mail in UCSI are newly introduced both in developing countries. Similar result was also obtained in the

context of adoption of e-government initiatives in Malaysia, particularly e-sharia portal usage. Fortunately, both e-sharia portal and POS are among governments' initiatives to ease access and use of information related to e-sharia services in Malaysia and reduced the excess cash-based transactions in Nigeria. Similarly, findings in this study is in line with Al-Shafi and Weerakkody (2009) e-government adoption study in the state of Qatar. Their findings indicate that citizens' expectation with regard to the performance of e-government is high, thus they indicated their willingness to adopt the initiative.

Also in the perspective of developed countries, studies were conducted in the context of e-file and mobile device adoption in U.S and Finland. The findings in these studies concurred with the current study, as performance expectancy was found to have significant positive relationship with behavioural intention.

These findings indicates that performance expectancy is a powerful determinant of behavioural intention across different contexts, for example different technologies, voluntariness of use, country economic status etc. Overall, the results in this study can be interpreted as; owners and managers of retail industry in Nigeria believed that POS can be useful in their retail business; hence they expected that the system will improve their business process performance. This outcome is not unexpected, going by the frequent sensitization campaign embark upon by the Nigerian government and a number of commercial banks in respect of the derivable benefits from using POS (see Appendix L and M).

5.2.2.2 Effort Expectancy as Determinant of Behavioural Intention

In the context of the current study, Effort Expectancy is defined as owners' and managers' anticipated simplicity and/or difficulty of using POS in their businesses. Therefore after an in-depth review of past literature and careful consideration of the context under study, a hypothesis was formulated as thus; there is significant positive relationship between effort expectancy and behavioural intention to use POS. This hypothesis was tested; however, the result indicated that there is no evidence of significant positive relationship between effort expectancy and behavioural intention, in the context of POS adoption in Nigerian retail industry.

Although the findings in this study is mysterious, however it is not surprising considering some of the past studies' results. For example, the Wang and Yang (2005) also found that there is no statistical evidence to conclude there is significant positive relationship between effort expectancy and behavioural intention to adopt online stocking in Taiwan. Auspiciously, online stocking is a comparable technology with POS. This finding was further confirmed in Wu *et al.* (2007) study. They found no significant positive relationship between effort expectancy and behavioural intention in the context of 3G mobile adoption in Taiwan. Similarly, the findings in the current study is not in isolation as Cheng *et al.* (2008) also found no significant positive relationship exist between effort expectancy and behavioural intention to use internet banking among Chinese bank customers. Additionally, effort expectancy was found to be insignificant in predicting behavioural intention to adopt mobile commerce in the context Chinese mobile service users.

It is interesting to note that these findings are also consistent with the results of Cheng *et al.* (2011). They concluded that no significant positive relationship was detected between effort expectancy and behavioural intention to adopt information technology. Furthermore, similar result was obtained in the context of mobile banking in Taiwan. Empirical evidences demonstrated that no significant positive relationship exist between effort expectancy and behavioural intention. This was further confirmed in Zhou (2012). The study found that behavioural intention is not influenced by effort expectancy in the context of location-based services adoption.

The finding in the current study indicated that managers' anticipation of POS difficulty in operating the POS is a serious drawback in implementation of cash-less policy in Nigeria. Although there is no statistical evidence to conclude that the relationship hold, however, the finding is an interesting discovery, because it will guide the stakeholders the next line of action. Interestingly, experts and stakeholders in the financial sector have recently lamented that prospective users of POS exhibited serious technophobia towards e-payment systems. For example, the Deputy Governor of the CBN posited that prospective users are concerned over the safety of their money on e-payment gateways, due to the frequency of global financial fraud involving online payments. For example, Nwokoji (2014) reported that N4.8 billion was recently lost in a span of nine (9) months, due to e-fraud. This has led to the growing technophobia among prospective users of e-payment platforms (Idowu, 2014; Ogbodo, 2013). Technophobia has been defined as "as fear or dislike of an advanced complex device like computers or the technology in general. It generally refers to the sense of an irrational fear, but others contend fears are

justified' (Ahmad, Kamba, & Usman, 2013, p. 164). They thus concluded; "It is obvious that in this era of ICT, Nigeria as a nation will find it very difficult to cross the digital divide if concerted effort is not made to promote and continue to enhance ICT education" (Ahmad *et al.*, 2013, p. 164). Therefore it is logical to conclude that retail managers' anticipated simplicity and/or difficulty of using POS in their businesses (effort expectancy) was unable to influence their behavioural intention due to their technophobia.

5.2.2.3 Social Influence as Determinant of Behavioural Intention

Based on the definition of this construct in the context of this study; the degree to which the behaviour of owners and managers of retail business is subjected to their perception that other people who are important to them, think that they should use POS and that its usage will enhance their business image, a hypothesis was formulated. The hypothesis regarding this relationship states that there is significant positive relationship between social influence and behavioral intention to use POS. Therefore this hypothesis was tested and the result confirmed that the stated relationship significantly exists. This is not surprising considering the results of a number of past studies that examined this relationship. For example, Huang and Qin (2011) found significant positive relationship between social influence and behavioural intention in the context of adoption of virtual fitting room among Chinese shoppers. Furthermore, Wu *et al.* (2012) found significant positive relationship between social influence and behavioural intention in the study of I-Pass adoption among Taiwanese passengers. Similarly, the current study findings concurred with the result of the examination of the relationship between social influence

and behavioural intention (Lin & Anol, 2008), in an online social support adoption study. The result of the current study is also in line with Lai *et al.* (2009)'s findings. They established that social influence has a significant positive relationship with behavioural intention in the context of m-commerce adoption among Hong Kong citizens. Additionally, a significant positive relationship was found between social influence and behavioural intention in a study that investigates the adoption of IT innovations among Malaysian entrepreneurs. Interestingly, result similarities in the above studies are not surprising, because they shared contextual similarities with the current study. For example, both I-Pass and POS are information technologies that use smart card technology to allow passage and transfer funds respectively. They are also similar considering IT innovation adoption among entrepreneurs and POS adoption among retailers, both in developing countries.

On the hand, similar results were obtained in developed country setting (United States). For example, Payne and Curtis (2008), Wills *et al.* (2008) and Marchewka *et al.* (2007) found significant positive relationship between the said independent and dependent variables in the context of computer-aided Audit, e-medical record and courseware management software adoption respectively. These results further confirmed that social influence is an important determinant of behavioural intention, because the relationship holds for different context and country socio-economic status.

It can be deducted from the result of this relationship, that Nigerian retail managers have consented to the fact that their role models think that they should use POS. Furthermore they believed that the government and financial services providers are willing to support

the use of POS. This is precisely the situation, going by the numerous media campaign and advertisement featuring local celebrities, for example Alake (2013). Furthermore, many of the commercial banks embark upon enlightenments campaign as a marketing effort to penetrate the market with their customised POS, for example Standard Chartered (2012) posted on its website, a Q&A to answer frequently asked questions related to CBN cash-less policy, which assured the prospectus users of POS, particularly the merchant, that the device does not require high level of literacy.

Similarly, the immediate past Governor of the Central Bank of Nigeria and currently one of the most influential monarch (Emir of Kano) in northern Nigeria is considered as a role model by many Nigerians (Fani-Kayode, 2014). He was at the forefront of the cash-less policy campaign during his reign as the CBN Governor. These media campaign and assurances for POS issuing bank support might have helped in convincing the merchants to believe in POS adoption. Therefore it is appropriate to conclude that social influence is a crucial element in predicting behavioural intention.

5.2.2.4 Facilitating Conditions as determinant of behavioural intention

Facilitating Conditions is defined in the context of this study as the degree to which owners and managers of retail business perceived that infrastructures such as electricity and internet services, skills and supports are available to ease the use of POS in their businesses. Thus a hypothesis was formulated based on several past studies. The hypothesis states that facilitating conditions has a significant positive relationship with behavioural intention. Based on the statistical result in the previous chapter, this

hypothesis is supported (p.0.002); meaning that there is significant positive relationship between facilitating conditions and behavioural intention to use POS. Although this relationship was not theorised in the original theory (UTAUT), the finding in the current study is consistent with several past studies that further examined this relationship. For example, El-Gayar and Moran (2006) hypothesised that facilitating conditions has a significant positive relationship with behavioural intention to adopt PC tablet among US citizens. Based on statistical evidence, the hypothesis was supported. Similarly, the positive relationship between facilitating conditions and behavioural intention was found significant in Zhou (2008)'s study that investigated the adoption of m-commerce among Chinese university students.

Furthermore, in the context of internet banking in Malaysia, Foon and Fah (2011) found that social influence has a significant positive relationship with behavioural intention. This was further confirmed in the context of e-learning among Jordanian university students. Alrawashdeh *et al.* (2012) found that student's behavioural intention to use e-learning is determined by their perception of the availability of electricity, internet services, skills and support to ease the use of the e-learning system. This goes along with the context of the current study, as the definition of the construct depicts. Also consistent with above studies' findings is Zhou (2012)'s study that investigated location-based service adoption among Chinese 3G mobile users. They also found that facilitating conditions has a significant positive relationship with behavioural intention to use location-based services. Therefore these findings clearly indicated that the current study is not isolation in its findings.

The findings in the current study can be interpreted in this way; that the behavioural intention of owners and managers of retail industry in Nigeria is dependent on their firmed believed that they have the necessary resources, knowledge, support etc., to use the POS in their business. Hence the favourable facilitating conditions influence their behavioural intention to use the system. This is not unconnected with a number of assurances given by the stakeholders, for example banks, e-payment service providers and regulatory agencies such as CBN, Nigerian Communications Commissions (NCC), Consumer Protection Council (CPC), Nigeria Inter Bank Settlement Service (NIBSS) etc. For example, one of the banks answered a frequently asked question (FAQ) on its website. They expressed confident that NCC, CBN and service providers are working tirelessly to ensure un-interrupted service, through the provision of alternative services in the event of power and internet failure. These alternatives include production of battery powered and dual SIM POS.

This kind of pledges might have influenced the retailers to agree that there is support and infrastructure necessary to use POS in their business. Another reason for this finding might be as a result of the descriptions of the specifications of POS provided by the stakeholders, for example Central Bank of Nigeria (2011). Thus the merchants are convinced that POS is compatible with other systems the use in their business.

5.2.2.4 Customer Concerns as Determinant of Behavioural Intention

> *"Before managers decide to launch a technology, develop a product, build a plant, or establish new channels of distribution, they must look to their customers first: Do their customers want it? How big will the market be? Will the investment be profitable? The more*

> *astutely managers ask and answer these questions, the more completely their investments will be aligned with the needs of their customers."(Christensen & Bower, 1995, January, p. 1).*

The new construct that forms the extension of UTAUT is defined in the context of this study as the degree to which a merchant is bothered with anything that will form a negative impact on the customer's perception of their business processes. Therefore this study pioneered the integration of this construct in technology adoption literature, as a direct determinant of behavioural intention to adopt technology. It is consequently hypothesised to have significant positive relationship with behavioural intention to use POS. Based on the statistical evidence that confirmed there is significant positive relation between customer concern and behavioural intention, it can be interpreted as thus; the higher the managers concerned about their customer, the higher they intent to adopt the POS.

Although there is rarely an attempt in the past to explore this relationship, let alone coming across a finding that is consistent with the current study's findings, the outcome of the current study is an interesting one. This is an interesting result because of its consistent with reality in merchant-customer relationship, particularly in the retail industry. It is also consistent with a number of assumptions that suggests merchant's optimum responsibility of bearing in mind their customer first, before any other matter is decided in their business. For example, Hewing (2014) argued that customer's standpoint is of great significance in business process change perspectives. Particularly in Nigeria, retail customers "value convenient, modern, hassle-free shopping and loyalty rewards" (Fiorini, Hattingh, Maclaren, Russo, & Sun-Basorun, 2013, p. 5). Similarly, in

this era of technological advancement, customer centrism and technologically sophisticated customers (Suki & Ramayah, 2010), there is a general notion that a merchant is expected to provide user friendly and innovative business process, particularly payment process options (Griffiths, 2006). Therefore it would be a suicide for any merchant to hesitate the adoption of POS.

Furthermore, a new payment mechanism such as POS has become a trend in advanced countries such as the United Kingdom, United States etc. Interestingly, there is no restriction of access for nowadays customers to the ever-growing technology-driven global marketplace. They are also exposed to information about technology-driven products offering, vis-à-vis convenient payment and delivery options. Consequently, the merchants at the local markets are trying hard to retain their customers against the backdrop of thread from remote competitors. They offer such customers some incentives when they pay using electronic means.

It is interesting to note that merchants might be hesitant to adopt new payment process change in their business, given the dilemma that comes with change, especially changes that affects customers. However, based on the above reasons and the assurances given by the regulators and service providers, merchants' hesitations might be eliminated. Therefore it is not unexpected of merchants who have high customer concern to intent to adopt new payment process that promises them business process improvements.

5.2.3 Discussion of Findings of Moderating Hypotheses

Based on review of result of past literature and careful examination of the context of the study, it was concluded that there is need to further expand the body of knowledge. This was done by subjecting the direct relationships discussed in the previous section, to a moderating influence of a third variable. Coincidentally, the context further revealed that lack of awareness of benefits, features and cost of deploying POS in one's business, hinders its adoption. Therefore the current study identified and theorised that Technology Awareness moderates the relationship between UTAUT independent variables and behavioural intention to use POS. Technology Awareness is defined in the context of this study as the merchant's knowledge of the existence, features, costs, benefit and simplicity or otherwise of using POS in their businesses. Consequently, four moderating hypotheses were formulated and tested, based on the interaction between the moderator and the predictor variables. Out of the four hypotheses, two were supported, while two others were rejected. The following sections discuss these findings.

5.2.3.1 Performance Expectancy * Technology Awareness * Behavioural Intention

The hypothesized moderating effect in this path postulates that behavioral intention of managers with high technology awareness will be stronger than those with low technology awareness. On the contrary, the hypothesis was rejected based on lack of statistical evidence to support it. This indicates that the significant positive relationship between performance expectancy and behavioral intention is not contingent on technology awareness of retail managers. However, this finding is a thought-provoking

going by the result obtained with respect to direct relationship between performance expectancy and behavioral intention. Because the result further substantiates that performance expectancy is a perfect determinant of behavioral intention, irrespective of the level of technology awareness of owner/manager.

The relationship might have not been contingent on technology awareness because of the managers' firmed believe that POS will improve their business process. Their faith in the system is influenced by persistent campaign by various stakeholders that the system (POS) has great benefits. For example, in its bid to ensure massive adoption of POS, the CBN promised POS prospective users that the system comes with tremendous benefits; "it saves you from robbery, theft, cost of cash management, hassles of counting cash, looking for change, getting more customers that do not have cash but card, access to more revenue from value added services of POS such as bills payment and airtime vending, etc" (Central Bank of Nigeria, 2012, p. 3). This and many more campaigns might influence managers' behavioral intention irrespective of their level of technology awareness.

Additionally, another possible rational of the mystery in the current study, might be due to the demographic characteristics of the respondents. Ninety six per cent of the respondents are educated to at least secondary school level. This consists of 12.6 per cent of them educated to secondary school level, 24.5 per cent diploma level, 51.6 per cent degree/HND level, while 6.9 and 0.6 per cents are holders of masters and PhD respectively. Their level of education suggests that they are at least exposed to similar digital technology devices such as smartphones. Therefore their knowledge of the

benefits of such devices might lead to their intention to adopt other devices such as POS, irrespective of their awareness of the features benefits and cost of POS in specific.

5.2.3.2 Effort Expectancy * Technology Awareness * Behavioural Intention

In this scenario, behavioral intention was proposed to be determined by an interaction between effort expectancy and technology awareness. The hypothesis states that the significant positive relationship between effort expectancy and behavioral intention is moderated by technology awareness, such that the relationship will be stronger for managers with high technology awareness than managers with low technology awareness. Interestingly, the result of the hypothesis testing revealed that the relationship is stronger for managers with high technology awareness, but weak relationship for managers with low technology awareness. However, the direct relationship between effort expectancy and behavioral intention is not statistically significant. Even though the direct relationship is not significant, it is interesting to note that the finding suggests that technology awareness is an important moderating variable for this relationship. Sharma, Durand, and Gur-Arie (1981) referred to such moderators as 'pure moderator', because it is "not related to either the predictor or the criterion variable. Rather, it interacts with the predictor variable to modify the form of the relationship" (Sharma *et al.*, 1981, p. 293).

Correspondingly, in the context of the current study, the influence of effort expectancy on behavioral intention is contingent on the level of managers' technology awareness, because of the following reasons. The constructs is operationally defined as anticipated

simplicity and/or difficulty of using POS in retail businesses. Hence understanding the system's ease of use, complexity, flexibility and time needed to become skilful etc., is subject to managers' knowledge of these components. Incidentally, synonymous to knowledge is awareness. Therefore it is not surprising that the relationship between effort expectancy and behavioral intention is contingent on the level of managers' technology awareness.

5.2.3.3 Social Influence * Technology Awareness * Behavioural Intention

The predictor variable in this relationship is operationally defined as the extent to which of owners and managers of retail business is subjects their behaviour to perception of other people who are important. Thus they think that they should use POS, because it will enhance their business image. Due to inconsistent findings in the past literature and careful consideration of the context of study, the current study subjects the relationship between social influence and behavioural intention to moderation effect of technology awareness. The hypothesis is supported, thus the finding can be interpreted as; social influence predict behavioural intention of managers whose awareness of cost, benefits and features of POS is higher, than for managers with low technology awareness.

It is interesting to note that the relationship might be stronger for managers with high technology awareness because of their exposure to media campaign about the benefits and cost of deploying POS in one's business, thus they became aware of the importance of adopting technology such as POS. For example, the CBN is engaged in massive media campaign to reach out to the merchant to embrace electronic payment gateways,

particularly the POS. The interaction also might have worked perfectly because, consistent with the findings in Venkatesh *et al.* (2003), where social influence – behavioural intention relationship was found to be perfectly moderated by gender. Thus the relationship was stronger for men than for females. Incidentally, majority of the respondents in the current study are male.

Similarly, the finding in this study is not in isolation, because awareness was also found to moderate the relationship between intention to use traffic violation e-payment in the context of Kuwait e-government services (Omar, 2011). These findings further substantiates that awareness/technology awareness is an important moderating variable in the context of intention, behaviour and their antecedents relationships.

5.2.3.4 Facilitating Conditions * Technology Awareness * Behavioural Intention

Another interesting finding is the hypothesized moderating effect of technology awareness on the relationship between facilitating conditions and behavioral intention. The hypothesis assumed that the significant positive relationship between facilitating conditions and behavioral intention is contingent on the level of managers' technology awareness, such that facilitating conditions for managers with high technology awareness, determines their behavioral intention to use POS than those with low technology awareness. On the contrary, hypothesis was tested and found not significant. Although the hypothesis was rejected, it is interesting to note that facilitating conditions is an important determinant of behavioral intention irrespective of managers' level of

technology awareness. This is an interesting finding because it demonstrates the robustness of facilitating condition in predicting managers' behavioral intention.

The robustness exhibited by facilitating conditions might be due to assurances by the stakeholders, such as CBN, NIBSS etc., that there is external support related to the use of the system. Similarly, to discourage the cash-based transaction and encourage electronic based payment process, charges are imposed on any cash deposit as "cash handling charge' on daily cash withdrawals or cash deposits that exceed N500,000 for Individuals and N3,000,000 for corporate bodies" (Central Bank of Nigeria, 2012, p. 1). Therefore users of POS are automatically exempted from paying such charges. The exemption therefore comes as an incentive to the merchants, giving them an impression that there are special incentives from government for using POS in business.

Consequently, the robustness of facilitating conditions as important direct determinant of behavioral intention rendered the proposed moderation of technology awareness irrelevant. Interestingly, the irrelevancy concurred with the notion of homologizcr moderator as discussed in Sharma *et al.* (1981). They demonstrated that homologizcr moderator is such a moderator variable that neither interact, nor related to the predictor variable.

5.2.4 Discussion of Research Objectives

Following highlighting of the practical and theoretical issues in problem statement and careful consideration of the context of the study, four research questions were stated. To

answer the research questions, the questions were transmuted into research objectives. Then the objectives were transformed into hypothesis and subsequently tested. The following discussions review the research objectives and highlighted whether the objectives has been achieved.

Number one objective of this study was to determine the influence of four independent variables on behavioural intention to use POS in Nigerian retail industry. Thus Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Condition were hypothesised as direct determinants of managers' behavioural intention to use POS. Based on the results of the hypothesis testing, all except effort expectancy were found as significant positive influencers of behavioural intention. The accepted hypotheses confirmed previous studies' findings. Accordingly, discussion of the justification of the findings was provided in section 6.2.2. Therefore the objective was achieved.

Secondly, an objective was set to investigate if technology awareness and the four UTAUT constructs can interact to predict behavioural intention, thus the relationship between the UTAUT independent variables and behavioural intention will be stronger for managers with high technology awareness than those with low technology awareness. Subsequently, four moderating hypotheses were formulated. The result of the hypothesis testing indicated that two out of the four hypotheses were supported, while other two were not. Although half of the hypotheses were not supported, the justifications of the accepted hypotheses, as well as the likely reason behind the mystery were discussed in section 6.2.3. Similarly, effect size of the moderating versus the direct effect model was calculated. The moderating model has a small effect size (0.115),

however “even a small interaction effect can be meaningful under extreme moderating conditions, if the resulting beta changes are meaningful, then it is important to take these conditions into account” (Wynne W Chin et al., 2003, p. 211). Therefore this objective is also achieved.

Thirdly, one of the main objective this study is to make an extension of UTAUT theory with a new variable; Customer Concern. This extension was justified in the statement of problem, therefore was subjected to hypothesis testing. Interestingly, the hypothesis was not only supported, but the new construct appeared to have the highest effect (beta 0.386) on the dependent variable, amongst all the variables in the extended model. See Table 4.10. Furthermore the variable has the largest effect size (f^2) in the model as depicted in Table 4.12.

Finally, this study seeks to calculate the predictive relevance (Q^2) of the extended model, in accordance with (Geisser, 1974; Stone, 1974). Therefore the SmartPLS blindfolding procedure was followed. This objective is also achieved, since the model has a strong predictive capability (0.283), because any Q^2 value that is >0, the model has predictive relevance (Hair *et al.*, 2014).

5.3 Research Implications and Contributions

The overall aim of this study is to apply and make extension of Unified Theory of Acceptance and Use of Technology (UTAUT) in two fold. First, it is aimed to theoretically add an independent variable to the existing ones in the model and empirically validate the extension. Secondly, it is aimed to introduce a moderating

variable to moderate the relationship among the variable in the model. Hypothesis for the relationships in the model was formulated, tested and findings were presented and discussed. Therefore, having discussed the findings of the study in the previous sections, there are implications of these findings to the body of knowledge and practice. These implications and contributions are hereby discuss in the following section Furthermore, discussions of the flaws in the methodology of previous literature was presented, thus the current study pay attention to those methodological flaws and improved them. These improvements therefore poses some implications, thus becomes methodological contributions. Subsequently, implications arising from the theoretical and methodological contributions generate practical implications and contributions, thus they are presented and discussed.

5.3.1 Theoretical Implications and Contributions

The outcome of this study has some theoretical implications. First of all, although technology adoption phenomena has been widely studied across contexts, both at individual (customer) and organizational (manager) levels, however, there is no coherent attempt to investigate the phenomena in the perspectives of manager decision making process, vis-à-vis concern for customer. Therefore, this study implies that the application of technology diffusion theories have fall short of theorizing the impact of customer on the decision making process in organizations. Secondly, the existing literature views technology diffusion in isolation, although there are areas of study which are interrelated with. Thus the existing literature was fragmented. Consequently, the current study viewed technology adoption as a process of change, especially in the context of business

enterprise; change from notes and coins method of payment, to an electronic based payment process. Therefore the current study connects Change Management, Business Process Reengineering (BPR) and Electronic Payment System (EPS) diffusion and synthetized the otherwise differing entities (Abubakar, Ahmad, & Baharin, 2013).

Although what constitutes a theoretical contribution is still a debatable topic, Whetten (2009) argued that formulations of novel theory or extension of existing ones is considered a contribution to theory. Similarly, Phillips and Pugh (2010) enumerated what makes a PhD work original. This includes, among others, synthesising what was previously fragmented, adding construct to an existing theory etc. Furthermore, there has been persistent emphasis on the role of context in theory development, for example, Whetten (2009), Johns (2006), Feldman (2004), etc. Therefore, a framework for developing a context-driven theory for information system research was provided. "Context-specific theory development emphasizes the interplay between the characteristics of technologies, users, and usage contexts" (Hong *et al.*, 2014, p. 132). Interestingly, the extension in the current study is contextually driven, because of the recurrent customer-merchant interaction in retailing business. There is frequent physical and virtual interaction between merchants and their customers, the importance of customers to business enterprises vis-à-vis their technological sophistication.

Based on the above therefore and drawing from the recommendation for future research in UTAUT; that future studies should extend the theory to examine behavioral intention and actual use behavior beyond what is already known and understood by introducing theoretically motivated additional independent, moderating and mediating variables, the

current study proposed and extended UTAUT with an independent and moderating variable. This was done after careful consideration of the context of the study and exhaustive literature review (see Appendix N). Based on the literature review, it was found that previous researchers paid no attention to the influence of customer concerns on managers' decision making process, thus customer concerns variable was added to the existing UTAUT model. Finding of the empirical study established that customer concerns is an important determinant of behavioral intention to use technology in businesses, especially given the effect size (largest in the model) of the new construct. Interestingly, this study is not in isolation in this regard, as similar theoretical extensions, particularly for UTAUT can be seen in Lai *et al.* (2009), Carter *et al.* (2011), Maldonado *et al.* (2011), Rajapakse (2011), Zhou (2012) etc. Refer to Appendix O.

Another theoretical contribution of this study is the introduction of moderating role of technology awareness on the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions and behavioral intention. Although statistical evidence does not support the hypothesis for moderating effect on performance expectancy, facilitating conditions-behavioral intention paths, the demographic characteristic of the data and the current situation in the context of the study justified the mysterious findings. This therefore provided an insight on the nature of the context being investigated. On the other hand, empirical evidences proved that technology awareness strengthen the significant positive relationship between effort expectancy, social influence and behavioral intention. This implies that awareness,

particularly technological cognizance is an important variable that interacts with the independent variables to predict behavioral intention.

Finally, application of previously tested theories and models in different context from that which it was tested is a basis for generalization of the theory. Interestingly, this study pioneered the application of UTAUT to study the Nigerian retail context. Therefore the study further substantiates the robustness of UTAUT in explaining user intention and use behavior with regards to technology implementation in organizations.

5.3.2 Methodological Implications and Contributions

On the basis of methodological approach, this study contributes in enhancing the quantitative methodological approach, particularly in terms of measurement mode of two latent constructs, sampling and analysis techniques. Firstly, in the past, there has been frequent use of students as subjects, even if the study unit of analysis was apparently organizational (managers). Similarly, although UTAUT was meant for organizational level, researchers inappropriately sampled individual users (customers) instead of individuals in organizations (Gao & Deng, 2012; Rasheed & Shiratuddin, 2009). This implies that many of past studies might be characterized with erroneous selection of respondents. The current study therefore, improved the methodology, by appropriately selecting owners and managers of retail business as respondents.

Secondly, measurement model modes were not specified for the two constructs that made the extension of UTAUT in the current study. The two variables; customer

concerns and technology awareness were adapted from Susskind *et al.* (2003) and Nambisan *et al.* (1999) respectively. The studies were silent on whether the indicators are formatively or reflectively measured. Hence the current study specified the measurement model mode of the indicators, based on the guidelines provided in Hair *et al.* (2014). The 5 items each for customer concerns and technology awareness were measure reflectively based on their wordings and direction of causality etc. See section 6.2.1 for detailed discussion on this. Therefore, in addition to bringing forth the two constructs into technology diffusion research, this study further defined the measurement modes of the indicators of the constructs.

Thirdly, although PLS-SEM has received remarkable application in the recent past, especially in the information system research, only a few of its application estimated some advanced level PLS analysis such as effect sizes (f^2), predictive relevance (Q^2) and effect size of the predictive relevance (q^2). Calculating these further enhance the understanding of the most important exogenous variable in explaining the R^2 of the endogenous latent variable in a given model and the predictive capability of the model. Furthermore, as the popular maxim articulates; a picture says a thousand words, a graphical representation of the moderation plots was provided in the currents study. This further enriched understanding of extend of the moderation.

5.3.3 Managerial (practical) Implications and Contributions

Service Providers

1. The outcome of this research can be useful information to internet service providers, to help them get first-hand information on users' preference in the services they provided. Particularly the significant positive relationship between performance expectancy and behavioural intention. This gives the ISPs clue with regards to expectation of the prospective users, hence the provide services that matches user preference.

2. "My bank would support the use of POS" was one of the statements that measured social influence. This statement implied that managers of retail industry anticipated support from financial institutions, particularly banks. Therefore financial service providers would also find the results of this study useful, as prospective users have express their perceptions with regard the systems use.

3. Credit/debit card are said to be the most frequently used means of e-payments, thus card issuing banks and manufacturers can as well use the outcome of this research to customize their cards based on user's preferences and enhance the security features of the card.

Regulatory Authorities

Regulatory bodies are government agencies established and authorized under legislative provisions to ensure conformity with the rules and guidelines stipulated by the law.

Their main functions are to police a particular industry to ensure compliance. They are also called regulatory agencies.

1. The Central Bank of Nigeria, is the body in charge of regulating all financial institutions and their activities in Nigeria, hence outcome of this research will be of great importance to CBN. They can use it to strengthen its financial policies and roll-out new programs that are in line with best practices. Also the much desired cashless economy policy of the CBN will be achieved.

2. One of the motivating factors for the current study is the high volume and value of cash-based transactions, which leads to high cost of cash management. This led to the role-out of cash-less policy, which is aimed at reducing the cash-based to cash-less. Therefore, as soon as the merchants begin to adopt the new payment mechanism, the cost of cash management will be minimal, as payments become cashless.

3. Economic and Financial Crimes Commissions (EFCC) is a government agency in charge of checkmating financial crimes that is so rampant in Nigeria, which can be linked with high volume of cash-based transaction. The commission will find the outcome of this research very useful instrument in curtailing the menace of financial crimes. If successfully implemented, e-payment system will provide EFCC an opportunity to track all financial transactions in the country.

4. Nigerian Communication Commission (NCC) is another government establishment that is responsible of regulating all activities in the information and communication sector. It can also benefit from the outcome of this research, as they might use it to roll-out a policy framework that will ensure all stakeholders (consumers and service providers) play their legitimate roles in the provision and usage of secured and reliable e-payment technologies. It will also use the outcome of the research to improve in developing the infrastructures and making regulations regarding piracy prevention and security issues, so that merchants can be encouraged to embraced e-payment services.

Significance to the Retail Industry

1. Due to the excess cash transactions, armed robbery has been of frequent occurrence and retailers appear to be the major victims of such crime. This study examined the resistance to change in the retail industry, thus the result can lead to full implementation of e-payment system and subsequently reduced the rate of armed robbery, as payments becomes cash-less.

2. As consumers are getting more technologically sophisticated (Ahmad, 2012), their preference to technology based processes increases, thus merchants who embraced the change may benefit more patronage than the ones who resists the change.

3. CBN imposed a charge of 3 and 5 per cent on daily cash transaction that exceeds N500,000 and N3,000,000 for individual and corporate organisations respectively. However, as the merchants adopts the new payment system, thus eliminates cash in the payment process. Therefore there will be no charges for depositing money of whatsoever amount, because the process does not involve cash.

Implication to Business Sustainability

The adoption of POS helps to account for transactions in the "informal sector" for tax and other government related activities, reduce the cost of cash management. Prospective E-payment Service Providers, both locally and internationally will use the result of this work to create user-friendly and secured e-payment services to the teaming Nigeria's populace in this market segment. It will also reduce high rate of crimes that are related to movement, transaction & keeping of large sum of money.

Impact on the Environment, Social and Economics

It will be the beginning of a cashless society, hence it will help reduced excess use of paper for printing of Notes, eliminates writing of cheques, hence it help to safeguard the environment. Economic growth and development as transparency and accountability will improve. Payment can be made swiftly and remotely using various devices, thus it helps increase the efficiency of operation and convenience of payments. The risks

associated with drawing cheques will be eliminated. It will also create an avenue for employment generation, as there will be increase in EPSs providers.

5.4 Limitations of the study

As it is the practice in scientific research, particularly behavioral science research, there might be some theoretical and/or methodological issues that might enhance the reliability and validity of the research findings, but have not been fully taken care of, often because of some factors beyond the control of the researcher. These limitations are hereby enumerated and discussed.

First of all, this study focused on behavioral intention alone, thereby neglecting actual usage, unlike in UTAUT. However, this is because the context of the study is lagging behind in terms of adoption POS. It was reported that POS adoption is at 6 per cent (Adepetun, 2012), therefore there might be few subjects to be surveyed, who already adopted the POS. Therefore the current study is constrained to study the intention only. Similarly, the UTAUT was tested in Venkatesh *et al.* (2003) in a longitudinal study. However, the current study collected data in a cross-sectional manner. This is because the current study investigated the determinants of behavioral intention, Venkatesh *et al.* (2003) examined its consequence (actual behavior).

Secondly, the current study was constrained with the non-availability of sampling frame for some sectors of the retail industry. This might be as a result of lack of research culture in Nigeria. Therefore, a sampling technique that is not dependent on sampling frame was used. Although it is a probability sampling, area sampling, a specific variety

of cluster sampling is least generalizable. However it is least expensive. Furthermore the size of sample used in the current study might not be particularly representative of the population, but it is adequate based on power analysis, thus acceptable when using PLS-SEM. However, effort has been made to gather more data by making several follow ups, but the retailers were busy with their time-demanding business schedules. Therefore, due to limited financial resources, the survey was called off. See section 5.2 for details.

Thirdly, the variance explained in behavioral intention in this study is 56 per cent, thus is less than 70 per cent variance explained in Venkatesh *et al.* (2003). This implies that there might be other variable which can add the variance explained of the endogenous latent variable in the model. Furthermore, the current study examined only the direct relationships (and moderating) of independent variables and behavioral intention. It does not consider whether there might be some mechanisms through which these independent variables determines behavioral intention. Finally, the extended UTAUT proposed in this study was only tested in Nigerian retail industry.

5.5 Recommendation for Future Research

The limitations of the current study was highlighted and discussed in the previous section. Therefore these limitations offer avenues for future researches. Hence this section discussed these avenues and offer recommendations for future researchers to explore these avenues.

As the government is making effort to ensure significant diffusion of POS, through mass media campaign and adoption of findings and recommendations of scientific investigations such as the current study, the adoption of POS might significantly grow. Hence researchers can examine behavioral intention and actual behavior in one study. For that reason, this study recommends future studies to collect data in longitudinal approach. This might enhance understanding of the phenomena, by examining whether behavioral intention truly leads to use behavior. Additionally, the respondents in the current study have actually expressed their confidence that POS usage will increase their productivity, transaction quality, process efficiency and overall performance. Therefore future studies should examine the impact of POS usage on business performance.

Considering the inability of the current study to gather large sample size due to logistics constraints, future studies should limit such constraints by obtaining substantial funding for their research. This increases the possibility of collecting large sample size that can sufficiently represent the population. Furthermore, if situation warrant access to comprehensive sampling frame, future studies should adopt more generalizable probability sampling technique such as simple random sampling, systematic, stratified random sampling techniques etc. This will enhance the generalizability of their findings. On the other hand, the extended model could be tested in another context; using covariance based structural equation modeling technique (CB-SEM). Although this might appears as replication, however it is important to test the model across context, using different estimation approaches. As the hallmark of scientific research assumed,

the application of the extended model in similar context will further substantiates its replicability.

Similarly, in order to maintain parsimonious model this study might have ignored some important predictors of behavioral intention. For that reason, this study recommends future researchers to expand the horizon of the current understanding of phenomena. The expansion could be in form of theoretically and contextually-driven factors that improves on what is currently known and understood. Furthermore, the direct relationships explored in this study might not be sufficient, because the mechanisms through which these relationships existed are not known. Therefore, future researchers could investigate the intervening mechanism among the relationship between performance expectancy, social influence, facilitating conditions, customer concerns, facilitating conditions and behavioral intention.

5.6 Conclusion

The motivation of the researcher to embark on this study was informed by the amount of physical cash circulating in Nigerian economy and its consequences on cost of cash management thus becomes a source of concern for the government. While CBN rolled out cashless policy to drain the excess cash-based economy via POS and other electronic means of payment, the prospective users resist changing to the new payment process. People, process and technology are integral parts business process reengineering and technology, which is a subset of change. To begin change, change sense of urgency (SU)

is required to be created in the people. Interestingly SU has been traced to behavioral intention.

However, while existing literature's attempts were incomprehensive in examining behavioral intention, particularly related to technology adoption, the context of the study (retail industry) hinted that customer is an integral part of its business. Therefore the current study conceptualized customer concerns as determinant of behavioral intention, along with UTAUT independent variables. Similarly, the context also revealed that the inconsistencies found in the literature could be remedied with a moderating effect of technology awareness on the relationships among the constructs in the model. Therefore hypotheses were formulated, tested and the findings were discussed.

One of the milestones achieved in this study is its unique approach to technology diffusion phenomena. While the objectives of this research were achieved, the study has succeeded in distinguishing itself, by examining the technology adoption phenomena from the perspective of business process change management. This is rarely seen in the literature, because past studies examined the phenomena in isolation. Furthermore, this study achieved bulk of the hallmarks of scientific investigations enumerated in various texts, such as purposiveness, rigor, precision and confidence, objectivity and parsimony.

REFERENCES

Abadi, H. R. D., & Nematizadeh, F. (2012). An empirical investigation of the level of user's acceptance of e-banking among some customers of banks in Iran. *International Journal of Academic Research in Business and Social Sciences,, 2*(6), 418-430.

Abbad, M. M., Morris, D., & De Nahlik, C. (2009). Looking under the bonnet: factors affecting student adoption of e-learning systems in Jordan. *The International Review of Research in Open and Distance Learning, 10*(2), 1-13.

Abubakar, F. M., & Ahmad, H. (2014). Determinants of behavioural intention to use e-payment system in Nigerian retail industry: A conceptual extension of UTAUT with concern for customers. *International Journal of Contemporary Business Management (IJCBM), 1*(1), 87-93.

Abubakar, F. M., Ahmad, H. B., & Baharin, S. (2013). *Establishing Basis for Funnel Approach in Research: Using Ontology to Examine Electronic Payment System from the View of Business Process Reengineering* Paper presented at the 21st International Business Information Management Association Conference, Vienna, Austria.

AbuShanab, E., & Pearson, J. (2007). Internet banking in Jordan: The unified theory of acceptance and use of technology (UTAUT) perspective. *Journal of Systems and Information Technology, 9*(1), 78-97.

Ackfeldt, A.-L., & Coote, L. V. (2005). A study of organizational citizenship behaviors in a retail setting. *Journal of Business research, 58*(2), 151-159. doi: 10.1016/S0148-2963(03)00110-3

Adeoti, O., & Oshotimehin, K. (2011). Factors influencing consumers' adoption of point of sale terminals in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 2*(5), 388-392.

Adepetun, A. (2012, 30 July). Survey puts PoS usage, penetration in Nigeria at six per cent, *The Guardian*. Retrieved from http://www.ngrguardiannews.com/index.php?option=com_content&view=article&id=93855:survey-puts-pos-usage-penetration-in-nigeria-at-six-per-cent&catid=31:business&Itemid=562

Agabonifo, O. C., Adeola, S. O., & Oluwadare, S. A. (2012). An assessment of the role of ICT in the readiness of Nigerian bank customers for the introduction of cashless transactions. *International Journal of Computing and ICT Research, 2*(6), 9-22.

Agboola, O. O. (2012). CBN reviews the cash-less Lagos policy. *Press Release.* Retrieved 25/5/2013, 2013, from http://www.nibss-plc.com/about-nibss/nibss-profile

Ahmad, A. (2012). Technology Management School: Evolution and imperative. *International Journal of Business, Humanities and Technology, 2*(2), 156-162.

Ahmad, H., & Francis, A. (2006). Empirical investigation on satisfaction and service quality level of radical process change implementation. *International Journal of Management Studies (IJMS), 13*, 1-27.

Ahmad, H., Francis, A., & Zairi, M. (2007). Business process reengineering: critical success factors in higher education. *Business Process Management Journal, 13*(3), 451-469.

Ahmad, S. A., Kamba, M. A., & Usman, M. (2013). Technophobia versus ICT acceptance and use in teaching and learning among academic staff of universities in northern Nigeria. *Indian Journal of Applied Research, 3*(12), 161-165. doi: 10.15373/2249555X

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Arizona, USA: Sage Publications, Inc.

Aiyevbomwan, E. (2013). The rise of Retail Business in Nigeria -TheInsider (Vol. 2013). Lagos: Sesema PR Limited.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211. doi: 10.1016/0749-5978(91)90020-T

Ajzen, I. (2002). *Constructing a TPB questionnaire: Conceptual and methodological considerations*. Retrieved from http://chuang.epage.au.edu.tw/ezfiles/168/1168/attach/20/pta_41176_7688352_57138.pdf

Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management, 44*(8), 681-691. doi: 10.1016/j.im.2007.09.002

Al-Mashari, M., & Zairi, M. (1999). BPR implementation process: an analysis of key success and failure factors. *Business Process Management Journal, 5*(1), 87-112.

Al-Nawawi, Y. I. S. (2001). *Text, Translation and Notes: Imam Nawawi"s Collection of Forty Hadith*. Kuala Lumpur.: Islamic Book Trust.

Al-Shafi, S., & Weerakkody, V. (2009). *Understanding Citizens' behavioural Intention in the Adoption of E-Government Services in the State of Qatar*. Paper presented at the European Conference on Information Systems, Verona, Italy.

Alake, T. (2013). Cashless Lagos Campaign - POS Machine: Youtube.

Alrawashdeh, T. A., Muhairat, M. I., & Alqatawnah, S. M. (2012). Factors affecting acceptance of web-based training system: Using extended UTAUT and structural equation modeling. *International Journal of Computer Science, Engineering and Information Technology (IJCSEIT), 2*(2). doi: http://arxiv.org/abs/1205.1904

Alvesson, M., & Kärreman, D. (2007). Constructing mystery: Empirical matters in theory development. *Academy of Management Review, 32*(4), 1265-1281. doi: 10.5465/AMR.2007.2658682

American Educational Research Association. (2006). *Standards for reporting on empirical social science research in AERA publications*. Washington, DC: Author.

Amoroso, D. L., & Cheney, P. H. (1991). Testing a causal model of end-user application effectiveness. *Journal of Management Information Systems, 8*(1), 63-89.

Anckar, B. (2003). Drivers and inhibitors to e-commerce adoption: Exploring the rationality of consumer behavior in the electronic marketplace. *ECIS 2003 Proceedings*, 24.

Anderson, J., & Gerbing, D. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological bulletin, 103*(3), 411 - 423.

Appiah, A., & Agyemang, F. (2006). *Electronic retail payment system: User acceptability and payment problems in Ghana.* (Master's thesis). Retrieved from

http://planarkitekterna.se/fou/cuppsats.nsf/all/2317be39b43b8abfc125712a0039746 4/$file/Microsoft%20Word%20-%20BTH%20Master%20Thesis.pdf

Armenakis, A. A., & Bedeian, A. G. (1999). Organizational change: A review of theory and research in the 1990s. *Journal of management, 25*(3), 293-315. doi: 10.1177/014920639902500303

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of marketing research, 14*(3), 396-402.

Arthur, W. B. (2009). *The nature of technology: What it is and how it evolves* (2nd ed.). New York: Free Press.

Ayo, C. K., & Ukpere, W. I. (2012). *Further development of a secured unified e-payment system in Nigeria: A critical viewpoint* P. Ifinedo (Ed.) *E-Business–Applications and Global Acceptance* (pp. 41-52). doi:10.5772/2256

Bacon, T. R. (2003). Helping people change. *Industrial and Commercial Training, 35*(2), 73-77.

Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science, 16*(1), 74-94. doi: 10.1007/bf02723327

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative science quarterly, 36*(3), 421-458.

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of environmental psychology, 27*(1), 14-25. doi: 10.1016/j.jenvp.2006.12.002

Bamberger, P. A., & Pratt, M. G. (2010). Moving forward by looking back: reclaiming unconventional research contexts and samples in organizational scholarship. *Academy of Management Journal, 53*(4), 665-671. doi: 10.5465/AMJ.2010.52814357

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. London, UK: Prentice-Hall, Inc.

Bandura, A. (1997). *Self- Efficacy: The Exercise of Control* (1st ed.). New York: Worth Publishers.

Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology studies, 2*(2), 285-309.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173-1182.

Bates, S. R., & Jenkins, L. (2007). Teaching and learning ontology and epistemology in political science. *Politics, 27*(1), 55-63. doi: 10.1111/j.1467-9256.2007.00279.x

Belasco, J. (1990). Enlist champion change agents. *Executive Excellence, 7*(8), 9-10.

Bertrand, M., & Bouchard, S. (2008). Applying the Technology Acceptance Model to VR with people who are favorable to its use. *Journal of CyberTherapy & Rehabilitation, 1*(2), 200-207.

Bhaskar, R. (1975). Feyerabend and bachelard: two philosophies of science. *New Left Review, 94*(3), 31-55.

Bickel, R. (2012). *Multilevel analysis for applied research: It's just regression!* London: Guilford Press.

Biola, K., & Dan, O. (2012). Research Shows Friends are No.1 Influence on Nigerian Youths, as Airtel Repositions as Friendship Network. Retrieved 15 April, 2013, from TMKG Publishing www.brandworknigeria.com

Birch, A., & Irvine, V. (2009). Preservice teachers' acceptance of ICT integration in the classroom: applying the UTAUT model. *Educational media international, 46*(4), 295-315.

Brett, J. M., Tinsley, C. H., Janssens, M., Barsness, Z. I., & Lytle, A. L. (Eds.). (1997). *New approaches to the study of culture in industrial/organizational psychology*.

Bryman, A., & Bell, E. (2007). *Business research methods* (2nd ed.). New York: Oxford University Press.

BurgeSmani, R. A., & Wheelwright, S. C. (2004). *Strategic management of technology and innovation* (5th ed.). New York: McGraw Hill.

Burton-Jones, A., & Hubona, G. S. (2006). The mediation of external variables in the technology acceptance model. *Information & Management, 43*(6), 706-717. doi: 10.1016/j.im.2006.03.007

Callaghan, W., Wilson, B., Ringle, C. M., & Henseler, J. (Eds.). (2007). *Exploring Causal Path Directionality for a Marketing Model Using Cohen's Path Method*. Aas, Norway: MATFORSK.

Carlsson, C., Carlsson, J., Hyvonen, K., Puhakainen, J., & Walden, P. (2006). *Adoption of mobile devices/services—searching for answers with the UTAUT*. Paper

presented at the System Sciences, 2006. HICSS'06. Proceedings of the 39th Annual Hawaii International Conference on.

Carter, L., Schaupp, L. C., & McBride, M. E. (2011). The US e-file initiative: an investigation of the antecedents to adoption from the individual taxpayers' perspective. *e-Service Journal, 7*(3), 2-19.

Casebeer, A. L., & Verhoef, M. J. (1997). Combining qualitative and quantitative research methods: considering the possibilities for enhancing the study of chronic diseases. *Chronic diseases in Canada, 18*(3), 18-13.

Central Bank of Nigeria. (2011). *Guidelines on Point of Sale (POS) Card Acceptance Services*. Abuja: Retrieved from www.cenbank.org.

Central Bank of Nigeria. (2012). Central Bank of Nigeria: The Cashless Nigeria Project. Retrieved October 2nd, 2012, from www.cenbank.org/cashless/#

Chang, M. K., & Cheung, W. (2001). Determinants of the intention to use Internet/WWW at work: A confirmatory study. *Information & Management, 39*(1), 1-14. doi: 10.1016/S0378-7206(01)00075-1

Chang, S.-C., & Tung, F.-C. (2008). An empirical investigation of students' behavioural intentions to use the online learning course websites. *British Journal of Educational Technology, 39*(1), 71-83. doi: 10.1111/j.1467-8535.2007.00742.x

Charbaji, A., & Mikdashi, T. (2003). A path analytic study of the attitude toward e-government in Lebanon. *Corporate Governance, 3*(1), 76-82. doi: 10.1108/14720700310459872

Chen, L.-L., Kuan, C. J., Lee, Y.-H., & Huang, H.-L. (2011). *Applicability of the UTAUT model in playing online game through mobile phones: Moderating effects*

of user experience. Paper presented at the IEEE International Technology Management Conference (ITMC), 2011 San Jose, CA, USA.

Cheng, D., Liu, G., Qian, C., & Song, Y.-F. (2008). *Customer acceptance of internet banking: Integrating trust and quality with UTAUT model.* Paper presented at the IEEE International Conference on Service Operations and Logistics, and Informatics, 2008. IEEE/SOLI 2008, Beijing, China.

Cheng, S.-Y., Tsai, M.-T., Cheng, N.-C., & Chen, K.-S. (2012). Predicting intention to purchase on group buying website in Taiwan: Virtual community, critical mass and risk. *Online Information Review, 36*(5), 698-712. doi: 10.1108/14684521211275984

Cheng, X., & Wang, L. (2010). *A comparative study of consumers' acceptance model in mobile-commerce.* Paper presented at the 2nd International Conference on Computer Engineering and Technology (ICCET), 2010 Chengdu, China.

Cheng, Y.-S., Yu, T.-F., Huang, C.-F., Yu, C., & Yu, C.-C. (2011). The comparison of three major occupations for user acceptance of information technology: Applying the UTAUT model. *iBusiness, 3*(2), 147-158. doi: 10.4236/ib.2011.3202

Chiemeke, S., & Evwiekpaefe, A. (2011). A Conceptual framework of a modified unified theory of acceptance and use of technology (UTAUT) Model with Nigerian factors in E-commerce adoption. *Educational Research, 2*(12), 1719-1726.

Chima, O. (2011, 6 Oct. 2011). CBN: Cash Mgt Cost May Rise to N192bn, News, *ThisDay*. Retrieved from http://www.thisdaylive.com/articles/cbn-cash-mgt-cost-may-rise-to-n192bn/99900/

Chin, W. W. (1998a). Commentary: Issues and opinion on structural equation modeling. *MIS quarterly, 22*(1), 7-16.

Chin, W. W. (1998b). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295-336). London, UK: Psychology Press.

Chin, W. W. (2010). Bootstrap cross-validation indices for PLS path model assessment. In V. E. Vinzi, W. W. Chin, J. Henseler & H. Wang (Eds.), *Handbook of partial least squares* (pp. 83-97). Verlag Berlin Heidelberg: Springer.

Chin, W. W., & Gopal, A. (1995). Adoption intention in GSS: relative importance of beliefs. *ACM SigMIS Database, 26*(2-3), 42-64. doi: 10.1145/217278.217285

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information systems research, 14*(2), 189-217. doi: 10.1287/isre.14.2.189.16018

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. In R. H. Hoyle (Ed.), *Statistical strategies for small sample research* (Vol. 1, pp. 307-341). New York, US: SAGE Publications, Inc.

Chiu, C.-m., Chang, C.-c., Cheng, H.-l., & Fang, Y.-h. (2009). Determinants of customer repurchase intention in online shopping. *Online Information Review, 33*(4), 761-784. doi: 10.1108/14684520910985710

Christensen, C. M., & Bower, J. L. (1995, January). Disruptive technologies: catching the wave. *Harvard Business Review, 35 (1),* 43-53.

Chtourou, M. S., & Souiden, N. (2010). Rethinking the TAM model: time to consider fun. *Journal of Consumer Marketing, 27*(4), 336-344. doi: 10.1108/07363761011052378

Chuan-Chuan Lin, J., & Lu, H. (2000). Towards an understanding of the behavioural intention to use a web site. *International Journal of Information Management, 20*(3), 197-208. doi: 10.1016/S0268-4012(00)00005-0

Coakes, S. J., & Steed, L. (2009). *SPSS: Analysis without anguish using SPSS version 14.0 for Windows*. New York, NY, USA: John Wiley & Sons, Inc.

Cochran, W. G. (2007). *Sampling techniques* (6th ed.). New York NY, US: John Wiley & Sons.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological bulletin, 112*(1), 155.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale NJ: Erlbaum.

Compeau, D., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS quarterly, 23*(2), 145-158. doi: 10.2307/249749

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS quarterly, 19*(2), 189-211.

Covington, J. (2001). Leading successful, sustainable change. *Executive Excellence, 2*(5), 15-16. http://www.strategyletter.com/CD0905/guest_article.php

Cox, D. R., & Hinkley, D. V. (1979). *Theoretical statistics* (2nd ed.). Florida, US: CRC Press.

Cox, R., & Brittain, P. (2004). *Retailing: an introduction* (Fourth ed.). Upper Saddle River, New Jersey: Pearson Education Limited.

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Calofonia: Sage Publications.

Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (1st ed.). Saddle River, NJ: Prentice Hall

Creswell, J. W. (2012). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). London, UK: SAGE Publications, Incorporated.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Newcastle upon Tyne, UK: SAGE Publications Limited.

Daniel, B., & Bush. (2002). *Marketing research without SPSS* (4th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Dankwambo, I. H. (2009). *Understanding the e-Payment System*. Abuja: Budget Office, Nigeria Retrieved from http://www.budgetoffice.gov.ng/workshop%20paper/e-payment%20BoF.pdf.

Davenport, T. H., & Short, J. E. (2003). Information technology and business process redesign. *Operations management: critical perspectives on business and management, 1*, 1-27.

David-West, O. (2012). *Retail electronic banking quality (EBQ) in Nigeria: a performance evaluation*. Paper presented at the 24th National Conference of the Nigeria Computer Society (NCS), Uyo.

Davis, F. D. (1985). *A technology acceptance model for empirically testing new end-user information systems: Theory and results.* Massachusetts Institute of Technology, Sloan School of Management.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science, 35*(8), 982-1003.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace1. *Journal of Applied Social Psychology, 22*(14), 1111-1132. doi: 10.1111/j.1559-1816.1992.tb00945.x

Dawes, J. G. (2008). Do data characteristics change according to the number of scale points used? An experiment using 5 point, 7 point and 10 point scales. *International journal of market research, 51*(1), 61-104.

Deal, K. (2006). Structural equation modeling statistics for softies. *Marketing Research, 18*(4), 38-40.

Deng, S., Liu, Y., & Qi, Y. (2011). An empirical study on determinants of web based question-answer services adoption. *Online Information Review, 35*(5), 789-798. doi: 10.1108/14684521111176507

Diamantopoulos, A., & Siguaw, J. A. (2006). Formative versus reflective indicators in organizational measure development: a comparison and empirical illustration.

British Journal of Management, 17(4), 263-282. doi: 10.1111/j.1467-8551.2006.00500.x

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: an alternative to scale development. *Journal of marketing research, 38*(2), 269-277.

Drejer, A. (1996). Frameworks for the magement of technology: towards a contingent approach. *Technology Analysis & Strategic Management, 8*(1), 9-20.

Drucker, P. F. (1969). *The age of discontinuity: guidelines to our changing society* (1st ed.). New York: Harper & Row.

Du, H., Zhu, G., Zhao, L., & Lv, T. (2012). An empirical study of consumer adoption on 3G value-added services in China. *Nankai Business Review International, 3*(3), 257-283. doi: 10.1108/20408741211264576

Duncan, O. D. (1952). Urbanization and Retail Specialization. *Social Forces, 30*(3), 267-271.

El-Gayar, O. F., & Moran, M. (2006). College students' acceptance of Tablet PCs: an application of the UTAUT model. from Dakota State University http://www.homepages.dsu.edu/moranm/research/publications/dsi06-rip-tam-utaut.pdf

Erdfelder, E., Faul, F., & Buchner, A. (Cartographer). (1996). G*POWER: A general power analysis program. Retrieved from http://link.springer.com/article/10.3758/BF03203630

Euromonitor International. (2012). *International Marketing Data and Statistics 2013.* (1), Euromonitor International Ltd.

Fagbemi, T. O., Uadiale, O. M., & Noah, A. O. (2010). The ethics of tax evasion: Perceptual evidence from Nigeria. *European journal of social sciences, 17*(3), 360-371.

Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. Akron, OH, US: University of Akron Press.

Fani-Kayode, F. (2014). Jonathan, Sanusi and the birth of a hero, *Premium Times*. Retrieved from http://www.premiumtimesng.com/opinion/155613-jonathan-sanusi-and-the-birth-of-a-hero-by-femi-fani-kayode.html

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior research methods, 41*(4), 1149-1160. doi: 10.3758/BRM.41.4.1149

Feldman, D. C. (2004). What are we talking about when we talk about theory? *Journal of management, 30*(5), 565-567. doi: 10.1016/j.jm.2004.05.001

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage publications.

Fillion, G., Hassen, B., & Jean-Pierre, E. (2011). *Testing UTAUT on the use of ERP systems by middle managers and end-users of medium- to large-sized Canadian enterprises.* Paper presented at the Allied Academies International Conference.

Fiorini, R., Hattingh, D., Maclaren, A., Russo, B., & Sun-Basorun, A. (2013). Africa's growing giant: Nigeria's new retail economy. *Consumer and Shopper Insights.* from http://mckinseyonmarketingandsales.com/sites/default/files/pdf/Nigerian%20consumer.pdf

First Bank Nigeria. (2012). POS Terminals. 2012, from www.firstbanknigeria.com/EBanking/PoSTerminals/tabid/114/Default.aspx

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research* (1st ed.). Boston, US: Addison-Wesley Publishers.

Fisher, R. A. (1925). *Theory of statistical estimation.* Paper presented at the Mathematical Proceedings of the Cambridge Philosophical Society.

Foon, Y. S., & Fah, B. C. Y. (2011). Internet banking adoption in Kuala Lumpur: An application of UTAUT model. *International Journal of Business and Management, 6*(4), 161-167.

Fornell, C., & Cha, J. (1994). Partial least squares. *Advanced methods of marketing research, 407*, 52-78. doi: 10.1002/0471667196.ess1914.pub2

Fornell, C., & Larcker, D. F. (1981a). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18*(1), 39-50.

Fornell, C., & Larcker, D. F. (1981b). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research, 18*(3), 382-388.

Freeman, M., Preissle, J., Roulston, K., & Pierre, E. A. S. (2007). Standards of evidence in qualitative research: An incitement to discourse. *Educational Researcher, 36*(1), 25-32. doi: 10.3102/0013189X06298009

Gao, T., & Deng, Y. (2012). *A study on users' acceptance behavior to mobile e-books application based on UTAUT model.* Paper presented at the IEEE 3rd International Conference on Software Engineering and Service Science (ICSESS), 2012 Beijing, China.

Gbegi, D. (2013). An evaluation of the effect of fraud and related financial crimes on the Nigerian economy. *Kuwait Chapter of Arabian Journal of Business and Management Review, 2*(7), 81-91.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural equation modeling and regression: guidelines for research practice *Communications of the Association for Information Systems, 4*(7), 1-70.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika, 61*(1), 101-107. doi: 10.1093/biomet/61.1.101

Geyer, G., Kuhn, C., & Schmid, B. (1996). *Designing a market for quantitative knowledge.* Paper presented at the 29th Hawaii International Conference on System Sciences, 1996., Maui, Hawaii, USA.

Gholami, R., Ogun, A., Koh, E., & Lim, J. (2010). Factors affecting e-payment adoption in Nigeria. *Journal of Electronic Commerce in Organizations (JECO), 8*(4), 51-67. doi: 10.4018/jeco.2010100104

Glynn, S. M., & Koballa, T. (2006). Motivation to learn in college science. *Handbook of college science teaching, 25*, V32.

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS quarterly, 19*(2), 213-236.

Götz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In V. E. Vinzi, W. W. Chin, J. Henseler & H. Wang (Eds.), *Handbook of partial least squares* (pp. 691-711): Springer.

Graeber, D. (2001). *Toward an anthropological theory of value: the false coin of our own dreams* (1st ed.): Palgrave New York.

Gravetter, F., & Wallnau, L. (2007). *Statistics for the behavioral sciences* (7th ed.). Balmont, CA: Thomson Wadsworth.

Green, S. B., & Salkind, N. J. (2010). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (5th ed.). Upper Saddle River, New Jersey: Prentice Hall Press.

Griffiths, A. (2006). *101 ways to really satisfy your customers: How to keep your customers and attract new ones* (2nd ed.). Crows Nest, Australia: Allen & Unwin.

Guarino, N., Oberle, D., & Staab, S. (2008). What is an Ontology. In S. S. R. Studer (Ed.), *Handbook on Ontologies: International Handbooks on Information Systems* (1 ed., pp. 1-17). Karlsruhe, Germany: Springer.

Guriting, P., & Ndubisi, N. O. (2006). Borneo online banking: evaluating customer perceptions and behavioural intention. *Management Research News, 29*(1/2), 6-15. doi: 10.1108/01409170610645402

Guy, C. M. (1998). Classifications of retail stores and shopping centres: some methodological issues. *GeoJournal, 45*(4), 255-264. doi: 10.1023/A:1006960414161

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A prima on partial least squares structural equation modeling (PLS-SEM)* (1st ed.). Los Angeles: Sage.

Hair, J. F., Money, A. H., Samouel, P., & Page, M. (2007a). *Research methods for business* (2nd ed.). West Sussex: John Wiley & Sons

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19*(2), 139-152. doi: 10.2753/MTP1069-6679190202

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science, 40*(3), 414-433. doi: 10.1007/s11747-011-0261-6

Hair, J. F., Tatham, R. L., Anderson, R. E., & Black, W. (2007b). *Multivariate Data Analysis* (6th ed.): Pearson Prentice Hall Upper Saddle River, NJ.

Hair, J. J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Hamel, G. (2000a). *Leading the Revolution* (1 ed.). Boston, MA, USA: Harvard Business School Press.

Hamel, G. (2000b). Waking up IBM: How a gang of unlikely rebels transformed Big Blue. *Harvard Business Review, 78*(4), 137-146.

Hamilton, D., & Gabriel, J. (2012). Dimensions of fraud in Nigeria quoted firms. *American Journal of Social and Management Sciences, 3*(3), 112-120. doi: 10.5251/ajsms.2012.3.3.112.120

Hammer, M., & Champy, J. (1993a). Business process reengineering. *London: Nicholas Brealey*.

Hammer, M., & Champy, J. (1993b). *Reengineering the corporation: a manifesto for business evolution* (2nd ed.). London: Nicholas Brealey.

Harari, O. (1996). Why did reengineering die. *Management Review, 85*(6), 49-52.

Hayduk, L. A., & Littvay, L. (2012). Should researchers use single indicators, best indicators, or multiple indicators in structural equation models? *BMC medical research methodology, 12*(1), 159-175. doi: 10.1186/1471-2288-12-159

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (1st ed.). New York: Guilford Press.

Henseler, J. (2012). PLS-MGA: A non-parametric approach to partial least squares-based multi-group analysis *Challenges at the interface of data analysis, computer science, and optimization* (pp. 495-501). Berlin Heidelberg: Springer.

Henseler, J., & Chin, W. W. (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling: A Multidisciplinary Journal, 17*(1), 82-109. doi: 10.1080/10705510903439003

Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. In V. E. Vinzi, W. W. Chin, J. Henseler & H. Wang (Eds.), *Handbook of partial least squares* (pp. 713-735). London: Springer.

Henseler, J., Ringle, C., & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing (AIM), 20*, 277-320. doi: 10.1108/S1474-7979(2009)0000020014

Hewing, M. (2014). *Business process blueprinting: A method for customer-oriented business process modeling* (1st ed.). Berlin, Germany: Imprint: Springer Gabler.

Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of applied psychology, 72*(2), 307-313.

Ho, K. K. W., & See-To, E. W. K. (2010). *An Exploratory Study on the Impact of Trust on Different E-Payment Gateways: Octopus Card Vs. Credit Card*. Paper presented at the Pacific Asia Conference on Information Systems, Taipei, Taiwan.

Hong, W., Chan, F. K., Thong, J. Y., Chasalow, L. C., & Dhillon, G. (2013). A Framework and Guidelines for Context-Specific Theorizing in Information Systems Research. *Information systems research, 25*(1), 111-136.

Hong, W., Chan, F. K. Y., Thong, J. Y. L., Chasalow, L. C., & Dhillon, G. (2014). A framework and guidelines for context-specific theorizing in information systems research. *Information systems research, 25*(1), 111-136.

Huang, N., & Qin, G. (2011). *A study of online virtual fitting room adoption based on UTAUT*. Paper presented at the International Conference on E -Business and E -Government (ICEE), 2011, Shanghai, China.

Huh, H. J., Kim, T. T., & Law, R. (2009). A comparison of competing theoretical models for understanding acceptance behavior of information systems in upscale hotels. *International Journal of Hospitality Management, 28*(1), 121-134.

Hui, B. S., & Wold, H. (1982). Consistency and consistency at large of partial least squares estimates. In K. G. Jöreskog & H. Wold (Eds.), *Systems under indirect observation* (pp. 119-130). North Holland, Amsterdam: Springer.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: a review of four recent studies. *Strategic management journal, 20*(2), 195-204. doi: 10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7

Humphrey, C. (1985). Barter and economic disintegration. *Man, 20*(1), 48-72.

Humphrey, C., & Hugh-Jones, S. (1992). *Barter, exchange and value: an anthropological approach* (1st ed.). Cambridge: Cambridge University Press.

Humphrey, D., Kim, M., & Vale, B. (2001). Realizing the gains from electronic payments: costs, pricing, and payment choice. *Journal of Money, Credit and Banking, 33*(2), 216-234.

Iacobucci, D., & Churchill, G. (2004). *Marketing research: methodological foundations* (9th ed.). Mason, OH: Thomson/South-Western.

Iacobucci, D., & Churchill, G. (2009). *Marketing research: methodological foundations* (10th Ed.). Boston, MA, US: Cengage Learning.

Idowu, B. (2014). Cashless: PoS Transactions Value Hits N27bn In 2 years – CBN, *Leadership*. Retrieved from http://leadership.ng/business/387937/cashless-pos-transactions-value-hits-n27bn-2-years-cbn

Ifinedo, P. (2012). Factors influencing e-government maturity in transition economies and developing countries: a longitudinal perspective. *ACM SigMIS Database, 42*(4), 98-116. doi: 10.1145/2096140.2096147

Ilesanmi, F. (2012). Cashless Policy: Disconnects Must be Fixed - Adeyemi | Nigeria CommunicationsWeek. Retrieved 10/9/2012, from Communicationsweek Media Limited (Nigeria) www.nigeriacommunicationsweek.com.ng/e-guest/cashless-policy-disconnects-must-be-fixed-adeyemi

International Monetary Fund. (2012). World Bank list of economies.

Jankowicz, A. D. (2005). *Business research projects*: Cengage Learning Business Press.

Jean, L., Scott, B., & Patrick, D. (2011). World Payments Report. Scotland

Jessup, L. M., Valacich, J. S., & Wade, M. (2008). *Information systems today: Why IS matters*: Pearson Prentice Hall.

John, D. (2002). *Organisational learning and effectiveness*: Routledge.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review, 31*(2), 386-408. doi: 10.5465/AMR.2006.20208687

Kale, Y. (2012). *Nigerian economy in the first half of 2012 & revised economic outlook for 2012 - 2015*. Abuja: National Bureau of Statistics Retrieved from http://www.nigerianstat.gov.ng/.

Kendall, S. D. (2006a). Customer service from the customer's perspective. In L. Fogli (Ed.), *Customer service delivery: Research and best practices* (pp. 3-21). San Francisco: Jossey-Bass.

Kendall, S. D. (2006b). Customer service from the customer's perspective. *Customer service delivery: Research and best practices*, 3-21.

Khong, K. W., & Richardson, S. (2003). Business process re-engineering in Malaysian banks and finance companies. *Managing service quality, 13*(1), 54-71.

Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision support systems, 44*(2), 544-564.

Kitchenham, B., & Pfleeger, S. L. (2002). Principles of survey research part 5: Populations and samples. *ACM SIGSOFT Software Engineering Notes, 27*(5), 17-20. doi: 10.1145/571681.571686

Kotter, J. B. (1995). Leading change: Why transformation effors fail. *Harvard Business Review*, 59-67.

Kotter, J. B. (1996). *Leading change* (1st ed.). Boston MA: Harvard Business Review.

Kotter, J. P. (2008). *A sense of urgency* (1st ed.). Boston, Massachusetts: Harvard Business Press.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educ Psychol Meas, 30*(3), 607-610. doi: 10.1177/001316447003000308

Kumar, M., Talib, S. A., & Ramayah, T. (2013). *Business research methods*. Kuala Lumpur: Oxford Fajar/Oxford University Press.

Kuo, Y.-F., & Yen, S.-N. (2009). Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior, 25*(1), 103-110. doi: 10.1016/j.chb.2008.07.007

Kwek, C. L., Tan, H. P., Lau, T.-C., & Rahman, A. (2010). Investigating the shopping orientations on online purchase intention in the e-commerce environment: A Malaysian study. *Journal of Internet Banking and Commerce, 15*(2), 1-22.

Lai, D. C.-F., Lai, I. K.-W., & Jordan, E. (2009). *An extended UTAUT model for the study of negative user adoption behaviours of mobile commerce.* Paper presented at the The 9th International Conference on Electronic Business, Macau.

Lallmahamood, M. (2007). An examination of individual's perceived security and privacy of the internet in Malaysia and the influence of this on their intention to use e-commerce: Using an extension of the technology acceptance model. *Journal of Internet Banking and Commerce, 12*(3), 1-26.

Lam, T., Cho, V., & Qu, H. (2007). A study of hotel employee behavioral intentions towards adoption of information technology. *International Journal of Hospitality Management, 26*(1), 49-65. doi: 10.1016/j.ijhm.2005.09.002

Laudon, K. C., & Traver, C. G. (2007). *E-commerce: business technology society business. technology. society*. (4th ed.). Upper Saddle River, New Jersey: Pearson Prentice Hall.

Laudon, K. C., & Traver, C. G. (2010). *E-Commerce 2010: Business Technology, Society* (6th ed.). London, UK: Pearson.

Ledez, R. E. (2008). Change management: getting a tuned up organization. *Business Intelligence Journal*, 111-119.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems, 12*(4), 305-328. doi: 10.1016/j.accinf.2011.05.002

Li, H., & Huang, W. (2009). Applying theory of perceived risk and technology acceptance model in the online shopping channel. *World Academy of Science Engineering and Technology, 53*(4), 919-925.

Li, L. (2010). *A critical review of technology acceptance literature*. Accounting, Economics and Information Systems. College of Business, Grambling State University. Grambling, LA. Retrieved from http://www.swdsi.org/swdsi2010/sw2010_preceedings/papers/pa104.pdf

Liao, C., Liu, C.-C., & Chen, K. (2011). Examining the impact of privacy, trust and risk perceptions beyond monetary transactions: An integrated model. *Electronic Commerce Research and Applications, 10*(6), 702-715. doi: 10.1016/j.elerap.2011.07.003

Lim, W. M., & Ting, D. H. (2012). E-shopping: An analysis of the uses and gratifications theory. *Modern Applied Science, 6*(5), 48-63. doi: 10.5539/mas.v6n5p48

Limayem, M., Hirt, S. G., & Chin, W. W. (2001). *Intention does not always matter: the contingent role of habit on IT usage behavior.* Paper presented at the The 9th European Conference on Information Systems, Bled, Slovenia.

Lin, C.-P., & Anol, B. (2008). Learning online social support: an investigation of network information technology based on UTAUT. *CyberPsychology & behavior, 11*(3), 268-272. doi: 10.1089/cpb.2007.0057

Lin, C.-S., Tzeng, G.-H., Chin, Y.-C., & Chang, C.-C. (2010). Recommendation sources on the intention to use e-books in academic digital libraries. *Electronic Library, The, 28*(6), 844-857. doi: 10.1108/02640471011093534

Ling, K. C., Chai, L. T., & Piew, T. H. (2010). The effects of shopping orientations, online trust and prior online purchase experience toward customers' online purchase intention. *International Business Research, 3*(3), 63-76. doi: 10.5539/ibr.v3n3p63

Little, T. D., Bovaird, J. A., & Widaman, K. F. (2006). On the merits of orthogonalizing powered and product terms: Implications for modeling interactions among latent variables. *Structural Equation Modeling, 13*(4), 497-519. doi: 10.1207/s15328007sem1304_1

Lohmöller, J.-B. (1989). *Latent variable path modeling with partial least squares* (1st ed.). Berlin Heidelberg: Springer-Verlag

Lowe, R. F., & Montagu, D. (2009). Legislation, regulation, and consolidation in the retail pharmacy sector in low-income countries. *Southern Med Review, 2*(2), 35-44.

Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioural causal theory: When to choose it and how to use it. *IEEE Transactions on Professional Communication, 57*(2), 123-146. doi: 10.1109/TPC.2014.2312452

Lu, H., Hsu, C., & Hsu, H. (2005). An empirical study of the effect of perceived risk upon intention to use online applications. *Information Management & Computer Security, 13*(2), 106-120. doi: 10.1108/09685220510589299

Lu, Y., Cao, Y., & Yang, S. (2010). *An empirical investigation of behavioral intention to use online services.* Paper presented at the The 2nd IEEE International Conference on Information Management and Engineering (ICIME), 2010 Chengdu, China.

Makama, S. D. (2010). *2006 Population and Housing Census*. Abuja, Nigeria.

Maldonado, U. P. T., Khan, G. F., Moon, J., & Rho, J. J. (2011). E-learning motivation and educational portal acceptance in developing countries. *Online Information Review, 35*(1), 66-85. doi: 10.1108/14684521111113597

Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information systems research, 15*(4), 336-355. doi: 10.1287/isre.1040.0032

Mangin, J. P. L., Bourgault, N., León, J. A. M., & Guerrero, M. M. (2012). Testing control, innovation and enjoy as external variables to the technology acceptance model in a north American French banking environment. *International Business Research, 5*(2), 13-26. doi: 10.5539/ibr.v5n2p13

Marchewka, J. T., Liu, C., & Kostiwa, K. (2007). An application of the UTAUT model for understanding student perceptions using course management software. *Communications of the IIMA, 7*(2), 93-104.

Mardikyan, S., Beşiroğlu, B., & Uzmaya, G. (2012). Behavioral Intention towards the Use of 3G Technology. *Communications of the IBIMA, 2012*(2012), 1-10. doi: 10.5171/2012.622123

Marsh, D., & Stoker, G. (2002). *Theories and methods in political science* (2nd ed.). Basingstoke, UK: Palgrave.

Martins, E. P., & Garland Jr, T. (1991). Phylogenetic analyses of the correlated evolution of continuous characters: a simulation study. *Evolution, 45*(3), 534-557.

May, T. (2011). *Social research: Issues, methods and research* (4th ed.). New York City, US: McGraw-Hill International.

Mingers, J. (2001). Combining IS research methods: Towards a pluralist methodology. *Information systems research, 12*(3), 240-259.

Mintzberg, H. (1988). Generic strategies: toward a comprehensive framework. *Advances in Strategic Management, 5*(1), 1-67.

Mitchell, M. L., & Jolley, J. M. (1992). Generating the research hypotheses : Tapping intuition, theory and existirrg research. *Journal of Clinical Neuroscience, 15*(2), 37-90.

Mofleh, S., Wanous, M., & Strachan, P. (2008). The gap between citizens and e-government projects: The case for Jordan. *Electronic Government, an International Journal, 5*(3), 275-287. doi: 10.1504/EG.2008.018875

Moghavvemi, S., Salleh, N. A. M., Zhao, W., & Mattila, M. (2012). The entrepreneur's perception on information technology innovation adoption: An empirical analysis of the role of precipitating events on usage behavior. *Innovation: Management, Policy & Practice, 14*(2), 231-246. doi: 10.5172/impp.2012.14.2.231

Montalvo, C. (2006). What triggers change and innovation? *Technovation, 26*(3), 312-323.

Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information systems research, 2*(3), 192-222.

Morgan, G. (1980). Paradigms, metaphors, and puzzle solving in organization theory. *Administrative science quarterly, 25*(4), 605-622.

Naibbi, A. I., & Healey, R. G. (2014). Using geographically weighted regression to estimate the spatial patterns of fuelwood utilization in Nigeria. *American Journal of Geographic Information System, 3*(3), 109-121. doi: 10.5923/j.ajgis.20140303.01.

Nambisan, S., Agarwal, R., & Tanniru, M. (1999). Organizational mechanisms for enhancing user innovation in information technology. *MIS Quarterly, 23*(3), 365-395. doi: 10.2307/249468

National Bureau of Statistics Nigeria. (2012). Nigerian economy in the first half of 2012 & revised economic outlook for 2012 - 2015. Abuja, Nigeria: National Bereau of Statistics.

National Youth Service Corps. (2013). About the scheme. Retrieved 1st June, 2013, from http://www.nysc.gov.ng/about/about.php

Neuman, W. L. (2004). *Basics of social research* (2nd ed.). Boston, Massachucetts: Pearson.

Ngai, E. W., & Gunasekaran, A. (2004). Implementation of EDI in Hong Kong: An empirical analysis. *Industrial Management & Data Systems, 104*(1), 88-100. doi: 10.1108/02635570410514124

Nunnally, J., & Bernstein, I. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Nunnally, J., & Bernstein, I. (1994). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill.

Nwankwo, O., & Eze, O. R. (2013). Electronic payment in cashless economy of Nigeria: Problems and prospect. *Journal of Management Research, 5*(1), 138-151. doi: 10.5296/jmr.v5i1.2650

Nwaolisa, E. F., & Kasie, E. G. (2011). Electronic retail payment systems: User acceptability and payment problems in Nigeria. *Arabian Journal of Business and Management Review, 1*(9), 111-123.

Nwokoji, C. (2014). N4.8bn lost to e-fraud in 9 months —NIBSS, *Nigerian Tribune*. Retrieved from http://tribune.com.ng/news/news-headlines/item/21388-n4-8bn-lost-to-e-fraud-in-9-months-nibss

Nysveen, H., Pedersen, P. E., & Thorbjørnsen, H. (2005). Intentions to use mobile services: antecedents and cross-service comparisons. *Journal of the Academy of Marketing Science, 33*(3), 330-346. doi: 10.1177/0092070305276149

O'Sullivan, D., & Abela, A. V. (2007). Marketing performance measurement ability and firm performance. *Journal of Marketing, 71*(2), 79-93. doi: 10.1509/jmkg.71.2.79

Odumeru, J. A. (2012). The acceptance of e-banking by customers in Nigeria. *World Review of Business Research, 2*(2), 62 – 74.

Ogbodo, D. (2013). Nigeria: Mobile money transactions hit N10.1 billion in August, *This Day*. Retrieved from http://allafrica.com/stories/201309240418.html

Ogunleye, G. O., Adewale, O. S., & Alese, B. K. (2012). *An exploratory study on electronic retail payment systems: user acceptability and payment problems in Nigeria.* Paper presented at the 24th National Conference of the Nigeria Computer Society; "Towards a Cashless Nigeria: Tools and Strategies", Lagos.

Ojiako, U., Chipulu, M., Maguire, S., Akinyemi, B., & Johnson, J. (2012). User adoption of mandatory enterprise technology. *Journal of enterprise information management, 25*(4), 373-391. doi: 10.1108/17410391211245847

Oladejo, M., & Akanbi, T. (2012). Bankers perceptions of electronic banking in Nigeria: A review of post consolidation experience. *Research Journal of Finance and Accounting, 3*(2), 1-11.

Omar, K., Ala'a, Al-Nasrallah. (2011). *Determinants of e-Gov adopt in Kuwait: The case of the traffic violation e-payment system (TVEPS)* Paper presented at the Second Kuwait Conference on e-Services and e-Systems, Kuwait.

Onyema, A. (2011). Internet infiltration to Nigeria: Burden of cyber-crime to e-commerce. *Internet and Society: Technology and Politic of Control, 7*(1), 23-31.

Ooi, K.-B., Sim, J.-J., Yew, K.-T., & Lin, B. (2011). Exploring factors influencing consumers' behavioral intention to adopt broadband in Malaysia. *Computers in Human Behavior, 27*(3), 1168-1178. doi: 10.1016/j.chb.2010.12.011

Oshlyansky, L., Cairns, P., & Thimbleby, H. (2007). *Validating the Unified Theory of Acceptance and Use of Technology (UTAUT) tool cross-culturally.* Paper presented at the 21st British HCI Group Annual Conference on People and Computers, Swinton, UK.

Özkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. *Journal of enterprise information management, 23*(3), 305-325. doi: 10.1108/17410391011036085

Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Crows Nest, Australia: McGraw-Hill International.

Pappas, I., Giannakos, M. N., Pateli, A., & Chrissikopoulos, V. (2011). *Online purchase intention: Investigating the effect of the level of customer perceptions on adoption*. Paper presented at the IADIS International Conference e-Society 2011, Avilla, Spain.

Parmjit, S., Chan, Y., & Gurnam, K. (2006). *A comprehensive guide to writing a research proposal* (1st ed.). Kuala Lumpur: Venton.

Pather, S., & Remenyi, D. (2004). *Some of the philosophical issues underpinning research in information systems: from positivism to critical realism.* Paper presented at the 2004 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists on it Research in Developing Countries, Cape Town, South Africa.

Payne, E., & Curtis, M. (2008). Can the unified theory of acceptance and use of technology help us understand the adoption of computer-aided audit techniques by auditors: Working paper, University of Louisville.

Peng, D. X., & Lai, F. (2012). Using partial least squares in operations management research: A practical guideline and summary of past research. *Journal of Operations Management, 30*(6), 467-480. doi: 10.1016/j.jom.2012.06.002

Phau, I., & Poon, S. M. (2000). Factors influencing the types of products and services purchased over the Internet. *Internet Research, 10*(2), 102-113. doi: 10.1108/10662240010322894

Phillips, E., & Pugh, D. (2010). *How to get a PhD: A handbook for students and their supervisors* (4th ed.). Berkshire, England: McGraw-Hill International.

Pilkington, A., & Teichert, T. (2006). Management of technology: themes, concepts and relationships. *Technovation, 26*(3), 288-299.

Plouffe, C. R., Hulland, J. S., & Vandenbosch, M. (2001). Research report: Richness versus parsimony in modeling technology adoption decisions—understanding merchant adoption of a smart card-based payment system. *Information systems research, 12*(2), 208-222. doi: doi:10.1287/isre.12.2.208.9697

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88*(5), 879-903. doi: 10.1037/0021-9010.88.5.879

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of management, 12*(4), 531-544. doi: 10.1177/014920638601200408

Porter, A. C., & Brophy, J. (1988). Synthesis of research on good teaching: Insights from the work of the Institute for research on Teaching. *Educational leadership, 45*(8), 74-85.

Qureshi, I., & Compeau, D. (2009). Assessing between-group differences in information systems research: a comparison of covariance-and component-based SEM. *MIS Quarterly, 33*(1), 197-214.

Raj, D. (1968). *Sampling theory* (1st ed.). New York: McGraw-Hill.

Rajapakse, J. (2011). *Extending the unified theory of acceptance and use of technology (UTAUT) model.* Paper presented at the 4th International Conference on Interaction Sciences (ICIS), 2011, Busan, Korea.

Rasheed, J., & Shiratuddin, N. (2009). The moderating effect of gender on behavioural intention to use iris authentication approach for public authentication among Nigerian users of public terminals. *Jurnal Sistem Teknik Industri, 10*(3), 918-922.

Reffat, R. (2003). *Developing a successful e-government.* Paper presented at the Symposium on e-Government: Opportunities and Challenge. Muscat Municipality, Oman.

Rehman, M., Esichaikul, V., & Kamal, M. (2012). Factors influencing e-government adoption in Pakistan. *Transforming Government: People, Process and Policy, 6*(3), 258-282. doi: 10.1108/17506161211251263

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of research in Marketing, 26*(4), 332-344. doi: 10.1016/j.ijresmar.2009.08.001

Reizenstein, R. (2004). Customer. In M. J. Stahl (Ed.), *Encyclopedia of health care management* (1st ed.). Thousand Oaks, Califonia: Sage Publishers Inc.

Rigopoulos, G., & Askounis, D. (2007). A TAM framework to evaluate users' perception towards online electronic payments. *Journal of Internet Banking and Commerce, 12*(3), 1-6.

Ringle, C. M., Wende, S., & Will, A. (2005). SmartPLS 2.0 (beta): Hamburg, Germany.

Rogers, E. M. (1962). *Diffusion of lnnovation* (1st ed.). New York: Free Press.

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.

Rouibah, K. (2012). *Trust factors influencing intention to adopt online payment in Kuwait*. Paper presented at the Southern Association for Information Systems Conference, Atlanta, GA, USA.

Rouibah, K., Abbas, H., & Rouibah, S. (2011). Factors affecting camera mobile phone adoption before e-shopping in the Arab world. *Technology in Society, 33*(3), 271-283. doi: 10.1016/j.techsoc.2011.10.001

Salisbury, W. D., Pearson, R. A., Pearson, A. W., & Miller, D. W. (2001). Perceived security and World Wide Web purchase intention. *Industrial Management & Data Systems, 101*(4), 165-177. doi: 10.1108/02635570110390071

Sanchez-Franco, M. J. (2006). Exploring the influence of gender on the web usage via partial least squares. *Behaviour & Information Technology, 25*(1), 19-36. doi: 10.1080/01449290500124536

Sanusi, S. L. (2011). *Banks in Nigeria and national economic development: A critical review*. Paper presented at the Seminar on Becoming An Economic Driver While Applying Banking Regulations, Lagos.

Sekaran, U. (2003a). *Research methods for business: A skill building approach* (4th ed.). New York, NY: John Wiley and Sons.

Sekaran, U. (2003b). Research Methods for Business: A Skill Building Approach, : John Wiley and Sons.

Sekaran, U., & Bougie, J. (2009). *Research methods for business: A skill building approach* (5th ed.): Wiley.

Seneler, C. O., Basoglu, N., & Daim, T. U. (2010). An empirical analysis of the antecedents of adoption of online services: A prototype-based framework. *Journal of Enterprise Information Management, 23*(4), 417-438. doi: 10.1108/17410391011061753

Service Related Credit Cards Processing. (2012). How an electronic payment process takes place. Retrieved 22nd November, from http://www.servicerelated.com/

Sharma, S., Durand, R. M., & Gur-Arie, O. (1981). Identification and analysis of moderator variables. *Journal of marketing research, 18*(3), 291-300.

Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of consumer research, 15*(3), 325-343.

Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic management journal, 20*(7), 595-623. doi: 10.1002/(SICI)1097-0266(199907)20:7<595::AID-SMJ47>3.0.CO;2-5

Sin, S. S., Nor, K. M., & Al-Agaga, A. M. (2012). Factors affecting Malaysian young consumers' online purchase intention in social media websites. *Procedia-Social and Behavioral Sciences, 40*(5), 326-333. doi: 10.1016/j.sbspro.2012.03.195

Standard Chartered. (2012). FAQs on CBN Cash-less Society Policy. In S. Chartered (Ed.), (pp. 1-5). Abuja.

Starkweather, J. (2012). Step out of the past: Stop using coefficient alpha; there are better ways to calculate reliability. *Research and Statistical Support*.

Stigler, S. (2008). Fisher and the 5% level. *Chance, 21*(4), 12-12. doi: 10.1080/09332480.2008.10722926

Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society. Series B (Methodological), 36*(2), 111-147.

Su, S.-P., Tsai, C.-H., & Chen, Y.-K. (2012). *Applying the technology acceptance model to explore intention to use Telecare system in Taiwan.* Paper presented at the 13th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel & Distributed Computing (SNPD), 2012, Kyoto, Japan.

Suki, N. M., & Ramayah, T. (2010). User acceptance of the e-government services in Malaysia: structural equation modelling approach. *Interdisciplinary Journal of Information, Knowledge & Management, 5*(1), 395-413.

Sumak, B., Polancic, G., & Hericko, M. (2010). *An empirical study of virtual learning environment adoption using UTAUT*. Paper presented at the 2nd International Conference on Mobile, Hybrid, and On-Line Learning, 2010. ELML'10, Saint Maarten, Holland.

Sundel, M., & Sundel, S. S. (2004). *Behavior change in the human services: Behavioral and cognitive principles and applications*. Thousand Oaks, California: SAGE Publications, Inc.

Susskind, A. M., Kacmar, K. M., & Borchgrevink, C. P. (2003). Customer service providers' attitudes relating to customer service and customer satisfaction in the customer-server exchange. *Journal of applied psychology, 88*(1), 179-187. doi: 10.1037/0021-9010.88.1.179

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education.

Tacq, J. J., & Tacq, J. (1997). *Multivariate analysis techniques in social science research: From problem to analysis* (1st ed.). London: Sage Pbulications Limited.

Tan, A. (2012). Industry of POS. Retrieved 14 Nov. 2012, from http://www.irrica.com/point-of-sales-system-pos/133-industry-of-pos.html

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information systems research, 6*(2), 144-176. doi: 10.1287/isre.6.2.144

Thompson, R. L., & Higgins, C. A. (1991). Personal computing: Toward a conceptual model of utilization. *MIS quarterly, 15*(1), 125-143.

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1995). Influence of experience on personal computer utilization: Testing a conceptual model. *Journal of Management Information Systems, 11*(1), 167-187.

Toffler, A. (1970). *Future shock* (1st ed.). New York: Random House.

Tong, D. Y. K. (2009). A study of e-recruitment technology adoption in Malaysia. *Industrial Management & Data Systems, 109*(2), 281-300. doi: 10.1108/02635570910930145

Trochim, W. M., & Donnelly, J. P. (2008). *Research methods knowledge base* (3rd ed.). Boston: Atomic Dog/Cengage Learning.

Troshani, I., & Rao, S. (2007). Drivers and inhibitors to XBRL adoption: A qualitative approach to build a theory in under-researched areas. *International Journal of E-Business Research (IJEBR), 3*(4), 98-111. doi: 10.4018/jebr.2007100106

Tsang, E. W. K., & Willliams, J. N. (2012). Generalization and induction: Misconceptions, clarifications, and a classification of induction. *MIS Quarterly-Management Information Systems, 36*(3), 729-748.

Tuckman, B. W., & Sexton, T. L. (1992). Self-believers are self-motivated; self-doubters are not. *Personality and Individual Differences, 13*(4), 425-428. doi: 10.1016/0191-8869(92)90070-6

Tunde, D., & Medinat, A. (2013). Fuel retailers defraud Nigerians of N20bn in 3 months —Investigation, *Nigerian Tribune*. Retrieved from http://tribune.com.ng/news2013/index.php/en/news/item/10646-fuel-retailers-defraud-nigerians-of-n20bn-in-3-months-investigation

Turban, E., Lee, J. K., King, D., Liang, T. P., & Turban, D. (2009). *Electronic commerce 2010* (6th ed.). Upper Saddle River, New Jersey: Prentice Hall Press.

Uzonwanne, J. (2011). Investing in Nigeria: A Brief Strategy Guide. Abuja: Monitor Company Group Limited Partnership.

Uzor, B. (2012, 22 Aug. 2011). Only 3, 000 functioning PoS terminal in Nigeria, Newspaper, *BusinessDay Newspaper*. Retrieved from http://www.businessdayonline.com/NG/index.php/tech/78-computing/26343-only-3-000-functioning-pos-terminal-in-nigeria

Vakola, M., Tsaousis, I., & Nikolaou, I. (2004). The role of emotional intelligence and personality variables on attitudes toward organisational change. *Journal of Managerial Psychology, 19*(2), 88-110. doi: 10.1108/02683940410526082

Van Biljon, J., & Kotzé, P. (2007). *Modelling the factors that influence mobile phone adoption.* Paper presented at the Annual Research Conference on IT Research in Developing Countries, Pretoria, South Africa.

Van Birgelen, M., de Ruyter, K., & Wetzels, M. (2003). The impact of attitude strength on customer-oriented priority setting by decision-makers: An empirical investigation. *Journal of Economic Psychology, 24*(6), 763-783. doi: 10.1016/S0167-4870(03)00052-7

Van Dijk, J. A., Peters, O., & Ebbers, W. (2008). Explaining the acceptance and use of government Internet services: A multivariate analysis of 2006 survey data in the Netherlands. *Government Information Quarterly, 25*(3), 379-399. doi: 10.1016/j.giq.2007.09.006

Van Slyke, C., Belanger, F., & Comunale, C. L. (2004). Factors influencing the adoption of web-based shopping: the impact of trust. *ACM SigMIS Database, 35*(2), 32-49.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science, 46*(2), 186-204. doi: 10.1287/mnsc.46.2.186.11926

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *Management Information Systems Quarterly, 24*(1), 115-140.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly, 27*(3), 425-478.

Venkatesh, V., Sykes, T. A., & Zhang, X. (2011a). *'Just what the Doctor ordered': A revised UTAUT for EMR system adoption and use by Doctors.* Paper presented at the 44th Hawaii International Conference on System Sciences (HICSS), 2011 Kauai, HI.

Venkatesh, V., Thong, J. Y. L., Chan, F. K. Y., Hu, P. J. H., & Brown, S. A. (2011b). Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context. *Information Systems Journal, 21*(6), 527-555. doi: 10.1111/j.1365-2575.2011.00373.x

Viinikkala, M. (2003). Ontology in Information Systems. *Disponible en.* from http://www.cs.tut.fi/~kk/webstuff/Ontology.pdf

Walker, J. (2014). The RetroPsychoKinesis Project. *Chi-Square Calculator.* Retrieved 15 July, 2014, from https://www.fourmilab.ch/rpkp/experiments/analysis/chiCalc.html

Wan, C., Cheung, R., & Shen, G. Q. (2012). Recycling attitude and behaviour in university campus: a case study in Hong Kong. *Facilities, 30*(13/14), 630-646. doi: 10.1108/02632771211270595

Wang, H. I., & Yang, H. L. (2005). The role of personality traits in UTAUT model under online stocking. *Contemporary Management Research, 1*(1), 69-82. doi: 10.7903/cmr.v1i1.73

Warshaw, P. R. (1980). A new model for predicting behavioral intentions: An alternative to Fishbein. *Journal of marketing research, 17*(5), 153-172.

Watson, J. B. (1913). Psychology as the behaviorist views it. *20*(2), 158-177. doi: 10.1037/h0074428

Whetten, D. A. (2009). An examination of the interface between context and theory applied to the study of Chinese organizations. *Management and Organization Review, 5*(1), 29-55. doi: 10.1111/j.1740-8784.2008.00132.

Wills, M. J., El-Gayar, O., & Bennett, D. (2008). Examining healthcare professionals' acceptance of electronic medical records using UTAUT. *Issues in Information Systems, 9*(2), 396-401.

Wilson, B. J. (2011). *An investigation into three consumer constructs: explaining the nature of relations influencing brand relationship quality.* (Doctor of Philosophy), RMIT University.

Wold, H. (1974). Causal flows with latent variables: partings of the ways in the light of NIPALS modelling. *European Economic Review, 5*(1), 67-86. doi: 10.1016/0014-2921(74)90008-7

Wold, H. (1982). Soft modelling: The basic design and some extensions. In K. G. Jöreskog (Ed.), *Systems under indirect observation, Part II* (pp. 36-37). Amsterdam: North Holland Publishing.

Wong, I. A., & Dioko, L. D. A. (2013). Understanding the mediated moderating role of customer expectations in the customer satisfaction model: The case of casinos. *Tourism Management, 36,* 188-199. doi: 10.1016/j.tourman.2012.10.010

Wong, K.-T., Russo, S., & McDowall, J. (2013). Understanding early childhood student teachers' acceptance and use of interactive whiteboard. *Campus-Wide Information Systems, 30*(1), 4-16. doi: 10.1108/10650741311288788

Wu, L. (2012). An empirical research on poor rural agricultural information technology services to adopt. *Procedia Engineering, 29,* 1578-1583. doi: 10.1016/j.proeng.2012.01.176

Wu, M.-Y., Yu, P.-Y., & Weng, Y.-C. (2012). A Study on User Behavior for I Pass by UTAUT: Using Taiwan\'s MRT as an Example. *Asia Pacific Management Review, 17*(1), 92-111.

Wu, Y. L., Tao, Y. H., & YangJ, P. C. (2007). *Using UTAUT to explore the behavior of 3G mobile communication users.* Paper presented at the IEEE International Conference on Industrial Engineering and Engineering Management, 2007, Singapore.

Yahya, M., Nadzar, F., Masrek, N., & Rahman, B. A. (2011). *Determinants of UTAUT in measuring user acceptance of e-syariah portal in syariah courts in Malaysia.* Paper presented at the The 2 nd International Research Symposium in Service Management Yogyakarta, Indonesia.

Yamin, M., & Lee, Y. (2010). *Level of acceptance and factors influencing students' intention to use UCSI University's e-mail system.* Paper presented at the International Conference on User Science and Engineering (i-USEr), 2010, Selangor, Malaysia.

Yaqub, J., Bello, H. T., Adenuga, I. A., & Ogundeji, M. O. (2013). The cashless policy in Nigeria: Prospects and challenges. *International Journal of Humanities and Social Science*, *3*(3), 200-212.

Yu, C.-S. (2012). Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model. *Journal of Electronic Commerce Research, 13*(2), 104-121.

Zhou, T. (2008). *Exploring mobile user acceptance based on UTAUT and contextual offering.* Paper presented at the International Symposium on Electronic Commerce and Security, 2008 Guangzhou City, China.

Zhou, T. (2011). The impact of privacy concern on user adoption of location-based services. *Industrial Management & Data Systems, 111*(2), 212-226. doi: 10.1108/02635571111115146

Zhou, T. (2012). Examining location-based services usage from the perspectives of unified theory of acceptance and use of technology and privacy risk. *Journal of Electronic Commerce Research, 13*(2), 135-144.

Zhu, G., Sangwan, S., & Lu, T.-J. (2010). A new theoretical framework of technology acceptance and empirical investigation on self-efficacy-based value adoption model. *Nankai Business Review International, 1*(4), 345-372. doi: 10.1108/20408741011082543